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**Reconciling the irreconcilable? An application of economics to
long-term fiscal sustainability of the HIV/AIDS response in
Uganda**

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Thesis submitted for the degree of Doctor of Philosophy

October 2019

Thesis declaration form

I, Charles BIRUNGI, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Date: 2nd October 2019

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Abstract

This Ph.D. aims to propose a pragmatic approach to the long-term fiscal sustainability of the HIV and HIV response in Uganda. It is motivated by the fact that whereas financing of the HIV response has been among the dominant economic development issues over the last years, it now faces an uncertain outlook. Using a mixed-methods research approach, this Ph.D.'s empirical, theoretical, and methodological contributions improve our understanding of the economics (and politics) of achieving fiscal sustainability of HIV responses. Empirically, I found that Uganda will not “end AIDS” by 2030 despite projected significant reductions in AIDS deaths and new HIV infections by 68% and 80% respectively between 2010 and 2030 under a scale-up strategy, the Fast-Track approach. From a fiscal perspective, the corresponding direct and indirect HIV-induced contingent fiscal liabilities range between 150% and 200% of GDP (in 2015 terms). To cope with these fiscal quasi-liabilities implied by the national HIV response, a novel analytical framework for achieving fiscal sustainability of HIV responses is proposed and, through a proof-of-concept, validated in this Ph.D. Theoretically informed and relying on a set of core principles, behavioral economics-inspired, explicit political analysis and, game-theoretic approaches, I empirically assess the likely evolution of future public spending and revenues through analytic policy simulations and conclude that the fiscal space created from applying this novel and pragmatic approach could meet the above-mentioned HIV-induced contingent fiscal liabilities estimated at US\$ 24 billion by 2030. This Ph.D. also explores political economy considerations regarding long-term funding for the HIV response. This Ph.D. hopes to contribute to technically sound and politically achievable approaches to addressing HIV-related long-term fiscal challenges in Uganda and, more broadly, toward literature on the political economy of fiscal sustainability.

Impact Statement

The findings of this thesis provide further insight into the pathways for fiscally (and politically) sustainable HIV responses in Uganda, demonstrating how the seemingly “irreconcilable” HIV financing paradox can be reconciled. It is one of the first pieces of empirical work coherently investigating the following three inter-related big questions facing the HIV response in Uganda as it seeks to cope with HIV-related long-term fiscal challenges: Can it possibly be financed? Would the government, donors, or others want to finance it? And how can this be financed? By linking these three areas of research that previously were treated separately, this research fills a critical gap in the literature, opening exciting new challenges and opportunities for academic and policy inquiry.

My research finds the existence of technically sound and politically feasible policies that can make HIV revenue-raising and spending fiscally sustainable in Uganda. Principally, the analytical framework proposed and tested in this thesis has highlighted the importance of pragmatically considering political, behavioural economics, and game-theoretic perspectives, alongside macro-fiscal ones, to ensure the multidimensional approach presented in this thesis has an extended positive impact. This work has thus increased understanding around these issues and triggered new strategies capitalising on the findings. To date, my research has captured the interest of several economists, academics, and HIV response policymakers working on sustainable financing of HIV, health, and development who are keen to integrate my findings to improve existing financing mechanisms and architecture. I am also currently working on a project on how to stimulate political prioritization of health within domestic budgets. My findings could therefore play a key role in developing government, private sector, and donor policy for how HIV responses could be financed.

I have presented my work internationally at the International Health Economics Association (iHEA) Congresses in Milan, Italy and Boston, U.S in 2015 and 2017 respectively; International AIDS Economics Network (IAEN) pre-conferences in Durban, South Africa and Amsterdam, The Netherlands in 2016 and 2018 respectively; INTEREST workshop in Lilongwe, Malawi in 2016; and the African Health Economics and Policy Association (AfHEA) scientific conferences in Rabat, Morocco and Accra, Ghana in 2017 and 2019 respectively. Through my membership in the Working Group on GHS and UHC (which works globally to explore the intersections of two of global health's most important initiatives), Global Health Cost Consortium (GHCC), BMJ Advisory Group on the Health, Wealth, and Profits series, the Bill and Melinda Gates Foundation-supported "Economic impact of HIV" project, and the UNAIDS' Economists core group, I also attend regular meetings using my research to extend knowledge, contribute towards future directions in the field and encourage others to consider this research area.

Finally, as an applied economist, I chose to preserve and extend the value of my Ph.D. work by not keeping it apart in an ivory tower, disengaged from the world, but by taking it out to do battle with real-world policy and programmatic issues and processes. As a senior health economist with the United Nations in Uganda, Kenya, Malawi, Botswana, and Zimbabwe, I have managed to engage in policy processes using some of the tools and skills developed and insights gained during this study. Specifically, I have provided analytic and policy advisory services on improving the allocative efficiency of HIV responses. Currently, am involved in an international collaboration to develop practical policy ideas for reforming 'health taxes' for domestic resource mobilization (DRM) for universal health coverage (UHC) in sub-Saharan Africa (SSA). This is offering me an opportunity to diffuse the tools and approaches developed as well as insights gained in this Ph.D. to a regional and global audience.

Acknowledgements

To my supervisors – Associate Professor Timothy Edwin Colbourn and Professor Marcos Vera-Hernández – I am grateful for your generosity of time and intelligence. I have learned so much from you. I also had so much fun along the way! You have both invested a huge amount of time in providing academic support to me. Your critical comments and feedback are gratefully acknowledged. You have been a pleasure to work and spend time with. I have been privileged to have had the opportunity to benefit from your knowledge, experience, and passion. Drs. Markus Haacker and Hassan Haghparast-Bidgoli, my MPhil/Ph.D. upgrade examiners, engaged with my project during the upgrade process. You gave me a huge amount of useful and challenging feedback which was invaluable in helping me clarify the aims and objectives of my Ph.D.

Special thanks to everyone who took part in the study. I hope in some very small way, this work may help contribute to a better world. Without your unwavering support, this study could not have been carried out. I am deeply indebted to my examiners – Professors Deborah Johnston and Gorik Ooms – for their suggestions that helped to further improve the presentation of my thesis.

During the writing of this thesis, the work has greatly benefitted from exchanges and feedback from many individuals as I presented preliminary results at conferences and workshops. Throughout this process, I have been fortunate to receive conference funding from the International AIDS Economics Network (IAEN), International Health Economics Association (iHEA), African Health Economics and Policy Association (AfHEA), World Bank, UNAIDS, University College London, INTEREST, Association of Heterodox Economics (AHE), and the Bill and Melinda Gates Foundation. These fora were an extremely productive and creative time for me, and many of the ideas that I stumbled upon while there are in this thesis.

My close friends – you know who you are – have been there for me throughout, whether to listen to my academic woes or to help take my mind off them. I am lucky that you guys are on my side. You all helped keep me sane in the face of the ridiculous amounts of work that this full-time-PhD-whilst-doing-a-full-time-job entailed. In a special way, thanks to the Bisangas - you opened your home to me in London. I am forever grateful.

Finally, my family has suffered three long years of me being a student. Your love, faith, and unwavering support kept me going during times when I never thought it would end. I am eternally grateful. I could not have done it without you. I regret that I could not spend more time with my family, especially the ninjas (read children) – the other Birungis – over the years this thesis was written, and hope that one day you will take pride in this Ph.D.

Of course, all errors are entirely mine.

Preface

Growing up in rural Uganda, I witnessed first-hand the devastating effect of “*slim*” disease in the 1980s and 90s. As I went on to launch my career as a health economist in the 2000s, there was a very disturbing trend that became evident to me. On one hand, I noticed local voices became diminished. On the other hand, there seemed exceptionally more resources flowing to the HIV response – particularly from donors. Later, while leading the HIV, health, and development portfolio at UNDP in Uganda, as an international civil servant, these realities I had been keenly observing took on a new meaning for me. I vividly recall that evening on 22nd November 2011. It was a few minutes past 5:00 pm, when my mobile phone, safely tucked away in one corner of my desk, vibrated. A top-ranking government official was on the other end. I could sense the urgency and worry in her voice as she repeatedly said, “The Global Fund has canceled Round 11”. “What!” I was in surprise and disbelief as she repeated the message. The Global Fund Board, sitting in Accra, Ghana, had decided to cancel Round 11 that had only been launched a few months earlier.

I could understand the government official's worry. The Global Fund had been the main source of funding for the national HIV response. Behind this Board's decision to cancel Round 11 laid a risk to hundreds of thousands of Ugandan lives who depended on ARVs purchased using donor money. Given the magnitude of resources involved, these could not readily be financed from the government's own resources in the short-term. Thereafter, I got involved in a workstream to develop practical policy ideas to confront this profound development challenge whose significance I was certain would increase over the next several decades. This, among others, include the early think piece on options for sustainable financing for the HIV response as well as a panel discussion during the 2012 Joint Annual Review (JAR). This thesis, in part, is motivated by these critical junctures.

This thesis is organised as follows: in Chapter 1, as an introduction, I present the context within which this Ph.D. research is undertaken, the research question answered, the framework that guided the analysis in this thesis as well as the justification for this study. Thereafter, the thesis is structured into four inter-related parts: setting the scene; order of magnitude; macro-fiscal analysis; and discussions and conclusions. Part I comprises of one chapter that synthesizes relevant literature and data on the political economy of HIV/AIDS financing in Uganda. Part II contains two chapters, Chapter 3, using mathematical models, estimates, and projects the evolving burden of HIV disease in Uganda up to 2030. Chapter 4 estimates long-term financial resource needs for “ending” AIDS in Uganda through 2030. Part III, containing four chapters, deal s with the macro-fiscal dimensions of the thesis. A fiscal analysis of the national response to HIV/AIDS in Uganda is undertaken in Chapter 5. In Chapter 6, findings of a comprehensive literature survey on mechanisms to assure the fiscal sustainability of the HIV response are presented. Chapter 7 proposes a novel framework for the fiscal sustainability of the national HIV response in Uganda. Chapter 8, as a proof-of-concept, empirically analyses and validates the novel approach developed in this thesis to address the HIV fiscal sustainability challenge. Finally, Part IV, containing Chapter 9, brings the whole thesis together with reference to the fiscal sustainability of the HIV response. Specifically, this Chapter discusses the different strands of theoretical and empirical work laid out in the previous chapters and their corresponding novel contributions. Thereafter, I sketch a potential way forward.

Relevant additional information is included in extensive appendices. Their large number notwithstanding, all the thirteen (13) appendices are supplementary material. One does not require to read them for a full understanding of this thesis. Rather they are meant to ensure a complete record of all the work undertaken in this thesis is included in a single volume. Thus, to gain more insights into the context within which this research was undertaken,

one is invited to read them. Finally, the datasets used in this thesis are deposited at the UCL Research Data Repository accessible at <https://www.ucl.ac.uk/isd/services/research-it/research-data-repository>.

This thesis was completed between 2015 and 2019. A detailed timeline is provided in Appendix 1. Relatedly, a summary of my training and professional development, required as part of a UCL doctorate, is provided as Appendix 2 as a research log. A summary of the main contributions of this thesis is provided in § 9.2. As used in this thesis, § refers to a numbered section of the text. The following peer-reviewed journal articles¹ are anticipated:

- “Increasing political prioritization of health within domestic budgets” (Target journal: *BMJ*, currently under review);
- “It’s politics, stupid! A political analysis of the AIDS Trust Fund in Uganda” (Target journal: *African Journal of AIDS Research* (AJAR), published (see Appendix 4));
- “The end of AIDS: a global public good?” (Target journal: *African Journal of AIDS Research*);
- “Long-term liabilities of HIV financing = debt sentence? The fiscal impact of HIV in Uganda”, 2019 (Target journal: AJAR);
- “Getting most bang out of our buck? An allocative efficiency analysis of the national HIV/AIDS response in Uganda” (Target journal: *Health Economics*).
- “Politicisation, depoliticization and re-politicisation of HIV financing in Uganda” (Target journal: *Africa Studies*)
- Preferences on policy options for long-term financing of the AIDS response in Uganda (Target journal: *Applied health economics and health policy*)
- A novel analytical framework for fiscal sustainability of HIV/AIDS response in Uganda (Target journal: *Fiscal Studies*).
- The economics and politics of financing the AIDS response in Uganda: past, present and future directions (Target journal: *PLOS One*)

The papers listed below were published during my doctoral studies. They do not make a direct contribution. However, they are related and relevant to the thesis.

- “Poverty as a barrier to antiretroviral therapy access for people living with HIV/AIDS in Kenya” (with Markus Haacker) published in AJAR in 2018
- “Global health security and universal health coverage: from a marriage of convenience to a strategic, effective partnership” (with Clare Wenham, Devi Sridhar, Rebecca Katz, Larry Gostin and colleagues) published in *BMJ Global Health* in 2019

It is envisaged that some additional papers may be published from the nascent work undertaken in this thesis. Whereas some of the work in this thesis intersects with my current policy advisory work at UNAIDS, the views therein do not in a way reflect the views of UNAIDS. Additionally, this Ph.D. does not draw on any of the work undertaken as part of my international civil service work at UNAIDS. The work presented in this thesis is entirely my own, as are any remaining mistakes.

Charles Birungi
London, 2nd October 2019

¹ Drafts of some of these papers are included in this thesis as Appendices. To this end, as appropriate and for brevity, only a summary of their key findings is included in the main body of this thesis.

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Acronyms and Abbreviations

ADPG	AIDS Development Partners Group (in Uganda)
AfDB	African Development Bank
AfHEA	African Health Economics and Policy Association
AHE	Association of Heterodox Economics
AIDS	Acquired Immune Deficiency Syndrome
AJAR	African Journal for AIDS Research
ANC	Antenatal Clinic
AR	Average Revenue
ART	Antiretroviral Therapy
ARVs	Antiretrovirals
ATC	Average Total Cost
ATF	AIDS Trust Fund
AYP	Adolescents and Young People
BMJ	British Medical Journal
CCD	Chronic Communicable Diseases
CEO	Chief Executive Officer
CGE.	Computable General Equilibrium
CHF	Community Health Fund
CIT	Corporate Income Tax
CSF	Civil Society Fund
CSR	Corporate Social Responsibility
CTL	Currency Transaction Levy
DAH	Development Assistance for Health
DALY	Disability-adjusted life year
DFID	Department for International Development
DIPI	Domestic Investment Priority Index
DPT	Diagnosis, Prescription and Treatment
DRM	Domestic Resource Mobilization
DSA	Debt Sustainability Analysis
EC	European Commission
ECEA	Extended Cost Effectiveness Analysis
ESA	East and Southern Africa
FSW	Female Sex Workers
FTT	Financial Transaction Tax
GAM	Global AIDS monitoring
GARPR	Global AIDS Progress Reporting
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GF	Global Fund
GFATM	Global Fund against HIV/AIDS TB and Malaria
GHC	Ghanaian Cedi
GHCC	Global Health Cost Consortium
GHS	Global Health Security
GNI	Gross National Income
GoU	Government of the Republic of Uganda
GPG	Global Public Good
GPI	Global Public Investment
GRN	Gross Resource Need
HIV	Human Immuno-deficiency Virus
HPDG	Health Partners Development Group
HRH	Human Resources for Health

HSSF	Health Sector Services Fund
HTS	HIV Testing Services
IAEN	International AIDS Economic Network
IAVI	The Vaccine Alliance
IBRD	International Bank for Reconstruction and Development
ICAH	International Collective Action for Health
IDA	International Development Association
IFAC	International Federation of Accountants.
IFC	international Finance Corporation
iHEA	International Health Economics Association
IHME	Institute for Health Metrics and Evaluation
IMEM	Integrated Macroeconomic Model
IMF	International Monetary Fund
IPF	International Public Finance
JAR	Joint Annual Review
JUPSA	UN Joint Program of Support on AIDS
LICs	Low Income Countries
LMICs	Low- and Middle-Income Countries
MC	Marginal Cost
MDG	Millennium Development Goals
MIC	Middle Income Country
MIGA	Multilateral Investment and Guarantee Agency
MMPB	Mozambique Malaria Performance Bond
MMV	Medicines for Malaria Venture
MoFPED	Ministry of Finance, Planning and Economic Development
MoH	Ministry of Health
MSM	Men who have Sex with Men
MTCT	Mother-to-Child Transmission
MVI	Malaria Vaccine Initiative
NASA	National AIDS Spending Assessment
NATF	National AIDS Trust Fund
NCDs	Non-Communicable Diseases
NDP	National Development Plan
NGO	Non-Governmental Organisation
NHIF	National Health Insurance Fund
NHIL	National Health Insurance Levy
NHS	National Health Services
NRM	National Resistance Movement
NRN	Net Resource Needs
NSP	National AIDS Strategic Plan
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
OOP	Out-of-Pocket payment
OPM	Oxford Policy Management
PAHO	Pan American Health Organisation
PBF	Performance-Based Financing
PEP	Post-Exposure Prophylaxis
PEPFAR	President's Emergency Plan for AIDS Relief
PFM	Public Finance Management
PIT	Personal-Income Tax
PLHIV	People Living with HIV
PMTCT	Prevention of Mother-to-Child Transmission
PPE	Politics, Philosophy and Economics

PPG	Public and Publicly-Guaranteed
PPP	Purchasing Power Parity
PrEP	Pre-Exposure Prophylaxis
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analysis
RBF	Result Based Financing
REDD	Product REDD
RMNCAH	Reproductive, Maternal, Neonatal, Child and Adolescent Health
ROI	Return on Investment
RSSH	Resilient and Sustainable Systems for Health
SCEs	Self Coordinating Entities
SDGs	Sustainable Development Goals
SEM	Structural Equation Model
SFA	Stochastic Frontier Analysis
SHA	System of Health Accounts
SIBs	Social Impact Bonds
SSA	Sub-Saharan Africa
SSE	Social and Solidarity Economy
TaSP	Treatment as Prevention
UAC	Uganda AIDS Commission
UCC	Universal Catastrophic Coverage
UHC	Universal Health Coverage
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
UNITAID	International Drug Purchasing Facility
UNPD	United Nations Population Division
VAT	Value-Added Tax
VFM	Value-for-money
VHI	Voluntary Health Insurance
VSL	Value of Statistical Life
WHO	World Health Organisation
WTO	World Trade Organisation

Chapter 1

Introduction

1.1. Introduction

This chapter presents the context within which this Ph.D. research took place, the research question answered and the framework that guided the analysis in this thesis, including the justification for researching the economics of long-term fiscal sustainability of the response to HIV/AIDS in Uganda.

1.2. The context

This Ph.D, taking an interdisciplinary approach, develops a pragmatic approach to fiscally sustainable long-term financing for HIV and AIDS in in Uganda. Over the last 35 years, the HIV response has been a dominant global development issue. Currently, however, it faces an uncertain outlook. Owing to transitions in global health financing policies and practices for universal health coverage (UHC), the interest in using of economic evidence for public policymaking related to HIV financing has increased, including considerable empirical evidence on the same. Using the political settlements framework and theories of welfare state development (Khan, 1995 and 2000) that bring to the fore the role of competing interests and ideas in shaping global HIV/AIDS policy, HIV financing is quintessentially political (Redžepagić and Llorca, 2007; Acemoglu and Robinson, 2013). As such, determining how best to publicly finance HIV/AIDS services – in the long-run - involves important political economy considerations (Gostin, 2014; Johnston et al., 2015; Piot, 2015; Haacker, 2016; Whiteside, 2019, 2018; Gilson, 2019).

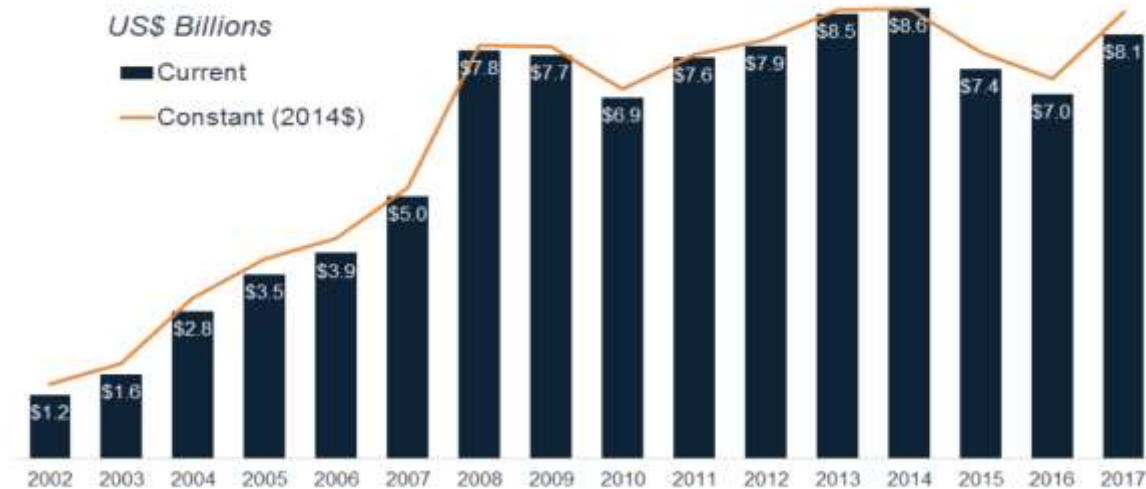
Historically, the HIV financing policy discourse has combined – in various constellations – three main elements: a human rights perspective (UNAIDS, 2020), a teleological (or goal-oriented) approach whereby HIV strategies are designed in line with overarching objectives such as “ending AIDS” or meeting the Sustainable Development Goals (SDGs), and an economic perspective which emphasizes returns to investment, framing HIV policies as good investments and highlighting the most cost-effective components. It is to the latter approach, and specifically a public finance perspective, to HIV policy that this thesis contributes. This perspective is motivated by the fact that it has been variously used to good effect, for example in the investment framework, highlighting the financial savings which arise as a consequence of overall or specific HIV investments (Schwartländer et al, 2011), work estimating, and projecting costs and fiscal consequences of HIV across categories of public spending (Haacker and Lule, 2011), and work estimating the liabilities arising from the lifetime costs of HIV treatment and care and placing it in a macroeconomic context (Atun and others (2015), Haacker (2016), Over (2008)).

Since the government's three core functions - allocation, stabilization, and redistribution - are inherently political, fundamentally altering the distribution of entitlements and responsibilities and the attendant gains and losses, it thus follows that economics and politics are co-determined. This is more so regarding fiscal policy (Gaspar et al., 2017). In Uganda, however, there is a paucity of evidence on the political economy dimensions and how they influence the fiscal sustainability of HIV response. By extension, as economics and politics are intricately and irretrievably interwoven, the quest for practical solutions to the national HIV response-related fiscal sustainability challenges behooves us to pay careful and closer

attention to the interactions between politics, economics, and other realms. Taking a political economy perspective, this thesis addresses this gap by uniquely spanning perspectives of economics, public finance, politics, and global health to help policymakers develop more effective strategies for coping with HIV-induced long-term fiscal challenges. This represents a significant departure from other works that address the economic aspects of HIV/AIDS financing. This way, it provides an empirical analysis (and ensuing new insights) into novel economic and political mechanisms of expanding and sustaining fiscal space for the national HIV response in Uganda.

Globally, HIV and AIDS are profound economic and fiscal challenges (Johnston, 2013; Haacker, 2016), imposing a strain on the fiscal resources of hard-hit countries such as Uganda and their international development partners. Without a functional cure and/or an efficacious vaccine, this burden is projected to significantly increase over time. The global response to HIV / AIDS has been remarkably unparalleled in the history of global health and development over the last 35 years since HIV was first diagnosed. Partly motivated by the notions of 'global solidarity and mutual responsibility' (Altman and Buse, 2012), investments in HIV/AIDS response have increased significantly, with remarkable returns on investment – in terms of reductions in new HIV infections, AIDS-related deaths, and stigma and discrimination as well as productivity increases among other benefits (UNAIDS, 2015).

Figure 1: Development assistance for HIV/AIDS in low- and middle-income countries, 2002 – 2017



Source: Author’s own compilation from UNAIDS and KFF (2018).

In Uganda, as in many other low – and middle-income countries (LMICs), HIV/AIDS remains a dominant health and development priority. An analysis of the HIV financing landscape, however, suggests an uncertain outlook (Oppenheimer and Bayer, 2009; Birungi, 2011; Haacker, 2016; Whiteside and Oberth, 2016). Internationally, as shown in Figure 1, development assistance for HIV leveled off in 2008 after many years of steady growth. At the current growth rate, it is highly unlikely that the global response will invest the targeted US\$ 26.2 billion in 2020 (Stover et al., 2016). This, inter alia, is largely due to five (5) primary considerations. First, the 2007/8 global economic crisis brought fiscal pressure to bear on the budgets for development assistance from the high-income Organization for Economic Cooperation and Development (OECD) countries (Dieleman et al., 2014). The rapidly changing global health financing landscape is another consideration. This shift is characterised by reprioritised development assistance for health (DAH) specifically, and donor aid more generally. Consequently, there are growing questions concerning future aid flows. Third, rising

ethnocentric nationalistic politics is the antithesis to international cooperation in a globalized world, strong global institutions, and global solidarity – with inward-looking policies not only renege on promises of humanitarian assistance but less likely to provide robust technical and financial assistance to poorer countries such as those most affected by HIV. Additionally, due to strong economic performance in some low-income and high HIV-burdened countries, as some of them transition – in economic terms - from low to middle-income country (MIC) status, increasing attention is paid to domestic resource mobilization (DRM) for HIV, health, and development. This graduation, in turn, effectively changes their eligibility to access some multilateral and bilateral development assistance, and concessional financing among others (Whiteside, 2019; Resch and Hecht, 2018). Lastly, this pattern has been attributed to "donor fatigue" by some researchers (Grépin, 2012). The current shifts in donor funding priorities away from HIV/AIDS, even as it persists as a pandemic (and syndemic) globally, due to the so-called "donor fatigue" confirms the well-known challenge of short donor attention spans in the health sector (Foster, 2005).

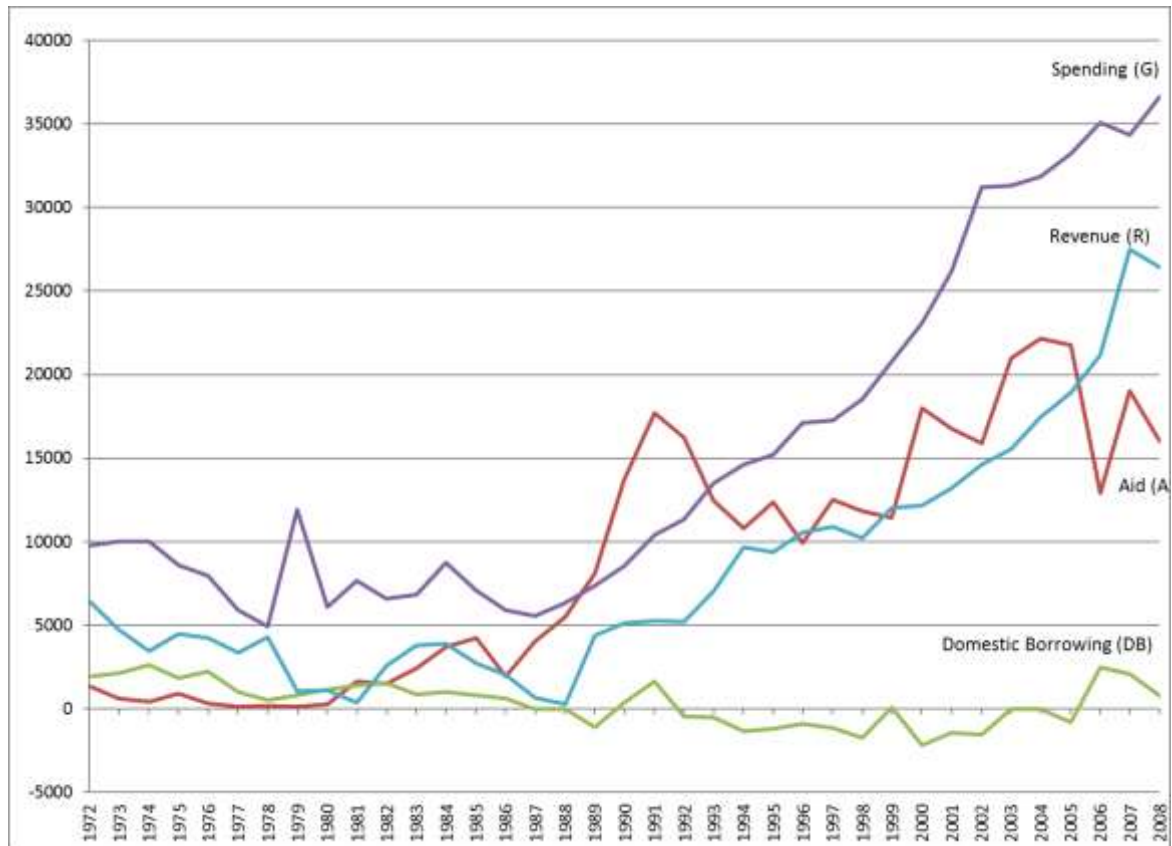
On the other hand, at the national level, dependency on external sources for HIV funding is high. In fiscal year 2016/17 for which most comprehensive HIV spending data is available for Uganda, 94% of the US\$ 689 million invested that year was from external sources (Uganda AIDS Commission (UAC), 2012). Importantly, more than 50% of this is from a handful of bilateral development partners. Second, external funding outlays are characterized by very high year-on-year uncertainties and unreliabilities, posing challenges to predictability (Zikusooka et al., 2009). Finally, the role of external financing – as reflected in the relative contribution to overall total spending – is progressively declining. This emerging HIV funding landscape has, in turn, brought to fore uncertainties regarding the national HIV response's financial sustainability at a time of great promise when the country is working towards and on the cusp of "ending the AIDS epidemic as a public health threat by 2030" (Government of Uganda (GoU), 2015).

Partly motivated by the above, GoU investments in HIV are expected to rise, with US\$ 383 million projected to be allocated from domestic resources in FY 2019/20 (UAC, 2012). In absolute terms, this would represent a more than tenfold increase relative to the FY 2009/10 government share of total HIV funding. Additionally, financial resource needs for the HIV response are rising, with gross resource needs projected to rise to US\$ 918.9 million in 2019/20 from US\$ 579.7 million in 2009/10 (UAC, 2012). This compares favorably with my estimates in Chapter 3. Stover et al. (2016) estimated the resource needs to rise to US\$ 876 by 2020. This steep rise in financial resource needs is a consequence of four inter-related factors. The first driver is lifetime HIV treatment needs, accounting for over 50% of all HIV spending. Relatedly, as ART improves survival prospects, the ensuing costs are impacted by longer living cohorts of people living with HIV (PLHIV) on treatment. Thirdly, expanded treatment guidelines that increase the CD4 count thresholds imply that PLHIV eligible for (and receiving) treatment increase concomitantly. Finally, with the third fastest-growing population in the world (UNFPA, 2017), the corresponding size of the population at risk of HIV infection is also rapidly expanding. This consequently increases the costs of population-based HIV prevention. Overall, an HIV financing gap of 33.4% is estimated for the period 2011/12 to 2019/20 (UAC, 2012).

Bridging global health and public finance perspectives, as I show in this thesis, despite a narrative of positivity, and (premature) celebration in international HIV policy, the future funding of national HIV responses would be difficult. Past exceptional increases in investments in the HIV response have contributed to important progress in global health. Now, the challenge is not only to sustain these achievements but accelerate further progress, all in a context of increasingly tight fiscal constraints and an uncertain long-term economic outlook. Additionally, the context is complicated by the increasingly growing fiscal pressures on HIV

spending from epidemiological and demographic shifts as well as the imperative to confront other equally important long-term fiscal challenges such as climate change, growing inequalities, emerging and re-emerging infectious diseases (EIDs) of pandemic potential, and public and publicly guaranteed (PPG) debts among others. Finding a novel pragmatic approach to make HIV spending more fiscally sustainable without compromising other important achievements in efficiently assuring equitable access to quality services is one of the novel contributions of this thesis. This is at the heart of realising the right to health (Ooms et al., 2019).

Figure 2: Fiscal variables 1972–2008 (in Billion UGX, 2005 prices)



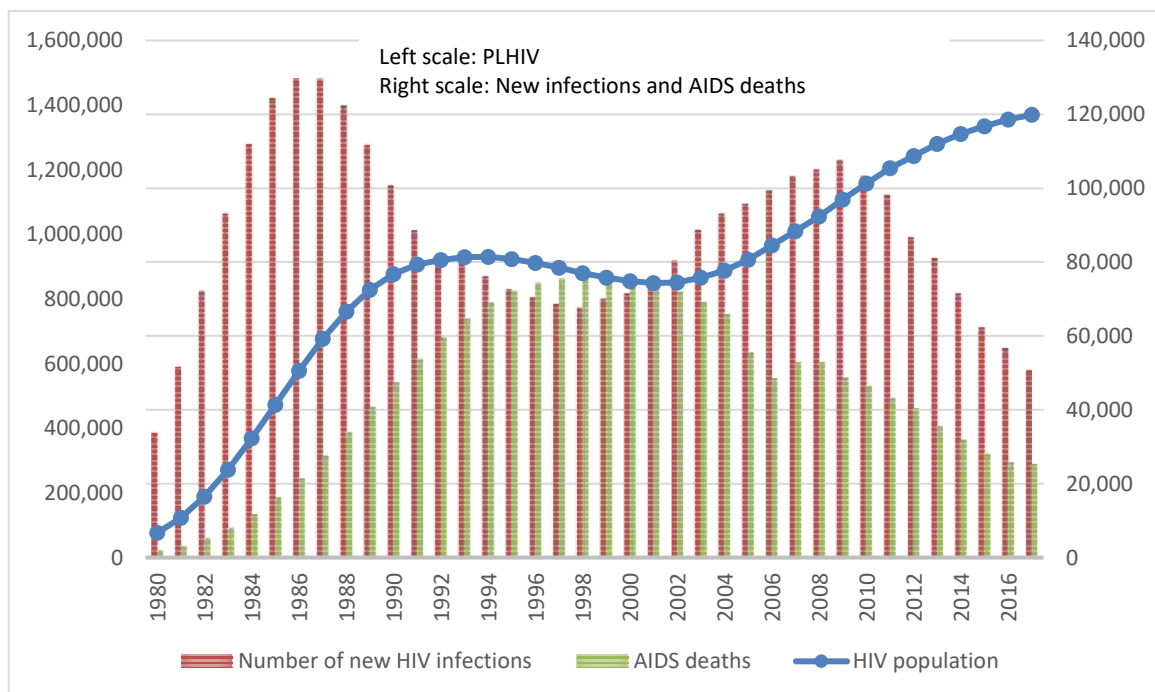
Source: Author’s analysis from Bwire et al. (2017) and Bank of Uganda (2019).

To provide some context for the discussion, I discuss the most relevant data and forecasts about the state of Uganda’s economy and the HIV/AIDS epidemic and response. With 44 million people (as at the end of 2018), Uganda is an East African country and was one of the first countries worldwide to witness a generalized HIV epidemic (Bond, 1986). Looking at recent economic developments and outlook (International Monetary Fund (IMF), 2018), six conclusions can be made. First, real gross domestic product (GDP) growth is positive (with growth generally above sub-Saharan Africa (SSA) average, and year-on-year real GDP growth gradually increasing). Second, inflation (both core, headline, and right-hand side (RHS)) are low and under control. Third, the exchange rate has significantly depreciated, and – owing to currency fluctuation – the Uganda Shilling (UGX) has declined in value (Whiteside and Zebryk, 2017). Forth, regarding the external situation, there is an increasing current account deficit. Fifth, there are adequate international reserve buffers. Also, in terms of inflation targeting, there is effective interest rate signaling, albeit lending rates remaining high. Finally, whereas the tax-

to-GDP ratio has increased over the last few decades, it remains lower than the average for the SSA region. Overall, medium-term economic development prospects are favorable, and - as Figure 2 shows - recent fiscal performance has largely been positive (despite aid being more volatile).

There are economic causes of HIV (Nana and Whiteside, 2006; Johnston, 2013). Also, the AIDS epidemic has negatively affected the economy (see Bollinger et al. (1999) and Jefferis and Matovu (2008), for example, for studies analyzing economic impacts of AIDS in Uganda). However, in discussing the macroeconomic effects of HIV/AIDS, caution needs to be exercised. Whereas earlier modeling studies (Kambou et al., 1992; Jefferis and Matovu, 2008; United Nations Population Division (UNPD) and United Nations Department of Economic and Social Affairs (UNDESA), 2004) estimated large impacts on economic growth, efforts to empirically establish the same have largely been unsuccessful. This may suggest that something could be wrong with the calibrated models. Overall, contrary to earlier projections, HIV has not had a significant impact on economic growth. While AIDS-related mortality among working-age adults undoubtedly reduces GDP growth, its net effect on GDP per capita is ambiguous at best. Second, recent extensive syntheses of literature on impacts on households affected by HIV and AIDS (Johnston, 2013; Seeley, 2014) suggest that members of affected households recover economically after a couple of years. Haacker (2016), similarly, does not find a correlation between HIV/AIDS and subsequent change in poverty rates. To resolve the conflicts in the literature on whether HIV/AIDS is neutral, good or bad for economic growth (and development), I contend that part of the solution to this puzzle could be that some households in the community (not affected by an AIDS death) gain at the expense of households affected by HIV/AIDS (e.g. employment opportunities, control of assets). Consequently, the impacts of HIV and AIDS on affected households do not fully translate into an aggregate effect.

Figure 3: Estimated HIV-related disease burden in Uganda (1980 – 2017).



Source: Author's estimations based on UNAIDS (2018).

Uganda once heralded as a “success story” on the African continent for exceptionally reducing HIV prevalence from the highs of 18% in the early 1990s to as low as 6.4% in the 2000s (Stoneburner and Low-Beer, 2004), is now at crossroads. As Figure 3 shows, four key conclusions can be deduced from the summary picture of the epidemic’s geography. First, with new HIV infections continuing to exceed AIDS-related deaths, an “AIDS transition” (Over, 2009) is far from being achieved. Second, the previously heralded “success story” has ended. Importantly, the resurgence in new HIV infections - shown here by the second epidemic peak - highlights how vulnerable past gains in controlling the epidemic are. Third, thanks to declines in AIDS death rates due to ART scale-up and population growth, the size of the HIV population is on the rise for nearly the last 2 decades. Finally, in summary, Uganda faces a growing “epidemiological sustainability” challenge, as investments are not effective at decreasing new HIV infections, AIDS-related deaths, and HIV-related stigma and discrimination to contain the epidemic (Haacker, 2016; Piot et al., 2015).

To appreciate the contribution to the economics and politics of fiscal sustainability developed in this thesis, there are different aspects of ‘sustainability’, but are all inter-related – as they center around fiscal considerations, contribute to each other, and are a pre-requisite for the fiscal sustainability of the national HIV response in Uganda. It is this interplay I work out more clearly to develop the meaning of sustainability more clearly in this thesis. It motivates the theoretical and empirical analysis herein. Whereas fiscal sustainability has been a frequently mentioned concept, drawing on theories of the economics of achieving fiscal sustainability, I contend that ensuring that “the government budget must be balanced in present-value terms” (Hamilton and Flavin, 1986: 811) is the simplest definition, without unnecessary oversimplification. Implicit in this definition are important connections between debt, deficit, and fiscal sustainability. In the tradition of economic analysis applied here, fiscal sustainability is a long-term concept (far beyond the typical traditional 3-5 years national strategic planning and policy period that Uganda has often adopted in its sustainable financing discourses). To this end, an HIV strategy is deemed fiscally unsustainable if there is no plausible financing scenario beyond an arbitrary policy period.

From the onset, it is important to note that HIV/AIDS is a unique global challenge with both chronic and infectious disease characteristics, co-morbidities, very slow progression of the disease, and attendant transmission dynamics. As such, owing to successfully extending access to HIV treatment, HIV/AIDS – hitherto a “death sentence” (Palmisano and Vella, 2011; Collier et al., 2015a) - has effectively transitioned into what I prefer to call a chronic communicable disease (CCD). This has, in turn, decreased HIV/AIDS’ impact on “full income” (Robinson, Hammit and O’Keeffe, 2018; Jamison et al., 2013)² among other measures of economic returns to investment. The ensuing longer survival prospects of PLHIV have considerably increased life expectancy and, subject to achieving viral suppression, PLHIV able to live relatively near-normal lives. To this end, ART access is effectively a life-long commitment for PLHIV and financing agents, with the financing of the HIV response absorbing not only a substantial proportion of government revenues, GDP, and other HIV/AIDS-related government spending, but that these spending needs and the attendant fiscal costs are projected to continue for decades into the future. Even in the face of progress in substantially reducing new HIV infections, most of these costs are “locked-in” (or committed into the future) by past HIV infections. Finally, as investments in the response to HIV/AIDS account for more than a third (i.e. 37.5%) of total health expenditure in Uganda (UAC, 2012), it is safe to argue that HIV/AIDS spending has consequences on the composition of overall government

² In this thesis, the “full income” metric addresses the question: what is the loss in income that is equivalent – in terms of life prospects – to the increased health and mortality risks posed by HIV/AIDS? See Appendix 7 for details.

spending by crowding out other types of spending³. This fact is corroborated elsewhere (Shiffman, 2008).

Relatedly, owing to the very long time lags between HIV infection, when HIV treatment is needed, and individual PLHIV death, current HIV policy objectives imply long-term spending commitments. Specifically, HIV prevention efforts having long-term financial consequences (as they affect the future demand for HIV/AIDS services). To this end, the quasi-fiscal liability⁴ implied by the costs of the national HIV/AIDS program resembles a long-term financial liability - shaped by both past, current, and future HIV, health, and development policies. In other words, the implicit fiscal costs of HIV/AIDS (including, but not confined to the national response to HIV/AIDS) - largely arising from the aforementioned distinguishing characteristics as well as the implicit political and ethical considerations – are better described as a long-term financial commitment and thus call for a paradigm shift in the policy responses and financing mechanisms. In the economics literature, this quasi-fiscal liability has empirically been measured as the (discounted) projected costs of meeting all PLHIV's demand for HIV services (Haacker, 2011). In a nutshell, without a transformational “game-changer” such as a functional cure and/or an efficacious vaccine, new HIV infections add to this liability. By extension, successful HIV prevention reduce it.

Methodologically, the above-mentioned long lags between HIV infections and the need for HIV services, including the corresponding long duration over which these services (especially HIV treatment and that for opportunistic infections) are required complicate the assessment of the fiscal implications of the HIV response and epidemic. To overcome this challenge, comparable to Over (2008) and Lule and Haacker (2011), I interpret the current and future fiscal costs of HIV programs as fiscal liabilities – somewhat analogous to a debt *de facto* but not *de jure*. The IMF/World Bank debt sustainability assessment (DSA) (analytical) framework (IMF, 2016), while focusing on formal debt, takes a pragmatic approach to what constitutes debt by explicitly acknowledging liabilities implied by the social security system, for example. These are very similar to the HIV-induced fiscal quasi-liabilities. Technically, the implicit policy commitments to provide HIV treatment and related services may constitute a ‘constructive obligation’ (IFAC, 2002) with a valid expectation that the GoU will fulfil these commitments. This viewpoint recognises health as a human right, entailing national and international responsibilities (Ooms, 2008; Ooms et al., 2019). However, whereas a forward-looking analysis of the long-term fiscal consequences of HIV and AIDS are necessary given the very limited acknowledgement (and factoring in) of the challenge of coping with attendant fiscal costs of the national HIV response in Uganda, in and of itself, this is not sufficient to progress towards a fiscally sustainable AIDS response. As a way forward, recognising the politics of evidence (Parkhurst, 2017; Piot et al., 2015), I argue that evidence-informed and politically feasible solutions need to be advanced and embedded within a fiscal policy framework. It is in this context that reconciling the seeming irreconcilable paradox - of rising fiscal costs in a time of declining fiscal resources availability - is the crux of this Ph.D.

³ Importantly, some HIV/AIDS costs do not appear in the national accounts (e.g., HIV/AIDS may affect government capacities, but not the contribution to measured GDP, which is based on the size of the government payroll).

⁴ A term that is usually used in public finance literature for fiscal liabilities such as pension obligations, which are not a debt *de jure*.

1.3. Towards redefining fiscal sustainability of HIV/AIDS responses

The theoretical and empirical literature on the economics of achieving fiscal sustainability (Fatás (2010), for example) is characterized by an increasing wake-up call to deal with the unsustainable budgetary imbalances, largely due to the recent increase in debt-to-GDP ratios. Similar calls have been made for the fiscal sustainability of health systems (and HIV responses) (Kaul and Conceição, 2006; Heller, 2009; Thomson et al., 2009; OECD, 2015; Haacker, 2016). As a comprehensive synthesis of the literature is beyond the scope of this thesis, below I offer an abbreviated summary of the body of international evidence. It is provided to help us rethink the current and future fiscal policy choices with regards to the fiscal sustainability of the HIV response in Uganda.

First, the above-mentioned budget imbalances are largely a result of policies implemented over the last decades. They are projected to get worse in the future with increasing expenditures - and the attendant contingent fiscal liabilities - associated with long-term fiscal challenges such as demographic and epidemiological changes. Second, there are possible fiscal adjustments that governments could adopt to reduce the structural budget deficit over the near future, such as significant reforms that provide growth opportunities to ease the adjustment process. Third, future changes in spending and taxes have macro-fiscal impacts. For instance, assuming that economic agents internalize these future changes, even though they might take place several years from now, they will have an effect today as they influence both the expectations of economic agents and the credibility of short-term consolidation. Finally, while major fiscal consolidations are possible over a short period and can even lead to GDP growth rates rising, more often than not, they are typically correlated with expenditure reductions, especially entitlements such as the 'entitlement burden' of HIV (see, for example, Over (2008) and Lyman and Wittels (2010), as well as transfers and salaries.

Generally, from the above, fiscal sustainability entails governments maintaining policies and expenditures into the future, without major adjustments and excessive PPG debt burdens for future generations. Theoretically, however, recent public finance debates have centered on an exact definition of fiscal sustainability (Edwards, 2002; Bird, 2003; Heller, 2005), with some analysts (Chalk and Hemming, 2000; Gottret and Schieber, 2006) arguing that this concept has more than often been advocated for than defined. Unsurprisingly, in its broadest sense, the related concept of sustainability has often been defined in terms of self-sufficiency over a specified period. Traditionally, the concept of fiscal sustainability has been inextricably linked with the related one of debt sustainability (IMF, 2014). By extension, in practice, ensuring a country meets both the solvency and liquidity conditions - in terms of its PPG debt – is central to its fiscal sustainability.

As this thesis assesses the consistency of the national HIV response with fiscal sustainability, two points of clarification are critical at this juncture. First, as Haacker (2016: 204) notes the “purpose is not to develop a criterion to dismiss a proposed HIV/AIDS strategy, but to complement the discussion of the shifts in global HIV/AIDS financing, and to inform policy discussions between the national government and donors on a ‘fair share’ of domestic vs. external financing”. Secondly, to arrive at ways of assessing the fiscal sustainability of the HIV response, operational definitions are needed. Here, three operational definitions are of relevance to this study. To OECD (Blanchard, 1990), fiscal sustainability is the “*ability of a government to maintain public finances at a credible and serviceable position over the long term*”. On other hand, the European Commission (EC) (2014) defines it as the “*ability to continue now and in the future current policies (with no changes regarding public services and taxation) without causing public debt to rise continuously as a share of GDP*”. Finally, the IMF (Heller, 2005) refers to a “*set of policies as sustainable if a borrower is expected to be able to continue servicing its debt without an unrealistically large future correction to the balance of*

income and expenditure". In short, it appears from both theory and practice that measuring fiscal sustainability utilizes non-increasing PPG debt-to-GDP ratio. This benchmark is helpful in distinguishing sustainable fiscal policies from unsustainable ones. However, as Chalk and Hemming (2000) show, current fiscal policy can be continued without necessarily threatening solvency and liquidity, nor implying that public debt must be non-increasing. It is this perspective that I take in this thesis as health is a human right whose progressive realisation necessitates challenging austerity narratives.

Considering the above-mentioned definitions as well as the ensuing analysis of the political dimensions and meaning of sustainability in this thesis, I posit that four pointers for application to this study emerge. First, fiscal sustainability is a constraint. Thus, it needs to be respected. As such it is not an objective in and of itself (Thomson et al., 2009). Also, it can safely be conceptualized as an accounting challenge, whereby fiscal space⁵ is insufficient to meet current and future response needs. As a corollary, *how* governments achieve fiscal sustainability matters. Second, whereas some attempts have been made to address the fiscal sustainability challenge for the HIV response at both the global and regional levels, such as the seminal work undertaken under the auspices of The *aids2031* Consortium (2011) and *RethinkHIV* (Collier et al., 2015a) respectively, there is a paucity of specific application to Uganda. The best-known application to Uganda is Haacker and Lule (2011) who provide four-country case studies of the fiscal implications of HIV/AIDS and, by adopting a forward-looking analysis of the fiscal burden of HIV/AIDS, places the response to HIV/AIDS in a (national) fiscal context. However, the analysis therein is replete with several shortcomings. First, the data available for Uganda then (in 2010) was insufficient for detailed fiscal analysis. Second, the focus is largely on the consequences of HIV infections without providing a systematic treatment of the impacts of HIV/AIDS. Third, the study does not address the implications of the global slowdown (including the changing funding landscape) in HIV/AIDS financing directly. Finally, the effectiveness of the response to HIV/AIDS – such as treatment as prevention – is not factored in the analysis. As a consequence, the fiscal analysis estimates for Uganda are less extensive and relatively crude⁶. The unique approach in this Ph.D. takes the attractive features of Haacker and Lule (2011) – and while avoiding the shortcomings – applies them to Uganda using updated data and taking cognisance of recent developments in the field.

Third, by spanning interdisciplinary dimensions, this study not only allows for understanding the fiscal dimensions of HIV/AIDS but also explores political dimensions to inform a novel approach to pragmatically address the challenge of coping with long-term liabilities for HIV. To the best of my knowledge, except for Haacker (2016) that adopts a global dimension, it is these aspects that uniquely set this study apart and distinguishes it from other existing economics of HIV works that largely address aspects of the economic impact of HIV/AIDS and the effectiveness of the response to HIV/AIDS (Bloom and Peter, 1997; Ainsworth et al., 1998; Nattrass, 2004; Barnett and Whiteside, 2006; Sahn, 2010; Over, 2011; Bjørn, 2012; Johnston, 2013; Whiteside, 2016).

Finally, the role of economics in informing HIV policy is increasingly being recognised (Kirigia et al., 2005; Kumaranayake, 2008; Moatti and Eboko, 2010; Birungi, 2011; Schwartländer, et al., 2011; Anyanwu et al., 2012; Johnston, 2013; Vassall et al., 2013; Haacker, 2016; Piot et al., 2015). In Uganda, AIDS has, from the outset, been as much a socio-economic, political, and ethical issue as a medical challenge (Tumushabe, 2006; Altman and Buse, 2012; Johnston, 2013; Gostin, 2014; Piot, 2015; UNAIDS, 2015; Haacker, 2016; Merson

⁵ In this study, fiscal space is the "room in a government's budget that allows it to provide resources for a desired purpose without jeopardizing the sustainability of its financial position or the stability of the economy" (Roy and Heuty, 2009).

⁶ This observation does not, in any way, detract from the policy value of the findings.

and Inrig, 2018; Whiteside, 2019) and the unprecedented achievements of the response are a testament to bio-medical progress but also a consequence of politico-econo-socio-legal action on the social and structural drivers of HIV vulnerability. Recognizing the concatenation of these structural trends, this study re-examines the political, philosophical, and economic case for financing the HIV response. The novelty of this study lies in its extensive empirical analysis and methodological innovations, which allows for an in-depth exploration of current and long-term fiscal challenges of financing the national HIV response, and therefore provides a springboard for thinking about pragmatic and innovative approaches to improving fiscal sustainability.

1.4. Research aim, objectives and question

1.4.1. *Research aim:*

This Ph.D. aims to propose a pragmatic approach to fiscally sustainable long-term financing for HIV and AIDS in Uganda. As such the study will contribute to finding fiscally legitimate and novel mechanisms of expanding and sustaining fiscal space for the national HIV/AIDS response.

1.4.2. *Research objectives:*

The primary objectives of this study are:

1. To estimate the medium and long-term resource needs of the national HIV response in Uganda
2. To construct and evaluate the feasibility of various options for long-term financing of the HIV response.
3. To propose a novel analytical framework for the fiscal sustainability of the HIV response in Uganda.

1.4.3. *Research question:*

What constitutes a pragmatic approach to fiscally sustainable long-term financing for HIV and AIDS response in Uganda?

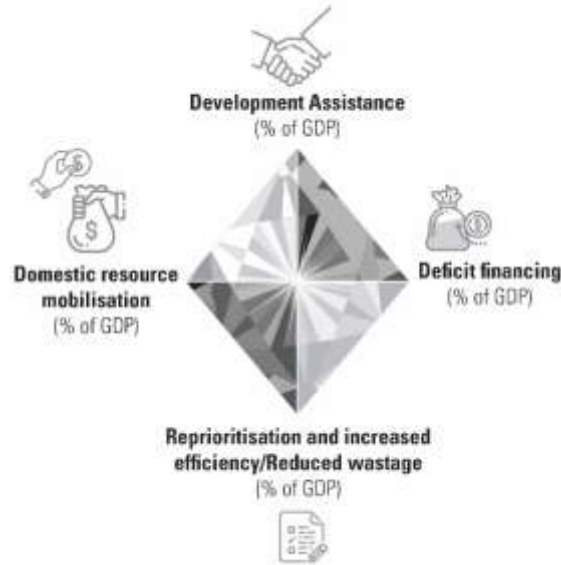
1.5. The analytical framework

This section presents an analytical framework that guided the analysis in this thesis. It builds on and extends health economics literature (Olsen, 1998; Piot et al., 2015; Haacker, 2016; Whiteside and Oberth, 2016; Connolly, 2016) that point at the “fiscal space diamond” (Heller, 2003, 2006a and 2006b; Roy and Heuty, 2009), DSA (IMF, 2014), domestic investment priority index (DIPI) (UNAIDS, 2013) and other benchmarking matrices (Galárraga et al., 2013; Remme, 2018; Haakenstad et al., 2019; Sterck, 2018, 2019) as dominant analytical frameworks used to analyse fiscal sustainability of health and HIV programs. Importantly, each of these differs regarding analytical tractability in an explicit framework. Below, I briefly discuss the limitations inherent in each, to serve as a “springboard” for introducing and elucidating some key aspects of what would constitute a novel approach to the fiscal sustainability of the HIV response.

First, the “fiscal space diamond” - as an organising framework - does not study the interrelatedness of the government’s decision to address its fiscal problems. Ávila and colleagues (2013) observe that domestic HIV investment is associated with increases in economic growth and HIV burden. Similarly, a government’s ability to collect taxes and spend the same prudently is an important determinant of development assistance allocation behaviours of donors (largely in the context of counterpart funding) effectively and efficiently. Therefore, as Figure 4 shows, the interdependence between different financing policy levers

will be overlooked by looking at them separately. As an analytical framework, however, it facilitates answering policy questions on the macro-fiscal possibilities to expand the budgetary room to achieve intended policy goals. The financing policy levers are macro-fiscal conditions, prioritisation, earmarking, efficiency, and external grants and donor assistance (Tandon and Cashin, 2010; Barroy et al., 2017).

Figure 4: The fiscal space diamond



Source: Author’s compilation from Heller (2005)

Second, the DIPI – here, calculated by dividing the percentage of general government revenue (GGR) each country invests in national HIV response by the country’s HIV prevalence (see Eq. (1)) - does not look at debt-to-GDP ratios and corresponding country’s overall public debt position. Consequently, it is oblivious of the broader macroeconomic context as it is not underpinned by any financial programming that would allow for an analysis of the current state and future outlook of the economy. Also, DIPI is biased. HIV/AIDS costs rise with HIV burden and GDP per capita, but less than linearly. The DIPI is far from offering a normative benchmark. Its application usefulness is in its ability to compare DIPI scores across countries. For intra-country comparison, however, the Index is insufficient as it lacks a normative “target” DIPI. Consequently, national policy application is limited.

$$DIPI = \frac{\text{Country public spending on HIV}}{\text{General Government Revenue (GGR)}} \times \frac{\text{Total population}}{\text{Number of PLHIV}} \dots\dots\dots (1)^7$$

Finally, Lule and Haacker (2011) uniquely place the response to HIV/AIDS in a (national) fiscal context and adopt a forward-looking analysis of the financial burden of HIV/AIDS. Its shortcomings as extensively discussed in § 1.3. Relatedly, Haakenstad et al. (2019), apply stochastic frontier analysis (SFA) to estimating the potential government spending on HIV. While this novel analysis represents a methodological advance to fiscal

⁷ As a proxy for measuring the extent of investment priority given to the national AIDS response, this index ranges from 0 to 1, where 0 = no priority, and 1 = perfect high priority. In other words, to interpret this metric while implicitly bringing together the interrelated concepts of ability-to-pay and willingness-to-pay, a higher value is indicative of a concomitant high level of priority in line with HIV burden and revenue.

space estimates, as a key limitation, they do not cap the estimates at the total cost of financing the response to the disease. As a consequence, they estimate that US\$ billions more could be paid by LMICs, but this is entirely driven by China, who can pay more, but does not need to pay more as the HIV burden is relatively low there. I contend that it does not make sense to ask China to pay more than the full cost of an optimal response to HIV. Their global estimates are completely flawed because of this issue.

From the above, it is apparent that approaches to fiscal sustainability analysis as applied to HIV, to date have been somewhat unsatisfactory. Below, in Figure 5, I delineate a simple analytical framework that blends the themes of the above approaches to effectively analyse and address the fiscal sustainability of HIV programs. It explicitly seeks to move beyond diagnosing the fiscal consequences to pragmatically addressing them (Piot, 2015).

Figure 5: The clusters for analysing fiscal sustainability of HIV response



This framework, as applied to the analysis of the fiscal sustainability of the HIV response in Uganda, starts from and builds on four inter-related premises. Firstly, stocktaking the state of the HIV/AIDS epidemic and response is a critical starting point to serve as a “springboard” to the application and identification of tools and policy levers to improve fiscal sustainability. In medium and long-term fiscal policy and planning, the impacts of and response to HIV/AIDS remain very important factors.

In the second cluster, the framework postulates that the impacts of and the response to HIV/AIDS - as with all long-wave events (Barnett, 2006) - affects the state of public finances for many years to come. This Ph.D. posits that information about long-term forecasts of the magnitude of the epidemic’s trajectory and fiscal costs are needed to inform the diagnosis and monitoring of fiscal sustainability of the national HIV response. As such an analysis of the macroeconomic and fiscal context (GDP, government revenues and expenditures) - serving as an “early warning system” - enables an explicit assessment and quantification of how the national HIV response absorbs fiscal resources in the long-run, including how this is affected by changes in HIV incidence. The interplay of these policy dynamics and choices influence and determine short-term financing needs and financing options.

Thirdly, recognising that fiscal sustainability of HIV response is affected by a complex interaction between multiple factors – ranging from political to economic and institutional ones, a forward-looking critical assessment of the contextual factors is pertinent to adroitly address the emerging new HIV/AIDS policy such as the current national HIV response that is built on a fiscally unsustainable business model (for example by depending on external funding for more than 67% of its needs (UAC, 2012)). I contend that a good analytical framework should recognise these factors that act as enablers and barriers to implementing fiscal sustainability measures. These, *inter alia*, include broader development policy objectives of key stakeholders as well as their local values and preferences. These are especially important in social diseases (Auerbach et al., 2009; Göran, 2009; Acemoglu and Robinson, 2013; Colenbrander et al., 2015). In other words, considering the complex and dynamic nature of the local context, the varied stakeholders' ideas and power, and the highly unique characteristics of HIV such as being a CCD, it behooves us to gain a deep understanding of these factors. Finally, informed by political economy considerations among others, the last cluster proposes to develop policy levers to effectively enhance greater fiscal sustainability of the HIV response without compromising other objectives such as equity and financial protection.

1.6. Conclusion

This chapter introduces this thesis. In Uganda, the fiscal sustainability question for the HIV response can be framed in two ways. One is in terms of whether the current course of fiscal policy can be sustained. However, as the HIV/AIDS “debt” is in real terms, the other asks whether tough policy choices will have to be made. These are pragmatic questions with political, ethical, macroeconomic, and fiscal policy implications. Additionally, as recent assessments point to the fact that international political economy is one of the many factors that drive and determine responses to the HIV/AIDS pandemic, HIV financing inclusive (Tumushabe, 2006; Hecht et al., 2009; Johnston et al, 2015; Sparkes et al, 2019), this Ph.D. pays attention to political mechanisms and feasibility issues given that “policy space”⁸(Bhuyan, 2010) acts as an enabler or hindrance in any attempt to alter the status quo (der Gaag et al., 2009; Vassall et al., 2013; McIntyre and Meheus, 2014).

⁸ As used in this thesis, ‘policy space’ is a “...sum of documents (formal policies), ideas, and agreements embodied in the stance of key stakeholders, as well as programs and related resources that implement agreed-upon formal policies and ideas” (John, 1998).

Part I

Setting the scene

We can't solve problems by using the same kind of thinking we used when we created them.
- Albert Einstein (1879 – 1955)

Chapter 2

The political economy of financing the HIV/AIDS response in Uganda

2.1. Introduction

This chapter reviews and synthesizes available literature and data on the financing of the national HIV response from a political economy perspective. This perspective is motivated by the realization that infectious diseases, such as HIV, are not just viruses but rather social, economic, and political forces to reckon with (Kickbusch et al., 2013; Piot, 2015; Quick and Fryer, 2018). Financing the corresponding control, elimination, and eradication of HIV is thus rooted in a synergistic combination of politics, science, and economics, among others. In Uganda, whereas TB, malaria, and more recently Ebola and Zika have all had political importance, as the history of the HIV response has shown over the past three decades, HIV is *sui generis*. Both the epidemic and response have been so highly politicized. Consequently, financing its control is in a realm all of its own, marking a new phase in how politics, science, economics, and infectious diseases interact in global health.

To better understand the financing of the HIV response in Uganda, an economics lens is key (but not the key). Previous studies have largely focused on economic dimensions (Kabajulizi, 2016). I posit that we need deeper, nuanced research and not simply more of the same. In this chapter, I argue that the economics lens *per se* - in and of itself - is insufficient to address the fiscal sustainability challenge. As economics and politics are co-determined (Gaspar et al., 2017), to answer the fiscal policy question at the root of the HIV financing policy discourses, it behooves us to draw on other related social sciences - especially politics - in this inquiry. As Acemoglu and Robinson (2013:1) show, "sound economic policy should be based on a careful analysis of the political economy and should factor in its influence on future political equilibria". Using this framework, among others, I find that the past, present, and future of HIV financing have particularly significant underlying human rights, moral, and political dimensions. Specifically, politics has a decisive influence on the fiscal sustainability of HIV responses.

The added value of this chapter is three-fold. First, I broaden and deepen current understandings ('narratives') of the HIV financing landscape in Uganda by identifying how 'alternative narratives' - narratives with a more inclusive and egalitarian perspective, beyond those of predominant power structures - can be used to study fiscal sustainability of HIV responses, particularly regarding why it is an issue and what can be done. This analytical approach is motivated by the growing importance of narratives in health economics and policy on one hand, and the power of dominant discourses on the other. Considering this, from a decolonial lens and to move Uganda towards a more fiscally sustainable HIV response, I call for 'alternative narratives' that not only resist but also contest dominant discourses. In the tradition of narrative economics (Shiller, 2017), I find that the current fiscal situation of the HIV response is partly a result of the popular narratives of the respective historical times of the epidemic and response. These narratives are deeply human phenomena. As such, they are difficult to research scientifically. However, as qualitative methods for health economics advance (Coast, 2017), I posit that they may, in the future, help us gain a better understanding of these developments in a more rigorous manner.

Second, inspired by the Southern Theory (Raewyn, 2007), the thesis contributes to a significantly less explored theme of “healing the malaise” in health systems and policy research (HSPR) termed as ‘Northern bias’. It is a truism that global health knowledge does not flow bi-directionally. Yet, to date, most literature on HIV financing displays a ‘Northern bias,’ in which voices of experts at academic institutions, think tanks, and health organizations are represented more than those of local authorities or individuals at the forefront of financing policy and reforms in Uganda, for example. This way, as a pathfinder to equitable global health, it is hoped that this analytic approach modestly contributes to decolonising global health by engaging with the intricacies of knowledge production.

Finally, this thesis contributes to the literature on the politics of financing HIV responses. The present chapter – to the best of my knowledge as a first in an academic study - by comprehensively analyzing the politics of establishing the AIDS Trust Fund (ATF) in Uganda (and discussing this within the theory and practice of trust funds) contributes to the academic literature on politics of fiscal policy in the context of HIV financing. Specifically, by deepening the understanding of the political economy dimensions of HIV financing policy reform implementation, this chapter seeks to contribute drive policy into practice more effectively.

Below, I will proceed in four broad steps. First, regarding the politics of HIV financing in Uganda, I explore and critically appraise the politicization, depoliticization and repoliticisation of HIV financing - through the exceptionalism and normalisation lenses. Second, to reverse the deprioritisation, I propose evidence-based approaches to stimulating political prioritization of HIV and health within domestic budgets. Thereafter, given the central role of the ATF in the practice of and the policy discourse on the fiscal sustainability of the HIV response, I undertake a political analysis of the multiple interests, processes, and actors for the establishment of the ATF, and locates it within the broader public finance literature. Finally, adopting an ‘investment case’ style, selected economic (and fiscal) dimensions of HIV financing are empirically analysed. The last section concludes with some pointers for future directions.

2.2. Politicisation, depoliticization and re-politicisation of HIV financing in Uganda

In 2008, Prof. Alan Whiteside, drawing from exceptional HIV financing and while comparing HIV to other pressing global equity issues, concluded that: “AIDS is a harbinger, the first of many new and alarming challenges, and has allowed us to learn. Only time will tell if we did” (132). However, barely 5 years later, in 2012, the Institute of Health Metrics and Evaluation (IHME) predicted the end of the “golden age of global health” (financing). More than 35 years since AIDS was first reported, Whiteside and Wilson (2016) describe “AIDS at 35” as a “midlife crisis”. Ooms (2017), on the other hand, however, prefer to see the present and future of the global response to HIV/AIDS as ‘growing pains’. As the preceding historiographical analysis shows, HIV financing stands at a major crossroads. It is in this context that this section analyses the politicisation, depoliticization and re-politicisation of HIV financing.

In Uganda, HIV/AIDS politics, policy, and activism has shaped and, in turn, has been influenced by, HIV financing. AIDS exceptionalism – a notion emanating from the idea that the AIDS disease requires a response and attendant financing over, above, and beyond the “normal” health interventions - thrust HIV and its financing into the realm of national and international politics where it rightly belongs. Consequently, the rise, fall, and revitalisation of HIV financing (that follows the exceptionalism path implicit in the epidemic curves earlier discussed) can best be explained by the scale and scope of the actions (or inactions) of existent political systems and the government in Uganda, the realities of policy and policymaking amidst national realities and external influences, and the ongoing opportunities

for - and limits of - activism and community mobilization. Major lessons can be gleaned from the politicisation, depoliticization and re-politicisation of HIV financing in Uganda. This section does not aim to be a comprehensive treatment of the subject but rather to set the scene for a political economy analysis of the fiscal sustainability of HIV response in Uganda.

In a nutshell, the global response to HIV/AIDS has been among the dominant global development issues over the last years but faces an uncertain outlook. In Uganda as elsewhere in high HIV-burdened LMICs, the future of financing of the HIV response is at a crossroads. Specifically, the politicisation and depoliticization of HIV explain the rise and fall of AIDS exceptionalism, and the attendant phenomenal increase in HIV financing and eventual stagnation and decline of HIV financing respectively punctuating these distinguishable phases. Whereas politics is decisively influential, however, it has not enabled a concomitant strategic shift in the financing perspective for a CCD such as HIV. The same is true for the corresponding financial and ethical burden that this entails. It is this mismatch that has put the financing of the national HIV response at some cross-roads.

Thus, learning from history as an entry point to chart a path forward, I question: 1) whether the challenges involved in HIV are unique, rather than even being exceptional? 2) if there is nothing exceptional anymore, what use is there in exceptionalism? Generally, it is a truism, HIV is exceptional in several ways ranging from it being the only pandemic retrovirus to, the (key) populations it disproportionately affects, the exceptional response it gave rise to which changed everything (UNAIDS, 2015), including global healthcare where HIV has led to improvements in everything from care pathways to clinical trial design. Specifically, to the first question, I argue that it is unique. Unique in the sense of how the personal and the political have been interfacing and mixing. It is also unique in the sense of living with something, an undesirable possession that is both yours and society's, hence truly social-psychological. To the second question, I contend that calling for a renewal of exceptionalism – as a means towards fiscal sustainability – would be politically advised. From a framing perspective, picking (or allowing to be trapped) by a set of “opposites” semantics - exceptional/ unexceptional, are - in and of themselves - unhelpful.

To this end, in this thesis, for a fiscally sustainable HIV response, I am not calling for renewed exceptionalism, as that time is gone. Rather, I contend that the uniqueness of the response - and the reasons why that continues to be so provides a useful workhorse to think and act politically on the central question of this thesis. Framing the discourse this way, in the ensuing novel framework for fiscally (and politically) sustaining the national AIDS response, among other attributes, call for renewed attention and passion for a cause that is far from resolved. This way, as one of the keys, public policy could be influenced through “repoliticisation” of HIV financing, with global health activism central to both coping personally and helping others at the same time.

Regarding global health financing policies, to foreground the repoliticisation, a phase that I argue is critical to the fiscal sustainability of HIV/AIDS responses in Uganda, I conclude that the “new normal” entails integrating the exceptional in an evolving response to AIDS. The national AIDS programming is off track in achieving ambitious targets (such as the UNAIDS Fast-Track targets) that are critical if the epidemic trajectory is to be bent and the country set on the path to end the AIDS epidemic by 2030 (a target enshrined in the SDGs). Additionally, in responding to calls to take “AIDS out of isolation”, the AIDS response should look beyond a single disease focus to embrace broader goals, including UHC and global health security (GHS). In this context, the International AIDS Society - Lancet Commission (Bekker et al., 2018: 312) calls for:

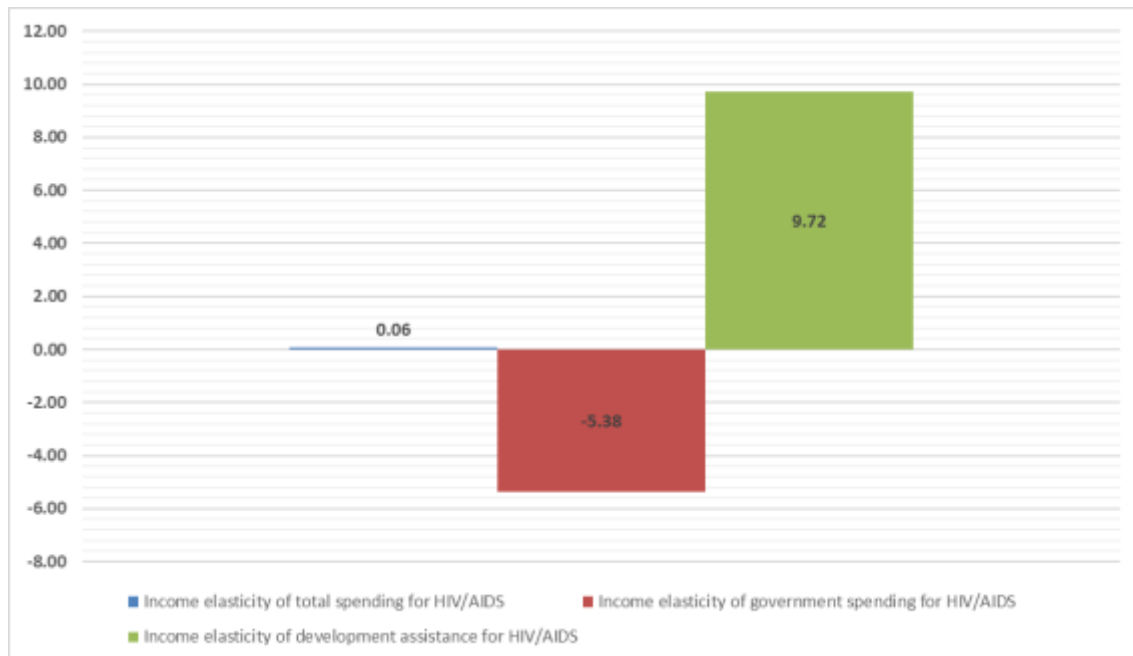
“HIV services should, where feasible, be integrated with broader health services... [but must] preserve and build on key attributes of the HIV response”

In conclusion, to advance global health and strengthen the HIV response in the era of the SDGs at a time of a fractured financing landscape, exploring the intersections between the future of global health and the HIV response requires rejuvenated financing of the global HIV effort which implicitly call for re-politicisation. To adroitly address the fiscal sustainability of HIV response in Uganda and elsewhere in high HIV-burdened sub-Saharan African (SSA) countries, the tensions and synergies in the above dynamic between financing for HIV, global health, and other sectors will need to be politically navigated in any framework to lurch from current complacency against HIV/AIDS. Finally, since 2000, across low-income countries as a group, health has been deprioritized and this group has become increasingly reliant on external assistance for health (yet this is poised to decline even further). How can this trend be reversed? The analysis here (and the ensuing framework advanced in this thesis) identifies levers on how to increase the political prioritization of health and HIV within domestic budgets.

2.3. Stimulating political prioritization of financing health domestically

Drawing on the politics of fiscal policy, this section presents nascent evidence-informed multidimensional ideas to stimulate political prioritization of financing health domestically, to catalyse investment decisions to reverse the displacement and replacement effects in health financing observed in the last 2 decades (IHME, 2018). Over the period 2000 to 2015, as shown in Figure 6, the elasticity of government spending with respect to GDP growth in Uganda is estimated at 0.87. In other words, on average, a 1 percent increase in GDP growth yields a 5.3 percent decline in government health spending and a 9.72 percent increase in development assistance for HIV. Considering that the elasticity of government spending on health to GDP growth is estimated at 1.16 on average for low-income countries (Tandon and Cashin, 2010), I conclude that the responsiveness of government expenditure to GDP growth in Uganda is negative, reflecting a “displacement effect” as aid disbursements lead to even fewer domestic resources allocated to the HIV response.

Figure 6: Elasticity of HIV expenditures to GDP in Uganda, 2000 – 2015



Source: Author’s analysis from IHME (2018) and IMF (2019).

The choice of the above-mentioned analytic period is motivated by four main considerations. First, as I show in Appendix 4, the period 2000-2015 coincides with a period of overall increases in HIV financing – the so-called “golden age” for HIV financing – ushered in by the millennium development goals (MDGs). Second, as a baseline, the year represents the period before the introduction of global health financing initiatives such as the United States (of America) President’s Emergency Plan for AIDS Relief (PEPFAR) and the GFATM. As such, it is suited to study financing trends from a historical perspective. Third, 2015 is a long enough period for the effects of the 2008/9 global economic crisis shock to have waned. Lastly, owing to data limitations, robust HIV resources tracking data was only available for this period.

However, as health aid is not solely motivated by health considerations, the above analysis needs to be cautiously interpreted. Observed correlations of health aid and domestic health spending in terms of a “displacement effect” are problematic given that correlation does not necessarily imply causation. To this end, I contend that the displacement effect, as strategic behavior, partly explains the deprioritisation of HIV financing within domestic budgets. This has policy implications for donor transitions. To smooth-out these deleterious effects, co-financing policies must take account of the displacement effects over the years by ensuring external financing is pegged on the recipient country meeting fair share of domestic financing as GDP grows rather than current practice where donor transitions are tied to a given cut-off date without taking into account this smoothed-out graduated approach to transition for sustainability.

Positing that politics can distort optimal fiscal policy, the above analysis suggests that HIV has been de-prioritised and Uganda is now relying on foreign aid more heavily. I argue that smart approaches can attenuate the negative effects and reverse this trend. It is in this context that I discuss evidence-based approaches to stimulating political prioritization of health and HIV within domestic budgets.

In Appendix 3, I present an analysis of evidence-based approaches to stimulating political prioritization of health within domestic budgets. To influence fiscal policy and practice, this analysis extends over two (2) dimensions – the “what” and the “how”. This dual approach is predicated on the recognition that growing interest in evidence-based public policymaking notwithstanding, a lot of work in this area disregards the view that the personal is political. Consequently, the largely nerdy approach dismally fails to adroitly engage with the political nature and the political economy of decision and decision support (Parkhurst, 2017; Dynan, 2018). To this end, in the first place, in terms of the “what”, I discuss the role, and the design, of economic evaluations in support of decisions on investment in health, in particular, if decisions are embedded in a broader development narrative. Here, I outline several tools that have been applied or recommended to capture such implications – for public finance, broad economic development indicators such as GDP per capita, and distributional aspects. While no consistent approach has emerged, I critically see this as a reflection of the multitude of the economic and development aspects of health, and the specific needs of decision-makers.

As a second dimension, the “what” dimension connects the above-mentioned technical discourses to the political areas and thus influence how policymakers listen to, use (or misuse) evidence and astutely act on it, I posit that various policy levers exist. These, *inter alia*, include those summarized in Box 1.

Box 1: Moving the needle: some levers for navigating the politics of evidence-based policymaking

1. simple storytelling;
2. building coalitions;
3. framing and persuasion;
4. analysing and acting on a robust evidence base;
5. the use of complementary influencing strategies;
6. learning and mastering the rules of the strategy game, and
7. a process of constant reflection and improvement to think and work politically.

Source: Author's compilation, adapted from Parkhurst (2017) and Cairney (2016).

In conclusion, as government-donor strategic behavior is analogous to a game of strategy, grounded in geopolitics, I argue that the above multidimensional approach as proposed in this Ph.D. thesis is essential and can be a strong driving force to ensure implementation of measures to improve and assure fiscal sustainability of health systems. Framing the growing ethnocentric nationalistic politics as critical pivots away from mutual solidarity, the intersection (and growing collision) between the science and politics of pandemics, particularly of EIDs, and the ensuing uncertain outlook could reverse hard-won gains in the HIV response in Uganda. In line with the geopolitical positioning theoretical framework (Gómez, 2018), as the global health financing landscape continues to evolve over the next decades and the attention of the global health community focuses on stimulating domestic government health spending as a pathway to fiscally sustainable health systems (including HIV responses), I note the criticality of gaining a deep and wide understanding of each country's sociopolitical context. Leveraging this, national ownership – with ensuing more and smarter investments on health - can be assured. Undoubtedly, looking forward, the principal sources for additional investments for HIV in Uganda are poised to be increasing the tax base and improved public financial management.

2.3.4. A primer on the role of trust funds for fiscally and politically sustainable HIV responses

2.3.4.1. Introduction

This section presents a primer on what we know about trust funds in public finance. As the global health financing landscape is transforming, especially regarding the role of ODA, recent policy debates have witnessed a growing interest in and proposals for establishing HIV/AIDS trust funds (Haacker, 2016; Kumar and Bhawalkar, 2016). This has largely been motivated by the need to increase and diversify domestic financing for HIV, health, and development. Other global health financing shifts driving these policy proposals, *inter alia*, include countries' need and commitment to publicly finance the move towards achieving UHC, GHS, and the sustainable development goals (SDGs); the need to increase prepaid revenues and effectively move away from deleterious out-of-pocket (OOP) expenditures on HIV and health, such as user fees; and as lost revenue replacement strategy due to the transition away from, or reduction in, DAH, or as donors gradually deprioritise and withdraw from specific HIV programs for geopolitical reasons, among other considerations.

As a financing policy option, the establishment of ATFs has gained attention. However, while a popular idea, the details of these trust funds are often ambiguous. It is this gap that this section seeks to fill. Specifically, it contributes to economic literature by characterizing what ATFs are by answering the following three policy questions: What is a trust fund and why might it be considered for use in public financial management, in general, or specifically in HIV/AIDS and health financing? In which ways have trust funds been used or proposed for domestic health financing in LMICs? And, what lessons can be gleaned from the experiences

regarding the role of trust funds in domestic health and HIV financing in LMICs? Hopefully, this can contribute to inform policy discussions on this potential instrument.

To the best of my knowledge, in SSA, the “AIDS Levy” - a surcharge of three (3) percent on personal and corporate income taxes - in Zimbabwe is the only example of a functional trust fund in the HIV field. It has been operational since 2000. To this end, ATFs remains a nascent idea. In both academic and policy circles, there is a general paucity of public finance literature on trust funds as financing policy instruments for health and HIV (UNAIDS, 2015). Comprehensively surveying the academic literature, this section provides a comprehensive stocktaking and discusses the role of trust funds – from a public financing policy and practice perspective - in assuring sustainable financing for HIV responses.

This section is divided into three distinct, yet interrelated, parts. In the first part, I present some definitions. This helps bring conceptual clarity to the analysis regarding what a trust fund is or not, and why might it be considered for use in public financial management (PFM), in general, or specifically in HIV financing. In the second part, I explore and critically appraise recent and current policy developments and practices. I articulate ways in which trust funds have been used or proposed for domestic HIV, health, and development financing largely in LMICs. The concluding sub-section summarizes key findings, draws out some lessons and policy implications from the experiences regarding the role of trust funds in domestic health financing and, and provides some pointers for future work.

2.3.4.2. Trust funds defined

In the public financial management (PFM) literature, there is no internationally agreed standard definition of a trust fund. In terms of typology, there are development and private sector-focused trust funds. Here, the former is a special-purpose vehicle arrangement set up to receive funding from one or more sources, held and disbursed by an appointed trustee per agreed terms and conditions. On the other hand, the latter is a fund comprised of a variety of assets (e.g., cash, bonds, stocks, private equity, real estate, etc) intended to provide benefits to an individual or organization. It is important to note that this dichotomy is complicated by the varied and context-specific properties of the numerous trust funds.

Additionally, whereas the global health financing policy discourse refers to trust funds, the PFM literature typically uses the term “extra-budgetary funds,” i.e., funds administered outside regular budget procedures. As I show, regarding the motives for setting up such funds discussed in this thesis, the properties of trust funds and extrabudgetary funds largely overlap. On this basis, I do not consider the distinction further. However, in the context of domestic HIV financing policy and practice, which is the key focus of this section, trust funds can further be defined by at least three (3) distinguishing properties.

In the first place, as *extra-budgetary funds*, their administration is outside the government’s regular budget cycle and processes. From an accounting and legal perspective, despite being predominantly funded from public sources such as taxes, the fund is a separate entity (or personality), serving a specific purpose and typically overseen by an appointed governing board. Relatedly, *earmarked taxes*, while not necessarily a distinguishing property of a trust fund, as shown by cases of recent proposals for establishing trust funds (see Table 2), they are increasingly an important aspect of the policy discourse on establishing ATFs. For example, most – if not all - recent proposals assign specific revenue streams, say a specific health tax, to the fund.

The second distinguishing property is with regards to the *modus operandi* of the fund. Here, there at least two (2) types of trust funds. One is an endowment-based trust fund, administering some assets. Here, income to financing its operations can be derived from

interest earned on the above-mentioned assets. Additionally, can draw down from or add to its endowment. On the other hand, analogous to a bank current account, the other type is a developmental one. Under this, most, if not all, operations are funded by current as well as grants, among others. This is the most common type in the HIV sector. The above-mentioned Zimbabwe ATF (i.e. the AIDS Levy) falls in this category.

Lastly, a trust fund can be defined by its *purpose*, which could be broad or specific. A case in point could be to underwrite specific activities (within the HIV response e.g. ART), the benefit to certain populations, and/or even focused on a specific geographical location. In a nutshell, by way of definition, “trust funds” (as HIV and health financing mechanisms) comprise funds which are subject to special administrative procedures, and which are assigned to a specific purpose. Therefore, as I show in Table 1, trust funds take different forms. Consequently, they are informed by and reflect many considerations.

Table 1: Defining factors for trust funds in PFM

Distinguishing factor		Definition
1	Funding	Frequently, trust funds are set up to pool funds from different sources (e.g., the government, donors, and the private sector) and account for their use.
2	Governance	While trust funds can be administered in a similar way as general government resources (e.g., in case of the “Uganda Road Fund” managed by the Ministry of Works and Transport), they can also be associated with special governance structures and procedures (e.g., the fund may be overseen by a board appointed by the government and other domestic and external stakeholders).
3	Administrative procedures	The funds may be held at a government account or a commercial bank, and be administered by the government, the trust fund’s executive staff (if there is such staff), or a third party.
4	On-budget / off-budget	Trust funds can be administered on-budget, supported by special accounting requirements ⁹ , or off-budget. If they are administered off-budget, government support would take the form of a transfer, expenditures supported by the fund would not appear in the public accounts directly

Source: Author’s compilation.

It is worth noting that trust funds in public financial management share properties with some other entities. Public enterprises also control funds that are administered separately from the government’s general resources, but – unlike trust funds which are predominantly funding instruments – they engage in some economic activity and typically derive the bulk of their revenues from it. Public insurance schemes are predominantly funded by private (members’) contributions, but may also serve additional purposes (e.g., expanding access, health systems strengthening) funded by budget allocations or donors. Where trust funds are predominantly financed by donor grants, it is sometimes unclear if they fall under the umbrella of public financial management or if they are instruments for disbursing external grants.

In development policy and practice, trust funds remain an important aspect. This is more so in the global discourses on domestic HIV financing. The GFATM, one of the foremost financing policy instruments for the global response to HIV/AIDS, is a trust fund. This notwithstanding, however, trust funds have, overall, not lived up to their hype as they have played a very thin role in financing HIV responses in LMICs. Consequently, despite the considerable interest in trust funds in the policy discourses on domestic health financing, the

⁹ In Uganda, for example, the fiscal resources released by a debt relief to highly indebted poor countries (HIPC) were usually held in a special account on-budget, supporting qualifying on-budget expenditures such as primary health care (PHC).

evidence on the use of the same as a domestic health financing instrument is relatively undeveloped, because few have been implemented to date.

In line with the aim of this critical appraisal, to document a *variety* of examples of trust funds, and to identify *motives* for the establishment of such trust funds, I conclude that there are mainly two principal motives for setting up trust funds emerge from this review – pooling funding from different sources and prioritizing specific aspects of HIV and/or health services. In academic and policy literature, to the best of my knowledge, Zimbabwe’s National AIDS Trust Fund (NATF) and Hong Kong AIDS Trust Fund are the only two (2) notable and long-standing functional examples of a trust fund supporting national HIV responses. In this section, I will focus on the Zimbabwe AIDS Levy. Legally set up in 1999 by an Act of Parliament, it is capitalised vide a 3% mark-up on income tax. This tax applies to both corporate and personal income. For its day-to-day operations, it is administered by the National AIDS Council (NAC) (Bhat et al., 2016). Importantly, it remains the principal source of domestic funding of the national HIV responses as well as the NAC’s operations. Whereas it was originally conceived as an instrument to also attract donor funding and pool resources (Madzingira, 2008), this objective is yet to materialise, in part because of the government’s strained relations with her donors. Importantly, in terms of its revenue-raising potential, while the NATF’s contribution is significant, it consistently covers less than 10% of the annual resource needs of the national HIV response. This is largely due to its design features – as a “current account”- but also a consequence of the deteriorating economic situation in the country. Endogenous factors impact on its operations. For example, in real terms, the recent hyperinflation in the country has grossly eroded the value of the revenue collected.

Table 2: Overview of ATFs and proposals

	Zimbabwe	Tanzania	Uganda	Kenya
Status	Established in 2000	Fund established but lacking committed funding	Supported in principle but no decisions taken	Proposed since 2012.
Objectives	<ul style="list-style-type: none"> • Self sufficiency • Seeking donor contributions 	<ul style="list-style-type: none"> • Reduce reliance on donors • Mixed investment and budget fund? 		<ul style="list-style-type: none"> • Self sufficiency • AIDS services in NHIF?
Governance	<ul style="list-style-type: none"> • Administered by National AIDS Council • Very broad mandate • Minister has considerable influence • Accounts available 	<ul style="list-style-type: none"> • TACAIDS to oversee, currently preparing regulations 		<ul style="list-style-type: none"> • Supervised by National AIDS Control Council
Revenue	<ul style="list-style-type: none"> • 3% levy on incomes and profits in formal sector • Integrated into tax system, collected by revenue authority • Funding at X million today 	<ul style="list-style-type: none"> • Seeking revenue from government • Draft legislation notes donations and investment income • Press report Sh3bn (\$1.38m) so far 	<ul style="list-style-type: none"> • Seeking 2% of revenues from beers, spirits and waragi • Seeking donations and contributions 	<ul style="list-style-type: none"> • Less than 1% of total revenues • Seeking new taxes • Seeking donor and private
Disbursements	<ul style="list-style-type: none"> • Local networks propose spending, decisions taken nationally • 50% for ARV 	<ul style="list-style-type: none"> • Grant model • 1% for coordination 		

Source: Kumar and Bhawalkar, 2016

On the other hand, especially in some East African countries, as Table 2 illustrates, ATFs have prominently featured in HIV financing policy discourses. First, for example, in Tanzania, despite a long and tortured road towards the establishment of an ATF (Bilal, 2011), it was not until 25th March 2015 that it was legislatively approved (Government of Tanzania, 2015). Officially launched in December 2016, the ATF's stated principal purpose is to reduce the current heavy donor dependence by raising and thereafter increasing domestic funding for the national HIV response. In terms of institutional embedment, its operations are overseen by a multi-actor Board of Trustees. It is planned that funds raised will be held separately from the traditional national accounts of the Government of Tanzania. Whereas details on the quantitative projections of revenue volume are not readily publicly available, the Act of Parliament establishing the ATF explicitly points to appropriations from Parliament, loans, donations, grants, and investment income among others as a source for funds for capitalising the same. It is worth noting that in fiscal year 2016/17, a total budget allocation of US\$ 2.4 million (equivalent to less than 1% of annual HIV spending) was made. In terms of private donations to the ATF, a commitment of US\$ 150,000 has been made to date.

Secondly, as critically analysed extensively elsewhere (see Appendix 4), Uganda is another example. At least since 2011, a proposal for an ATF has been on the table. Legally approved in 2014, by the time of finalising this thesis, it is yet to become fully operational. Finally, in Kenya, an ATF has also been under discussion for over a decade. The proposal – contained in a cabinet memo - has been endorsed by cabinet since late 2012, with a widened mandate that also covers priority noncommunicable diseases (NCDs). It is unclear though if or when it will be legally established or launched. By design, in terms of the scale of realisable financing, this is by far one of the most far-reaching and rigorous proposals in the region. Also, as an innovation, it is envisaged as a contribution to Kenya's pathway to UHC. According to NACC (2014), assigning 2% of government ordinary revenues (i.e. approximately 0.4% of GDP) to the trust fund for HIV and priority NCDs is pragmatically proposed. Given the size of Kenya's economy, in real terms, this rate is considerably higher than in both Tanzania, Uganda, and Zimbabwe. Thus, it has the potential to assure a relatively much higher share of domestically financing the national HIV response than presently. Finally, looking further ahead, drawing on analysis by Haacker and Birungi (2014), the ATF could be leveraged to smoothen the transition to UHC, for example by financially contributing to meet the HIV treatment costs under the national health insurance scheme (NHIS) among other options.

Despite the experience with ATF being thin, only recent, and not yet rigorously evaluated, I posit that some lessons are discernible. First, *per se*, ATFs are not necessarily a means to sustainable financing for HIV responses. As I have shown above, the revenue-raising potential of these policy instruments accounts for a very small and insignificant proportion of the resource needs of national HIV responses. Second, while ATFs have variously been framed as “innovative” financing instruments, they are all but innovative as, at least the proposals reviewed in this thesis, are based on very conventional taxes (via the government's general resource account). The literature on public financial management identifies several motives for setting up trust funds, including the following (some of which may apply concurrently):

1. Protecting essential public services from funding disruptions. When government revenues are volatile, and the government's ability to borrow, to iron out such fluctuations, is limited, revenue shortfalls may cause disruptions to public services. For example, negative revenue shocks might disrupt the procurement and availability of essential medicines. Establishing a fund that acts as a buffer against such shocks could be an effective way to formalize and manage the prioritization of such expenditures.

2. Enhancing greater transparency and accountability. From a public sector accounting point of view, a trust fund may facilitate accounting for the use of resources when public services are financed by earmarked taxes, fees, private contributions, or external grants. On other hand, in the case where public services are at least in part financed by donors, a trust fund may serve to meet specific accounting requirements of donors or to address donor concerns regarding the transparency of public finances in general. To achieve these ends, some trust funds are managed by third parties, e.g., a professional service provider.
3. Ability to carry unused funds over to the next fiscal year. A trust fund could be utilized if effective procurements do not gel well with the annual budget cycle, e.g., because purchases of medical supplies are time-sensitive, not entirely predictable over the budget cycle, or best conducted in bulk. Other motives (providing a buffer against revenue shocks, managing pooled resources) may also imply the need to carry funds over.
4. Managing pooled resources. A trust fund may serve to streamline administrative and accounting procedures where activities are supported by funding from several sources (in addition to accommodating donor requirements and addressing concerns on transparency and accountability).
5. Addressing a mismatch in time horizons between budget allocations and funding needs. Government budget timelines may not always align with the timeframe needed to finance priority services. The most common examples of funds addressing such a mismatch are pension funds or savings (or “wealth”) funds. Examples from public health include compensation funds benefitting individuals requiring long-term treatment, care, and income support (e.g., compensation funds benefitting people infected with HIV through tainted blood products).
6. Overcoming political obstacles in the public budgeting process. A trust fund, securing that funds will be allocated to some cause enjoying wide popular support, might help build consensus around an increase in taxes or national insurance contributions, and thus realize additional funding for public health. Also, a trust fund could serve as a funding vehicle for a program that is not well-aligned with ministerial responsibilities (e.g., a multi-sectoral disease prevention program) or for activities where the budget process is considered to yield inefficient outcomes (e.g., underinvestment in prevention and immunization programs).

In summary, on one hand, some trust funds have been set up to pool resources for financing a comprehensive package of HIV and health services. These include health-sector pooled funds typically involving large contributions from donors and some domestic resources, but also funds through which private resources (user fees or pre-paid contributions) are complemented by domestic fiscal (and sometimes also external) resources, to strengthen health services to the populations covered or expand coverage. On the other hand, concerning prioritizing specific aspects of health services, I argue that trust funds have variously been used to prioritize specific interventions and/or aspects of health services. The most important examples include trust funds in connection with the procurement of essential medical supplies, and trust funds in support of specific health programs, e.g., on HIV/AIDS or immunizations.

2.3.4.3. Discussion

The objective of this section is to assess the potential of trust funds in domestic health financing, in the context of shifts to UHC, GHS and the SDGs, the need to increase pooled, prepaid financing, and a transition to increased domestic financing (as the role of donor support

declines). To this end, two bodies of literature were reviewed – the literature on the use of trust funds in public finance in general, and the evidence on the use of trust funds in domestic health financing. The review shows that many of the motives for establishing trust funds in the literature on public finance are present in Uganda’s health sector. Overall, key among the peculiar aspects of the health sector is the strong presence of donors. For this reason, many of the domestic health trust funds identified also involve contributions from donors.

Some of the trust funds surveyed serve to protect essential public services from funding disruptions. Health-sector pooled funds can safely be interpreted in this way, providing an instrument to support a defined package of essential health services and contributing to build resilient and sustainable health systems, particularly in contexts when the government lacks the financial and institutional capacities (e.g., in Liberia or Zimbabwe). These funds are predominantly externally financed, but their governance serves to integrate the trust fund under the government’s health sector strategy. The only trust fund identified designed explicitly to isolate funding of essential health services from domestic fiscal disruptions is the Bhutan Health Trust Fund. Considering extremely volatile government revenues, this is achieved by establishing a capitalized fund, the revenue of which is sufficient to fund supported expenditures (initial purchases of vaccines). The fund has since transitioned to a mixed model, with a greater mandate (also covering procurement of essential medicines), and in part financed by an earmarked tax, but its endowment still serves as a buffer against revenue shocks.

The motives for establishing transparency and accountability have played an enabling role regarding external support. For example, the Health Transition Fund in Zimbabwe, administered by a third party (i.e. UNICEF), was established as a vehicle for donor support in the context of strained relations between funders and the government. In domestic health financing, trust funds have been used to administer and account for the proceeds of earmarked taxes (e.g., in case of the “AIDS levy” of Zimbabwe), and this motive may play a role more widely in case of funds which serve to pool funding from different sources. Setting up a trust fund per se, though, is not sufficient to achieve improved transparency and accountability.

The ability to carry unused funds over per se has played a limited role in domestic health financing. This ability is implicit in many arrangements involving pooled funding. However, the ability to carry unused funds overplays a role in the procurement of medical supplies, but such responsibilities are typically fulfilled by a public enterprise, which could also be in charge of distribution and retailing, rather than a trust fund.

The need to manage pooled resources plays an important role across health-related trust funds, regarding integrating external funding and complementing domestic private resources. With regards to external funding, trust funds do not only serve the obvious needs in managing and coordinating funding from different sources in support of specific health programs or the health sector overall, but they also offer a vehicle to separate the governance of these funds from the sources of funding (e.g., in case of the Health Sector Pool Fund of Liberia, where the government plays a small role in funding, but has a strong position in establishing funding priorities). Trust-fund like structures have also emerged where private funding (from user fees or prepaid contributions) is complemented by domestic public or external funding, to expand coverage or strengthen health services (e.g., in the case of the Health Sector Services Fund (HSSF) of Kenya, or the Community Health Fund (CHF) of Tanzania).

Two of the motives identified in the public finance literature – addressing mismatches in time horizons and overcoming political obstacles – have not played a significant role regarding the trust funds reviewed here. In a wide sense, of course, the motive of addressing

mismatches in time horizons is behind all pre-paid health financing schemes and therefore plays an important role in domestic health financing. Such health insurance schemes, though, are generally beyond the scope of this review (as they are not trust funds from a PFM perspective). The examples included here involve funds where private contributions complement domestic public and frequently external financing, i.e., they are characterized as pooled funds rather than pre-paid financing schemes. Additionally, I also find little evidence of trust funds as a tool for overcoming political obstacles. The experience with the policy discourse on trust funds, though, suggests that trust funds may serve as an expression of political priorities. E.g., the actual or proposed mandate of trust funds may change in line with the policy context (e.g., in the experience with the Bhutan Health Trust Fund, the Kenya AIDS trust fund, or the discussions on a health-related trust fund in Cameroon).

One area in which trust funds could help overcoming political obstacles is if they contribute to sustainable funding of health programmes, i.e. if they help unlock funding which would otherwise not be available. The trust funds classified here as vehicles to overcome transparency and accountability issues can be interpreted in this way. Trust funds continue to play a role in the policy discourses on sustainable domestic financing for health, particularly considering the ongoing transitions in the HIV financing architecture. However, the only trust fund with a track record (i.e. the NATF of Zimbabwe) only accounts for slightly over 10% of the annual financial resource needs of the national HIV response. Government commitments on ATFs in Tanzania and Uganda do or would account for a miniscule proportion (i.e. less than 3%) of the annual total costs of the national HIV response. It is also not obvious if these trust funds contribute to securing additional funding. While the tax surcharge financing the NATF was motivated by the burden posed by HIV and AIDS, it is not plausible that the Government of Zimbabwe would not have provided some funding for the HIV response. Some trust funds have facilitated solicitation of private donations (e.g., in support of the Tanzania ATF or the BHTF), but these have accounted for a relatively small proportion of revenues.

2.3.4.4. Conclusions

This sub-section has sought to critically analyse what we know about ATFs. I argue that ATFs have been and remain an integral part of the ongoing policy discourse sustainable HIV financing. However, this is mostly pronounced at the global level and less so at the national level. This is so largely because one of the most significant multilateral public-private funding agencies, the GFATM, is a trust fund. In the context of discussions about domestic financing, these have emerged as a potential model for governments and donors to commit to supporting the ongoing costs of the HIV response. Advocates who are rightly worried about fragile budgets, poor delivery capacity, and substantial needs are investing a considerable amount of hope into this model. Beneath the heated debates about the merit of trust funds remain the same set of questions that beguile health financing more generally – is this the right priority, will it lead to more effective spending, can it support the health system, and how will it be paid for?

In SSA, I conclude that the experience to date is thin, with the Zimbabwe AIDS Levy as the only example of a fully functional ATF support domestic resource mobilization (DRM) for national HIV responses in high HIV-burdened and resource-constrained countries facing steep financing challenges. ATFs are but one way of coping with these long-term fiscal challenges and are different from business as usual because they try to negotiate some distance from government. In certain contexts, this distance can be good and lead to innovation, but it is also highly susceptible to mismanagement and a weakening of the checks that otherwise might exist to ensure public funds are being spent well and on the right things. A misnomer is an idea that distance from the government necessarily equals sustainable sources of funding. Investment funds will always be subject to the vagaries of financial markets. Budgetary vehicles will survive for as long as governments remain committed to

giving them revenues, which may vary as economic circumstances change or views about tax policy changes.

In principle, are ATFs a good or a bad thing? It is perhaps not helpful to argue on this question. Rather each proposal must be considered on its merit. In summary, based on what we know about the proposals in Kenya, Tanzania, and Uganda, each of these has considerable work that remains to be done. Pragmatically, ATFs can be seen as policy instruments for isolating the financing of the national HIV response from the annual budget cycle process. Also, in jurisdictions where government financial operations are largely seen as intransparent, they can be the vehicle for unlocking the operating environment to restore fiduciary assurance and restore confidence to enable external contributions. However, there are

Trust funds are an instrument of isolating the HIV response from the annual domestic budget processor establishing an inviting environment for external contributions where government finance is seen as intransparent. However, there are disadvantages as well. ATFs can complicate the government's fiscal operations by adding layers of intransparencies and rigidities. For example, as shown above in Table 2, while proposals to establish ATFs most often entail some earmarked tax thereby allowing policymakers a fairly predictable and sustainable domestic revenue stream, in the absence of inbuilt flexible and regulating mechanisms, with the revenue stream having no or little semblance to the profile of spending needs, it may result in inefficient spending allocations.

Finally, the use of trust funds in domestic health financing broadly reflects motives for such arrangements identified in the literature on public finance. Several examples of the use of trust funds in domestic health financing suggest that they have been used to pool resources and manage the objectives of different stakeholders (notably of private stakeholders on one hand, and the national government on the other), and addressing certain inefficiencies associated with the regular budget process (e.g., by being able to carry over funds and maintain operating balances). One important aspect of the health sector is the prominent role of donors in many countries, who have also contributed to or motivated trust fund arrangements. However, to date, there is little empirical evidence on ATFs' positive contributions in terms of additionality of resources or prioritization. At best, they are unclear. The same is true for the financial sustainability of HIV and health programs *per se*. To this end, to amplify progress towards fiscally sustainable responses, there is a need to learn from the long durée.

2.3.5. A political analysis of the HIV/AIDS Trust Fund in Uganda

2.3.5.1. Introduction

This section seeks to improve our understanding of the political economy dimensions of fiscal policies, including the politics of fiscal policymaking. Methodologically, by reviving a tradition in political economy that gradually left mainstream economics (Hudson and Leftwich, 2014), I contend that existing traditional political economy analytical tools are insufficient to adequately grasp the inner politics of HIV financing in Uganda. Specifically, this section contributes to filling a knowledge gap regarding the establishment of the ATF by distinctively analysing what is inherently political about health financing policies and politics. These, *inter alia*, include power, processes, ideology, interests, agency, ideas, the subtleties of building and sustaining social movements and coalitions, and the role of contingency among others.

This section, using political analysis tools and Uganda's ATF as a case study, contributes to the literature by interpreting the inner and 'micro' politics of the reform processes and contexts in which HIV financing policy is designed and implemented. To better understand the inner politics of HIV financing policy, I argue that there is a need to smartly think and work politically. It is worth mentioning that this, among others, requires getting much better at

recognising and working with the different forms of power - in more detailed and careful ways - and at understanding how and where interests and ideas emerge. These are not academic niceties. Rather, they offer important new ways of working and levers for policy change. This, in and of itself, is key if the HIV response is to be politically and fiscally sustainable. Below, I present - in summary – key results of the political analysis.

2.3.5.2. The political analysis proper

A detailed analysis is presented in the published paper in Appendix 4. Accepting the risk of brevity, in a nutshell, I find that the role of trust funds in the practice of and the policy discourse on the sustainable financing of HIV responses and health is growing and is poised to continue as countries experience global health financing transitions. Currently, in Uganda, whereas the bulk of domestic public investments in the national HIV response are indirectly through taxation, that is to say via the government's general resource account, since the late 2000s, the ATF has been and remains a key element of ongoing policy discourses about health taxes specifically dedicated to supporting the HIV response, typically in combination with some “trust fund” arrangement. However, there is a paucity of political analyses on implementing trust fund arrangements to ensure the financial sustainability of national HIV responses.

In light of the above, innovatively applying a novel meta-framework that connects multiple streams and advocacy coalition frameworks to policy cycle models of analysis – as proposed by Howlett, McConnell & Perl (2016) - to politically analyse HIV financing policy design, adoption, and implementation as well as drawing on insights from public finance literature, I critically analyse the politics of the ATF in Uganda. Significantly, I find that politics was one of the most fundamental drivers for the establishment of the ATF in Uganda. Thus, HIV financing is inherently political. By extension, enacting the ATF, while framed in technical terms, was largely a strategic geopolitical positioning policy instrument that entailed navigating political economy challenges to effectively manage the multiple stakeholder groupings' politics. Despite the hype, with the mandated tax revenues earmarked to capitalize the ATF covering only a paltry 0.5% of the price tag of the annual resource needs for the national HIV response, I find (and conclude that there is) very limited and insignificant potential for the ATF to contribute to the financial sustainability of the national HIV response in Uganda. However, it may play a role in improving transparency and accountability for the use of funds.

Additionally, despite broad support for an ATF, there appears to be a considerable challenge to whether the money to be appropriated into a potential trust fund could be retained within the public sector without having to pass through the budget process. These findings have implications for global health politics. They suggest that a policy and political analysis of the position, ideology, power, and interest of the multiple stakeholders involved in health financing policy design, adoption, and implementation helps to understand their relative role in not only promoting, resisting, or blocking implementation, but also the dynamics of their interactions. Looking to the future, as good policy analysis requires good political analysis, I conclude that continuous rigorous systematic political analysis can bring meaningful insights to the understanding of the political economy dimensions of the ATF as an innovative financing policy instrument in Uganda. Also, to best serve the public interest, this analysis can serve as a basis for an ethically-informed consideration of various health financing policy alternatives. These can, in turn, help drive health financing policy to practice more effectively.

From a political economy perspective, there are some key policy considerations from the above. For Uganda, the ATF represents a considerable departure from their regular way of working and raises some policy dilemmas. By drawing on Hong Kong and Bhutan's experience, here, I outline three of the main policy challenges. First, I argue that conflating investment funds with extrabudgetary vehicles is not helpful. It is commonplace for advocates of ATFs to claim that they will be financed from tax revenues and secure donor or philanthropic

money. This conflation betrays that it is not clear whether the Trust Fund is going to be a budgetary vehicle or an endowment fund. These two models are very different in terms of how they work, when and how much they can spend, and the expertise they require. Though somewhat simplistic, these models can be stylized as:

Investment funds manage capital over multiple years to generate income that can be spent. The Bhutan Health Trust Fund is an example of an investment fund as it spent more than 15 years building capital simply to generate enough investment income to pay for the country's pharmaceutical needs. Outside health, examples include sovereign wealth funds and large university endowments in the United States. These aim to earn more than interest on government debt (what the government could earn if it simply put money in an account) so that income generated can be used to support spending in years where revenue is low or pay for some activity.

Budgetary vehicles are principally a means of directing how funds are spent within a particular fiscal year. Revenue is generally sourced from the government budget and in some cases through hypothecated taxes. The Hong Kong AIDS Trust Fund is an example of a budgetary vehicle that received a once-off contribution from the budget. Social Security Trust Funds used to finance health in many countries are an example of budgetary vehicles that are supported by hypothecated taxes. These funds can retain money from one year to the next, though this is generally done to meet policy objectives (e.g. support a provider that struggled to spend money) and less because they are seeking to invest money that is not spent.

Conflating these two funds is problematic. To blur the line between the two betrays that advocates have not always worked out whether they are seeking to be financially independent of government altogether (investment funds) or simply want a temporary break from government interference on spending but are happy to rely on government money (budgetary vehicles).

Investment funds demand big amounts of capital or considerable amounts of time. As a rule of thumb, seeking to spend \$4 million a year with interest rates at 4% (high by current standards) demands an underlying endowment of \$125m. Using the same interest rate, \$40m in spending would demand \$1 billion in capital and \$100m would demand \$2.5 billion in capital. As multi-billion-dollar endowments are hard to win, most investment funds begin with smaller amounts and do not pay out for years (even decades) until they grow to larger endowments (as was the case for Bhutan). These timelines can also be delayed by poor financial market conditions. This makes investment funds less suited to situations where spending is needed now rather than at some point in the future – such as AIDS spending.

As can be seen by comparing Bhutan and Hong Kong, investment funds and budgetary vehicles require very different kinds of expertise. For investment funds, balancing the tension between preserving capital and chasing higher market returns means hiring skilled investment managers that large institutions and very wealthy individuals are already competing for. In contrast, establishing a budgetary vehicle tends to be part of the skillset of a MoFPED. Investment funds are likely to be more attractive to philanthropy because they have the potential for greater independence from the government.

Second, and as discussed in §2.3.5, earmarking revenues comes with its challenges. Many of the proposals for AIDS Trust funds are seeking earmarked sources of revenue. There is considerable literature on the pros and cons of earmarking revenues, and it is not the

intention of this thesis to systematically review this¹⁰. Some argue that a transparent, hypothecated tax is an example of the 'benefit principle' that citizens ought to be able to see what services their money provides them. However, unlike social security, in an ATF, the people contributing taxes tend to be different from the beneficiaries of spending. The fact that earmarking is a worthwhile strategy among health advocates may reflect that governments are seen to be less likely to reduce taxes than cut spending.

A practical implication of earmarking is that it broadens the policy debate to the economic merit of a tax as well as the benefit that may come from its spending. For example, while payroll taxes are popular means of financing social spending, they are not considered to be good taxes in the public finance literature. Social security levies tend to tax the poor proportionately more than progressive income taxes and create disincentives to joining the formal sector. However, taxes on 'sins' such as alcohol and tobacco are often considered to be good taxes and come with health benefits but they offer declining sources of revenue if they are set at high enough to discourage bad behaviour, making them a poor source of revenue to rely on over a long time. See Chapter 8 for details.

Beyond questions of tax design, Finance Ministries are often opposed to hypothecated taxes because they are interested in having maximal scope to vary the size of taxes and spending each year. Dedicating a particular source of revenue entirely to one form of spending locks up a share of the government budget. Though AIDS spending may be small, there is also a concern that one form of hypothecation will open the door to other claims for worthwhile things (e.g. early childhood education) and will result in the budget being atomised into a series of commitments on both the revenue and spending sides of the ledger. This ultimately limits the MoFPED from creating a situation where the government is a net contributor or detractor – which is a core policy tool used to manage the economy. Furthermore, it will hamper the ability to move money between different priorities as views what is the most socially important spending evolve and administrations change.

Though important, debates over earmarking may serve as a distraction to the real policy test that AIDS Trust Funds face. The question that precedes whether funding is earmarked or paid from general revenue is whether a Trust Fund can show that it can spend money more efficiently and effectively than other government ministries, departments, and agencies, notably the MoPED and MoH in the case of Uganda.

Finally, I question whether, in terms of architecture, integrating with the health system – can trust funds be a compliment and not a substitute? Arguably the most important policy issue for ATFs is whether they can complement health system strengthening efforts. Piot and colleagues (Piot et al., 2015) called for HIV services to be delivered along with other health and non-health services as much as possible and emphasised the importance of policies outside of therapies delivered by the health system. A risk with the establishment of a dedicated ATF is that it may prioritise spending on interventions with direct HIV outcomes and not test these against other measures (such as social enablers) that could have more structural and long-term benefits for health (Vassal et al., 2013). Particularly, reducing gender-based violence (GBV), improving schooling for girls, and HIV-sensitive social protection for people living with, at risk of, or affected by HIV are cited as examples of measures that can make a big difference (Piot et al., 2015).

In conclusion, generally, HIV investments are often delivered – vertically in a siloed manner - through parallel structures to the health system. ATFs run the risk of compounding

¹⁰ For a paper that reviews the different sides of this debate McCleary (1991). Though old, many of the arguments remain the same today.

this. Poor coordination often results in the duplication of efforts by governments to dispense ARTs or miss populations at risk of HIV/AIDS. Parallel funding structures can undermine the efforts of the government to strengthen the health system, making Health Ministries that ought to be allies in HIV/AIDS into competitors that do not have an interest in seeing Funds succeed. Resolving difficult questions of how AIDS Trust Funds will support health system development ought to be the first step in thinking through whether these are suitable vehicles to meet domestic financing needs.

2.4. The economic and fiscal policy imperative for financing HIV in Uganda

2.4.1. Introduction

This section, spanning economic development, global development finance, and public health dimensions, answers the question: Why on earth should we continue to invest in HIV interventions? The financing for HIV has been motivated and shaped by many considerations. Economic and fiscal imperatives are such considerations. However, as AIDS is the most studied epidemic in history, a plethora of academic and grey literature address aspects of the economic impact of the HIV/AIDS epidemic and of the effectiveness of the response to HIV/AIDS that underlie the financing landscape and the shifts in the same.

Below, in a short bibliography, I place this research in context – to delineate the focus and added value of this section. This way of proceeding a key aspect that distinguishes my analysis from earlier investment case studies: explicitly, policy implications of the available evidence are deduced. Understanding these is critical for motivating and devising effective strategies for improving fiscal sustainability of the national HIV response, and aligning HIV/AIDS policies with other broader national health and development policy objectives. This section fills this knowledge gap by providing an empirical synthesis of the economic and fiscal imperatives for HIV financing in Uganda.

2.4.2. Research in context: 10 best resources on financing HIV services in LMICs

First, some books, largely edited volumes, have addressed socio-economic aspects of HIV/AIDS early on. These include Bloom and Goodwin (1997) or Ainsworth et al. (1998). These books have played a critical role in shaping the literature, describing HIV/AIDS as “first and foremost a public health problem, but (...) a problem with deep economic roots and potentially devastating economic consequences” (Bloom and Goodwin, 1997). The United Nations Population Division (2004) offers a good summary of earlier studies of the economic impact of the HIV/AIDS epidemic and response.

Barnett and Whiteside (2002, updated 2006) focus on the inextricable link between socio-economic factors and the spread of HIV. They argue that social deprivation and lack of social cohesion greatly contribute to HIV susceptibility. The second half of the book summarizes the empirical evidence on the micro- and macro-economic impacts of HIV/AIDS and reviews some developments regarding the global response to HIV/AIDS. Additionally, Peter Heller (2003)’s pioneering book, “Who Will Pay? Coping with Aging Societies, Climate Change and Other Long-Term Fiscal Challenges”, centrally places the imperative to integrally analyse and confront the multiple 21st-century long-term policy challenges high on government fiscal policymakers’ agenda. Lastly, Natrass (2004) discusses South African HIV/AIDS policies from an economic and ethical perspective and interprets HIV/AIDS policies as public choices on the allocation of scarce resources, in light of economic consequences and considerations on what constitutes a moral community.

Haacker (2004), like Haacker (2016), spans the economic and fiscal aspects of HIV/AIDS. As a background note, the book did grow from the need to provide high-level economic analysis and policy advice in high HIV-burdened and resource-constrained countries. Pulling some of the best talents from places like the Center for Global Development

(CGD), IMF, UNAIDS, World Bank, it describes HIV/AIDS as a major health shock that affects the economy through its impacts on the social fabric among other pathways. This has significant fiscal implications. However, unlike Haacker (2004), Haacker (2016) addresses issues regarding the financing of the HIV/AIDS response (at global, national, or sub-national level) and issues regarding the effectiveness and cost-effectiveness of HIV/AIDS interventions. Notably, Haacker (2004) precedes the age of widespread access to treatment.

Whiteside's "Very Short Introduction" (2008 and updated in 2016) provides an effective write-up of the epidemiology of HIV and AIDS and its attendant economic and social consequences. Worth noting, the first edition that does not cover, or barely addresses, issues regarding the financing of the global HIV/AIDS response and differences in the impact of HIV/AIDS across countries, and provides only a cursory discussion of the effectiveness of the national response or specific HIV/AIDS prevention measures. However, Whiteside (2016: 108), recognising the critical juncture of HIV financing, has a very short chapter titled "Funding the epidemic" that argues that:

"The response to HIV and AIDS has to be funded, whether the emphasis is on prevention, treatment, or both. AIDS is unique in part because of its complex financing. It requires long-term commitments for those increasing numbers on relatively expensive life-saving treatment. 'Funding the epidemic' looks at the history of funding from the mobilization of international money into low- to middle-income countries to the increased domestic funding from government budgets fed from general tax revenues. Looking forward, AIDS resource needs are projected to increase at least until 2020. The problem is that treatment for PLHIV is long-term and these costs remain unacknowledged by governments and donors."

Sahn (2010), based on a conference organized by the United Nations University in New York in 2008, provides in-depth discussions of aspects of the impact of HIV/AIDS epidemic and the ensuing response to it (including chapters by Haacker and Over, who also appear here). This book is a valuable one-stop resource on the socio-economic repercussions of HIV/AIDS. The book, however, is less effective in placing HIV/AIDS in broader public health and economic development context, and the treatment of financing issues and the effectiveness of the HIV response is uneven.

Birungi (2011), innovatively employing Williams (1986)'s schema of health economics as a conceptual framework, to inform policy and practice, critically analyses what is known and largely accepted about the economics of the HIV epidemic and response in Uganda. Worth noting, this Ph.D. thesis builds on this earlier study and attempts to fill a research gap identified then. Thus, pragmatic economic policy analysis is critical to addressing the fiscal sustainability challenges facing HIV responses. Specifically, the study notes that "this economic-oriented approach offers a more applied and practical framework for making (sustainably financing) universal HIV/AIDS prevention, treatment, care, and support a reality rather than remain a "mirage" in Uganda".

Lule and Haacker (2011) explore the fiscal implications of HIV/AIDS. A critique of the methods and data used in the case of Uganda have been discussed elsewhere (see §1.3). This book, in many ways, overlaps with Haacker (2016) in terms of placing the HIV response in a (national) fiscal context and adopting a forward-looking analysis of the HIV-induced fiscal burden of HIV/AIDS. However, the book lacks a cross-country or global dimension, it does not provide a systematic treatment of the impacts of ART, nor directly address the implications of the 2007/8 global slowdown on HIV financing. Also, it does not discuss the effectiveness of the response to HIV/AIDS.

Over (2011), like Haacker (2016), takes a global perspective on the response to HIV/AIDS, discusses aspects of HIV financing, and emphasizes the long-term nature of the financial commitments inherent to the response to HIV/AIDS. Also, novel in this book, taking a long-term view, it introduces the concept of an “AIDS transition”, a concept key to fiscal sustainability. This book, however, does not discuss the impact of HIV/AIDS, and the discussion of HIV prevention policies is heavily lopsided. The book was published by the Center for Global Development, which has established a brand reputation from their work on conditional cash transfers and cash on delivery in development policy. One-third of the book (essentially, the entire section dealing with HIV prevention) thus attempts to extend this approach to HIV/AIDS financing, and it has been much criticized for this imbalance and the applicability of these “cash on delivery” instruments in this context.

Additionally, Piot (2011) offers a comprehensive overview of the international AIDS response, including expert analysis of the challenges posed by HIV. Three major points, relevant to the economic analysis of the fiscal sustainability of HIV response, are worth noting. First, on AIDS as a global public good (GPG) (pp. 46-47), Piot notes that: "The concept of a global public good provides a strong foundation for an international response." Whilst this may have been correct early on - e.g., reflecting concerns about HIV/AIDS spreading globally, and the economic and security implications of this, and some aspects of the HIV/AIDS response (essentially, research funding) provide a public good. However, to motivate global investments in HIV prevention and treatment across developing countries through a "public goods" argument, I contend – and as I will discuss in detail later in this section) - it is required that there are strong interdependencies or spillovers, either economically (implausible, most countries with high HIV prevalence carry a very low economic weight, and HIV/AIDS has not destabilized any country economically so far), from a security perspective (but HIV/AIDS is no longer a significant concern in the security community) or in the area of health: What is the role of cross-border transmission in the spread of HIV/AIDS? E.g., are investments in HIV prevention in Africa or the Caribbean effective in reducing the spread of HIV/AIDS in donor countries, and more so than HIV prevention policies in donor countries? To this end, I find this a very questionable proposition, but this (or the earlier examples) would be critical for building a "public goods" argument.

Second, on combination Prevention (pp. 115-116), the text makes the point that there is no "silver bullet," and then spells out the principle of addressing each epidemiological situation through an optimal combination of interventions. What is missing, however, is what I take to be the essence of *combination* prevention - that there is no silver bullet but a set of *complementary* interventions which in combination have the potential to stop the spread of HIV – and thus move a country towards epidemiological sustainability (see Oberth and Whiteside (2016)), an aspect that I treat in this thesis as critical for fiscal sustainability. In this vein, two of the interventions discussed (i.e. treatment as prevention, male circumcision) reduce HIV transmission *across the population*, not in specific risk situations. A second aspect largely missing is cost-effectiveness. Given that, especially, treatment as prevention typically comes out as the most effective intervention in modeling exercises (in terms of the number of new HIV infections averted and lives saved), but it is also an expensive intervention and drives up the costs caused by new HIV infections. This begs the question: What is the optimal combination of prevention interventions to achieve prevention outcomes while containing or reducing these (increased) costs caused by new HIV infections? Surprising, this does not come out clearly from the outset, save for a passing reference made to this point (p. 142),

Lastly, on the economics of HIV/AIDS (pp. 131-145), the economic drivers of HIV are briefly discussed (pp. 131-134). However, the discussion of macroeconomic effects is lacking largely in two directions. One is concerning economic growth. Here, Piot uses just one calibrated model from a quarter of a century ago (Over, 1992) as an illustration. Efforts to

empirically establish the impacts of HIV and AIDS on economic growth have largely been unsuccessful, which suggests that something is wrong with the calibrated models and there has not been a large impact of HIV and AIDS on economic growth. Additionally, the book synthesizes the literature on the impacts of HIV and AIDS on affected households well. However, some of the evidence referred to suggests that members of affected households recover economically after a couple of years, and a correlation between HIV/AIDS and subsequent change in inequality and poverty rates is not seen. Part of the solution to this puzzle could be that some households in the community (not affected by an AIDS death) gain at the expense of households affected by HIV/AIDS (such as through employment opportunities and, control of assets) so that the impacts of HIV/AIDS on affected households do or not fully translate into an aggregate effect. The above-mentioned notwithstanding, three (3) conclusions are indisputable. First, AIDS-related death among working-age adults reduces GDP growth. However, the net effect on GDP per capita remains ambiguous. Second, owing to reduced fertility and increased child mortality, GDP per capita rises in the short-run. However, in the long-run, this results in aggregate lower growth of the working-age population and of GDP. Lastly, whereas the HIV response mitigates immediate mortality and birth effects, the ensuing impact on population structure only plays out over decades.

Under the auspices of the *RethinkHIV* project, Bjørn (2012) assembles an impressive roster of researchers discussing alternative approaches to HIV prevention. Alternative proposals were then evaluated and ranked by a roster of eminent (“Nobel-prize winning”) economists. However, this volume lacks an explicit discussion of the impact of the HIV/epidemic and response as well as the financing of the same. Also, for the non-specialized reader, the book is somewhat confusing, as the approaches in the different chapters are not compatible, e.g., in terms of measuring the cost-effectiveness of interventions.

Additionally, Johnston (2013)’s “Economics and HIV: The Sickness of Economics” is a critical text that not only explains how but also why economics, as a discipline, has been applied to the control of HIV. As a key finding, it shows that microeconomic approaches, like a public health approach, apports ‘blame’ on individual choices for continued onward HIV transmission. However, it posits that despite the attractiveness of these standard microeconomic approaches, their explanatory power is limited. This is more with so concerning the contemporary global patterns of HIV incidence and prevalence. This seems to suggest there are important factors that are excluded from current analytic approaches. Adopting a heterodox economics-leaning approach, Prof. Deborah Johnston contends that there is untapped potential for alternative approaches. To better understand the spread and impact of HIV, a political economy approach is proposed. This, it is argued, will bring deep meaningful insights.

As has come to be expected of heterodox economics debates, the analysis of the impacts that economic policy and action have on the spread of HIV infections, which is of relevance to HIV financing, makes three nascent but controversial contributions. First, in terms of the micro - and macro-economic causes of HIV, the book argues that health is often a reflection of socio-economic factors, the so-called social determinants of health (SDH). For example, for the acquisition of HIV, economics plays a critical role in at least two ways: 1) economic changes such as migration, occupation, inequality, and poverty alter people’s sexual behaviours and partners; and, 2) a country’s economic structure correlates with patterns of HIV risk and access to services. This economic influence is best illustrated by economic policies (and choices) such as public financing for HIV services such as ART which have a direct bearing on timely HIV treatment. This, in turn, affects HIV acquisition and onward transmission.

Is HIV good or bad for economic development? As I earlier showed, ambivalences remain prevalent with regards to this question. By shedding light on the arguments that keep resurfacing in the economics of pandemics literature each time the above question is posed, the book makes a nascent contribution. There are majorly two kinds of (over)simplification at the heart of this debate. In econometrics, correlation does not always imply causation. However, because of grossly misreading the history of pandemics, a wrong conclusion that mass epidemics promote faster economic growth is sometimes made. This is motivated by the argument that contends that with reduced population size, there is an assumed inherent incentive to optimise labour force participation in the economy. By extension, using the axiom of transitivity, labor wages, and productivity rise. Based on a careful reading of the history of pandemics (Rosenberg, 1992), I argue that for every example that seems to show this, there are as many showing the exact opposite. And HIV is in this latter category. The second kind of (over)simplification is theoretical. Here, the assumption that human beings are rational is fronted. I must hasten to add that this is a major limitation of mainstream economics. Applied to the HIV epidemic, in response to pervasive AIDS-related mortality, people are expected to behave in positive predictable ways. The case of HIV and education is often used, suggesting that HIV/AIDS will lead to higher education due to fewer children and thus a country can devote more resources to them. To this, again, I argue that this is indeed an oversimplification of reality, as it represents a gross misreading of lots of things. This fails to appropriately capture the pathways in which HIV/AIDS can and does negatively affect public expenditures, learners, educators, and individual as well as household finances.

The third contribution this book makes is to our understanding of how and when political economics could and ought to help prevent the spread of HIV. Intricately understanding how markets are structured, including who benefits from them when and why, is at the heart of the political economy approach. As a starting point, applied to HIV, this necessitates understanding how HIV infection risk can be magnified by certain kinds of economic structure among other dynamics that shape choice of sexual partners. A case in point is migration. It has been variously observed that in absence of guaranteeing migrants' residence rights, separation of families occurs. This, in turn, increases the absolute number of sexual partners per migrant. This has been at the centre of the rise in the appealing theoretical concept of the feminist political economy of intimacy.

Finally, Haacker (2016)'s "The Economics of the Global Response to HIV/AIDS" is a critical reading of relevance to the question of fiscal sustainability. Prof. David Bloom aptly describes it as: "... the most thoughtful, forward-looking, and practically-oriented treatise on the economics of HIV/AIDS to appear in years". In a nutshell, Markus (2016) argues that the HIV response has been among the dominant global development issues over the last years, but faces an uncertain outlook. The book reviews the evidence on the global impact of HIV/AIDS, in terms of health outcomes and consequences for economic development; discusses the state of global HIV/AIDS policies and financing; and applies tools from public finance to assess and improve the effectiveness, cost-effectiveness and financial sustainability of HIV/AIDS policies. By way of synopsis, without claiming to be a detailed review of the book, from an economic perspective, the book provides a review of the global impacts of HIV/AIDS and the consequences of the global response to HIV/AIDS so far, discusses the state of global HIV/AIDS financing, and describes state-of-the-art analytical tools to improve the cost-effectiveness and ensure the sustainability of HIV/AIDS programs.

Specifically, section I describes the global impact of HIV/AIDS. It describes HIV/AIDS as a severe global health shock and discusses macroeconomic and household-level consequences. It places HIV/AIDS in a broader health context and compares it to diseases commonly associated with low levels of economic development. It addresses the contribution of HIV/AIDS to global health inequalities and reviews the distributional implications within

countries. Section II reviews the state of the global response to HIV/AIDS. It describes the global response to HIV/AIDS so far, with an emphasis on (but not confined to) its financing and governance (including the institutions which have emerged as part of the global response to HIV and AIDS). It then reviews the state of global HIV/AIDS financing, also placing it in the context of general health and development financing. The section closes with a discussion of the funding outlook and its implications. Finally, section III addresses the design of HIV/AIDS policies, from a public finance perspective. It provides a discussion of the fiscal costs of HIV/AIDS (including, but not confined to the national response to HIV/AIDS), and describes the costs of the HIV/AIDS program as a long-term financial commitment. The section then discussed the cost-effectiveness of HIV prevention interventions, taking into account their fiscal consequences, and develops an integrated framework for assessing the cost-effectiveness and sustainability of the national response to HIV/AIDS.

2.4.3. Defining the focus and added value of this study

The analysis in this section, departing from traditional investment case-type of analyses, applies an economic and fiscal perspective to analyse the health, economic, and development dimensions of HIV financing, to optimise the fiscal sustainability of the national AIDS response. Below, I outline the purposes and considerations that define the focus and, thus, the scope of this analysis.

First, using the concept of a GPG, I rethink its economic and public policy foundations for the financing of an international HIV/AIDS response. Building on a growing body of literature on the GPG for health theory, this thesis uses this framework to theorise the imperative to fast-track (financing of) the response to HIV. Second, I empirically estimate the potential contribution of sustainable HIV financing to achieving a “grand convergence” in global health in Uganda. The notion of “grand convergence” is predicated on the goal to drastically lower mortality rates in LICs to levels of the best-performing MICs. Lastly, owing to the evolution of the financing of the global HIV response and by extension the outlook on its financial sustainability having been historically shaped, in part, by ideas and framing, using the (rhetorical) framing of “end of AIDS”¹¹, I estimate the economic returns on investing in ending the AIDS epidemic by 2030 in Uganda. Using a novel approach, the “full-income” approach, I show whether ending AIDS is a “good deal” by providing estimates of the economic benefits of such an investment. It is worth noting that, as used in this thesis, estimates of the impact of HIV/AIDS on “full income” address the question of “what is the loss in income that is equivalent – in terms of life prospects – to the increased health and mortality risks posed by HIV/AIDS?” Such estimates – frequently based on observed wage differences between employments with different mortality risks, or set by policy – are commonly used in the analysis of health or environmental policy interventions

Below, I proceed in two broad steps. First, in the next four sub-sections, I present and discuss the empirical results of the above-mentioned four defining foci for the economic analysis. This will serve as a point of departure for my discussion of lessons from public finance theory and practice on fiscal sustainability of HIV response, including the analysis of the same. This research makes an important contribution to our understanding, from an economic perspective, key best-in-class tenets, and attributes for a novel approach for sustainably financing responses to HIV/AIDS for a progressive fiscal and social contract. This evidence is important to mapping out the key aspects for consideration in developing a novel approach to fiscally sustainable long-term financing of the HIV response in Uganda, the research aim of this thesis.

¹¹ As earlier discussed, this framing, while largely politically rhetoric, derives in part from 2030 Global Agenda under which. Through the SDGs, the international community explicitly pledged to work towards “ending the AIDS epidemic as a public health threat by 2030”.

2.4.5. Ending the AIDS epidemic: a global public good?

This section addresses a growing body of literature on the GPG theory. Particularly, I focus on the use of this framework to fast-track the financing of the HIV response in the context of the new health and development agenda ushered in by the SDG era. The quest to respond to pandemics, as one of the solutions to supranational collective action challenges, has renewed attention to financing and delivering GPGs for health (Moon, Røttingen and Frenk, 2017; Smith, 2003). As I show in this thesis, central to the challenge of fiscal sustainability of the national HIV response in Uganda is the imperative to ensure collective action at the international level. This is central to the GPG concept. It is in this context that I explore how this concept can advance health and fast-track ending AIDS as a public health threat in Uganda.

Globally, as I show in Appendix 5, the response to HIV has been unprecedented in the history of global health and development, with the responsibility for financing a shared one. Explaining the trends inherent in the past and current financing architecture, I argue that there is an implicit consensus that fast-tracking ending AIDS is a GPG that requires not only a collective but also an exceptional international response. Secondly, I posit that domestic investment in HIV can and ought to continue increasing as respective countries' economies grow and the ensuing resource are allocated in tandem with the corresponding ability to pay and disease burden, subject to overall country's debt sustainability position and financial resource needs for the HIV response. Owing to the global economic downturn precipitated by the 2007/8 global economic crisis, as discussed elsewhere (see §1.2), there is growing pressure on ODA, including for HIV. This reality, in turn, calls for fairer ways to share the financing responsibility on the part of national and international actors, as a *conditio sine qua non* for fast-tracking the HIV response.

Importantly, this analysis contributes to our understanding of what exactly we mean by GPGs for health. As a starting point, I use the concept of market failure as a central argument to conceptually show how the global response to HIV and AIDS is a GPG. This economic rationale – grounded in public finance principles - serves as a bedrock for motivating investments in HIV. By extension, subject to technical and political feasibility among other constraints to public sector responses, I argue that the fiscal sustainability of HIV responses in Uganda can and ought to be addressed through a variety or combination of public financing policy instruments that, *inter alia*, include taxation (such as health taxes), financial subsidies, mandates, and behavioral economics-informed behavioral change interventions.

Departing from the conventional definition (that is based on a purely economic framing of a public good), and comparable to Schäferhoff et al. (2019), the analysis goes beyond traditional GPGs for health, to encompass not only adroitly managing the negative cross-border externalities but also to foster global leadership and/or stewardship. Here, positing that the GPG concept can be a powerful instrument when arguing and making a case for strategically investing in the HIV response as it produces benefits that transcend individual countries, I delineate five (5) key and unique value propositions for the case to invest in the HIV response in Uganda, as part of the global response to HIV/AIDS at a time when the financing outlook is faltering as both governments and markets have natural incentives to under-invest. First is the issue of an exorbitant cost of inaction. As shown in Chapters 3, 4, and 5, taking inadequate actions to finance the “end of AIDS” (as shown in the Fast-Track analytic policy scenario) could be associated with excess avoidable AIDS-related deaths, new HIV infections, productivity losses to the economy, factors that drive Uganda into a fiscal “debt sentence” and major economic losses due to opportunity cost as financial resources invested in the HIV response are diverted away from other equally worthwhile investments in global development as well as productivity losses to the economy as PLHIV labor force participation declined in the absence of affordable effective HIV treatments or a functional cure. Second,

and relatedly, investments in HIV as a GPG yield impressive health and economic returns to investment (relative to other global development investments), such as in full-income terms. Third, investments in HIV in the “risky middle” countries can help contribute to addressing the so-called “middle-income dilemma” in global health. As used in this thesis, “risky middle” refers to high HIV-burdened MICs. This has implications for the fiscal sustainability of HIV responses. As Whiteside et al (2019: 360) show:

“...there is particular concern for “people left behind”, the factors determining a country’s ability to mobilise resources in the context of multiple development needs — including economic disparities; the political economy of fiscal decision-making; levels of health investment; health and community systems; political will; and currency fluctuations. While donors will support lower-income countries and higher-income countries can compensate from domestic resources, there is a risk that some high-burden, lower middle-income countries will be unable to sustain a response”

On the other hand, the “middle-income dilemma” in global health refers to the fact that more than two-thirds (i.e. nearly 70%) of the world’s poor now live in MICs rather than in LICs. Worryingly, it is projected that nearly 9 of every 10 people in extreme poverty will be living in SSA by 2030. It is important to note that there is a substantial literature on the social gradient of HIV/AIDS (for example, see Mishra (2007), Parkhurst (2013); Johnston (2013), Haacker (2016), Haacker and Birungi (2018). By extension, PLHIV in MICs – for example – face very high rates of poverty and avoidable mortality (owing to limited access to HIV treatment, see Haacker and Birungi (2018) for example), yet international public finance – in the form of DAH – does not reach these majority poor as the countries in which they live are largely ineligible due to their per capita income level, income inequalities notwithstanding. Finally, investments in HIV response as a GPG spur economic development, say through improved labor productivity among PLHIV on treatment. This, in turn, could – in the next few years – aid the graduation of MICs from DAH particularly multilateral concessional assistance, providing an opportunity for aid reallocation to other equally deserving – from a cost-effectiveness perspective – global functions that in and of themselves are potentially cost-saving.

As an additional perspective to this important debate, Piot (2015:46) argues that “The concept of a global public good provides a strong foundation for an international response.” This may have been correct early on - e.g., reflecting concerns about HIV/AIDS spreading globally, and the economic and security implications of this. Some aspects of the HIV/AIDS response (essentially, research funding) provide a public good. However, to motivate global investments in HIV across developing countries through a GPG argument, it is required that there are strong interdependencies or spillovers, either economically (which is implausible given that most countries with high HIV prevalence carry a very low economic weight, and HIV/AIDS has not destabilized any country economically so far), from a security perspective (with HIV/AIDS no longer a significant concern in the security community) or in the area of health: What is the role of cross-border transmission in the spread of HIV/AIDS? For example, are investments in HIV prevention in Africa or the Caribbean effective in reducing the spread of HIV in donor countries, and more so than HIV prevention policies in these donor countries? I find this a very questionable proposition, but this (or the earlier examples) would be critical for building a “public goods” argument.

It is important to note, however, that the collective investments in the global HIV response – and the attendant returns to investment – are largely a product of activism couched in the HIV social movement, political sloganeering, and trends among elites driven by geopolitical positioning considerations rather than merely using economic logic and evidence alone to persuade actors. Considering these historical perspectives on the political dynamics of financing HIV as a GPG, I contend that other justifications are needed and below I briefly expound on these. I contend that these, acting as complements to the technical analysis above

should, with its logical basis, be sufficient to move governments and elites to action. The narrow usage of the common law notion of “moral duty” seems inappropriate given the fact this concept has been a driver of the “universal access to treatment” agenda. Given that prices of HIV drugs have come down to very low levels, its application is limited. This, however, does not necessarily obviate a moral ‘duty to rescue’. For example, the notion of humanity would justify rescue even between strangers. Globalisation makes this quite possible. The other is utilitarianism, reasoning that posits that those actions are right that best maximise happiness and reduce suffering. Finally, natural law rule that urges us to treat others as we would wish to be treated (with an implicit assumption that we would wish to be treated well). To this end, I argue that this novel approach of using the broader term “global functions” – as originally proposed by Jamison et al. (2013) – provides a useful analytical framework to capture the full set of activities that can be considered as an international collective action for health (ICAH).

In conclusion, owing to both markets and governments largely failing to act and finance HIV as a GPG for health especially in the SDG era, the world – and we human beings who live in it – are sub-optimally better off than if we invested more resources and attention in HIV as a GPG. The UN bold goal of “ending AIDS” becomes more distant with each passing day as the global community deprioritises HIV and its financing – both internationally and domestically – continues to falter as evidenced by recent declines. To reverse this trend, in addition to the nascent ideas I present in § 2.3, I recommend three practical actions that may provide a surer path to generating the kind of action we desperately need today to assure fiscal sustainability of HIV responses in Uganda: (i) countries must scale-up public financing mechanisms for HIV responses as a GPG – and as a pathway to UHC to assure equity and financial protection, (ii) as a new era of aid, development partners must support HIV responses as a GPG with global public investment, and (iii) in the spirit of duty bearers being held to account by rights holders, individuals and communities must demand that leaders provide funding and take action on HIV as a GPG, including following through on global commitments such as those enshrined in the 2016 UN High-Level Meeting Political Declaration on Ending AIDS.

2.4.6. Achieving a grand convergence” in global health: a critical note on the potential contribution from sustainable HIV financing in Uganda

This section empirically assesses the contribution of HIV financing to achieving a “grand convergence” in global health in Uganda. The body of work in this section draws from Boyle et al. (2015) and is motivated by Jamison and colleagues (2013)’ work – in the context of the Lancet Commission on Investing in Health - that elaborates a compelling investment case for a “grand convergence” in selected key global health outcomes. As used in this section, “grand convergence” refers to a “reduction in the burden of infections and RMNCH disorders in most high-mortality low-income and middle-income countries down to the rates presently seen in the best-performing middle-income countries (e.g, Chile, China, Costa Rica, and Cuba, conveniently labeled the “4C” countries)” (Jamison et al., 2013: 2-3). In this section, in line with the SDG timeline (and to connect the findings in this thesis to the broader policy discourses), I mathematically estimate what the above-mentioned “grand convergence” might achieve - and the corresponding level of investment required to cost-effectively do so - by 2030.

I show that Uganda can significantly converge – in terms of key health outcomes – with those of wealthier countries by 2030 and could be achieved through financing strategic HIV investments, among other strategic investments. This analysis is relevant for two main reasons. First, the notion of a “grand convergence” is an implicit unifying goal for health and wellness within the SDGs framework. Second, the differential impacts of HIV justify this analysis. As I earlier mentioned, the economic impacts of HIV largely derive from its direct impacts on health outcomes such as life expectancy. As these HIV-induced health impacts

significantly differ from those caused by other health conditions in very important respects¹², it thus follows that these do not simply represent a mere reversal of health gains. Given the strong evidence of HIV epidemic and response' impact on key health outcomes in Uganda, this section specifically delineates the contribution of HIV to the "grand convergence" goal. Although the analysis suggests that the annual price tag to achieve "grand convergence" is large in absolute terms, with a "full income" approach, I find that the benefits would be enormous and offset these costs. From an economic evaluation perspective, this makes the investment highly attractive.

As shown in Appendix 6, compared with a constant coverage scenario (i.e. "Business-as-Usual" scenario), there would be more than 152,000 AIDS-deaths averted in Uganda between 2016 and 2030. For the period between 2016 and 2035, this rises to 185,000 lives saved. This represents 32% of all deaths averted. Additionally, because of convergence, relative to the constant coverage scenario, AIDS deaths would decline by 94% while new HIV infections would decline by 87% by 2030 (from the 2016 baseline). Over a 20-year period between 2016 – 2035, the total incremental cost to achieve the "grand convergence" through strategic and enhanced investment scaling-up optimal health technologies and building resilient and sustainable systems for health (RSSH) is US\$ 19,435,362,245. Specifically, for the years 2015, 2020, 2025, 2030, and 2035 the incremental costs of achieving a "grand convergence" would be US\$ 1,111,713,186, US\$ 1,106,208,681, US\$ 1,334,497,825, US\$ 1,545,681,279 and US\$ 1,921,733,143 respectively. This translates into cost per capita of US\$ 28.02, US\$ 24.58, US\$ 25.29, US\$ in 2015, 2020, 2025, 2030 and 2035 respectively. From a benefit-cost analysis perspective, excluding system costs, the cost per death averted drops by more than a half from US\$ 7,755.98 in 2015 to US\$ 3,269.9 in 2030. Finally, using 10-year totals, HIV accounts for 5% and 9% of total program costs for the period 2016 – 2025 and 2026 – 2035 respectively. In conclusion, I find that key health outcomes in Uganda can significantly converge with those of wealthier countries by 2030, in line with the notion of a "grand convergence". Also, it is plausible that working towards this globally unifying goal may motivate strategic investments in the national HIV response.

2.4.7. Estimating of the economic benefits of financing the end of AIDS in Uganda: a full-income approach

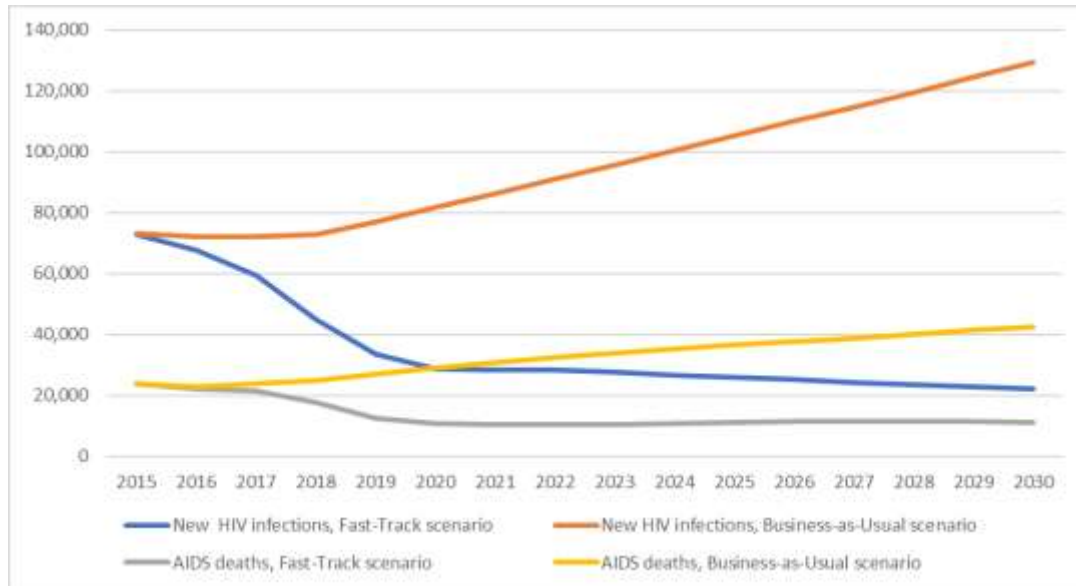
Globally, hundreds of billions of U.S. dollars, if not trillions, have been invested in the response to HIV/AIDS over the last three decades. Yet, the prospects of ending AIDS remain uncertain. Specifically, the changing global health financing landscape has led to questions regarding why on earth should we (continue to) finance efforts to end AIDS in Uganda? Learning from the past, this is the central question I answer in this section where I empirically estimate economic benefits within a full-income framework.

Methodologically, the novel approach taken in this section has its foundation in the seminal work by Nordhaus (2002) who argued that the value of increased health (longevity) could be as important as the increase in economic growth. Building on this, Becker et al (2005) coined the term "full-income" to represent the way the quantitative and qualitative growth rate in the "full" lifetime income comprehensively empirically values both the gains in material income and the gains in longevity. However, it was not until 2013 when the *Global Health 2035* report used the "full income" approach to state that chosen health interventions in LMICs could bring 9 to 20 Returns on Investment (RoI) – in full-income terms. By adding the value of changes in life expectancy to the value of changes in the gross domestic product (GDP), a "full income" approach incorporates the benefits of health improvements into national accounts.

¹² A case in point is HIV/AIDS' relatively strong impact on mortality among young adults. On the other hand, many other health conditions largely affect primarily infants, young children and old people.

This way, the ensuing full effects of health improvements at the population level are adequately captured.

Figure 7: Key outcomes of Fast-Track and constant scenarios in Uganda



Source: Author’s analysis from UNAIDS (2018).

In this section, taking a macroeconomic approach, as detailed in Appendix 7, I value mortality risk reductions within a full-income framework. Specifically, I estimate the economic benefits of ending AIDS in Uganda by 2030. Using a novel measurement tool, the “full-income” approach, I question – from an economic perspective – whether ending AIDS is a “good deal”? Globally, within the SDGs framework, there is consensus – implicit in SDG 3 - to end the AIDS epidemic as a public health threat by 2030. Additionally, in June 2016, the UN General Assembly adopted a political declaration with clear fast-track targets to enable the realization of the above-mentioned ambitious global goal. Stover et al. (2016) have estimated that US\$ 11 billion is needed for Uganda to achieve these targets by 2030. While the price tag is known, the corresponding economic benefits of such an investment is unknown. It is this knowledge gap that this analysis seeks to fill. Also, to the best of my knowledge, this study is the first academic study to apply the full-income approach to HIV in Uganda – from both a retrospective and prospective perspective.

It is worth noting that the estimates of the impact of HIV/AIDS on “full-income” address the question of “what is the loss in income that is equivalent – in terms of life prospects – to the increased health and mortality risks posed by HIV/AIDS?” Such estimates – frequently based on observed wage differences between employments with different mortality risks or set by policy – are commonly used in the analysis of health or environmental policy interventions. In 2016, Uganda (alongside other countries) agreed on a Fast-Track strategy to “end the AIDS epidemic by 2030” by markedly reducing new HIV infections, AIDS-related deaths, and HIV-related discrimination (see Figure 7 above).

In assessing the economic returns of the ambitious Fast-Track strategy, I estimated the incremental costs and benefits, and the net economic returns of the Fast-Track scenario in Uganda, compared to a counterfactual defined as maintaining coverage of HIV-related services at 2015 levels (the so-called “Business-as-Usual” scenario). As shown above, the

ensuing benefits are calculated using the full-income approach, which values both the changes in income and mortality, and the productivity approach. I find that the incremental costs of the Fast-Track scenario over the constant scenario for 2015-2030 represent US\$ 3 billion or US\$ 72.97 per capita. The full-income valuation of the incremental benefits of the decrease in mortality amounts to US\$ 450.85 per capita, representing 6.18 times the resources invested.

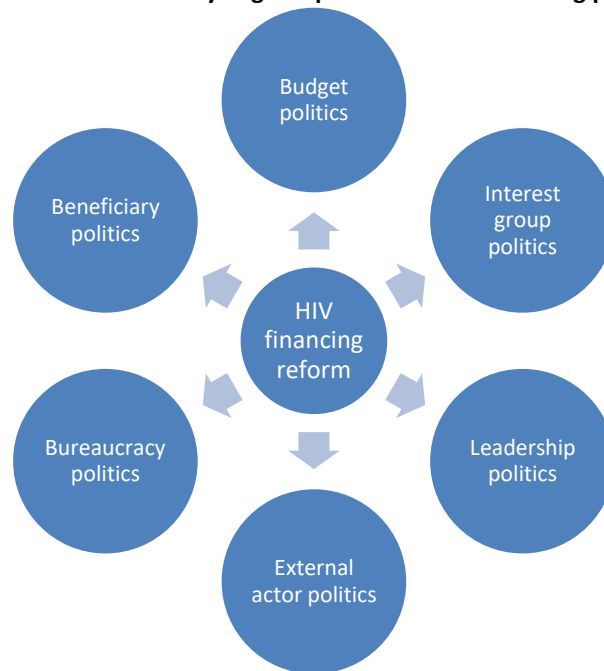
In conclusion, to put these results in perspective, it is important to note that the above results are consistent with other estimates of public health interventions' RoI. A systematic review of public health interventions in high-income countries by Masters et al. (2017) found the median benefit-cost ratio to be 8.3. Additionally, the RoI found in this study falls within the ranges found by the only two studies (Lamontagne et al (2017) and Forsythe et al (2019)) – that to the best of my knowledge - that apply a full-income approach to the HIV response. The economic and social value of the additional life-years saved by the Fast-Track approach exceeds its incremental costs. In other words, this implies that this strategy is a sound economic investment. It is highly efficient and this holds true even in comparison to other investments in global development. The “full-income” approach for health, as applied in this thesis, represents a novel measure that captures social benefits beyond gains in productivity, representing a more comprehensive common metric that is suited to inform priority setting among competing HIV, health and non-health global development interventions. Finally, on basis of impressive RoI, the HIV response in Uganda merits prioritization.

2.5. Conclusion

This chapter analysed the political economy dimensions of HIV financing. I find that health financing is inherently political. To inform thinking and working politically, I argue that health financing policymaking is rarely 'evidence-based' but, from the politics of evidence-based policy, it appears political factors such as ideology, interests, incentives, ideas, issues, institutions, and information - acting in unison - play a role. From a policy theories perspective, in terms of the role of actors, the empirical evidence presented suggests that a HIV financing policy can and ought to be evidence-based. This requires that policy advocates, as the history of HIV social movement in Uganda has demonstrated over the last three decades, think and work politically to effectively to take collective action, speak to and change minds, and exploit information power asymmetries. Similarly, countries seeking to reform their HIV financing policies can do so by astutely learning and mastering the rules of the political games, form beneficial relationships and networks with powerful key actors. This is key to building knowledge base and gaining trust of various stakeholders. These can then be exploited to gauge, make, and break coalitions, including smartly navigating the pivotal politics of identifying and exploiting legislative policy windows, using proven effective influencing strategies¹³.

¹³ Telling a compelling human interest connecting an urgent HIV financing policy challenge and its potentially most feasible solution(s) is one such strategy that has been applied to good effect in enacting the ATF in Uganda.

Figure 8: A six-dimensional model of analyzing the politics of HIV financing policy reforms



Source: Author's adaptation from Campos and Reich (2019).

Finally, the empirical results in this chapter combine insights from policy studies with real-world experiences. As shown in the example of the ATF, HIV financing policy design, implementation and reform often involves complex and contentious interactions, processes and bargains among many stakeholders and policy architects, with varied positions, ideas, power, ideologies, and influence, both within and beyond the health sector. As a key lesson, implementing HIV financing policies and reforms is not only politically contentious but also changes sensitive distributions. Thus, to move the national HIV response in Uganda towards a fiscally sustainable path, significant political economy barriers need to be overcome to gain political consensus. However, current HIV policy discourses show limited analysis of these fiscal challenges. The same is true for a political analysis of policy proposals to address them. This chapter has extended boundaries in this direction. As I show in Figure 8, the identified key political economy factors (referred to as dimensions in this thesis) guide as to how policymakers and practitioners can develop practical strategies to navigate the identified factors and thus increase the likelihood of implementing technically sound and politically feasible HIV financing reforms. Lastly, by analyzing how to use evidence to influence policy, this chapter has provided powerful tools for the policy-making process.

Part II

Order of magnitude

As far as the propositions of mathematics refer to reality, they are not certain; and as far as they are certain, they do not refer to reality.

- Albert Einstein (1879 – 1955)

Chapter 3

The end of AIDS: a possibility or pipedream? Modelling the future trajectory of the HIV epidemic in Uganda

3.1. Introduction

This chapter mathematically projects the possible future trajectory of the HIV epidemic in Uganda through 2030. Uganda has been a trailblazer and one of the first global “success story” in bending the HIV epidemic curve, with declining HIV prevalence rates reported in several sentinel surveillance sites across the country since 1992 (Parkhurst, 2002). However, there are “miles to go” (UNAIDS, 2018) if the commitment to end the AIDS epidemic as a public health threat by 2030 is to be realized. Some analysts have raised questions on whether the Fast-Track strategy aimed to markedly reduce HIV incidence by 90% by 2030, the target benchmark for “ending AIDS by 2030”, is mere rhetoric or based on science (Braithwaite, 2018; Kenworthy et al. 2018). Using surveillance, survey, and program data to mathematically model future trends of the burden of HIV/AIDS disease in Uganda, this chapter contributes to improving our understanding of the possible future courses of the epidemic.

Internationally, Uganda is credited for having pioneered HIV sentinel surveillance in the mid-1980s. Largely relying on HIV testing of antenatal clinic (ANC) attendees, as a key decision and delivery science tool for epidemic control, HIV sentinel surveillance sites have played a critical role in aiding epidemic monitoring (Celentano and Beyrer, 2008). Over the years, these efforts have been supplemented by cohort studies and cross-sectional surveys. It is important to note that these data, however, are usually confined to estimates of HIV *prevalence* (the share of PLHIV in each population), risk factors for infection, or the natural history of HIV infection. To inform HIV policy and program planning, estimates about HIV *incidence* (the annual rate at which people become newly infected), disease burden, and the corresponding needs are essential. Additionally, whereas the efficacies of most biomedical interventions to avert new HIV infections, and save lives are well understood, their comparative effect and impact on the burden of disease over time on a population level are difficult to gauge. Finally, in Uganda, the health management information system (HMIS) records only a fraction of HIV-related events. The same is true in most resource-constrained settings. To this end, software-based mathematical models may be an acceptable substitute for epidemic estimations and projections. In this chapter, I employ Spectrum (Avenir Health, 2019). This is a compartmental mathematical model of HIV transmission and disease progression, to produce estimates of epidemic trends.

In the epidemiology of HIV, it is generally accepted that there are two different kinds of information about the state of the epidemic in Uganda – survey-based data (e.g., from the 2016 Uganda population-based HIV impact assessment (UPHIA) (GoU, 2017), surveys on HIV prevalence at sites like antenatal clinics, or general (i.e., non-HIV/AIDS - specific) health surveys), and model-generated data, e.g., the annual estimates on the state of the HIV epidemic in Uganda. The former is important as they provide direct evidence on the evolving HIV/AIDS epidemic, and information on the scale of the epidemic across different population groups or regions. On the other hand, the latter interpret the direct evidence in terms of consistent estimates and projections of the state of the epidemic and are typically on a high level of aggregation (Hankins, 2013). This chapter reviews and interprets the direct evidence available, in terms of modelled estimates and projections.

From a historical perspective, as Figure 2 shows, new HIV infections and AIDS-related deaths have continued to decline overall. Between 2010 and 2018, these declined by 43% and 58% respectively. However, overall, little is known about the future of the HIV epidemic in Uganda, to the extent, as earlier mentioned, contentions persist on whether “ending the AIDS epidemic as a public health threat by 2030” is a pipedream or possibility in Uganda. For example, see Heywood (2013) and UNAIDS (2013). This chapter contributes to filling this knowledge gap, to inform policy choices that bring down the epidemic curve further to epidemic transition (Ghys et al., 2018) to, among others, curtail the concomitant ever-growing unsustainable level of demand for ART and other HIV services. This “epidemiological sustainability” (Haacker, 2016; Whiteside and Oberth, 2016) is key if the national AIDS response is to become fiscally sustainable as the two notions are inextricably inter-related.

Schwartländer and colleagues (2011) propose a ‘Strategic Investment Framework’ that – at a global level - describes how the scale-up of key high-impact HIV interventions could dramatically reduce new HIV infections and AIDS-related deaths in LMICs by 2015. Importantly, in line with the goals of the 2011 United Nations High-Level Meeting (HLM) Political Declaration, this framework included ambitious coverage goals that would result in a reduction of new HIV infections by more than half. One of the notable shortcomings of the ensuing investment approach was a projected leveling in the number of new infections at about 1 million annually. This is far from the goal of ending AIDS by 2030 enshrined in the sustainable development goals (SDGs) which seek to achieve a 75% and 90% decrease by 2020 and 2030 respectively, relative to the 2010 baseline. In absolute terms, these translate into 500,000 and 200,000 new HIV infections among adults (15+ years old) by 2020 and 2030 respectively. To address this shortcoming, UNAIDS has developed the Fast-Track approach, providing a clear roadmap and actions required to achieve the goal of ending AIDS (Stover et al., 2016). In simple terms, this approach is predicated on a rapid scale-up of targeted interventions over the next 5 years. Thereafter, it calls for maintaining a high level of programme implementation until 2030. This way, it aims to reduce new infections and AIDS-related deaths by 90% from 2010 to 2030.

The impacts of the HIV/AIDS epidemic are dramatic, yet the long-term consequences are difficult to measure. Consequently, the first contribution of this chapter is to show the impact of the Fast-Track approach – in terms of HIV infections and AIDS deaths averted - compared to a counterfactual scenario of constant coverage for all services at 2015 levels (hereafter referred to as “Business-as-Usual” scenario in this thesis). This lets us, in a realist evaluation tradition, answer the question of whether the Global Goals’ target to end AIDS by 2030 is a possibility or a pipedream. As used in this chapter, the “end of AIDS” implies that, by 2030, the number of new HIV infections and AIDS-related deaths declines by 90% compared to 2010 (UNAIDS, 2014). By extension, this implies that HIV infections may not disappear in the foreseeable future. However, the AIDS epidemic can be ended as a global health threat. I question whether this framing is appropriate. A second contribution is a novel approach that enables sound and precise estimates and projections of the state of HIV/AIDS. This serves two purposes. First, an understanding of the state of the epidemic informs current HIV policies and the emerging new HIV strategy. Second, to motivate investments in HIV/AIDS, it is necessary to understand the consequences, in terms of controlling the epidemic and improving health, social, and economic outcomes, and the empirical analysis in this chapter provides some signposts to this end.

The rest of this chapter is structured as follows. First, to bring theoretical clarity and set the context for the empirical analysis, I critically analyse whether ending AIDS is achievable. The next section details the methods I used and motivates the choice of parameters and assumptions used in the analysis. The third section presents the key results. In the fourth section, I discuss the results. The last section concludes.

3.2. Ending AIDS: origins, the theory and future directions

The notion of “ending AIDS”, first conceived in a Washington, DC, jail cell, has been a subject of much debate in academic literature. Scientists and activists alike have largely hyped the goal of “ending AIDS” out of fear of ‘donor fatigue’ and a loss of momentum in the face of recognized challenges in the response on one hand. This framing helps create an increased sense of urgency to “finish the job”. On the other hand, it has been premised on the view that the tools and political will be necessary to end AIDS as an epidemic exist. Such an end would see many PLHIV long and healthy lives with HIV. I argue that this is misguided optimism.

In its usage, “ending AIDS” has often been conflated with control, eradication, and elimination. It is important to note that the idea of eliminating infectious diseases from society dates to the 18th century when Edward Jenner envisioned the elimination of smallpox through widespread vaccination. As Amon et al (2018) show, in the past 100 years of global health history, only one (1) disease – smallpox – has been eradicated. The work to eradicate two (2) diseases - guinea worm and polio – is ongoing. However, for three (3) diseases, that is malaria, yellow fever, and yaws, the eradication efforts have performed dismally and failed. A careful reading of the above-mentioned histories concludes that the common cause for failure is largely the inadequate attention to the social and political contexts. This state of affairs has introduced various measures of disease occurrence and control. These, however, have often been conflated. Generally, by 1997, the difference between basic epidemiological measures of disease occurrence and control had generally been defined (see Box 2).

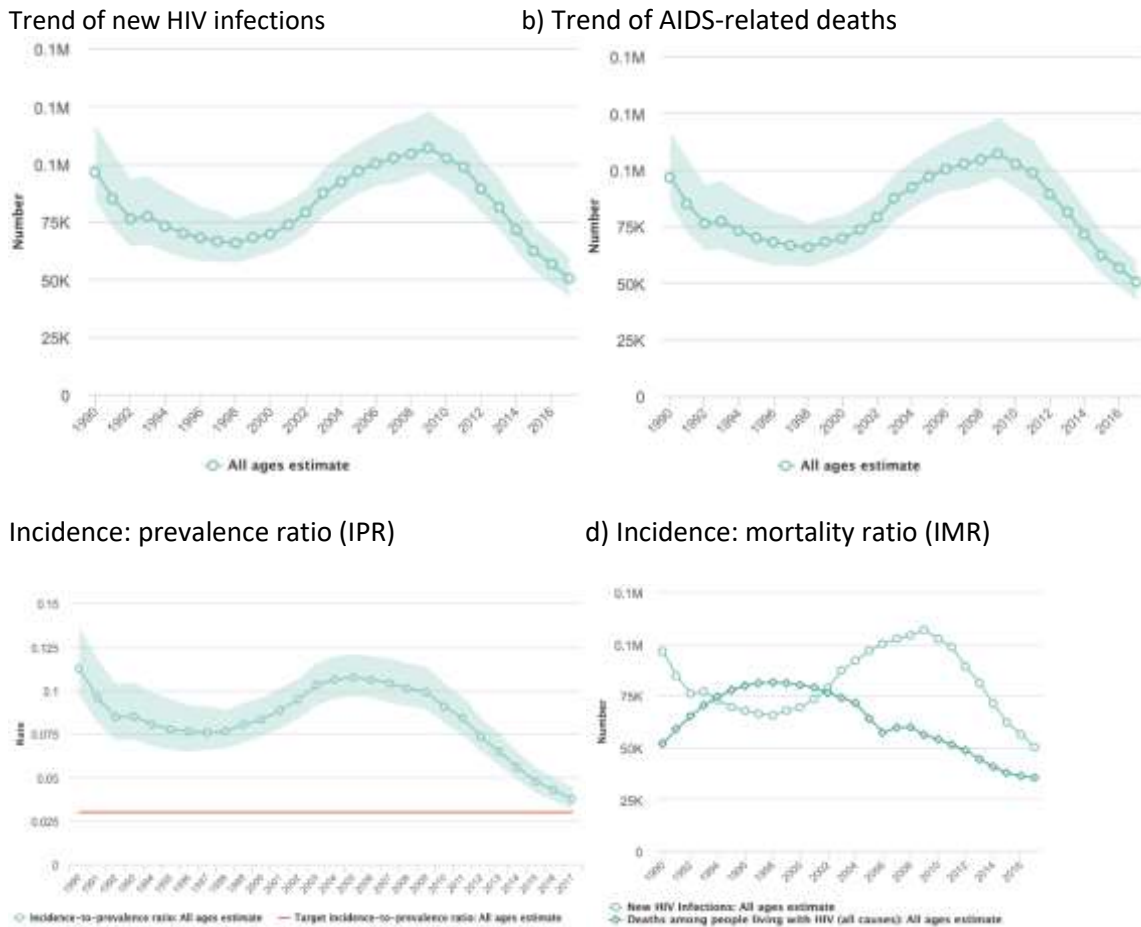
Box 2: Basic epidemiological measures of disease occurrence and control

- Control: Reduction of disease incidence, prevalence, or mortality in a geographically defined area to a locally acceptable level via evidence-based interventions.
- Elimination of transmission: Complete cessation of incidence in a geographically defined area. Because the disease-causing agent persists, elimination requires ongoing intervention to maintain.⁴
- Elimination as a public health problem: Reduction of incidence and morbidity below a specific (globally defined) level.
- Eradication: Complete removal of the disease-causing agent from the natural environment. The disease-causing agent might persist in controlled laboratory environments. Prevention interventions are no longer needed.
- Extinction: Complete removal of the disease-causing agent from all natural and laboratory environments.

Source: Author’s compilation from UNAIDS (2018) and Goga et al. (2019).

In the past few years, three (3) of the main global HIV actors - UNAIDS, PEPFAR, and GFATM - have promoted a goal of HIV epidemic control, epidemic transition, and an “end of AIDS” – most often used interchangeably. The logic behind these is not novel as it draws on seminal work by Over (2011)’s key idea of an “AIDS transition”. This simple but powerful idea entails reducing the number of new infections below the number of AIDS deaths so that the total number of PLHIV declines. As both the 2016 United Nations High-Level Meeting’s Political Declaration and the SDGs adopted “Ending the AIDS epidemic” as their 2030 goal, it is important that progress towards that goal can be objectively assessed. The starting point is to make “epidemic control” real. It is in this context that UNAIDS, in October 2017, convened the UNAIDS Science Panel to build consensus on the meaning of “epidemic control”, generally understood – and while accepting the risk of oversimplification - as a shift from high HIV incidence and mortality to low levels of transmission and effectively managed care (Galvani et al., 2018; UNAIDS, 2018).

Figure 9: Epidemiological metrics and benchmarks for a transition in Uganda’s HIV epidemic, 1990 – 2017



Source: UNAIDS (2018)

Finally, building on Omran (1971)’s theory of epidemic transition that posits that as countries become wealthier, modernization and socio-economic progress drive down high rates of avoidable mortality due to infectious diseases on one hand and noncommunicable disease (NCD) burdens increase on the other hand, epidemiological metrics and benchmarks for a transition in the HIV epidemic have been developed (Ghys et al., 2018). These seek to quantitatively define and measure control of the HIV epidemic. Figure 9 shows the status of the HIV epidemic transition for Uganda. Key characteristics of the proposed HIV epidemic transition metrics and their benchmark values are summarized in Appendix 8. In this chapter, I use these HIV epidemic transition metrics to project potential progress in reducing the public health threat of HIV in Uganda by 2030. However, this is without caution. First, although Omran (1971)’s theory was initially generally met with support within the scientific community, the case of HIV and NCDs raises doubts about the validity of a single, generalizable theory of epidemic transition. This is best exemplified by the spread of HIV in high-income countries on one hand and the growing burden of NCDs in LMICs on the other. Second, past efforts to define epidemic control have largely been unsuccessful. Additionally, there is growing recognition of health inequities in both settings. I contend that one such common cause for failure is the inadequate attention to social and political contexts. To this end, I argue that the need to address the socio-economic and political context remains critical.

3.3. Methods and data

3.3.1. Methods

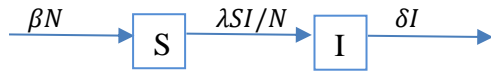
This study uses mathematical modeling techniques. Specifically, this analysis uses the Goals model, a module implemented in the Spectrum modeling software system (version 5.756) that estimates the impact of future prevention and treatment interventions (Avenir Health, 2019). Without undertaking a comparative analysis of mathematical models for HIV epidemiology (as this is beyond the scope of this Ph.D. thesis), my choice of the Spectrum model is motivated by the distinguishing characteristics that make it appropriate for this study. It is a phenomenological model that, as a starting point, calibrates to past epidemic trends and thereafter projects them to the future. Also, it has been used extensively to predict and estimate HIV epidemic trends in Africa and many countries in the world, including official HIV estimates and projections software by UNAIDS (Stover et al., 2017; UNAIDS, 2016; Stover et al., 2012). This simulation model divides the adult population 15-49 by sex and risk group (not sexually active, low-risk stable couples, medium risk people engaging in casual sex, sex workers and clients, men who have sex with men and injecting drug users). The model has been set up for Uganda using all available data sources to specify the distribution of the population by risk group, the behaviours for each risk group (number of partners, number of sexual acts per partner per year, condom use, and the proportion of the population that is married).

The Goals model also has an impact matrix that summarizes the impact literature to describe changes in behaviour by risk group because of exposure to behaviour change interventions (Stover et al., 2019). This dynamic model calculates new HIV infections by sex and risk group as a function of behaviours and epidemiological factors such as prevalence among partners and stage of infection. The risk of transmission is determined by behaviours (number of partners, contacts per partners, condom use) and biomedical factors (ART use, male circumcision, the prevalence of other sexually transmitted infections). Interventions can change any of these factors and, thus, affect the future course of the epidemic. This model, as a limitation in this study, does not explicitly consider structural drivers of the HIV epidemic. Social enablers such as decriminalization, gender-based violence (GBV), and stigma and discrimination reduction among others need to be in place to reach the coverage goals (for condom use, PrEP, testing, adherence, etc, for example). A pragmatic approach would mathematically model how much less impact we would get (for example due to not reaching 90% condom use, 90% knowledge of status, etc.) if social enablers are not in place. Additionally, the Goals model is linked to the AIM module in Spectrum that calculates the effects on children (0-14) and those above the age of 49. The AIM module also includes the effects of programs to prevent mother-to-child transmission on paediatric infections. Additionally, to replicate the epidemic dynamics, the model is fit to the historical pattern of prevalence. Fitting these data to a dynamic model, in turn, helps estimate current, and to project future, trends in prevalence, incidence, treatment needs, and deaths. Finally, for this analysis, two scenarios were created - the "Business as Usual" and "Fast-Track" scenarios. These are described in the next sub-section.

In conclusion, below, in the spirit of "initiating the uninitiated", I discuss the theory of the transmission dynamics underpinning the epidemiological modeling in this thesis. This is not an exhaustive treatment of the subject as this is beyond the scope of this thesis. These are extensively discussed elsewhere (see Vynnycky and White, 2011; HIV Modelling Consortium, 2016). As a starting point, as Figure 10 shows, sexual transmission of HIV (the dominant mode of HIV transmission in Uganda as discussed in Chapter 2) is dependent on contact between infected (I) and susceptible (S) individuals. Put differently, except for mother-to-child HIV transmission, people are born susceptible and the corresponding rate at which infections are acquired is proportional to the number of encounters between S and I cases. Drawing from the field of social network analysis, at the population level, thus the rate at which HIV infection spreads is dependent on five (5) significant and inter-related factors. As Vynnycky

and White (2010) note, these are: the number of infected people, the number of susceptible people who are available to be infected, the rate at which these two (2) distinct groups make contact, the probability that the infection is transmitted (per sexual contact), and the life expectancy of infected people.

Figure 10: A simple S-I model of the population dynamics of HIV in Uganda



Put differently, Figure 10 shows that the population grows at a per capita rate β , susceptible people become infected at a rate λ times the current HIV prevalence (I/N). Finally, people die of AIDS at a rate δ . As used in this chapter, in the absence of disease, the population growth rate is operationally defined as the birth rate minus the background death rate. By extension, the future trajectory of the HIV epidemic in Uganda is shaped by the intricate interplay of these factors. In line with natural epidemic curves, initially, there is an increase in the I=number of newly infected individuals. Therefore, as the number of infected individuals increases, the susceptible pool decreases, and the prevalence starts to level off.

Considering the above, I posit that after a steady-state has been reached and depending on behaviour change and/or other interventions aimed at reducing transmission, the prevalence may stabilise and/or eventually start to fall. Generally, it is a settled debate in the epidemiology of HIV literature that contact rate, the infectiousness, and duration of infectiousness are the key determinants of HIV spread. These factors, in turn, depend on demographic factors such as age and gender, social factors such as sexual networking patterns and sexual practices, biological variables such as the presence of other sexually transmitted diseases and (medical) male circumcision and, medical factors such as ART provision and treatment of AIDS-related opportunistic infections. Also, some analysts postulate that HIV discordance is due to unknown genetic factors. It thus follows that understanding the basic dynamics of HIV infection offers a useful workhorse to model its future trajectory and effectively control it. To know the burden of HIV disease at any time and its evolution with time, prevalence and incidence are the most fundamentals metrics. This study provides these measurements.

3.3.2. Data and assumptions

Epidemiological data are from the latest national estimate for Uganda prepared using Spectrum. This includes surveillance and survey data on HIV prevalence as well as program data on coverage of PMTCT and ART programs. International studies are used to set values of the epidemiological parameters such as the risk of HIV transmission per act and the variation in the risk of transmission by stage of infection, type of sex act, presence of other STIs, use of condoms, etc. These are described in Stover et al (2019) and UNAIDS (2019). Behavioral data are drawn primarily from the 2011 AIDS Indicator Survey, 2016 UPHIA, and the Modes of Transmission analysis (Wabwire-Mangen et al, 2009).

In terms of the policy analytic scenarios used in this chapter, under the “Business as Usual” scenario, coverage of all interventions was assumed to remain constant from 2015 to 2030. These are described in GoU (2015). The policy period 2030 is selected as the final year for estimations to minimise uncertainties with long-term projections. Additionally, this analytic period choice seeks to align the estimates with the target year set for “ending the AIDS epidemic” (as per the SDGs) and thus places this study within a global context. In the “Fast-Track” scenario, coverage of key intervention was assumed to increase in line with the Fast-Track targets elaborated in Stover et al. (2016). The respective coverage goals and effects of interventions are shown in Table 3.

Table 3: Coverage goals of the interventions, for the NSP and Fast-Track policy scenarios, included in this analysis

Intervention	Base coverage 2015	Fast-Track 2020 coverage	Fast-Track 2030 coverage
KEY POPULATIONS			
Service package for female sex workers	35%	90%	90%
Service package for men who have sex with men (MSM)	10%	90%	90%
Service package for transgender populations	0%	90%	90%
Service package for people who inject drugs (PWID)	5%	90%	90%
Opioid substitution therapy for PWID	5%	40%	40%
Service package for prisoners	n/a	90%	90%
BEHAVIOUR CHANGE INTERVENTIONS			
Condom promotion		90% condom use at last sex	90% condom use at last sex
Cash transfers for girls	0%	30% In Hyper-endemic countries with low rates of secondary school enrolment	50% In Hyper-endemic countries with low rates of secondary school enrolment
MEDICAL INTERVENTIONS			
Prevention of mother-to-child HIV transmission (PMTCT)	95%	95%	95%
Medical male circumcision (MC)	24%	90% of 10–29-year-old men in countries with generalized epidemics and low MC rate	90% of 10–29-year-old men in countries with generalized epidemics and low MC rate
Post-exposure prophylaxis (PEP)	Not known	80%	80%
Pre-Exposure Prophylaxis (PrEP) for sero-discordant couples		10% in generalized and hyper-endemic countries	30% in generalized and hyperendemic countries
PrEP for sexually active females 15–24 in areas with incidence above 3% in this population group	0%	10% in hyper-endemic countries	30% in hyper-endemic countries
Testing	not known	24% of all adults and children in countries with generalized epidemics and of key populations and people with multiple partners in countries with concentrated epidemics	Gradual decrease to 20% of key populations, those with multiple partners and pregnant women in all countries with an incidence below 0.1%. 20% of adults and children in countries with incidence above 0.1%
Pre-ART care		81% of people living with HIV (PLHIV) not on ART	90% of PLHIV not on ART
Adult ART	65%	81% (90% started, 90% retained)	90% (95% started, 95% retained)
SOCIAL ENABLERS			
		Includes community mobilization, media communications and other general population approaches that support behaviour change	

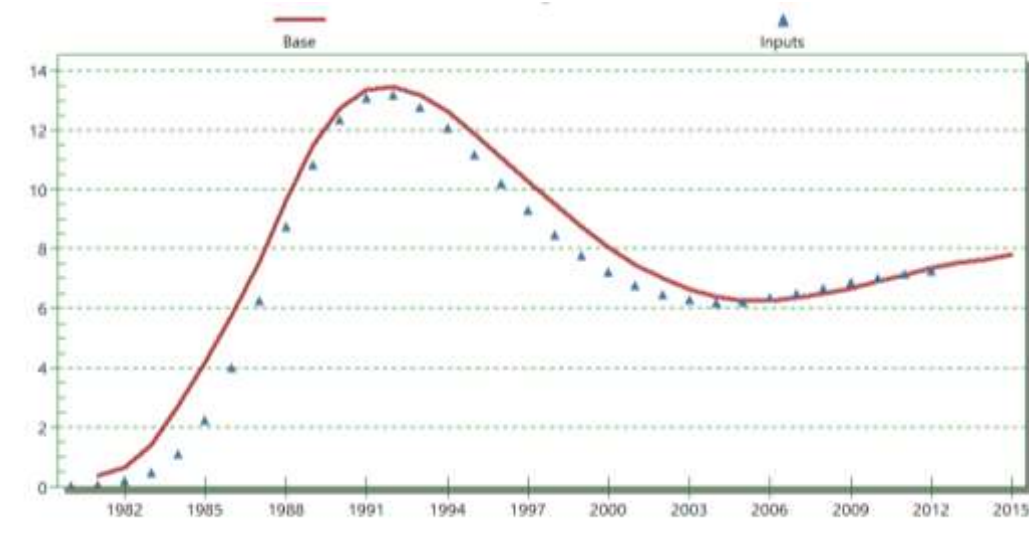
Source: Author's compilation from GoU (2015) and Stover et al. (2016).

3.4. Results

This section presents the mathematical modeling results.

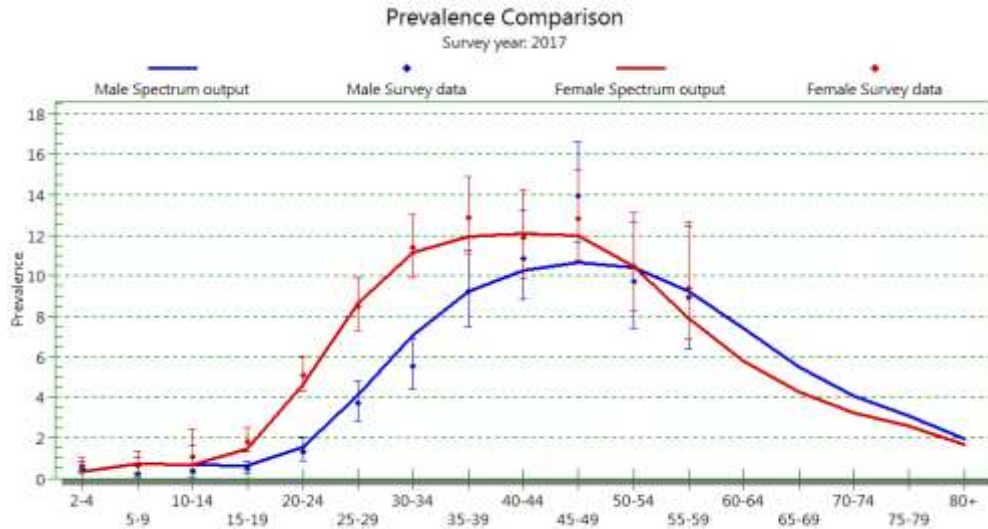
As a starting point, to understand the epidemic dynamics, using the official estimates file obtained from UNAIDS as a starting point, I updated the historical pattern of prevalence inputs from AIM to re-fit the model to replicate the epidemic dynamics. This involved comparing the model output to the surveillance and survey data and, if necessary, adjusting some of the inputs to better match available data. This is important because the incidence curves are different in Goals and AIM. In AIM, the incidence trend is generated by fitting to prevalence data. On the other hand, in Goals, the incidence trend is generated by simulating behaviors. To address this, I introduced an adjustment to the Goals results to obtain consistent estimates. Using the same starting year, I iteratively fed HIV prevalence estimates (by AIM) into Goals and thereafter feeding HIV incidence estimates (by Goals) into AIM. Thus, this innovative “splicing” enabled me to fit the key epidemic parameters in Goals to match the prevalence data. However, because of the different approaches (i.e. curve fitting versus behavioral transmission), the ensuing incidence curves are different. While, in this thesis, I attempt to get Goals to match the EPP incidence, they do not match exactly since these are different approaches. Figure 11 shows the resulting historical prevalence trend.

Figure 11: Goals model historical fit to adult HIV prevalence



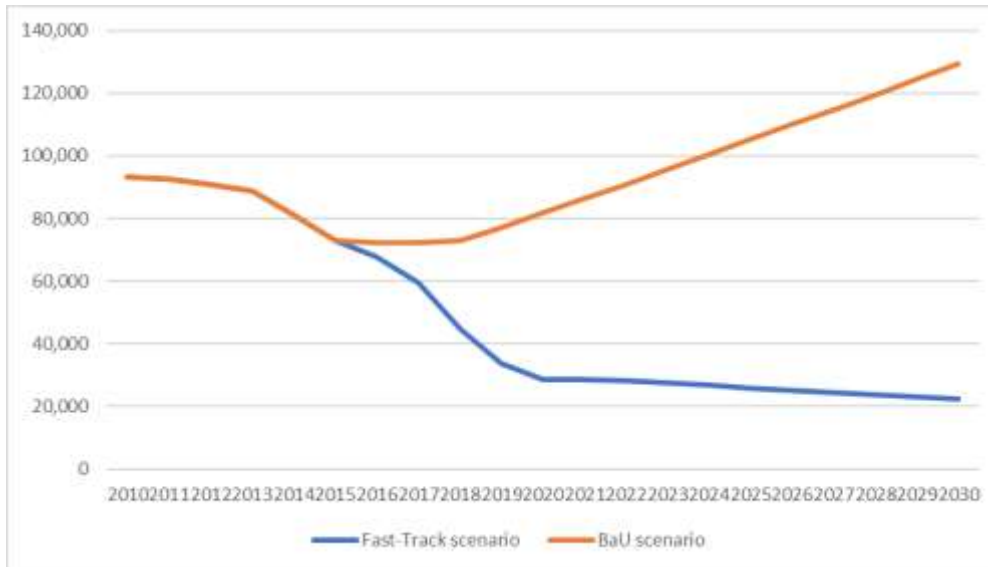
Relatedly, and as an additional analytic step to improve the robustness of the results, a prevalence comparison with the 2017 Uganda population-based HIV impact assessment (UPHIA), a household-based national survey conducted from August 2016 to March 2017, also yields a perfect fit with the modified national Spectrum file (see Figure 12). To this end, the results obtained are robust.

Figure 12: A prevalence comparison between Spectrum outputs and UPHIA



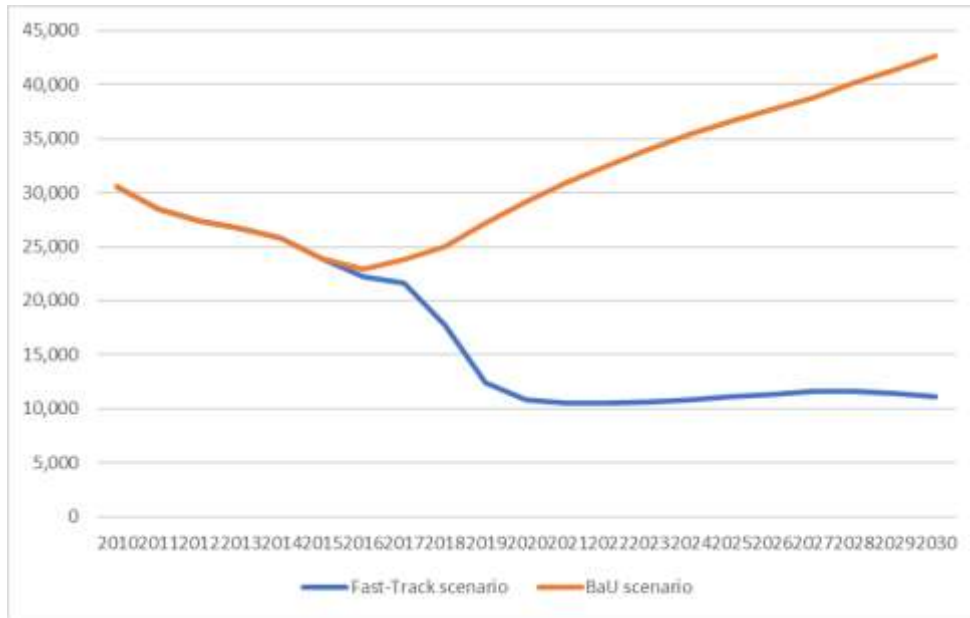
As Figure 13 shows, under the Fast-Track scenario, the scaling-up HIV prevention, treatment, and care programs would produce significant benefits including averting up to 882,368 new HIV infections between 2015 and 2030. This is 63% less than under the Business-as-Usual scenario. Relative to 2010, this represents an 80% reduction.

Figure 13: Number of new HIV infections, 2010 – 2030



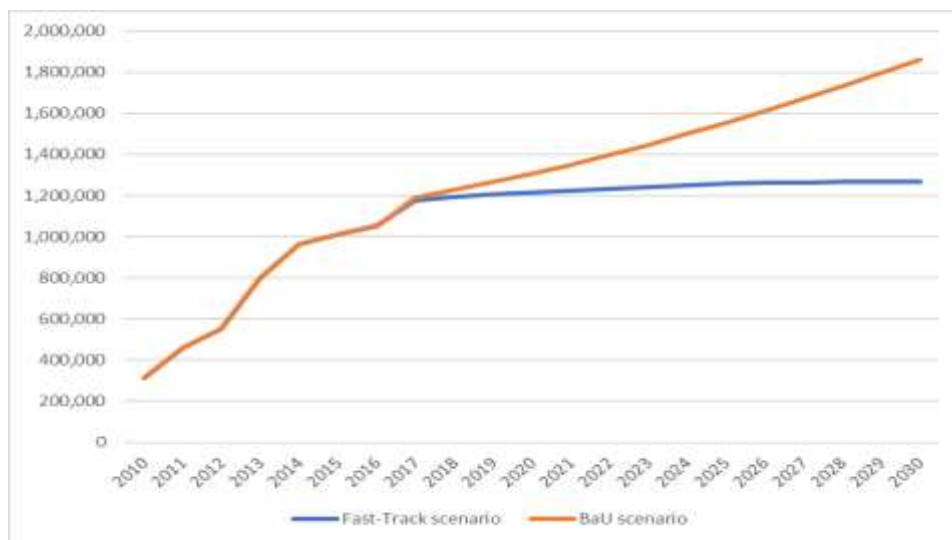
On the other hand, the trends in AIDS-related deaths are shown in Figure 14. The number of AIDS deaths would drop sharply due to the effects of scaling up ART. Compared to a 2010 baseline, the annual number of deaths would be 68% lower in 2030 with rapid scale-up under the Fast-Track scenario compared to the Business-as-Usual scenario. In absolute terms, this would avert 404,296 AIDS-related deaths between 2015 and 2030, reflecting a 58% difference between the 2 analytic scenarios.

Figure 14: AIDS-related deaths, 2010 – 2030



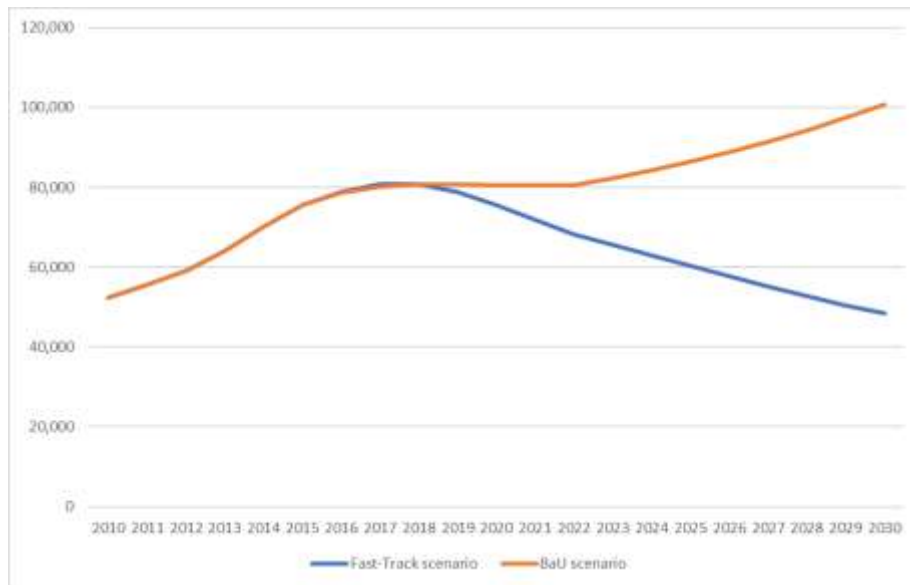
By extension, the large decline in the number of AIDS-related deaths results from the increasing number of people receiving ART. The combination of achieving 95% coverage and the expanded eligibility guidelines, thanks to implementation of a Test and Treat strategy, means that the number of adults receiving ART would increase sharply. The number of adults living with HIV needing ART would thereafter remain relatively stable under the Fast-Track scenario. It is important to note that maintaining ART coverage at the 2015 level (i.e. Business as Usual scenario) without also making progress with other prevention interventions would lead to even more people needing ART, as high as approximately 1.2 million in 2020 and 1.8 million by 2030 (see Figure 15).

Figure 15: Total need for ART (15+) - (Dec 31), 2010 – 2030



As a corollary, the scale-up of PMTCT coverage under the Fast-Track scenario would reduce the percentage of mothers who need PMTCT by 16% between 2010 and 2030 (see Figure 16). Effectively, this is a 22% difference between the 2 analytic scenarios over the 2015 - 2030 period. In real terms, this translates into 385,995 fewer mothers needing PMTCT. This would, in turn, reduce the number of children of HIV+ mothers who become infected. A combination of adopting of Option B+ and reaching 95% coverage by 2020 would reduce the overall final mother-to-child transmission rate (including breastfeeding period) by 72% between 2010 and 2030. However, it would remain high at approximately 8% through 2030. It is worth noting that more than half of the remaining transmission is due to the 5% of women who would not receive PMTCT services and seroconvert during pregnancy or breastfeeding.

Figure 16: Mothers needing PMTCT, 2010 – 2030



Additionally, owing to the net effect of declining new HIV infections and AIDS-related deaths on one hand and improved survival prospects on the other, a Fast-Track scenario will translate into 16% less PLHIV than a Business-as-Usual scenario between 2015 and 2030. See Figure 17. This, in turn, has an impact on the age structure of PLHIV. Figure 18, using estimated age pyramids of PLHIV for the years 2015, 2030 and 2050 under all the two policy scenarios, illustrate this point. The overarching change is the fact that PLHIV are older. This effectively transforms HIV/AIDS from a disease of young adults into a disease primarily affecting mid-age adults (many of whom might have been infected at a younger age but survive into mid-age) – with potential implications on the “greying of AIDS”. These implications, among others, include the aging of the population living with HIV who benefit from ART, the emergence of age-related NCDs, and heightened vulnerability to future pandemics owing to compromised immunities of PLHIV.

Figure 17: People living with HIV in Uganda, 2010 – 2030

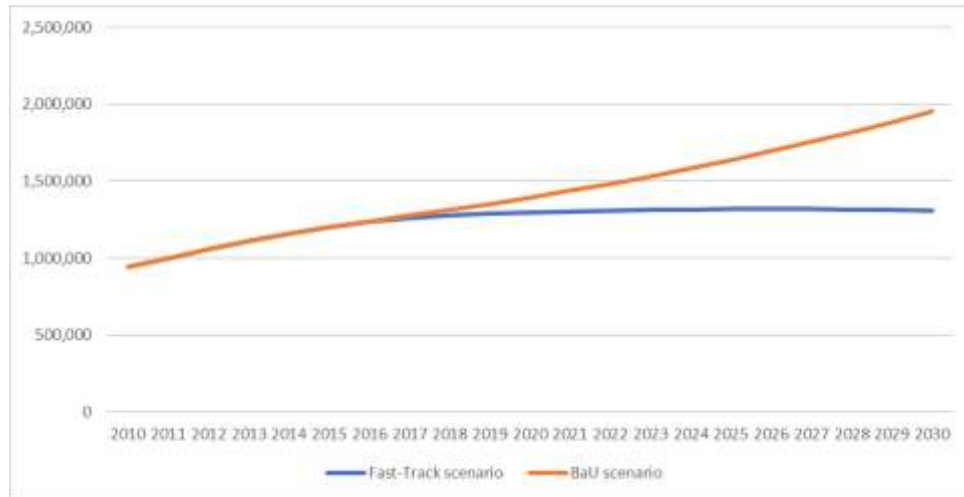
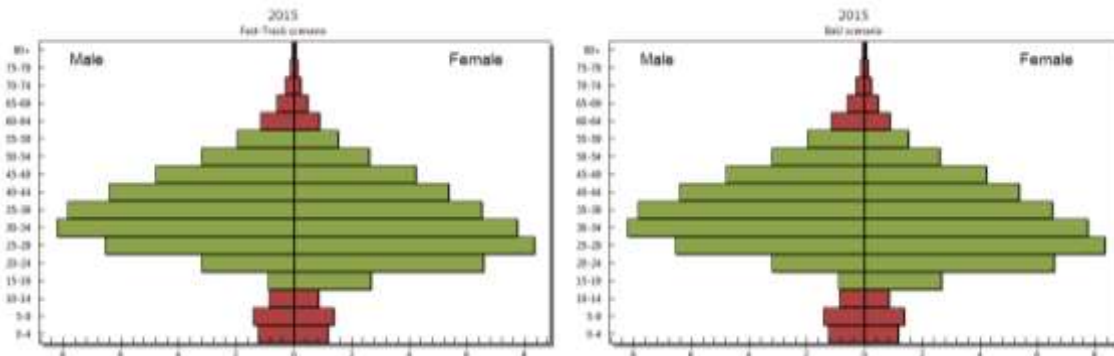
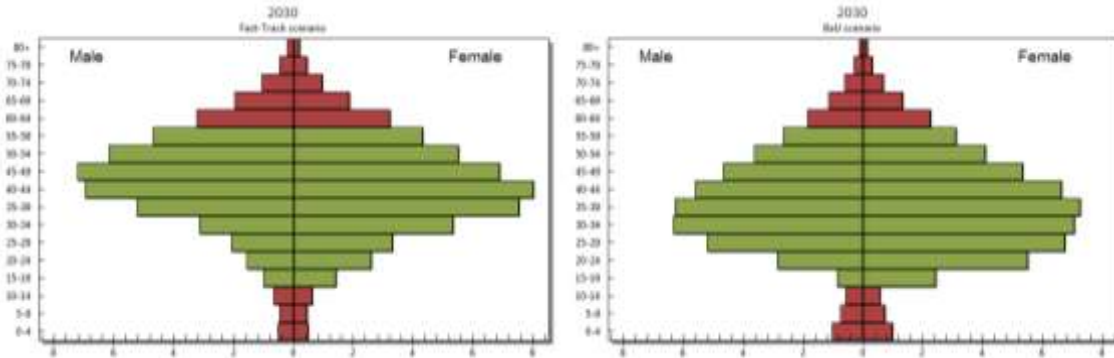


Figure 18: HIV age distribution (in percent) under the policy scenarios for the period 2015 – 2050*

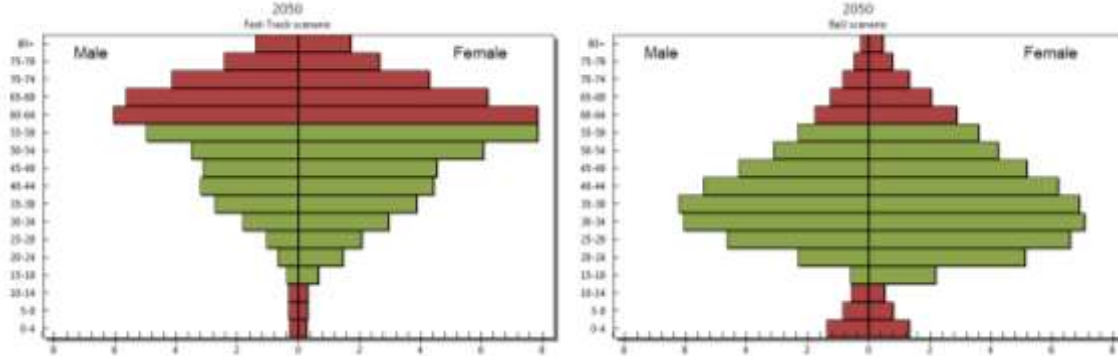
HIV age distribution in 2015.



HIV age distribution in 2030.



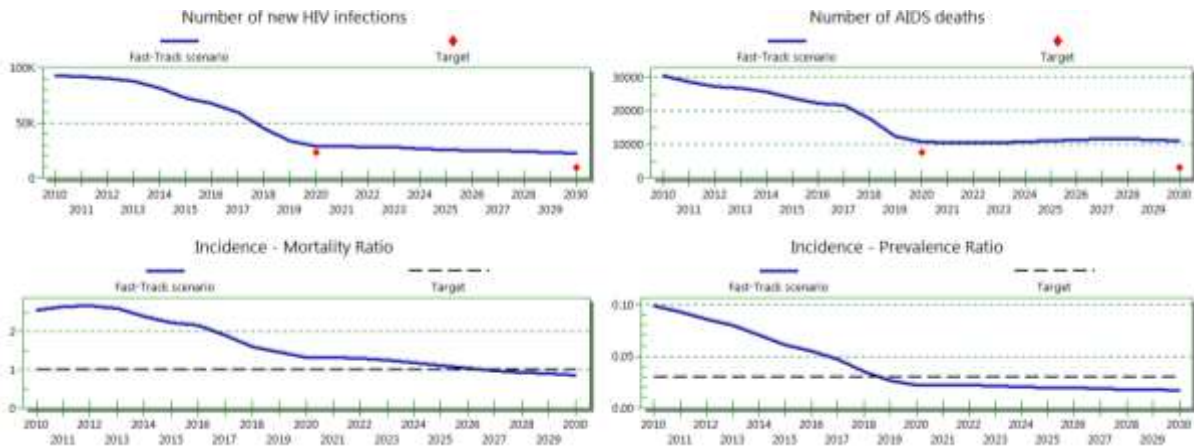
HIV age distribution in 2050.



* Colors as used in this analysis do not have any particular meaning.

In conclusion, owing to persistent new infections (albeit the projected reductions), because of the rapidly growing population, prevalence is projected to further decline. The same is true for incidence. Relative to the 2010 baseline, adopting the Fast-Track scenario compared to the Business-as-Usual scenario will enable Uganda to achieve only 2 out of 4 of the epidemic transition metrics within the UNAIDS-set target timeframe. Importantly, as shown in Figure 19, these trends reflect and can be attributed to several developments – both in HIV/AIDS epidemic and response terms. These are discussed in the next section.

Figure 19: Uganda’s progress towards epidemic transition, 2010 – 2030

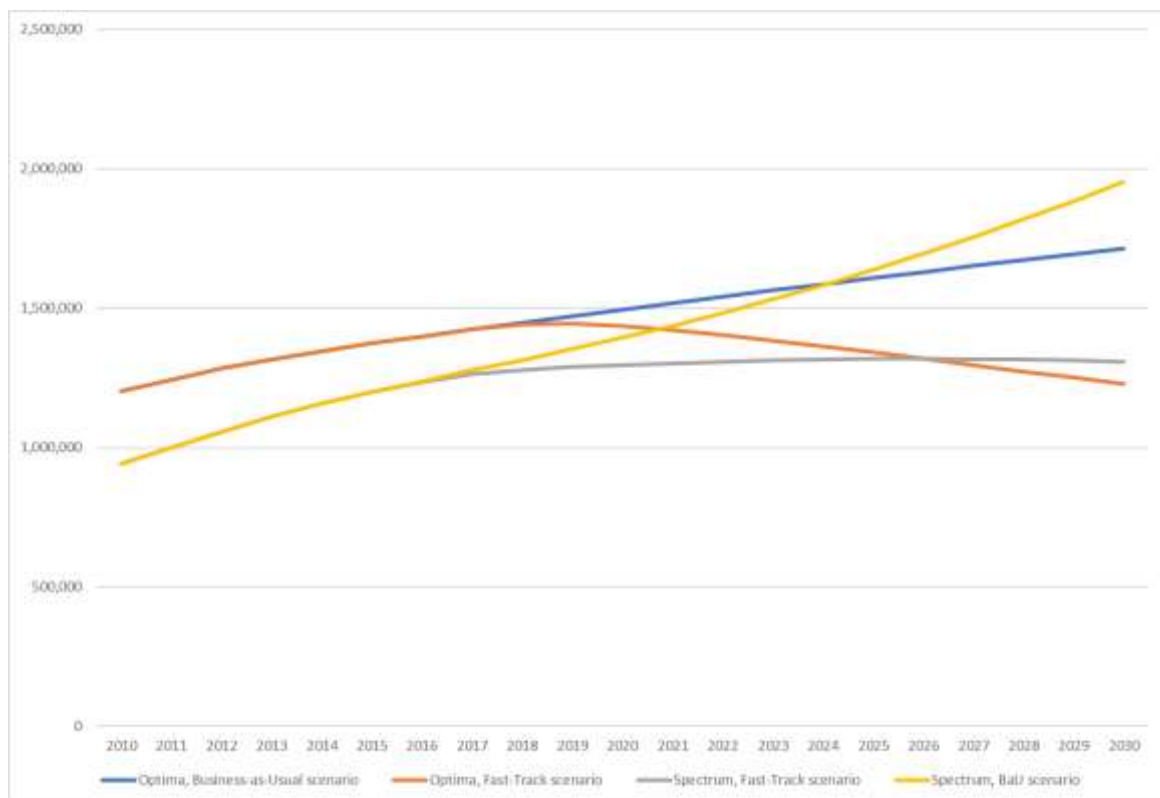


3.5. Discussion

This chapter shows that it is possible to achieve substantial reductions in new HIV infections and AIDS-related deaths in Uganda, in the order of magnitude of 80% and 69% respectively, between 2010 and 2030. These results are less than the global estimates in Stover and others (2016). In this forward-looking analysis, the number of HIV infections averted by each intervention is sensitive to three main inter-related factors. First, is current coverage. If current coverage is high, then the amount of scale-up to achieve the target will be less than for an intervention where coverage is currently low. Secondly, the relative effectiveness. Interventions with high effectiveness will avert more infections than those that will lower effectiveness. Finally, the target population. Interventions that reach many people with high risk will avert more infections than those that reach a smaller number of people and those will lower risk.

After a dramatic drop in new infections under the Fast-Track scenario, the number remains relatively constant through 2030. In this projection, the incidence rate continues to decline after 2015 but rapid population growth means that the number of new infections would be stable at around 36,000 per year by 2030. It is unclear what strategic package of the interventions with the most impact can avert the highest number of infections. Relatedly, as shown in this chapter, the number of AIDS deaths is expected to drop sharply due to the effects of scaling up ART. The size of the effect will depend on the number of people who receive ART. Adoption of the WHO (2015) guidelines would expand the number of people eligible for ART by over 300,000 PLHIV. Some of those newly eligible will already know they are infected, and some will already be enrolled in care. They can be started in ART quickly. However, others, particularly those with CD4 counts between 350 and 500 cells/ μ l are currently unaware of their status and can be identified only with expanded testing. Expanded testing will be even more important if Uganda decided to implement a Test and Treat strategy (implicit in the Fast-Track scenario). The Fast-Track scenario expands the number of PLHIV on treatment but since the additional patients have high CD4 counts and, therefore, low expected mortality without ART, the effects on AIDS deaths are minimal. In other words, the WHO 2015 treatment guidelines coupled with higher coverage would mean that 90% of all HIV-infected adults would already be eligible for treatment. Therefore, Test and Treat would only add 10-15% to the eligible population.

Figure 20: Comparative projection of PLHIV in Uganda using Optima and Spectrum, 2000 – 2030



Directionally, the findings of this analysis are robust. Compared with results from Optima analysis in Chapter 4, I find that both new HIV infections and AIDS decline under the Fast-Track scenario. However, the projected orders of magnitude vary with Spectrum estimating and projecting a higher HIV burden in terms of new HIV infections, AIDS deaths, and PLHIV. In aggregate terms, as Figure 20 shows, the number of PLHIV continue growing

under the Business-as-Usual scenario. This growth, however, is less so when I apply the Optima model. This is understandable as the two mathematical models vary substantially in structure, complexity, and parameter choices (Eaton et al., 2012; Eaton et al., 2015; World Bank, 2015). However, there is broad agreement suggestive that a Fast-Track approach has the potential to substantially reduce future AIDS burden. Interpreting these results, I argue that official national estimates (generated by UNAIDS using AIM) may be overestimating the HIV epidemic in Uganda as they largely rely on ART data to account for most of the effects. This could be compounded by the maturity of the epidemic and response. To this end, future HIV treatment, care, and prevention needs might be less than previously forecasted (see, Stover et al., (2016), for example). To inform more accurate projections, additional high-quality data about service provision for both HIV treatment, care, and treatment as well as behaviors could help.

Relatedly, the HIV-NCD nexus is complex. As IHME (2018) shows, the rise of NCDs in Uganda is not only driven by changes in lifestyle but is in part due to increased life expectancy owing to improved survival prospects from reduced premature mortality from HIV among other communicable diseases. The same holds true for child, and maternal illnesses. Additionally, preventable risk factors also contribute and present targets for NCD control efforts. Here, the “greying of AIDS” is well documented (see Haacker et al. (2019), for example, for the case of Botswana). This raises critical health systems challenges. Particularly, the implications of HIV disease on the overall NCD burden at the population level, and the corresponding evolving role of HIV as a co-morbidity with NCDs are less well understood. As the results in this thesis show (see §2.3), overall, HIV has slowed down overall population aging. Thus far, this has attenuated the growing burden of many NCDs. In the 1990s, the PLHIV cohorts reaching old age were decimated by AIDS-related deaths. However, drawing on the projected prevalence of selected NCDs in Uganda (IHME, 2018), it is projected that aging and the rise in various NCDs prevalence will likely rapidly accelerate circa 2030. This is due to a projected reduction in attrition of PLHIV cohorts due to ART scale-up. On the other hand, HIV prevalence among people affected by NCDs will increase or barely change. Thus, despite declines in HIV incidences, the interactions between HIV, ART, and NCDs will make the healthcare needs of PLHIV more complex. An immediate implication of these dynamics is that HIV will emerge as a key factor complicating NCDs management. In envisioning a health system fit-for-purpose, there is need to prepare to meet the health needs of a large number of PLHIV with NCD comorbidities. Finally, from a fiscal perspective, this will, undoubtedly, compound the HIV-induced and related fiscal challenges.

The limited, neoliberal-friendly menu of options implicit in the above Fast-Track scenario (and the corresponding approach advocated for by UNAIDS) continue perpetuating the microeconomic approaches that have, for the last 35 years, “found fertile ground in a public health approach that ‘blames’ individual choices for HIV transmission” (Johnston, 2013). If there are lessons from the past for the future, a political economy approach is needed. This is key to understanding how the risk of HIV infection and spread can be magnified by certain kinds of economic and social structure and related political economy factors such as those that affect patterns of intimacy, affection, illness (or the absence thereof) and, healthcare provisioning among other factors (Johnston, 2013). Thus, rather than focusing solely on ‘magic bullet nudges’ to alter choices about risky sex, I argue that a more inclusive political economy approach to HIV control is critical and should go beyond the rhetoric of “90-90-90”, among other Fast-Track targets, to embrace broad factors that affect the above-mentioned factors. In a bid to work and think politically, this could include a “90-90-90”-like targets for combination prevention cascades. This way, deep-seated and potentially politically sensitive economic and social factors that increase vulnerability can be adroitly confronted and addressed.

It is now 35 years since AIDS was first identified. Wilson and Whiteside (2016) contend that the AIDS epidemic is facing a “mid-life” crisis. Discourses on a ‘post-AIDS’ future characterise this crisis. In a 2013 World AIDS Day message, the then UNAIDS Executive Director, Michel Sidibé, notes that *“For the first time we can see an end to an epidemic that has wrought such staggering devastation around the world. For the first time we can say that we are beginning to control the epidemic and not that the epidemic is controlling us.”* He further adds that *“The world is poised to end AIDS....”* (UNAIDS, 2013). This self-congratulatory narrative in HIV policy, a precursor to the Fast-Track approach, can safely be interpreted as heralding a post-AIDS future. This begs critical analysis. First, in literal terms, according to the Merriam-Webster dictionary, “end” is defined as “the point where something ceases to exist”. As this study shows, HIV and AIDS do not cease to exist even with the most ambitious scale-up of interventions envisaged under the Fast-Track scenario. A number of new HIV infections and AIDS-related deaths (albeit decreased) are projected to continue to occur post-2030. These will continue to have fiscal implications for Uganda.

Second, I examine the epidemiological definition of “end of epidemic”. Whilst this varies by disease, depending upon the lifecycle and transmission pattern of the disease in question, the case of HIV/AIDS is more complicated. The fact that most PLHIV (in asymptomatic phase) do not know their serostatus, and by transitivity, public health officials don’t know it as well. This study shows that annual new HIV infections and AIDS-related deaths will continue in tens of thousands. As HIV/AIDS is a non-curable infectious disease, this level of magnitude is contrary to what can be epidemiologically defined as the end of an epidemic. No wonder, Mark Heywood (2013) remarked thus “Therefore the end of AIDS is nowhere near. At best half-way there with some very dark clouds ahead”. Bringing it all together, viewed this way, and as a springboard to critique the “end of AIDS” rhetoric, I contend that realism is lost in the idea of a “post-AIDS”. However, from an epidemiological perspective, as this chapter shows, this future is possible to imagine only if you define the “post-AIDS” era to mean that AIDS will no longer be of epidemic scale but remain endemic. In the absence of a functional cure and/or vaccine, and without confronting the political economy of HIV, the idea of a post-AIDS future is unlikely to happen in any realistic timeframe.

Relatedly, in fiscal terms, the rapid scale-up in ART will incur additional costs in the short term. However, it will also avert many deaths and new infections. The reduction in new infections caused by the ART scale-up will lead to a stable number of people on ART even with full coverage. What remains unknown is the order of magnitude of resource needs required to achieve this epidemic trajectory. However, owing to improved survival prospects for PLHIV, thanks to ART, there are notable demographic shifts. Four of these are worth highlighting. First, the reduced MTCT of HIV/AIDS translates into much-improved survival prospects of infants who become infected with HIV. Second, there is reduced HIV incidence among young adults, best visible in the reduced number of PLHIV at ages 20-24. Third, because of improved survival, the age distribution is shifting up. Finally, and related to the above-mentioned factor, I hypothesize a prospective rise in non-communicable diseases (NCDs) in Uganda. The HIV-NCD nexus is easy to overlook. However, I contend that it is vitally important. This is due to three (3) main factors. First, thanks to the advent of lifesaving ART, HIV is itself a chronic disease. In other words, HIV treatment requires the same types of continuity care and lifelong support as NCDs. Second, the HIV program is one of the first large-scale chronic disease control initiatives in most SSA countries. It thus offers local and effective models that can be emulated, adapted, and expanded. Third, as PLHIV live longer, as shown in the forward-looking analysis in this Chapter, they will acquire the same chronic diseases as others. Effectively, this necessitates paying attention to sustainable, scaled-up and integrated HIV and NCD services. This is important given that, in some cases, HIV and its treatment also increase the risk of specific metabolic disorders (Gelpi et al., 2020). There is some emerging body of evidence in this direction. To this end, in this thesis, I frame HIV as a chronic

communicable disease (CCD), owing to its chronicity (considering ART access) while remaining infectious.

This analysis has one main limitation. As expected, there are significant uncertainties inherent in these long-term projections. As earlier mentioned, there is some uncertainty about the effectiveness of each of the interventions in the context of Uganda. However, the major source of uncertainty is whether programs can be scaled up as envisioned here. Additionally, completely new interventions that may be available in the future are excluded here. Yet, such interventions such as prophylactic or therapeutic vaccines, though not currently existing, could make a potentially significant contribution by 2030. Also, I have limited the coverage of PrEP to 10% in 2020 and 30% in 2030. This analytic choice is motivated by the uncertainties around how quickly it can be implemented at scale while addressing issues of adherence and costs. Looking at the ecosystem of long-acting ARVs, there is certainly the potential for future PrEP formulations with improved adherence and efficacy as well as lower cost. These could play a much larger role in quickly achieving the desired reductions in HIV incidence. The target to scale-up ART coverage to the 90-90-90 cascade by 2020 is likely to be missed. In Uganda, major efforts are needed, coupled with attention to upholding human rights, expanded targeted HIV testing services, improved HIV treatment adherence and retention, and a concomitant increase in resources for the HIV response. Lastly, the significant contribution of VMMC can only occur if programs become more effective at generating demand in the most suitable age groups. Failure or delays in achieving any of the targets modeled in this Chapter will similarly delay the time by which the goal of ending AIDS can be achieved. And this could well go past 2030.

Finally, to gain a perspective on pointers for future work, it is useful to sample some broader issues – in terms of knowledge gaps – that could limit the use of the evidence in this study for policymaking. It is important to note that this scoping, is not necessarily exhaustive. In the first place, I note that this study does not engage with the political nature of decision making. Particularly, it is oblivious to how this influences the ways in which the ensuing evidence will be used (or misused) in political areas (Parkhurst, 2017). Second, the analytic scenarios used in this study are not necessarily (explicit) optimisation scenarios. Thus, from an allocative efficiency perspective, it remains unknown how HIV funding can be optimally allocated across a combination of HIV interventions to yield the greatest impact on health, let alone the resource needed to achieve epidemic control in Uganda. Finally, as the HIV/AIDS field is inherently political (Altman and Buse, 2012; Piot, 2015), it thus follows that some of the binding constraints to realising the estimated impacts in this study are political in nature. A case in point is service provision to key populations (KPs) (i.e. lesbian, gay, bisexual, transgender, and intersexed persons, as well as female sex workers and PWIDs). Nyanzi and Karamagi (2015), while critically analysing the social and political dynamics, point to the deeply polarised recriminalisation of homosexuality in Uganda. Whereas from a force-of-infection perspective, KPs hold the key to HIV epidemic control, it is implausible to scale-up KP services as per the Fast-Track targets in the context of a restrictive legal and policy environment such as Uganda's. To engender thinking and working politically (TWP), the next chapters in this thesis, will offer fresh insights into the nature of political bias with regards to evidence and attempt to answer some of these research questions.

3.6. Conclusion

This chapter modeled the future of the HIV epidemic in Uganda. In as far as “ending the AIDS epidemic as a public threat” goal, the evidence in this study points to the possibility of achieving dramatic declines in new HIV infections and AIDS-related deaths – within a generation - as long as implementation of evidence-based biomedical, structural and behavioural interventions is fast-tracked. In this regard, this analysis provides a roadmap for what is programmatically

needed to rapidly bring down infections and AIDS deaths within the next 15 years. However, I find the promise of “ending AIDS” dangerously exaggerated. The epidemic transition will not be achieved by 2030 as the Fast-Track approach, presented as a “game-changer”, is narrowly conceived and contains a limited individual behavior-focused menu of options, disregarding the underlying factors that increase HIV incidence. Finally, owing to the ecological limits of this narrow approach, as the global health history of pandemics shows, no global epidemic has ever ended in the absence of a medical cure and/or vaccine or a political economy approach that confronts the deep-seated socio-economic factors that sustain it. HIV is no exception. It is hoped that the evidence presented in this chapter will benefit policymakers in rethinking the approach to bring the epidemic under control in Uganda and thus set the stage for ending the AIDS epidemic as a public health threat.

Chapter 4

At what cost? An estimation of financial resource needs to control the HIV epidemic in Uganda

4.1. Introduction

This chapter empirically estimates financial resource needs to “end AIDS” by 2030 in Uganda. As Chapter 3 has shown, globally, there is consensus on the goal of ending the AIDS epidemic as a public health threat by 2030. At the national level, the political leadership in Uganda has embarked on a Fast-Track strategy to end the AIDS epidemic by 2030 (GoU, 2017). While there is substantial evidence on what is required to end the AIDS epidemic as a public health threat by 2030 at the global level (Hecht et al., 2009; Stover et al., 2016; Atun et al., 2016), the long-term understanding of how large are the financial resources required to end AIDS in Uganda by 2030 is very limited. This chapter contributes to addressing this gap in the literature and a central concern in long-term planning.

This chapter specifically examines what is the order of magnitude of financial resources needed to achieve the goal of ending AIDS, with available technologies and approaches. As used here, “ending AIDS” refers to the implementation of the UNAIDS Fast-Track approach. This empirical analysis is particularly relevant. First, HIV is a “long-wave event” – and in the words of Barnett (2006) - one that “... demands visionary thinking to engage with its implications and long-term ramifications”. Even after 35 years, planning AIDS responses (including estimating resource needs) has, except for global price tags, often taken 5-year short-term horizons. This analysis presents a medium-term perspective, in line with the SDGs. Second, understanding the medium-term resource needs is important for the design of HIV/AIDS prevention, treatment, and care policies, in terms of aligning HIV/AIDS policies with national development objectives, within constraints of fiscal risk and government debt.

Globally, cost estimation for HIV/AIDS interventions has been central to the economics of scaling-up the AIDS response (Kumaranayake, 2008; Vassall et al, 2017). Key actors are anxious to comprehensively forecast the resources needed to end AIDS. There is a paucity of comprehensive approaches to aid this. A review of existing approaches identified only one existing comprehensive approach, the UNAIDS resource needs model (RNM) (Sheppard et al., 2007). A key advantage of this approach lies in its simplicity. Also, with existing data, it is feasible to implement in Uganda. However, as a downside, it provides relatively little insights about the efficiency of existing national programs. Departing from orthodox methods used to estimate resource needs (Sheppard et al., 2007), in this chapter, I develop and apply a novel approach to resource needs estimations in three domains. Below, I discuss these methodological innovations.

First, I estimate net resource needs (NRN), by considering inherent HIV program inefficiencies (and potential (dis)economies of scale and scope as the response matures). On the methodological side, to ameliorate this weakness, an HIV allocative efficiency analysis is undertaken using an Optimization and Analysis Tool (Optima)(Kerr et al., 2015) - a mathematical model of HIV transmission and disease progression, which uses an integrated analysis of epidemic, program and cost data to determine an optimal distribution of investments across numerous HIV programmes, target populations, and funding levels. To the best of my knowledge, this Ph.D. represents the first Optima HIV application to Uganda. Finally, using recent literature on technical efficiency analyses (Zeng et al., 2012; Institute for

Health Metrics and Evaluation (IHME), 2015), this study uses the technical efficiency score and potential allocative efficiency gains as an adjustment factor to the gross resource needs (GRN). In other words, net resource needs (NRN) are estimated by netting out potential efficiency gains (Palmer and Torgerson, 1999) from GRN.

Second, drawing on the latest available evidence regarding economies of scale and scope of HIV/AIDS programs (Siapka et al., 2014; Sweeney et al., 2012; Kumaranayake, 2008; GoU, 2012), flexible cost functions are estimated by scaling various interventions' costs and to their respective coverage levels. A comparable approach is used in Meyer-Rath and Over (2012). Using time-variant unit costs, this approach allows for a more plausible characterization and projection of GRN. Arguably, some of the potential technical efficiency savings discussed above may arise from economies of scale and scope. However, given that the analysis of potential determinants of efficiency in the studies used (Zeng, 2012; IHME, 2015) exclude economies of scale, it is my considered view that the ensuing GRN estimations do not over-estimate the potential efficiency gains (and by extension under-estimate the NRN).

Finally, the resource needs estimates are placed in perspective by framing HIV spending as an investment (Schwartländer et al., 2011). To do this effectively, using Goals (Avenir Health, 2019), I estimate and present the combined program results in terms of the cost-effectiveness ratios per HIV infection averted, per death averted and per QALY gained (discounted at 3% as is commonly used in health economics literature). As the Uganda economy is expected to benefit from productivity gains as PLHIV who are too sick to work due to HIV/AIDS recover their labour productivity through initiating and sustaining ART (Resch et al., 2011), the discounted value of these gains is estimated. The impact and cost-effectiveness of HIV interventions is thereafter discussed considering cost-effectiveness thresholds for low-income countries (Revill et al., 2015; Drummond et al., 2005; Revill, 2015) and recent approaches that have emerged, in the economics of the global response to HIV/AIDS literature, to address aspects of the cost-effectiveness of HIV/AIDS-related interventions and program effectiveness

With these considerations in mind, the chapter is structured as follows: the next section describes, in detail, the methods used to estimate resource needs. Owing to methodological contributions made, much of the section focuses on discussing the above-mentioned three novel approaches to NRN estimation. In the third section, I calibrate the model(s), synthesizing the latest evidence on each of the above 3 aspects, and presents the estimates of the resources needs. A discussion of the results follows in the next section. This section, from both a theoretical and empirical perspective, lightly touches on the insufficiency of the approach in this chapter in understanding the full costs of the national response to HIV/AIDS from a "whole of government" approach. This discussion lays the ground for and motivates the fiscal analysis in the next Chapter. The last section concludes.

4.2. Methods and data

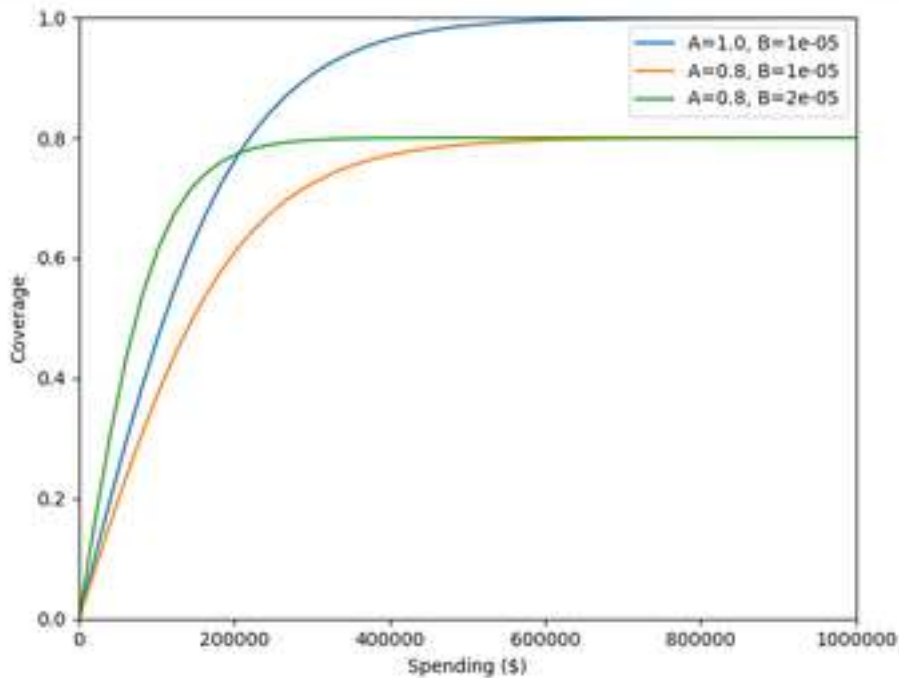
The analysis consists of two building blocks. First, using empirical epidemiological and demographic projection outputs from Chapter 3, I define the target population in need of a relevant HIV intervention. The estimates presented in this chapter largely build upon the methods used for the UNAIDS Global Resource Needs Estimates (see Stover et al., 2016). Additionally, for analytical comparison, the prevention, care and treatment, and support interventions used are as per Fast-Track and Business-as-Usual scenarios laid out in Chapter 3. To project the demand for HIV/AIDS, I multiply the identified target population by a time-varying target coverage rate. However, cognisant that unit costs change with program maturity and coverage expansion to reflect (dis)economies of scale and scope, I used flexible time-varying unit costs, as used in the cost-coverage functions in Optima 2.0 (Kerr et al., 2015).

Here, I construct and estimate logistic functions for all basic programs (Schwartländer et al., 2011). The function took the form of the following notation:

$$\text{coverage} = \frac{2A}{1 + \exp(-B \times \text{cost})} - A \dots\dots\dots (2)$$

Here, Equation (2) describes the upper half of a logistic function, where coverage is the y-axis and cost is the x-axis. "A" is the maximum coverage, and "B" is the "elasticity", i.e. how quickly coverage increases when you increase spending. For illustration, below – in Figure 21 - are some curves with different choices of A and B.

Figure 21: An illustration of the cost-coverage curve for HIV programmesⁿ



Source: Author's compilation.

Thus, parameterising Optima HIV 2.0 (Kerr et al., 2015) with unit costs and attendant coverage rates, I used the Data Exporter function to calculate the slope as (y1-y0)/(x1-x0). This yielded the time-varying flexible unit costs of the optimizable basic programs. Thereafter, to calculate the gross resources needed – by intervention and year, I multiply the projected target number of people to be served (e.g. female sex workers in need of a given service) by the target coverage (i.e. the percentage to be reached with a given intervention) and an appropriate time-variant flexible unit cost. Mathematically, this is represented by the following notation:

$$GRN = \text{Target population in need} * \text{Target coverage} * \text{Unit cost} \dots\dots\dots (3)$$

Recognizing that the national HIV response includes both optimisable and non-optimisable interventions, in addition to the direct intervention costs (for optimizable

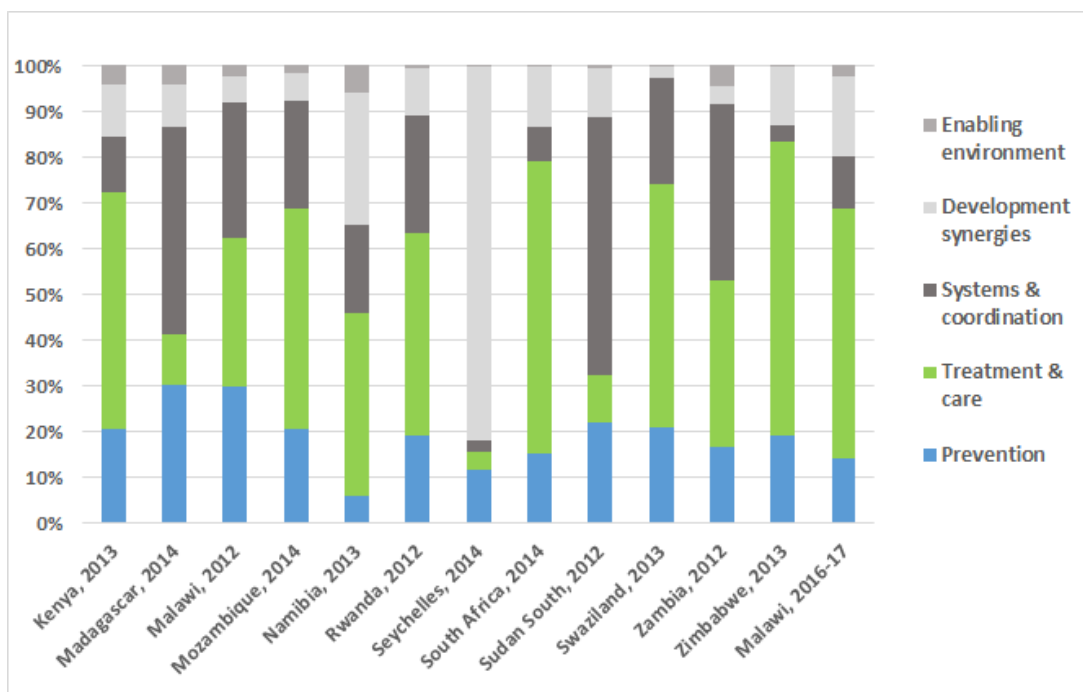
ⁿ Appendix 9 details the Python code used to produce the plot in Figure 21.

interventions), I include costs for non-optimisable interventions, referred to as Program and Social Enablers and Development Synergies in this thesis and elsewhere (Schwartländer et al., 2011). These enhance the impact of the key direct HIV interventions. As used in this thesis, “optimisable” interventions are those with a clear potential impact on reducing HIV transmission, morbidity, or mortality. On the other hand, “non-optimisable” ones are those that do not have a direct impact on health or where data limitations or classifications prevent a clear attribution to population-specific outcomes. In summary, as used in this thesis, Program Enablers include such interventions as planning and coordination, administration, supplies and logistics, staff training, monitoring and evaluation (M&E), including surveillance and information systems. On the other hand, Social Enablers include communications for public awareness, advocacy and building political commitment, reform of laws and legal policies, stigma reduction, and other structural interventions. Finally, Development Synergies refers to activities wholly or partially supported by the AIDS budget that support broader development objectives such as support for orphans and vulnerable children, AIDS education, and prevention of violence against women.

Importantly, in this study, costs related to building resilient and sustainable systems for health (RSSH) which can be operationally defined as part of Development Synergies, are included as a separate cost item. RSSH includes elements such as community-led monitoring and advocacy, social mobilization, and building community linkages, among others. Also, (conditional and unconditional) cash transfers for adolescents and young people (AYP) have broader development objectives and, using a co-financing principle and approach (Remme et al., 2014), I assume that financing for cash transfers will drop from 100% funding under AIDS budgets during 2016–2020 to 30% by 2030. Whereas they are problematic from a political economy perspective (Johnston, 2015), for an extensive analysis of how they work as a ‘nudge’ including their impacts, see Davis et al (2018). Management costs where they can be reliably attributed to a specific program are classified separately to the specific program they relate to. Additionally, where overheads contribute towards goods and services across programs or even outside the HIV budget (e.g., blood monitoring), values are apportioned appropriately.

Additionally, as an empirical basis for the costing of the above non-optimisable programs, using the most recently available data, I, together with colleagues, undertook an analysis of selected country expenditure data collected through various resource tracking approaches. See Appendix 10 for detailed methods and other key results. As Figure 22 shows, on average, Program Enablers add 14% to direct intervention costs, Social Enablers add another 8% and Development Synergies add another 10.7%. A review of Uganda’s National AIDS Spending Assessment (NASA) (UAC, 2012) estimates indicates comparable investment ranges. While the economies of these countries are vastly different and purchasing power differs significantly from country to country, even adjusting these spending estimates by purchasing power parity (PPP) shows very insignificant differences in real terms. This may imply that Uganda is the ‘same’ as these other Eastern and Southern African (ESA) region countries, PPP differences notwithstanding. Additionally, I included RSSH-related costs. Like Stover et al (2016), to support strengthen the health system to account for the demands of rapid scale-up envisaged under the Fast-Track scenario, this is assumed to rise from 6.1% of direct costs in 2016 to 9.7% by 2020, and then declining back to 6.1% by 2030.

Figure 22: Comparative analysis of HIV spending (by program area in %) in selected East and Southern African countries



Source: Benedikt et al. (2019)

Finally, by subtracting the total value of the expected total efficiency gains from the GRN, I estimate NRN. In the economics literature, despite different types of efficiency existing, efficiency can simply be defined as the achievement of a given level of output with the lowest possible input without compromising quality and equity. As Figure 23 shows, this thesis focuses on allocative and implementation efficiency. Table 4 provides operational definitions of each of these.

Figure 23: A simplified typology of efficiency in the HIV/AIDS response.



Source: Optima Consortium for Decision Science (OCDS), 2018.

Common to all these types of efficiency is the concern with the relation between resource inputs and either intermediate outputs or final health outcomes (such as new HIV infections averted, lives saved, life-years gained, quality-adjusted life-years (QALYs) etc) (Palmer and Torgerson, 1999). As this Ph.D. seeks to contribute to improving the fiscal sustainability of the national HIV response, as used in this chapter, efficiency refers to technical and productive efficiency and, allocative (social) efficiency. This narrow conceptualisation is informed by three main considerations. First, this is a Ph.D. project with a short time frame and thus a broader treatment of all possible efficiencies would require more time than available. Second, to improve the fiscal sustainability of HIV responses, among others, we need to use combinations of inputs wisely (technical and productive efficiency) and spend HIV financial resources on the right things in a way that benefits most (allocative (social) efficiency). It is important to note that while this is still only allocative efficiency within HIV spending, not within the health sector in general, or total expenditure more broadly, given that HIV spending accounts for a third of THE, it is assumed that optimizing investments in the HIV response will have a trickle-down effect on overall health spending (and by extension on total expenditure more broadly). Finally, owing to the fact that over 50% ((UAC, 2012) of available financial resources are 'locked-in' due to a political and ethical commitment (analogous to a "constructive obligation") to provide HIV treatment and care to all in need, there is limited room for virement to improve allocative efficiency. It is for this reason that I additionally explore implementation efficiency.

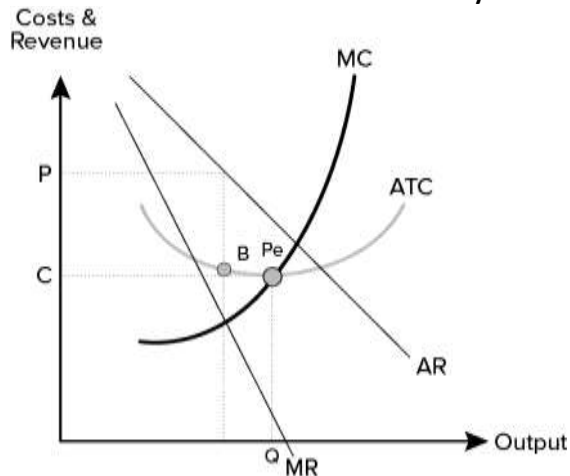
Table 4: Operational definitions of different types of efficiency in the HIV response

<p>Allocative efficiency is defined as the distribution of resources to a combination of programs, which will achieve the largest possible effect for available resources and set objectives.</p> <p>Implementation efficiency describes a set of measures to ensure that programs are implemented in a way that outputs are achieved with the lowest input of resources. In practical terms, improving implementation efficiency means identifying better delivery solutions.</p> <p>Technical Efficiency describes the delivery of a (health) service in a way that maximum output is produced at the lowest possible unit cost, while being delivered in accordance with operational quality standards.</p> <p>Integration and service delivery modalities: through simplified service delivery modalities and better integration of services, services can achieve better economies of scope and scale, reduce waiting times, and improve client satisfaction.</p> <p>Efficiencies in management and integration describe the optimal utilization of management, procurement systems, human resources and information to support effective and efficient service delivery. As with technical efficiency, efficiency in management and integration can enhance allocative efficiency, more especially, if more funding can be allocated to actual service delivery rather than management and administration.</p> <p>Efficiencies in financial flows describe the timely flow of funds and financial planning information at the national, sub-national, community, and service delivery levels.</p> <p>Institutional efficiencies describe the degree to which institutions, policy environments, laws, and regulations support and enable service delivery to the beneficiary and refer to the ability to reduce transactional costs.</p>

Source: Author's adaptation from OCDS (2018).

Theoretically, as Figure 24 shows, the HIV response is said to be allocatively efficient when the national AIDS program ‘pays’ a market price (P) for HIV services. As used here, this is one that reflects the true private marginal cost (MC) of producing that said HIV service. In other words, the *conditio sine qua non* for allocative efficiency for the national HIV response is to produce an output (in this case a given HIV service) where MC, just equals P. On the other hand, implementation efficiency occurs when resources are combined in such a way as to produce a given output at the lowest possible average total cost (ATC). As a rule of thumb, costs will be minimised at the lowest point on the short-run ATC curve. For this to occur, I contend that $ATC = MC$. This is because MC always cuts ATC at the lowest point on the ATC curve. Finally, in simple terms, technical efficiency relates to how much output can be obtained from a given input. Here, as a *conditio sine qua non*, maximum technical efficiency occurs when output is maximised from a given quantity of inputs.

Figure 24: Theoretical illustration of allocative and technical efficiency



Source: Author’s compilation.

The unit costs and efficiency adjustment factor (i.e. the total efficiency score) were drawn from academic and grey literature as well as empirical analysis. Below, I describe the three-stage process and the corresponding data sources used. First, a comprehensive search of academic and grey literature studying costs, determinants of costs, and/or cost-effectiveness of HIV interventions was undertaken. I searched for peer-reviewed literature available through Google Scholar, HIV InSite, POPLINE, and PubMed, using the following search string: "HIV"^o, "AIDS", "effic*", "effect*" and "Cost". Only studies with an abstract published in English, between 1st January 1990 and 31st December 2016, reported all the methodological principles required by the Global Health Cost Consortium (GHCC) reference case for estimating the costs of global health services and interventions (GHCC, 2017) and with a focus on Uganda were included in this chapter. By extension, on the other hand, abstracts of studies conducted in high-income countries, used modeled unit cost estimates that were not based on primary cost data collected in-country, repeated the same study population/program already in another study, gave costs only in charts, did not present any basis for the unit cost given in the study, did not provide a cost per person over a defined period or data from which that unit could be determined, or provided costs only on opportunistic infections, tuberculosis (except when integrated with HIV interventions), or commodities (unless they included the cost for procurement, shipping, insurance and/or social promotion) were excluded. Finally, conference presentations, posters, and MS PowerPoint presentations

^o Detailed search string for HIV is in Appendix 12.

were also excluded. In cases where a determination could not be made – whether to include or exclude - from the abstract, the full article was reviewed to inform the decision.

Articles used in this chapter were identified through a search conducted between July and December 2016. Three (3) comprehensive unit cost databases - based on a review of published and unpublished reports – were used. These are Avenir Health (2016), Kwesiga (2016), and GHCC (2019). To the best of my knowledge, these databases contain the most comprehensive Uganda-specific data on the cost of HIV interventions. This, however, does not detract from the fact that methodological heterogeneity and lack of transparency make it impossible to compare studies over setting and time (Fukuda and Imanaka, 2009; Kolaczinski and Hanson, 2006; Hanly et al., 2013; Luengo-Fernandez et al., 2009). As such, the need to develop standardised methods for cost estimation in global health cannot be overemphasized (Alvin et al., 2014). Improving the consistency, relevance, and quality of estimates is rooted in statistical theory. The statistical theory posits that the quality of an estimate can be defined along two dimensions, often referred to as internal validity: accuracy and precision. As used in this thesis, accuracy reflects the extent of bias in an estimate, and how far the estimate is from the true value of the mean. Precision, on the other hand, reflects the narrowness of clustering (variance) of the sample taken to estimate a central value, such as the mean. To this end, building on analytic approaches in the Reference Case for Costing Global Health (Vassall et al, 2017), this chapter considers the scientific rigour necessary to arrive at ‘good estimates’.

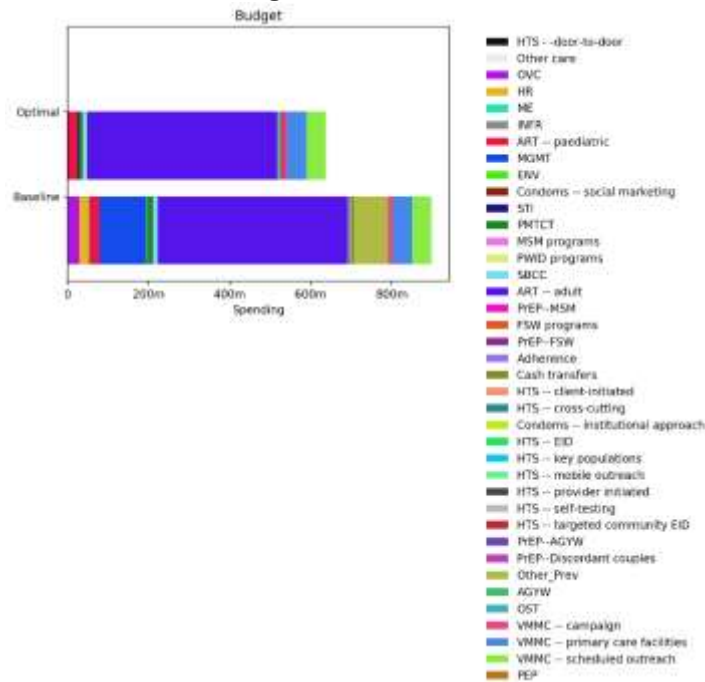
Owing to the heterogeneity of unit costs for HIV interventions (Menziés et al, 2012), concurrently with the literature review, I adapted a quality review instrument from Plosky and Bollinger (2013). Importantly, the structure and content of the above-mentioned quality review instrument were informed by and based upon the standardized template developed by Beck and colleagues (2010), other checklists for reviewing the quality of economic evaluations (for example, see Drummond (2005), GHCC (2019)). Using this tool, I then assessed each article and assigned a score of 0 to 80 to provide an objective assessment of the completeness of reporting by the author(s) of the factors affecting unit costs. As used in Plosky and Bollinger (2013), the indicators presented by Beck et al. (2010) such as “geographical settings covered”, “data client sample size”, “source of cost data” and “patient characteristics reported” were augmented by other critical reporting indicators such data in which cost data were collected, the currency used, service delivery sector, location and modality, in-kind goods and services used, user fees for HIV services, HIV prevalence in target geographical location and population, (dis)economies of scale calculated and, other exogenous factors such as donor transitions.

The measurement of the efficiency of HIV responses using parametric and non-parametric methods has proven challenging. This study overcomes the difficulties of earlier studies by using a hybrid and novel mixed methods approach to estimating the efficiency of the HIV response in Uganda. First, Zeng et al (2012) – the most comprehensive and rigorous study from the above-mentioned comprehensive literature survey – was used. It finds that the technical efficiency score for Uganda is 45.62%. Second, as earlier mentioned, I undertake an empirical analysis to diagnose allocative inefficiencies (see Appendix 10 and Figure 25). Optima HIV simulations show that Uganda could realise a 42% improvement in outcomes (both new HIV infections and deaths) with optimization relative to status quo – at 71.02% budget allocation of current (baseline) allocation. This implies that there is a 28.98% potential saving from optimizing allocations. Consequently, using these 2 inputs (from technical efficiency analysis by Zeng et al (2012) and the Optima HIV analysis) as proxies of possible efficiency gains and accounting for reasonableness (A4R), I assume 19%^p as levels of savings (or

^p This is 50% of the average of the sum of the maximum possible allocative efficiency gain and the technical efficiency score.

efficiency gains) possible – at a macro level – through to 2030. A comparable estimate is found in the empirical analysis by Remme (2018).

Figure 25: Optimisation to maximise health gains



It is important to note that whilst this pragmatic assumption lacks a strong empirical basis, it is borne out of a key lesson from decision and delivery science (Wilson, 2016) that realising those savings requires a painstaking focus on implementation processes and methods as well as political economy considerations. For example, while the theory of rational choice assumes that given full and accurate information, individuals correctly and carefully value costs and benefits and act accordingly. In other words, they are “knights” who are not self-interested (Le Grand, 1997; Le Grand, 2003). As policy studies have variously shown, this is not always the case. On the contrary, we observe human behavior and decisions that depart from the path predicted by rational choice theory – largely due to principal-agent problem, moral hazard, and adverse selection (see Table 5 for operational definitions, drawn from McPake, Normand, Smith and Nolan, 2020). Consequently, even in the face of most rigorous empirical analysis, well-intentioned efficiency-improving recommendations often fail to achieve their set objectives or implemented. It is in this context that, using insights from behavioral economics⁹, I present ideas from behavioral economics literature (Kahneman, 2011; Thaler and Sunstein, 2008) that apply to decision-making contexts to encourage a range of desired behaviors to realize the identified potential efficiency gains.

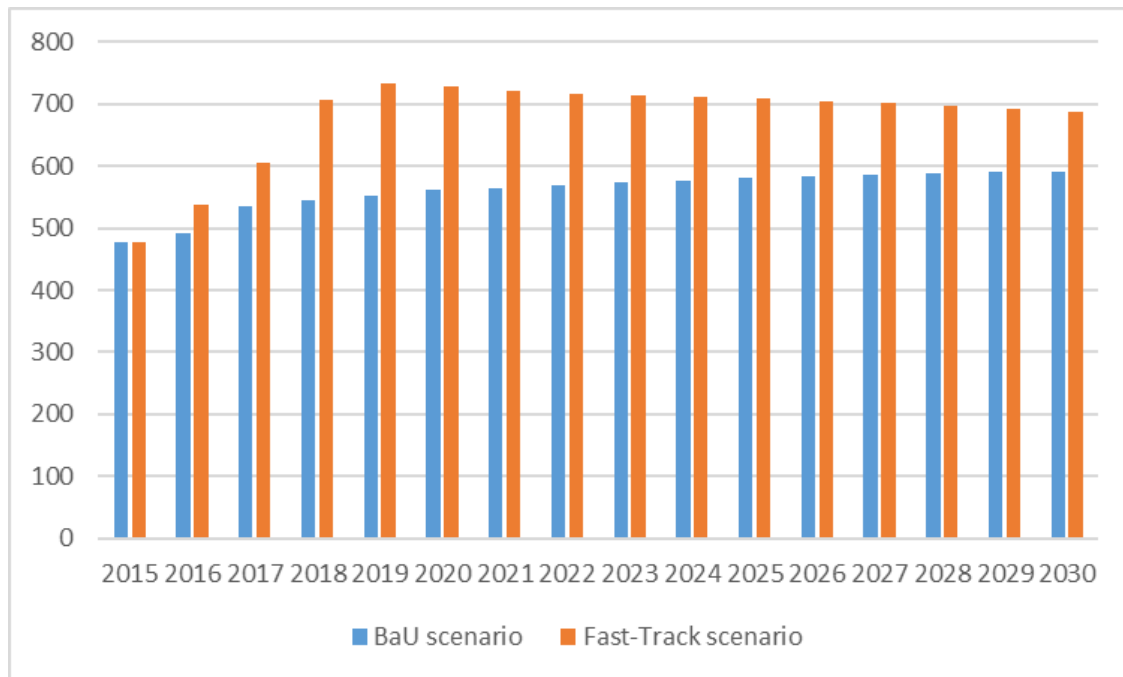
Table 5: Agency dilemma, moral hazard and adverse selection defined

<p>Agency dilemma: This is also known as the ‘principal-agent problem’ in economics literature. It occurs when one person or entity (referred to as the “agent” in this thesis) can make decisions and/or take actions on behalf of, or that impact, another person or entity, the “principal”. At its core, this dilemma arises and exists in circumstances where agents are motivated to act in their own best interests, which are contrary to those of their principals.</p> <p>Moral hazard: In a classical sense, it occurs when someone (unnecessarily) increases their exposure to risk when insured. This arises especially when a person takes more risks because someone else bears the cost of those risks. As used in this thesis, a moral hazard may occur where the actions of one party may change to the detriment of another after a financial transaction has taken place.</p> <p>Adverse selection: This describes a situation where market participation is affected by asymmetric information. For example, when buyers and sellers have different information, it is known as a state of asymmetric information.</p>
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4.3. Results

The rapid scale-up of strategic interventions, envisaged under the Fast-Track scenario, will require large and steep increases in expenditures. As shown in Figure 26, total annual expenditures would rise quickly from US\$ 478 million in 2015 and peaks at US\$ 734 million by 2019 and slightly drop to about US\$ 688 million by 2030 after the end of the catch-up phase. On the other hand, for the Business-As-Usual scenario, the gross resource rises from US\$ 478 million in 2015 to US\$ 591 million in 2030.

Figure 26: Gross (financial) resources needed (in US\$ million), 2015 – 2030



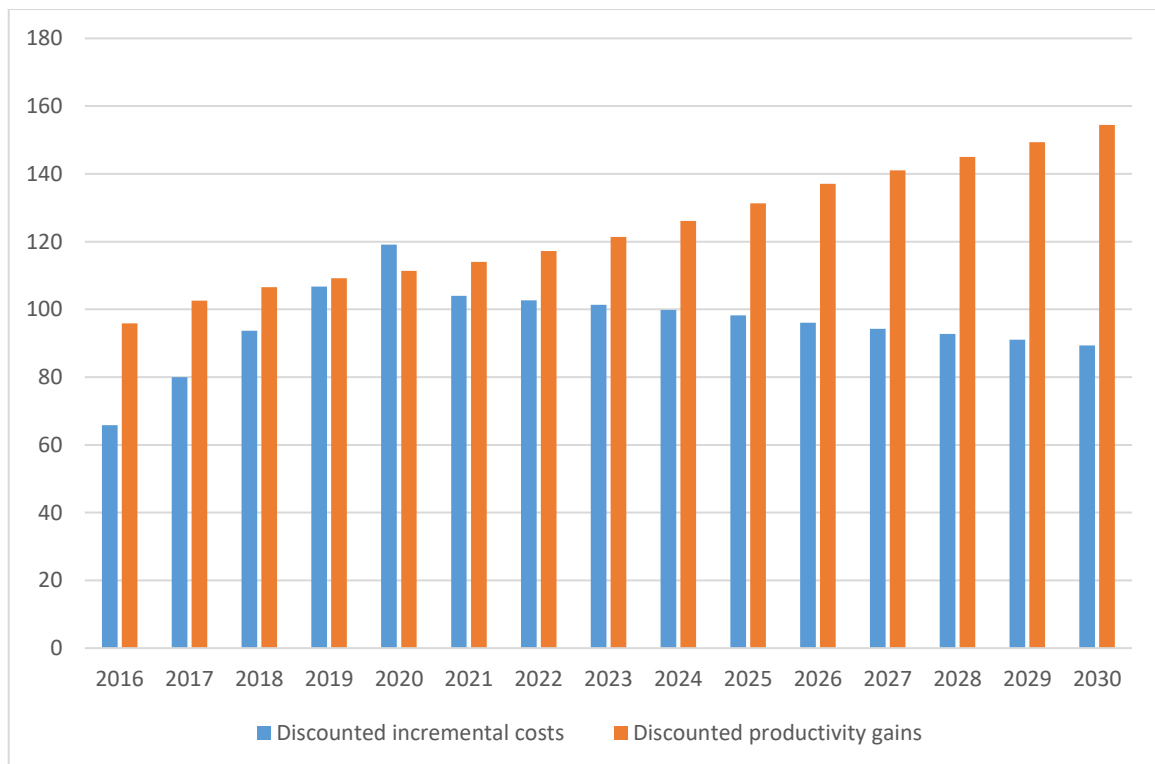
In absolute terms, over a 15-year period (i.e. 2016 – 2030), the total GRN amounts to US\$ 10,849 million and US\$ 8,971 million for the Fast-Track and Business-As-Usual scenarios respectively. By strategically choosing the Fast-Track scenario over the Business-As-Usual, an additional US\$ 1,878 is invested. Whereas the (scaling-up) Fast-Track scenario is more expensive than the (constant) Business-as-Usual, this chapter shows that the investment choices are stark: investing fully now to bend the epidemic curve and the ensuing resource needs or pay more later and keep on paying forever. This is a function of declining unit costs as coverage increases and economies of scale and scope set in as well as the attendant reduced disease burden.

In terms of resource needs by intervention, in 2016, it is estimated that ART accounts for over one-half of all expenditures (i.e. 50.31%). Given the importance of this intervention as a cost escalator, in tandem with assumptions agreed on by the Expert Group on ART (UNAIDS, 2014) for very ambitious price reductions of \$50-\$80 for 1st line by 2018 and below \$300 for second-line therapy, with little to no impact on costs from 3rd line, particularly as the massive ART scale-up would have most people on 1st line. Based on the market dynamics for ART, these cost reductions are highly likely. To this end, I assumed that the cost per patient can be reduced by 10% by 2020. This is important because ART accounts for an average of 50.31% of projected total expenditures. It will be important to continue to consider ways to reduce costs per patient while maintaining high standards. Among the factors that can be considered are: negotiating reductions in ARV prices as volumes increase; reviewing the

frequency and types of tests conducted; switching to new drug regimens that are cheaper and involve fewer pills load and thus simpler to adhere to; reviewing the frequency of scheduled visits, particularly for those patients who are doing well on treatment; shifting some tasks to lower-level health staff and, applying lessons learned from the most efficient treatment centers and transferring them throughout the system, using competition law to lower prices for medicines and, optimizing public health-related trade-related aspects of intellectual property right (TRIPS) Agreement flexibilities. In 2030, the largest components of expenditures would be ART (54.28%), and program support^f (35%).

The economy will also benefit from productivity gains as PLHIV who are too sick to work due to HIV and/or AIDS can recover their labor productivity through starting and staying on ART. The analysis of productivity gains in this study is based on Resch et al (2011). In basic terms, it assumes that productivity can be measured by GNI per working-age population and that a person living with HIV with a CD4 count less than 200 cell/ μ l has a disability of 80% compared to a person on ART. This assumption is backed up by the above-mentioned empirical work by Resch et al (2011). The discounted value of these productivity gains is equal to about US\$1,863 million compared to the discounted incremental costs of US\$ 1,435 million (Figure 27). Thus, from the perspective of the total economy, the net additional gains of achieving the Fast-Track goals would be US\$ 428 million and the net cost per QALY would be just US\$ 79. Thus, investing now to achieve the Fast-Track targets would be very cost-effective.^s

Figure 27: Discounted incremental costs and productivity gains (in US\$ million), 2016 – 2030

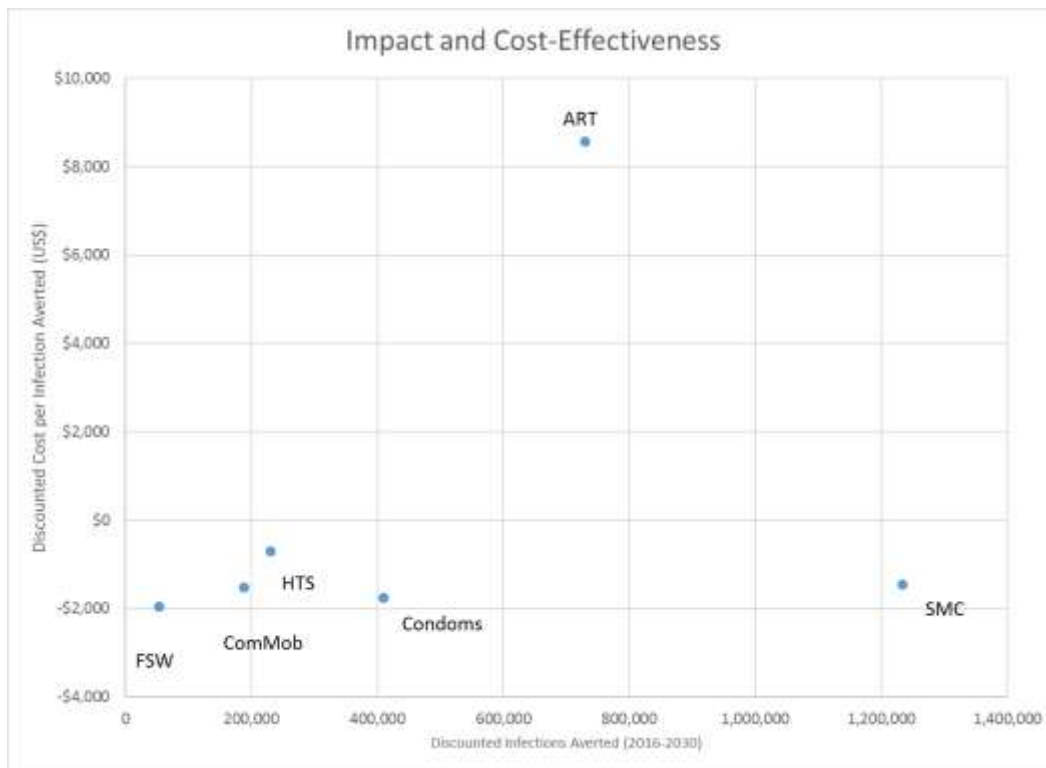


^f This includes program and social enablers and development synergies.

^s The Commission on Macroeconomics and Health (World Health Organization (WHO), 2001) suggests that health interventions be considered very cost-effective if the cost per QALY gained is less than GNI per capita. However, this is without controversy. See Appendix 3 for detailed discussions of the evolution in use of cost-effectiveness thresholds.

The incremental expenditure for the combined program results in cost-effectiveness ratios of US\$ 404 per infection averted, US\$ 1,349 per death averted and US\$ 100 per QALY gained^t. QALYs gained are calculated using the following disability rates: 0.453 for HIV+ adults with CD4 counts < 200 cells/ μ l, 0.779 for adults with CD4 counts > 200, 0.947 for those on ART. In terms of the total impact over the period 2016-2030 and the cost per infection averted for each of the major interventions (namely ART, FSW, HTS, VMMC, and condoms), as Figure 28 shows, the most infections are averted by safe male circumcision and ART, largely because the current coverage is low in relation to the Fast-Track goals. Note that for all interventions except ART, the cost per infection averted is negative. This means that the intervention would save money by averting infections. Therefore, this intervention would avert future treatment costs. ART has a large impact and is the most expensive way to avert new infections, but, of course, it is the only intervention that directly averts deaths.

Figure 28: Impact and cost-effectiveness of the Fast-Track scenario in Uganda, 2016 – 2030

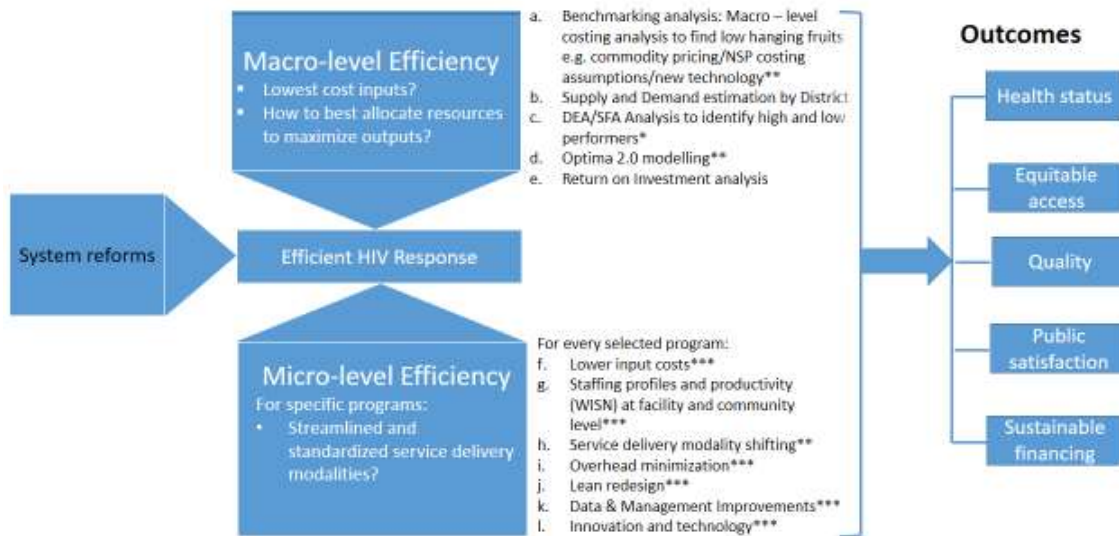


There are several ways that the efficiency of the response might be improved (see Figure 29). From literature, using a large international econometric model (Zeng et al., 2012), the efficiency score for Uganda in 2006 is 45.62%. In other words, the country could nearly double its outputs with the same inputs or deliver the same outputs with almost 50% of current resources (or inputs). On the other hand, the allocative efficiency modeling analysis in this chapter shows outcome optimization could be realized with an optimized budget that is 28.98% less than the baseline budget. Assuming an efficiency adjustment factor equal to the arithmetic mean of the sum of the maximum potential technical and allocative efficiency, this analysis suggests a potential efficiency gain of 37.3%. Put differently, the Fast-Track targets could be

^t Expenditures, new infections, deaths and QALYs are all discounted at 3%, as traditionally used in the health economics literature.

achieved with almost two-thirds of the estimated GRN. However, adjusting this factor for reasonableness given the constraints to realizing the full potential, I (subjectively) assume 50% of the identified efficiencies can be realized by 2030. Thus, 18.65% of the GRN could be saved by 2030. However, to actualize this future 'optimal efficiency' trajectory will require specific efficiency-enhancing measures and a strong policy commitment to improving the efficiency of HIV response in Uganda. I discuss these in the next section.

Figure 29: A micro-macro analytic framework for improving the efficiency of the national HIV response in Uganda



Source: Author's compilation

* Data from this analytic approach drawn from the literature.

** Empirical analysis undertaken for this study

*** Not applied to this study.

Below, in Figure 30, net resource needs (NRN) are then calculated considering efficiency savings. The model assumes that measures are put in place to allow for efficiency savings of 18.65% (i.e. efficiency adjustment factor). Implicitly, this resultant NRN is predicated on the assumption that the implementation of several efficiency-improvement policies and measures results in a more efficient national HIV response. Assuming linear progressive realization of identified potential efficiencies, a cumulative total of US\$ 1,067,805,170 in savings can be realised over the next 15 years (i.e. 2016 to 2030). In absolute terms, this translates into an NRN of US\$ 10,154,427,870 over the same period. This is slightly less than Stover and colleagues (2016)' estimate at US\$ 11 billion.

Figure 30: Efficiency-adjusted resource needs (in US\$ millions).

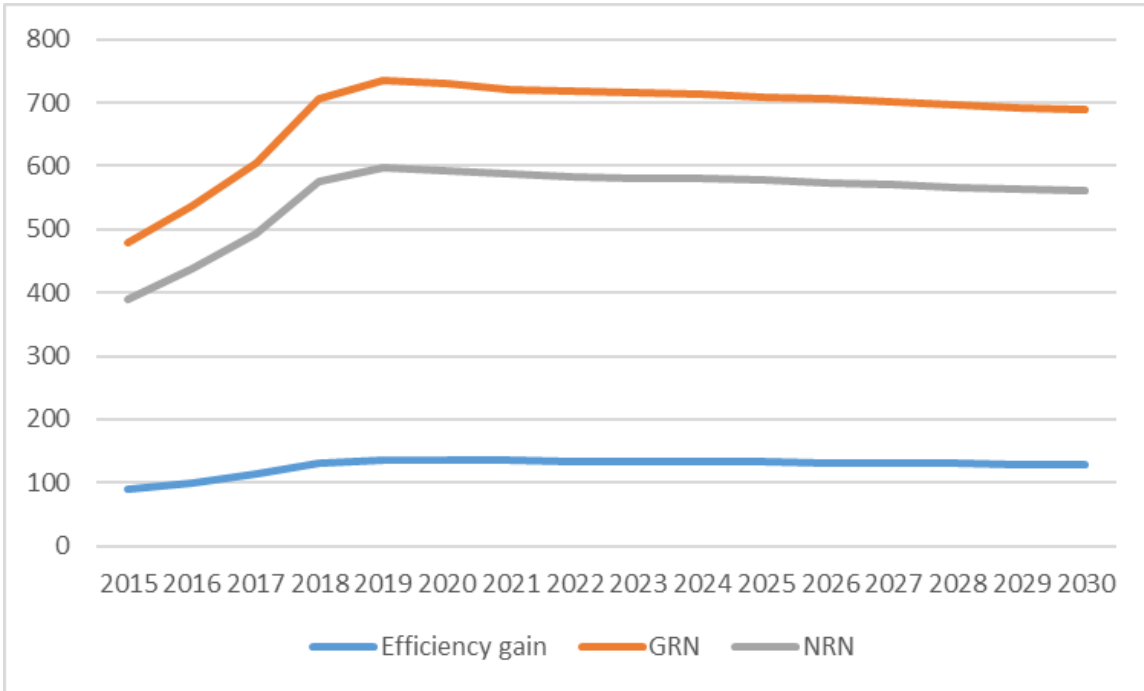
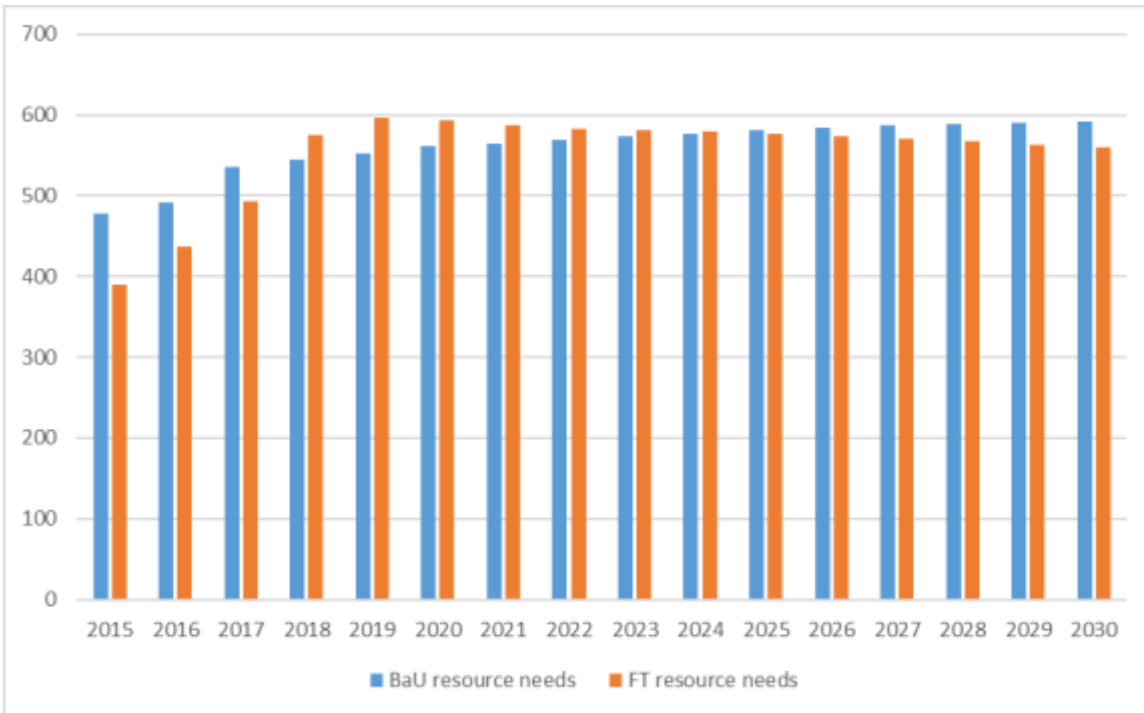


Figure 31: A comparison of resource needs, 2015 – 2030 (in US\$)



Overall, comparing resource needs reveals that a Fast-Track approach that maximises efficiency as opposed to the Business-as-Usual exceeds the latter by US\$ 146 million for the period 2015 – 2030.

4.4. Discussion

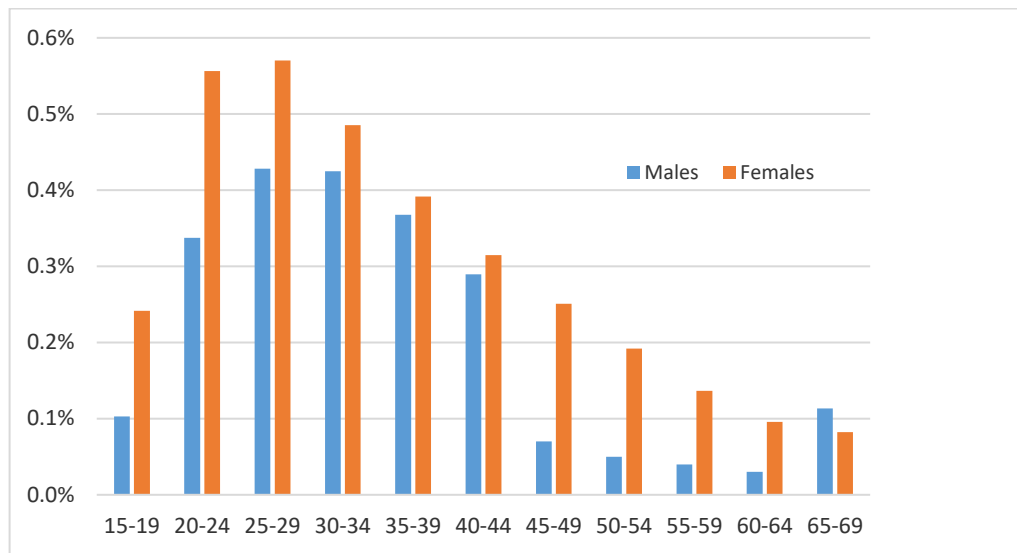
This chapter has estimated the financial resource needed to achieve Fast-Track targets by 2030 in Uganda. Scaling up to meet the Fast-Track goals - to near-universal coverage of key prevention and treatment interventions - will be a good investment but it will also require a significant increase in resources devoted to HIV/AIDS – rising from US\$ 478 million in 2015 to an annual average of US\$ 691 million per annum between 2016 and 2030. As Stover et al (2016) note, most important will be reaching targets for ART for all, voluntary medical male circumcision, PrEP, condoms, key populations and PMTCT.

Different scenario assumptions will change the cost and impact figures, but the differences are not large. The case of test and treat illustrates this. In 2015, WHO released new guidelines recommending treatment of all HIV+ adults with CD4 counts below 500 cells/ μ l. These guidelines are included in the Fast-Track scenario. Some have advocated for providing treatment to all HIV+ people regardless of CD4 count. This could have benefits for the health of the treated individuals as well as prevention benefits for the entire population. However, under the WHO 2015 guidelines, which include all HIV+ adults with CD4 counts below 500 cells/ μ l plus all HIV+ pregnant women and serodiscordant couples, 88% of HIV+ adults would already be eligible for treatment. Expansion of eligibility to all HIV+ adults would only add about 170,000 adults to the eligible population. Thus, the impact would be relatively small, averting 4% of new infections from 2010-2030 at a cost of about US\$ 7,500 per infection averted.

One key factor needed to generate the resources needed will be demonstrating that they are used efficiently. Here, efficiency and effectiveness (E^2) matters. The efficiency of some prevention activities may depend on how they are targeted. This focus is a key pillar of implementation science in global health. Primary prevention for those at the highest risk will be most efficient. However, while it is difficult to identify specific individuals at high risk, it is possible to identify population characteristics that are associated with high risk. As I show in this Chapter, certainly, those engaging in sex work, MSM, and PWIDs generally have high risk of contracting HIV. Thus, they should be a key focus of targeted HIV combination prevention efforts.

Relatedly, risk also varies significantly by geographic location. HIV prevalence is higher in urban populations than in rural populations, and higher in the Central region than elsewhere in the country (GoU, 2017). Ensuring high coverage of prevention services in these areas will increase efficiency. Generally, risk also varies by age. While we cannot readily measure incidence by age directly, it can be estimated by the model. Figure 32 shows the patterns of incidence by age and sex. For women, the incidence is highest at ages 20-29 while for men incidence peaks about 5 years later at 25-34. Programs that focus on protecting young people before or shortly after they become sexually active have the potential for greater impact. A good example is VMMC. Circumcisions provided to young men 10-19 will protect them through their most vulnerable years, whereas those for older men will confer protection for fewer years and during a period of lower risk. Other interventions, such as behavior change communications, testing, and condom promotion are not as long-lasting as male circumcision so they will be most efficient when focused on the age groups of highest incidence, 20-29 for women, and 25-34 for men.

Figure 32: Estimated incidence per 1,000 by age and sex, 2015



Source: Author's analysis of UNAIDS (2016)

Current conservative projections of investment needs in the HIV response in Uganda – as per the NSP (GoU, 2015) - are estimated at US\$ 3,786.70 million for the 5-year period up to 2020. This is 12.5% more than my NRN estimates in this chapter for implementing the Fast-Track strategy. Gauged against NSP projected inflows amounting to US\$ 2,868.3 million over the same period, this translates into a 24% and 13% financing gap for NSP and Fast-Track resource needs through 2020 respectively. It is thus apparent that frontloading of the above-mentioned resources needed to scale-up the national HIV response by 2020 will be challenging. This is largely due to fiscal constraints in Uganda. But this effort will allow set the country on a trajectory to end AIDS by 2030. This is worthwhile. Globally, few investments in international development have such a profound impact. This is well illustrated in §2.8, §2.9, §3.4, Lamontagne et al., 2018; Bjørn, 2012; Resch et al., 2011).

The outlook on the financing of the HIV response is uncertain. While the availability of external funding has been flat and is expected to decline, the demand for treatment services continues to increase. This funding shortfall has implications for the sustainability of the global response to HIV/AIDS. One key approach to help address the anticipated funding shortfall, both on the financing side, and in terms of improving the effectiveness of HIV/AIDS spending is efficiency. This chapter has shown how it could reduce resource needs. Recognising that record past efforts to improve the efficiency of the HIV response is mixed (Kahn et al., 2017), I posit that insights from behavioural economics could play a role to realise the identified efficiency gains. Below, I present ideas from the literature to support this application. First, I identify 20 cognitive biases and influences that are relevant to optimising HIV response. These, in no order of importance, are briefly presented in Table 6. Secondly, I propose some nascent interventions that can be applied and tested. I discuss key considerations for their effective implementation.

Table 6: Selected systematic and predictable cognitive biases and influences that are relevant to improving HIV program efficiency

No.	Bias / influence	Description
1	Affect	Our ^u emotional associations can powerfully shape our actions
2	Affect bias	Tendency to allow feelings that are not directly relevant to the actual costs or benefits of a decision to significantly influence decision-making.
3	Bandwagon effect	Tendency to be heavily influenced by what other people are doing.
4	Commitments	We seek to be consistent with our public promises, and reciprocate acts.
5	Defaults	We 'go with the flow' of pre-set options
6	Ego	We act in ways that make us feel better about ourselves
7	Identifiable victim bias	Tendency to respond more strongly to a single identified person who is at risk or who has suffered some harm than to a large group of people at risk or to a "statistical life".
8	Incentives	Our responses to incentives are shaped by predictable mental shortcuts such as avoiding losses
9	Loss aversion	Tendency to perceive losses as more significant than equivalent gains.
10	Messenger	We are heavily influenced by who communicates information
11	Normalcy bias	Tendency for individuals to enter a state of denial when facing pending danger.
12	Norms	We are strongly influenced by what others do
13	Omission bias	Tendency to judge harmful actions as worse than equally harmful omissions/inactions.
14	Present bias	Tendency to place a higher value on the present time over any future time.
15	Priming	Our acts are often influenced by sub-conscious cues
16	Saliency	Our attention is drawn to what is novel and seems relevant to us
17	Saliency bias	Tendency to take short cuts that rely on past experiences and typically focus on 1 component of a complex problem.
18	Social influence bias	Tendency to be influenced by perceived social norms.
19	Statistics-related bias	Neglect of or difficulty in interpreting probability. Statistics-related biases suggest that the way statistics and probabilities are presented affect their interpretation.
20	Status quo bias	Tendency to prefer the current state of affairs

Source: Author's adaptation from (UK) Institute for Government (2009) and Linnemayr et al. (2016).

Building on and acknowledging the role that the above-mentioned biases play in actors' policy- and decision-making, I propose behavioural economics-inspired interventions. These can be classified into three (3) categories: communication, pragmatic and game-theoretic. These proposals are predicated on the assumption that by connecting communication and programmatic interventions to their theoretical underpinnings, the efficiency of investments in the HIV response can be improved significantly. Moving the needle in this direction is at the heart of behavioral economics. On the other hand, game theory strategies, while bringing together disparate disciplines such as economics, philosophy and psychology, can inform strategic decision-making. Thus, they are proposed in this thesis for their potential practical significance in "stretching a dollar". They are informed by an analysis of the structural problems facing the HIV response and attempt to propose major reforms to tackle these.

First, in terms of *communication* interventions, as Table 6 shows, I posit that the desire to conform and/or adhere to social norms has potential to be optimally used to realise efficiency improvements in the national HIV response. As condoms use is one of the highly cost-effective interventions (see Figure 28), yet its promotion remains politically contentious owing to deep-

^u As used in this Table, the pronouns 'our' and 'we' refer to the *homo economicus*. Its figurative usage here in reference to an economic human derives from neoclassical economics' subjective portrayal of such an agent as consistently rational, narrowly self-interested, and optimally pursuing subjectively defined ends.

seated structural problems, it is to this that I propose to use “nudging” to adroitly leverage the observable norms of the majority to influence the behaviors of the minority. Here, for example, I propose a message such as “Don’t risk your life, more and more Ugandans choose not to have ‘live sex’!” as one way of practically using social norms messaging. It is combined with loss framing here. There is a paucity of empirical evidence on the effectiveness of social norms in globally health in general and in response to HIV/AIDS specifically. However, there is a growing body of evidence on its successful usage in broader development practice. Critically examining some of this body of evidence, to draw lessons for designing and refining the proposals in this chapter, has practical significance for the promotion of behavioural economics in enhancing fiscal sustainability of the HIV response in Uganda. In the hospitality industry, Goldstein et al. (2008) tested the effectiveness of social norms messaging regarding hotel-related laundry water conservation. Strikingly, a message invoking a social norm i.e. “Please reuse your towels; the majority of our guests do so” was compared to the traditional conservation messages framed only in terms of environmental protection i.e. “Please reuse your towels to protect the environment”. It was found to be more effective than the traditional approach for encouraging towel reuse (44.1% versus 35.1%).

As a practical implication, however, owing to heterogeneity in the prevalence of social norm, when using social norms messaging to improve the efficiency of HIV programs, it is important – *a priori* – to decide whether to use the approach in a more generalized universal campaign targeting the general population or a more targeted approach, say aimed at HIV program managers. Understanding the prevailing social norm is key to inform whether the message should employ a descriptive norm (“most PLHIV are taking ARVs and so should you”) or an injunctive norm (“your neighbors know that stealing money from HIV programs is bad”). As Linnemayr et al (2016) note, the type of social group involved determines the type of message that would be most appropriate and impactful. Applying this behavioral economics insight, for relatively homogeneous populations, most members may feel like part of the community and thus may respond well to community norm messages. One such message may be that “most residents of Hoima living with HIV don’t miss taking their ARVs.” On the other hand, for heterogeneous communities, it may be necessary to create different messages for the different sub-populations.

To this end, I argue that a social norms approach might be usefully employ to achieve social distancing measures. Put differently, rather than simply provide information or give direct instructions such as “stop implementing home-based care that does not have an impact on the epidemic”, these messages could be rephrased and reframed as social norms: “Don’t be the odd person out – over 95% of Ugandans agree that the best way to conduct male circumcisions is by using Prepex” Also, as Meeker et al (2014) shows, social norms can be explicitly established using public commitment instruments. One such example is when medical doctors sign and hang a visible statement in a hospital waiting room declaring their commitment to antibiotic stewardship. It has been shown to result in only prescribing antibiotics per established clinical guidelines. In all, several key considerations are worth noting if these are to be effective. The message should be true so as for it to be believable and credible. Other considerations include the authority of the messenger. Also, the appeal and clarity of the message matter. Finally, whether invoking a descriptive norm could have unintended consequences or “boomerang” effects, which occur when people who behave better than the norm start to behave worse after learning that they were exceeding the social norm (see Schultz et al. (2007), for example) is another important consideration. This effect sets in because people tend to conform to the group behavior, even if the norm is less desirable. Consequently, using descriptive and injunctive norms together can reduce the likelihood of a “boomerang” effect. This is well illustrated in energy conservation literature.

Secondly, in the category of pragmatic interventions, I propose commitment devices. By definition, a commitment device is a choice that an individual makes in the present to restrict future options. As Bryan et al. (2010) argue, it helps an individual effectively carry out future plans. Typically, this entails laying out consequences such as a financial penalty if a goal is not reached. Traditionally, they are used to overcome the present bias (Giné et al., 2010). In behavioral economics literature, there are two (2) main types of commitment devices: soft and hard. Failing these commitments results primarily in psychological consequences and economic penalties respectively. In practice, as commitment devices involve financial consequences, they also leverage loss aversion bias. An example of commitment devices is agreeing to pay a sum of money if an efficiency gain target is not met. Here, I argue that by asking individuals to explicitly commit their implementation intentions publicly and in writing can effectively motivate action. This could take the form of public *Health Manifesto* pledges by the national leaders. Milkman et al (2011) contend that signing one's name to these intentions can further create a feeling of commitment and can be even stronger when the intention is made publicly. However, as a main limitation, "hard" commitment device interventions can be logistically challenging for public agencies to administer given the financial stake.

Finally, from a game-theoretic perspective, this chapter proposes how to cut down the incidence of bribery (and corruption broadly) in the HIV response. Generally, recent years have seen growing skepticism towards anti-corruption efforts in the health sector in Uganda (Bakaitwoha, 2011). These induce an ever-increasing administrative burden. In anti-corruption studies, corruption generally takes different forms. Thus, by extension, there are different forms of bribes. The focus of this chapter is on bribes that people often must give to get what they are legally entitled to, referred to as harassment bribes in this thesis. This small but novel idea builds on and extends that of Basu (2011). In Uganda, bribery in healthcare is commonplace (Hunt, 2010). The bribery observed in relation to the health sector is similar, in many ways, to what can be observed in the HIV response more specifically. This, *inter alia*, includes informal payments demanded for HIV services that are supposed to be delivered free. This classic illustration of harassment bribery that is widespread in the health sector (including the HIV response) in Uganda, plays a large role in breeding inefficiency. It is outlawed under the Penal Code Act as well as under the 2009 Anti-Corruption Act (see Section 5). Both the giver and receiver of a bribe are thus liable to criminal prosecution.

As a useful workhorse, the economics of corruption postulates that the presence of honest officials lowers the bribe that a corrupt official can extract from efficient applicants (Rose-Ackerman, 1975; Mishra, 2005; Ahlin and Bose, 2007; Lambsdorff, 2007). This applies in a dynamic setting with a partially honest bureaucracy. I contend that to overcome behavioral impediments to honesty, novel experimental, and behavioral approaches to anti-corruption and reform ought to focus on detecting the intrinsic drivers rather than the extrinsic ones that (might) motivate ethical conduct. Considering the above, in this chapter, I apply the classical prisoner's dilemma game (Gibbons, 1992; Dixit et al., 2015) – taking the bribe-giver's strategies as "tell" and "not tell" and the bribe-taker's strategy is "do (the job)" or "not do". I propose that the act of giving a bribe to access HIV services among other services - despite being awful - is declared as a legitimate activity. Put differently, this proposal calls for legislative review and amendment to the Anti-Corruption Act of 2009 (and the Penal Code Act) to grant the giver of the above-mentioned 'harassment bribe' full immunity from any legally punitive action by the state. This way, in a nutshell, legalising bribe-giving (awful as it is!), while legally criminalising bribe-taking for bribes made to get what one is legally entitled to, will lead to a drastic decline in the incidence of bribery. Marquette (2019) finds impacts in this direction with the modus operandi of the Health Monitoring Unit in Uganda. Logically, once the law is reformed in this manner, the interests of both the bribe giver and the bribe-taker will be at divergence. On one hand, the bribe giver will be willing to cooperate in getting the bribe-taker caught. Knowing that this will happen, on the other hand, the bribe taker will be deterred from

taking a bribe. On the surface, in Uganda, this proposal has the potential to elicit a moral outrage. It is legal yet awful! It is important to note that what is being proposed in this chapter is not a retrospective pardon for bribe-giving. I am cognisant that retrospective pardons encourage rather than discourage corrupt behavior by rewarding the corrupt. Currently, this would include bribe-givers who are corrupt under Ugandan law. Thus, to avoid throwing the baby out with the bathwater, some points of clarification on key design features of this proposal are important at this juncture. I detail these below.

First, bribery is still illegal. As such, with this consideration, the total punishment meted out under the law for bribery may still be the same. If under the old system (before the proposed legal reform), the bribe giver and the bribe taker are fined UGX 200,000 each, what I am suggesting under this nascent proposal is that the bribe taker is fined double the amount. Thus, the effective penalty would be UGX 400,000 on the part of the bribe taker and 0 on the part of the bribe giver. Effectively, the entire punishment should be heaped on the bribe taker. The bribe giver is not penalized at all, at least not for the act of offering or giving the bribe. Second, in the event of a case of bribery being established in the court of law, the bribe taker is required to give the bribe, to the extent that its size can be uncovered, back to the giver. I hypothesize that such a change in the law will cause a dramatic drop in the incidence of bribery. The intuition is appealing (at least in theory). Under the current anti-corruption law, once a bribe is given, the bribe giver and the bribe taker become partners in crime. As such, it is in their joint interest to keep this fact hidden from the authorities and to be fugitives from the law, because, if caught, both expect to be punished. However, under the kind of revised law that I am proposing here, once a bribe is given and the bribe-giver collects whatever (s)he is trying to acquire by giving the money, the interests of the bribe-taker and the bribe-giver become completely orthogonal to each other. If caught, the bribe-giver will go scot-free and will be able to collect his/her bribe money back. The bribe-taker, on the other hand, loses the booty of bribe and faces a hefty punishment. Hence, in the post-bribe situation, it is in the interest of the bribe-giver to have the bribe-taker apprehended. Since the bribe-giver will cooperate with the law, the chances are much higher of the bribe-taker getting caught. It will be in the interest of the bribe-giver to have the bribe-taker get caught since, that way, the bribe-giver can then get back the money he/she gave as a bribe. Since the bribe-taker knows this, (s)he will be much less inclined to take the bribe in the first place. It is in light of this that I project a drop in the incidence of bribery. Indeed, under the proposed new law, when a person gives a bribe, (s)he will try to keep evidence of the act of bribery – such as a secret photo or jotting of the numbers on the currency notes handed over and so on - so that immediately after the bribery, (s)he can turn into an informer and get the bribe-taker caught. The upshot of this is not that the bribe-taker will get caught but he/she will not take the bribe in the first place. This is a deterrent even in situations where bribes are offered to jump the queue or get preferential treatment – as bribery patterns are disrupted because of fear of being arrested and punished (Marquette, 2019).

The analysis in this chapter and the ensuing results face some limitations. It should be noted that there are significant uncertainties in these projections. First, there is some uncertainty about the effectiveness of each of the interventions. Importantly, the major source of uncertainty is whether programs can be scaled up as envisioned here. I exclude prospective new technologies, such as a cure and prophylactic or therapeutic vaccines. These do not currently exist but could potentially contribute by 2030. Second, the behavioral economics-inspired interventions proposed and discussed in this section to support realize the identified efficiency gains have not been vetted, in-country, by national actors. Using design thinking principles, in the spirit of “ideation”, this thesis generates and develops these ideas but falls short of testing – in a real-world environment - the developed solutions. Importantly, they focus on improving the efficiency of the HIV response and do not address the other structural barriers facing the financing of the HIV response. To this end, these nudges could be mere fudges.

Finally, the estimates in this sub-study are an underestimate of the total costs of the HIV response. As Haacker (2011 and 2016) notes, some HIV/AIDS costs do not appear in the national accounts (e.g., HIV/AIDS may affect government capacities, but not the contribution to measured GDP, which is based on the size of the government payroll). Thus, this study does not take into consideration the fiscal costs of HIV/AIDS as most of these are ultimately caused by HIV infections and, the demand for HIV/AIDS-related services is highly persistent and follows HIV infections with a long lag.

It is important to note that the use of rationality calculus has been variously questioned. However, I posit that understanding crime by assuming relentless self-interested behavior on the part of all individuals is inappropriate. There are moral individuals, and their existence makes a large difference to how behavior in society at large plays out. Since the argument is being made here for harassment bribes, it can reasonably be expected that, if a change in the legislation is made in the manner suggested in this chapter, there will be a sharp drop in the incidence of harassment bribery. In fact, in the long-run, in this game of strategy, there is only one pure strategy - strict Nash Equilibrium. That is "being honest" on the part of both the bribe giver and taker. To this end, being a strict equilibrium, it is evolutionarily stable, including against any perturbation. Becker (1968)'s economic model, which takes an amoral view of individuals to weigh up net returns against the probability of getting caught and punished for illegal activity, is closely related to the game-theoretic proposal advanced in this thesis. As shown elsewhere (Basu et al., 2014), in a setting where bribe size is determined by Nash bargaining, detection is costly, and detection rates are set endogenously, asymmetric punishments have the potential to reduce bribery by incentivizing whistleblowing.

In conclusion, drawing on the economics literature, it is evident that different policies have been adopted by different countries to address this form of corruption. These, *inter alia*, include criminalizing both the bribe-giver and the bribe-taker, and imposing a larger and deterrent penalty on corrupt officers. Empirically, Verma and Sengupta (2015) examine the consequences of asymmetric and symmetric penalties by developing deterministic and stochastic evolutionary game-theoretic models of bribery. They find that an asymmetric penalty scheme can lead to a reduction in incidents of bribery, though the extent of reduction depends on how the players update their strategies over time. If the interacting members change their strategies with a probability proportional to the payoff of the alternative strategy option, the corresponding reduction in incidents of bribery is less pronounced. In other words, these results indicate that changing from a symmetric to an asymmetric penalty scheme may not suffice in achieving significant reductions in incidents of harassment bribery. It is in this context that this proposal is elaborated. Treating harassment bribes as legal is necessary but not sufficient to improve the efficiency of HIV spending in Uganda. Other reinforcing measures - targeted at the level of individual managers, policymakers as well as at the level of the community to mobilize political support and pressure - will need to be explored, tested, and enacted.

4.5. Conclusion

How large are the financial resources required for HIV/AIDS programs in Uganda through 2030? This is the primary question that this chapter attempts to answer. This, in turn, serves as a springboard to critically assess how policy decisions taken in the short and medium-term might dramatically affect the financial resources required to "end the AIDS epidemic" by 2030, including the fiscal sustainability of the same. Scaling up to meet the Fast-Track targets will require a significant increase in resources devoted to HIV/AIDS. However, overall, they are less than previously estimated (GoU, 2012; Stover et al., 2016), largely to methodological refinements. Particularly, by using time-varying unit costs and explicitly factoring in efficiency savings, these estimates are closer to real-world conditions. Also, I find that it will be a good investment as the marginal benefits – in terms of HIV treatment costs averted and productivity

gains to the wider economy – outweigh the incremental costs (relative to the Business-as-Usual scenario). Critically, the costs of inaction are large, yet the returns on investment are large.

This analysis provides a roadmap for what is needed – in financial terms - to move towards ending the AIDS epidemic as a global public health threat within the next 15 years as expressed in the SDG 3.3. Recognising that there are significant challenges ahead that must be addressed, I posit that now we need to marshal the resources, the will and, efficient and effective implementation of interventions to mobilise resources. However, since traditional technocratic approaches have fallen short in realizing the identified efficiency gains as one lever for expanding fiscal space for the HIV response, for example, this chapter contends that influencing behavior is central to public policy. Looking for innovative approaches, modest proposals – grounded in behavioral economics, pragmatism, and game theory – are developed to “nudge” policymakers and citizens into new ways of acting and thinking to improve efficiency and by extension reduce the order of magnitude of (financial) resource needs in Uganda.

Finally, while providing empirical evidence (and thereby fills the knowledge gap on what is the cost, in financial terms, of “ending AIDS” in Uganda) and contributing to methodological advances to the estimation of NRN for HIV programs, this present chapter does not deal with fiscal aspects of HIV/AIDS. As discussed in Chapter 1, HIV/AIDS has several properties which – alone and especially in combination – pose challenges for analysis of resource needs. First, thanks to ART scale-up, HIV – hitherto a communicable disease - has transitioned into a communicable and chronic disease (CCD). This thus calls for cost-effectiveness analysis to consider direct effects and population-level effects. Second, as a sexually transmitted disease, it is characterised by a high degree of heterogeneity of infection risk and intensity of transmission across the population. Third, HIV is generally characterised by slow disease progression. This, by extension, introduces long lags between HIV infection and health outcomes, and the ensuing dynamic (population-level) effects of HIV prevention interventions unfold over long periods (sometimes decades). Consequently, this translates into long-term treatment needs and resulting costs. As such, the analysis in this chapter falls short in analysing the fiscal burden of HIV/AIDS and thus effectively underestimates the total costs of the HIV response in Uganda. The above-mentioned “hidden” costs can safely be interpreted as a fiscal quasi-liability in this thesis since HIV introduces and imposes a spending commitment - politically and morally - that extends over a long period and cannot be changed easily ex-post, similar - in this regard - to pension commitments. Addressing this dimension of complexity is the focus of the next chapter.

Part III

Macro-fiscal dimensions

Policymakers today confront a number of profound developments; whose significance is certain to increase over the next several decades.

- Peter Heller (2003)

Chapter 5

Coping with the challenge of long-term liabilities of HIV financing: a fiscal analysis of the national HIV program in Uganda

5.1. Introduction

This chapter empirically assesses the long-term fiscal consequences of the HIV/AIDS epidemic and response in Uganda. Even after more than 35 years since the first case of AIDS were reported, the evolving long-term fiscal implications of the HIV and AIDS epidemic and response are not often acknowledged in academic and policy literature (Over, 2008; Lule and Haacker, 2011; Collier et al., 2015b; Atun et al., 2016; Haacker, 2016). Consequently, they are seldom considered in policymaking. HIV poses a long-term fiscal challenge, with intergenerational fiscal consequences largely due to its unique characteristics. It has both chronic and infectious disease characteristics as well as very slow disease progression and transmission dynamics.

In Uganda, while the number of people who are newly infected with HIV is declining and more people are receiving antiretroviral therapy (ART) (UNAIDS, 2018), because of success in extending access to treatment, HIV/AIDS has effectively transitioned into a chronic communicable disease (CCD). The ensuing improved survival prospects have considerably increased life expectancy for PLHIV as, subject to achieving viral suppression, they are now able to live relatively near-normal lives. This, in turn, has effectively increased the stock of HIV-positive citizens. Antiretroviral therapy (ART) access is effectively a life-long political and moral commitment for PLHIV and financing agents, with the financing of the HIV response absorbing not only a substantial proportion of current government revenues, gross domestic product (GDP), and other HIV/AIDS-related government spending (such as development assistance for health), but that these spending needs and the attendant fiscal costs - in the absence of a “game-changer” such as a functional cure and/or vaccine - are projected to increase and persist over decades into the future (Heller, 2003; Haacker, 2011).

I argue that the government needs to make policy changes now to take account of the potential fiscal consequences of these developments inherent in the evolution of the AIDS epidemic and response. In Uganda, HIV as a health issue has received the largest share of health financing accounting for 37.5% of total health expenditure (UAC, 2012). This is substantial. HIV/AIDS spending has consequences on the composition of overall government spending by crowding out other types of spending, including HIV/AIDS costs that do not appear in the national accounts (e.g., HIV/AIDS may affect government capacities, but not the contribution to measured GDP, which is based on the size of the government payroll). From a public finance perspective, considering the macro-fiscal context, the ensuing costs of the HIV/AIDS epidemic and response, shaped by past and current policies such as new HIV infections and life-long commitments to treatment, are long-term quasi-fiscal liabilities - analogous to a public and publicly guaranteed (PPG) debt *de facto* - as they are a commitment of future fiscal resources in real terms since they cannot be inflated away. In other words, HIV/AIDS costs are like an indexed debt.

In the economics literature, this quasi-fiscal liability has empirically been measured as the (discounted) projected costs of meeting the demand for HIV/AIDS services of all people currently living with HIV. Thus, new HIV infections add to this contingent liability while successful HIV prevention interventions (including treatment as prevention) reduce it. In this

chapter, given Uganda's high HIV burden (with a 5.9% adult HIV prevalence and 1.3 million PLHIV (UNAIDS, 2018), tepid GDP growth outlook in the medium – to long-term and rapidly growing public debt levels (including arrears) (AfDB, 2019) in an era of dwindling development assistance for HIV and health (IHME, 2018), we question whether a combination of a number of current and unfolding long-term fiscal challenges – such as climate, demographic, economic, technological and security (Heller, 2006) – will converge with HIV (and the attendant challenges of the “greying of AIDS” to create a significant and perpetual public debt sustainability challenge that we refer to as a “debt sentence” in this paper.

The empirical evidence on the fiscal consequences of HIV in Uganda is weak. While the innovative idea of the HIV response as a contingent liability was first introduced by Mead (2009), to the best of our knowledge, Lule and Haacker (2011)'s study of the fiscal dimensions of HIV/AIDS in Botswana, South Africa, Swaziland, and Uganda is the first to place the response to HIV and AIDS in a (national) fiscal context, and adopt a forward-looking analysis of the fiscal burden of HIV/AIDS. Without, in any way, detracting from the policy value of the findings in the above-mentioned ground-breaking study, I contend that the analysis therein is replete with some shortcomings. First, the data available for Uganda then (in 2010) was insufficient for detailed fiscal analysis. Second, the focus is largely on the consequences of HIV infections without providing a systematic treatment of the impacts of HIV/AIDS. Third, the study does not address the implications of the global slowdown (including the changing funding landscape) in HIV/AIDS financing directly. Fourthly, the effectiveness of the response to HIV/AIDS is not explicitly factored in the analysis. Finally, the study did not accommodate the costs of attaining an increased rate of viral suppression, as well as savings in average unit costs of treatment as more people become virally suppressed. As a consequence, the fiscal analysis estimates for Uganda are less extensive and relatively crude. Other recent analyses (Collier et al., 2015a; Atun et al., 2016) are straightforward cost analyses of HIV programs rather than an analysis of the costs which are caused, over time, by an additional HIV infection, and – aggregated to the program level – of the link between HIV incidence and the costs of the HIV/AIDS programs.

This chapter addresses these challenges by providing an empirical fiscal analysis of the costs of the national response to HIV/AIDS using an intergenerational economic framework. Drawing on the attractive features of the novel analytical approach by Lule and Haacker (2011) - and while avoiding the shortcomings – my fiscal model framework uses a modified generational accounting approach to estimate changes in the net present value (NPV) of government revenues and expenditures attributable to changes in disease outcomes. Recognising that time is ticking away to address long-term fiscal challenges posed by HIV, this paper contributes to our understanding of how the government can better take account of HIV-related long-term issues in her fiscal policymaking process through changes in both the analytic methods and response, stressing the vital need of a multipronged approach to avert a “debt sentence”. The rest of this chapter is structured as follows: the next section describes the methods and data used. Thereafter, I present the quantitative analysis results. The fourth section discusses the results, including the relevance of this novel approach to the analysis of and addressing the fiscal sustainability of HIV/AIDS programs. The last section concludes.

5.2. Methods and data

To effectively assess the long-term intergenerational fiscal consequences, I applied a fiscal model framework using a modified generational accounting approach. The analytical framework rests on three pillars: 1) a demographic and epidemiological module, 2) a set of tools to assess the fiscal costs of HIV/AIDS and 3) a macroeconomic model. The model, as used in this chapter, is extensively described elsewhere (Haacker, 2011). Table 7 provides details of the data used in this analysis. Novel in this analysis, I accommodate costs of attaining

an increased rate of viral suppression, as well as savings in average unit costs of treatment as more people become virally suppressed.

In a nutshell, the modeling framework used to conduct the fiscal analysis of the national HIV response in this chapter first combines a simple epidemiological framework and a costing model to provide explicit estimates of the costs which are caused, under the policy objectives of the national HIV/AIDS program, by new HIV infections. This is then utilized to estimate the financial savings achieved by investments in HIV prevention and can be used to inform the design of HIV prevention policies. Second, by adopting methods from public finance, the framework provides an assessment of the fiscal (quasi-) liabilities implied by the national HIV/AIDS program, which provides a tool for ranking alternative HIV/AIDS policies from a financial perspective (in addition to the health consequences), and assessing the magnitude of the financial burden posed by the national HIV response.

Building on earlier empirical analyses in this thesis, the analysis proceeds in three steps. First, based on the HIV national policy targets (see Table 3), estimates of the costs of HIV/AIDS programs (see § 4.2), and other publicly available information (such as demographic and macroeconomic data), I build projections of the fiscal costs of HIV/AIDS in Uganda. As used in this thesis, the policies and programs refer to the policy analytical scenarios – that is, “Business-as-Usual” and “Fast-Track” – as described in § 3.2. However, I also capture the fiscal costs of HIV/AIDS that are not included in a costing study of an HIV/AIDS program. These, *inter alia*, include the impacts of HIV/AIDS on government employees and certain social expenditures. Second, I estimate the costs incurred by a single infection. This analysis starts from the objectives of the national HIV/AIDS program (see § 3.2), and then calculates the expected fiscal costs caused by one additional infection under these targets. Thereafter, this analysis interprets these costs as a quasi-liability since, under the objectives of the HIV/AIDS program (and owing to human rights, political and moral considerations), an additional infection binds future fiscal resources. I then calculate the value of this liability (that is, the amount that would need to be put aside now to cover the costs of this infection) as the present discounted value of the expected costs incurred by an HIV infection.

Finally, estimates of the fiscal costs and the costs incurred by a single HIV infection are combined to analyze the evolving fiscal burden of HIV/AIDS. This helps locate the analysis within the broader macro-fiscal context of Uganda. Current costs of HIV/AIDS largely reflect HIV infections that have occurred in the past, and current policies affect the demand for HIV/AIDS-related services over many years or even decades. Because of these two aspects, current spending is not a good indicator of the fiscal burden of HIV/AIDS. This study’s estimate of the evolving fiscal HIV/AIDS burden is based on its quasi-liability, which, under Uganda’s HIV/AIDS policies, is incurred as a consequence of past and current HIV infections, or equivalently, the costs of providing HIV/AIDS-related services and coping with the impact of HIV/AIDS for all people currently living with HIV/AIDS. Costs incurred by new infections add to this liability, while the liability declines as the anticipated HIV/AIDS services necessitated by past infections are delivered.

Table 7: Parameters and data sources used in the fiscal analysis of national HIV program

Parameter	Data source	Additional notes
National epidemiological data and projections	UNAIDS (2018)	
Estimates and projections of the number of orphans ²²	UNAIDS (2018)	
Estimates of the state of the HIV/AIDS	UNAIDS (http://aidsinfoonline.org)	This was used to assess consistency with the Spectrum estimates. The UNAIDS data are published only in truncated or rounded form (with small numbers given in ranges only (“<1,000”, “<500”, “<200”, “<100”), and larger numbers are rounded to the nearest 1,000, 10,000, or 100,000. As such, these transformations result in inconsistencies when the data are used in a dynamic quantitative analysis
Macroeconomic data (like GDP or GDP per capita, or fiscal summary data like overall government revenues or expenditures)	IMF (2018)	However, this database is fairly thin to inform meaningful fiscal projections. As such, various IMF staff reports were used to complement it.
HIV spending	NASA (UAC, 2012)	Provides useful information for the costing of the national response to HIV/AIDS. Also, it contains detailed data on domestic and external financing.
Health expenditure	SHA HIV module	WHO health expenditure database (http://www.who.int/health-accounts/ghed/en/) though not explicitly used in this analysis was used to compare the financial burden of HIV/AIDS with health spending more generally ²³ .
Demographic projections	United Nations Population Division (UNPD)	Annual data on births were obtained from the more extensive subscription-only CD-ROM version rather than approximating the same from data in 5-year intervals in the online version at UNPD.
HIV interventions coverage rates	NSP (GoU, 2015)	See § 3.2

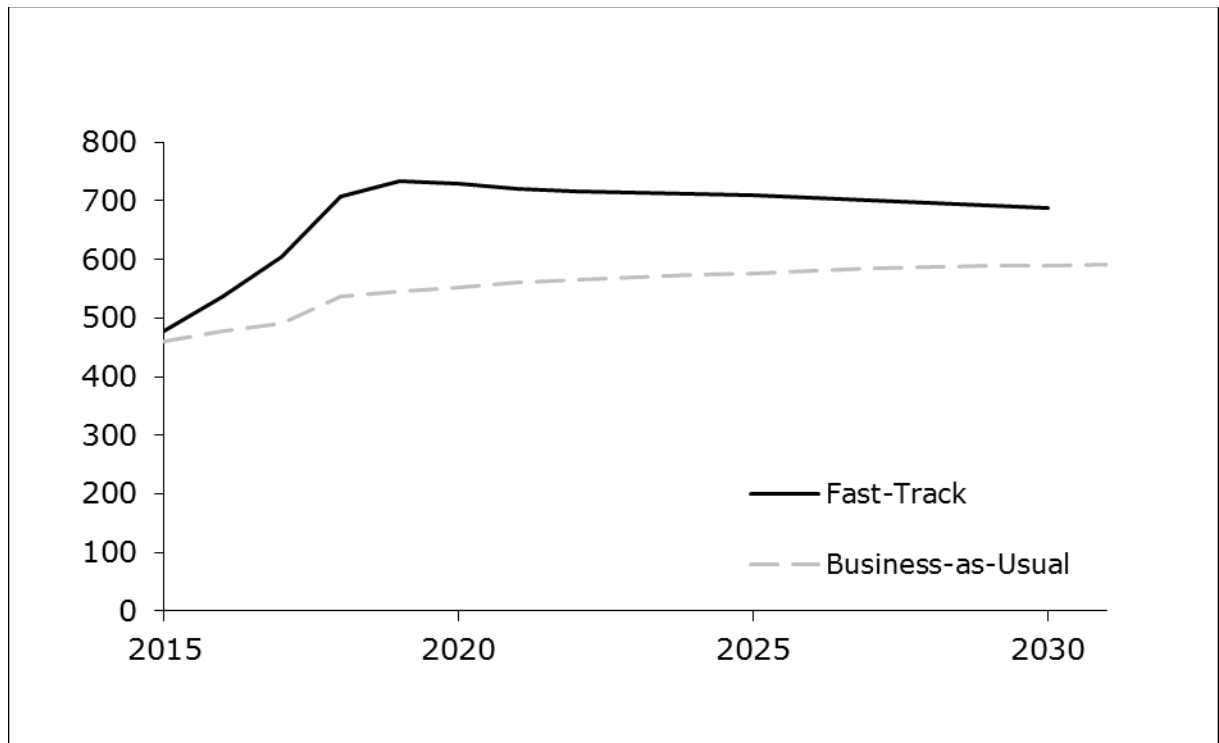
²² These are used as a reference point in the analysis.

²³ Not all HIV/AIDS spending can be classified as health spending.

5.3. Results

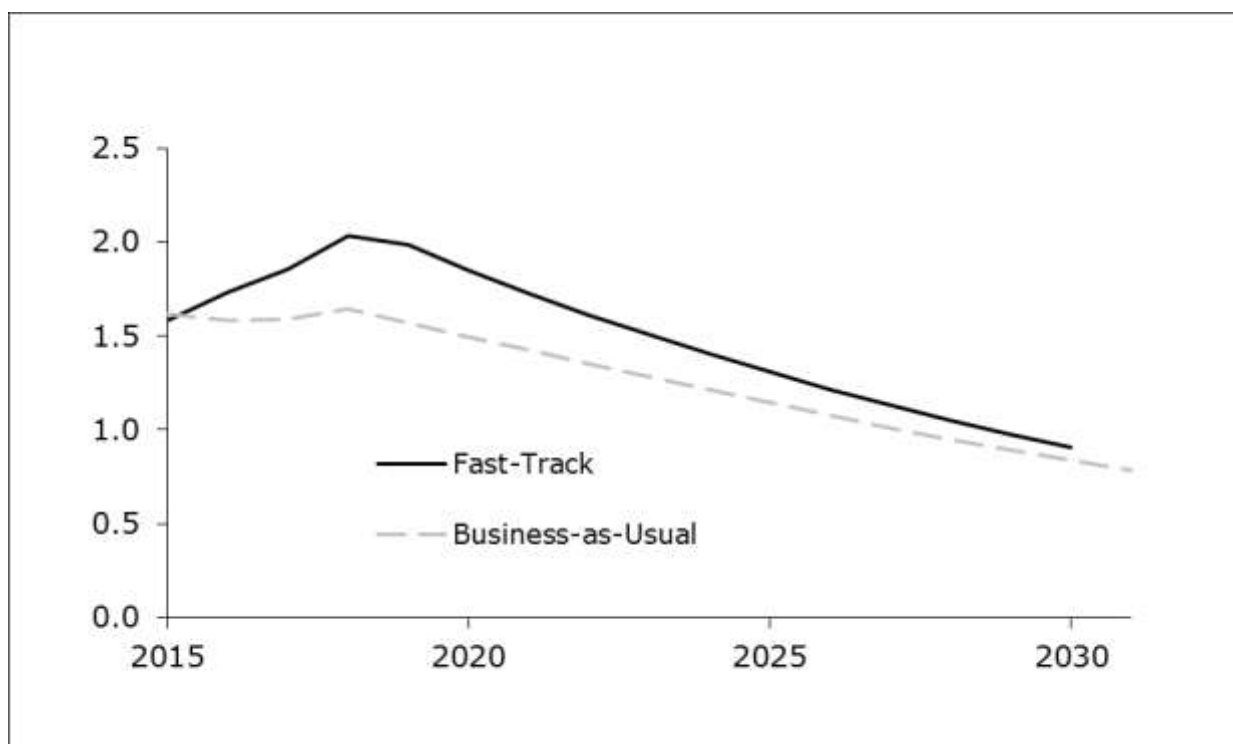
Figure 33 summarizes the projected costs of the emerging new HIV/AIDS strategy (i.e. both Business-as-Usual and Fast-Track scenarios), distinguishing the same two policy analytic scenarios as in § 4.2. At the outset, in 2015, HIV/AIDS spending is estimated at US\$ 478 million. Projected annual spending under the Fast-Track scenario increases and peaks at US\$ 734 by 2019. It then begins declining, largely because reduced HIV incidence results in financial savings.

Figure 33: Projected costs of emerging HIV/AIDS strategy, 2015-2030 (in 2015 US\$ millions)



To interpret these figures, it is important to keep in mind that Uganda is a rapidly growing economy, in terms of both population growth and rising GDP per capita. Relative to GDP, the envisaged costs, therefore, increase initially, from 1.6 percent of GDP in 2015 to 2.04 percent of GDP in 2018, but subsequently decline to 0.84 percent of GDP by 2030.

Figure 34: Projected costs of emerging HIV/AIDS strategy, 2015-2030 (Percent of GDP)



For the analysis of the cost-effectiveness and the funding needs of the national response to HIV/AIDS, the analysis of projected spending (Figures 33 and 34 above) – together with the analysis comparing spending and health outcomes (see § 3.3) – goes a long way. However, for the fiscal sustainability of the HIV response in Uganda - there are several important questions for the design of the national HIV/AIDS policy which this approach focusing on current spending on the program level, cannot address. These, *inter alia*, include:

1. What are the costs caused by one additional HIV infection? Equivalently, what are the cost savings from averting one HIV infection? The challenge here arises from the long-time frames of the consequences of an HIV infection. Whereas a specific HIV intervention incurs an immediate cost, or the costs of a national strategic plan extend over a few years, the consequences in terms of the costs of HIV/AIDS service extend over decades. Estimates of the cost consequences of one additional HIV infection can be used to inform current policy choices, e.g., by determining how anticipated savings relate to (and contribute to refinancing) the costs of the intervention.
2. What are the cost consequences of an HIV policy over a specific period, e.g., the course of a national strategic plan (4-5 years), or up to some date (e.g., 2030)? Including estimates of the cost savings initiated during this period through reduced HIV incidence, even if much of the savings extend beyond this period, gives a more accurate picture of the cost-effectiveness of HIV/AIDS policies contemplated, and their contribution towards financial sustainability.

It is to these that I now turn. Specifically, to address these questions, Figures 35 and 36 summarize estimates of the costs caused by new HIV infections occurring in 2015.

Figure 35: Cost caused by new HIV infections occurring in 2015 ("Business-as-Usual" scenario)

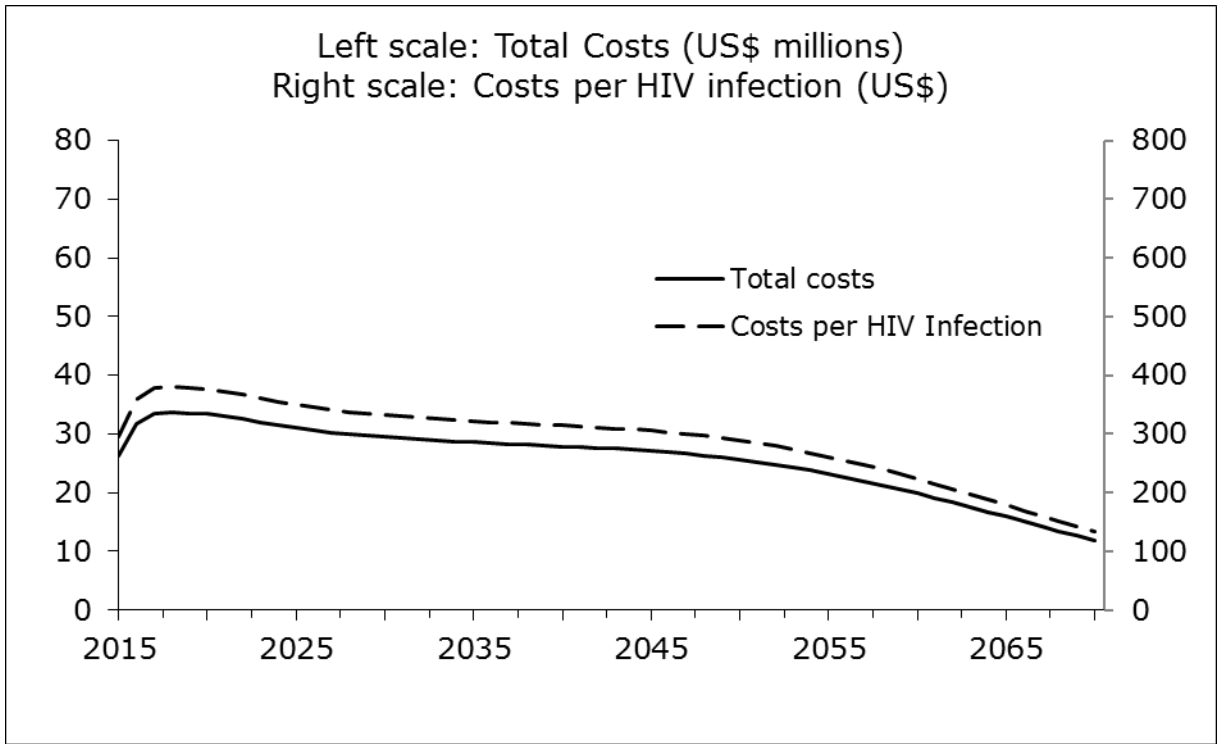


Figure 36: Cost caused by new HIV infections occurring in 2015 ("Fast-Track" scenario)

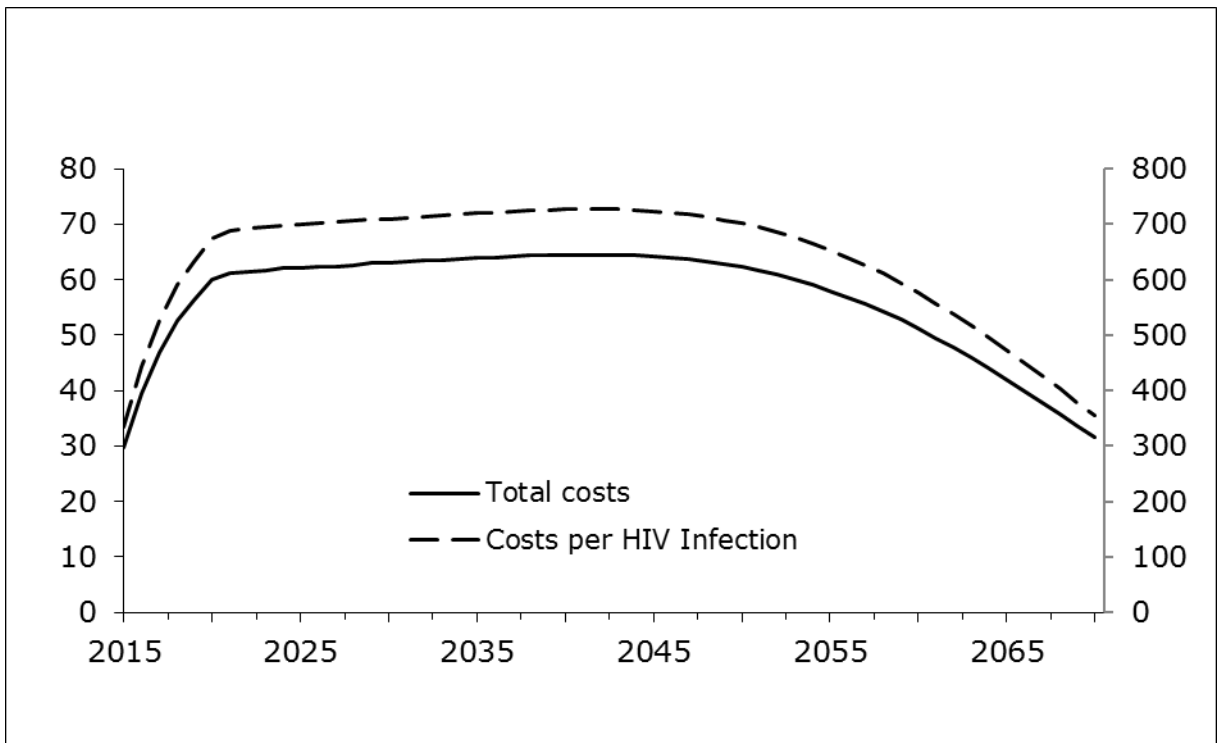


Figure 36 summarizes estimates of the costs caused by new HIV infections occurring in 2015. Under the “Business-as-Usual” scenario, the costs caused by one HIV infection peak at US\$ 380 in 2018, adding up to US\$ 5,660 in this scenario as the costs are spread over several decades. In the “Fast-Track” scenario, the costs caused by one HIV infection are much higher – adding up to about US\$ 24,000 (undiscounted). There are two reasons for the more than four-fold increase in the costs caused by one HIV infection in the scaling-up Fast-Track scenario – (1) more people who become infected with HIV progress to treatment, and they tend to access treatment earlier, and (2) early access to treatment is assumed to improve survival rates on treatment. These above estimates of the costs caused by one HIV infection are highly relevant for the fiscal sustainability of the HIV response in Uganda, considering questions such as:

1. Are current investments in HIV prevention appropriate, considering not only the envisaged health gains, but also the financial savings from reduced HIV incidence?
2. If one HIV infection causes a financial cost of US\$ 24,000, would additional investments in HIV prevention help reducing the costs of the HIV/AIDS response and contribute to financial sustainability?

Figure 37: Costs caused by all HIV infections in 2015, different discount rates (US\$ millions)

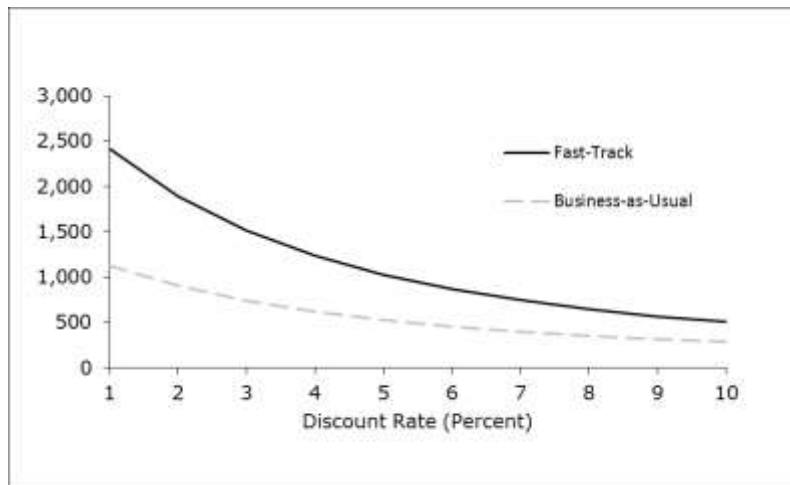
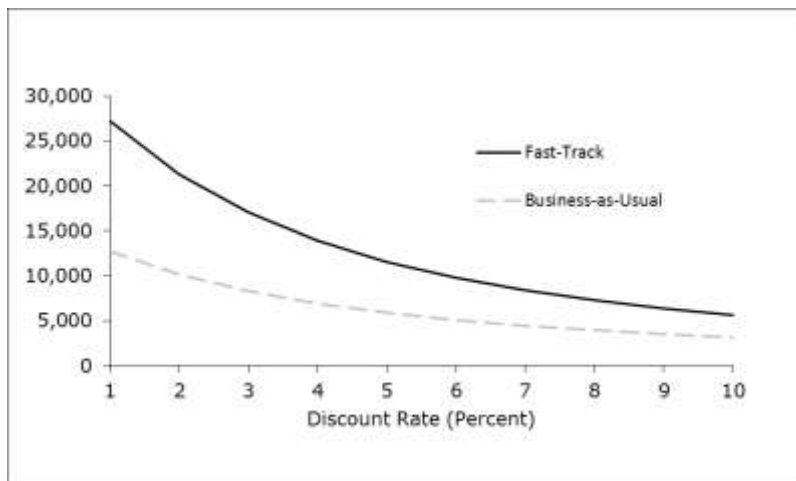


Figure 38: Costs caused by one HIV Infection in 2015, different discount rates (US\$)



Regarding the second question, any investments in HIV prevention at a cost of less than US\$ 24,000 would overall reduce the costs of the HIV/AIDS response. This does not imply that any investment in HIV prevention at a cost of less than US\$ 24,000 is necessarily effective, as it would also be sensible to establish if the intervention could be conducted at a lower cost (technical efficiency), or whether there are alternative interventions which would achieve the same outcomes at a lower cost (allocative efficiency). However, on the program level, one important point to keep in mind is the role of the discount rate. A discount rate of three percent is commonly used in health economics. There is no empirical validation for this convention. Like Haacker, Hallett and Atun (2020), I posit that a discount rate of at least 5% is more appropriate for economic evaluations in global health in LMICs such as Uganda. As the costs caused by one HIV infection are spread over a long period, the estimates of the overall savings are sensitive to the choice of a discount rate. Figures 37 and 38 provide a sensitivity analysis, with discount rates varying between 1 and 10 percent. For a discount rate of 7 percent, the costs caused by one HIV infection are about one-half, and at a discount rate of 10 percent, they are at one-third, compared to the costs evaluated at a discount rate of 3 percent.

The estimates of the costs caused by new HIV infections under the different scenarios point to a challenge in assessing the cost-effectiveness and financial consequences of alternative HIV/AIDS strategies – with high rates of access to treatment, PLHIV can expect to survive many decades, and the financial consequences are therefore also spread over decades. In particular, the financial consequences of HIV infections occurring in 2015 extend over at least 50 years (at which time only a small proportion of people who became infected in 2015 would be alive, but all of these would be receiving treatment). For this reason, the fiscal liabilities presented here run up to 2070. A key lesson here is that the costs caused by new HIV infections, and any savings from reduced HIV incidence, play a minor role in the build-up of costs over a short time horizon.

To capture these longer-term financial consequences, as earlier mentioned, it is useful to think of the costs of the HIV/AIDS program as spending commitments or financial liabilities. The costs of the HIV/AIDS response are not a debt *de jure* but absorb future financial resources just like a debt that needs to be paid off over time, and similar to a social security obligation such as old-age pensions. This perspective was introduced above, in the discussion of the costs caused by one additional HIV infection or the costs caused by all HIV infections occurring in 2015. Compared to an analysis that just looks at spending over a projection period, this analysis captures the costs caused by HIV infections over a policy period, irrespective of whether these costs occur within or outside of the period of (primary) interest. *i.e.*, an HIV policy that reduces HIV incidence absorbs fewer financial resources over the next decades and thus is less costly than an otherwise equivalent policy.

Finally, Table 8 provides a breakdown of spending commitments under the national HIV/AIDS policy. Including the costs of all PLHIV in 2015, and the costs of HIV/AIDS services to all people projected to become infected until 2030, the costs amount to US\$ 34.4 billion under the “Business-as-Usual” scenario, US\$ 46.1 billion under the “Fast-Track” scenario. Most of these costs reflect services to PLHIV, whereas the costs of prevention programs account for US\$ 7 billion (baseline) or US\$ 10 billion (“Fast-Track” scenario). Approximately 38% and 46% of spending commitments under the “Business-as-Usual” and “Fast-Track” scenarios respectively come from the costs of services to people already living with HIV as of 2015 (*i.e.*, those who became infected in 2014 or earlier). This large weight of costs of services to people already living with HIV in 2015 reflects the course of the epidemic – as HIV incidence came down steeply before 2015, therefore there is a large number of PLHIV in 2015, relative to the number of new HIV infections in that year and after. The other factor behind this persistence in the costs is improved survival – even in the “Business-as-Usual” scenario, many PLHIVs receive treatment and may survive beyond 2030.

Table 8: Spending commitments implied by the national HIV response (in US\$, million)

	Business-as-Usual	Fast-Track
Total Costs	34,398	46,057
Costs through 2030	17,879	24,636
Spending commitments beyond 2030	16,518	21,422
Prevention spending through 2030 (excl. treatment)	7,042	10,424
Costs of services to PLWH in 2015	12,928	21,285
Costs through 2030	7,042	10,424
Spending commitments beyond 2030	5,886	10,861
Costs caused by new HIV infections 2015-30	14,428	14,348
Costs through 2030	3,796	3,787
Spending commitments beyond 2030	10,632	10,561
	(Percent of 2015 GDP)	
Total Costs	149.8	200.6
Costs through 2030	77.9	107.3
Spending commitments beyond 2030	71.9	93.3

Source: Author's calculations.

Note: All cost estimates as of 2015, applying a discount rate of 3 percent.

5.4. Discussion

The chapter provides an empirical analysis of the fiscal consequences of Uganda's national response to HIV/AIDS. Based on the magnitude of the fiscal costs, with quasi-fiscal liabilities exceeding 150% (in 2015 GDP terms) across all policy analytic scenarios (i.e. "Business-as-Usual" and "Fast-Track" scenarios), Uganda is confronting a slowly gathering fiscal storm. These fiscal commitments "locked-in" by past and future HIV infections – analogous to public debt - exceed thresholds used to assess public debt sustainability. This is true notwithstanding that some of the consequences are much closer (say by 2030), and other fiscal consequences decades away. Countries at the brink of fiscal insolvency rarely have a debt/GDP ratio exceeding 140 percent of GDP, and in an IMF/World Bank debt sustainability analysis (albeit for low-income countries) a debt/GDP ratio exceeding 50 percent would be considered problematic (Chalk and Hemming, 2000).

For health economics and policy, three (3) outcomes of my analysis are particularly relevant. First, the estimates of the fiscal quasi-liability implied by the HIV/AIDS program provide a summary measure of the fiscal burden of HIV/AIDS epidemic and response in Uganda. This considers the level and the persistence of HIV/AIDS-related spending. It can, in turn, be used to assess the sustainability of the fiscal position of the national HIV response, using PFM tools developed to assess the sustainability of PPG debt. Second, at least from a fiscal angle, the estimates of the costs incurred by a new infection yield a tool to assess the cost-effectiveness of HIV prevention, treatment and impact mitigation measures and overall HIV program allocations. Comparable metrics can be effectively used to economically other global health challenges such as NCDs that share properties with HIV such as chronicity. Finally, the estimates of the evolving fiscal quasi-liability implied by the HIV/AIDS program, together with data on current spending,

enable a ranking of alternative HIV/AIDS-related policies from a fiscal perspective. To this end, this analysis contributes address resource allocation trade-offs.

In terms of fiscal space implications, by taking into account the targeted reductions in HIV incidence, the chapter answers the puzzle regarding what the implications for the long-term financial costs of the HIV/AIDS program are, arising from the analysis in Chapters 3 and 4. Below, I offer two points to illustrate the utility of this analysis. First, the costs occurring before 2030, and indeed after only 5 or 10 years are substantial. Thus this implies that a substantial proportion of the savings from reduced HIV incidence is realised within a policy period, say of 10 – 20 years. Second, as shown in this chapter, a substantial proportion of the costs occur after the 2030 policy analytic period. Nearly 50% of the spending commitments occur after 2030. This, by extension, implies that fiscal policies need to adopt a relatively long time horizon, as short and medium-term ones – such as 2030 - miss out on most of the fiscal consequences of any changes in HIV incidence occurring early in the period used in this study. It is for this reason that this analysis extends to 2070 to account for some of these consequences.

To appreciate the estimates of the costs caused by new HIV infections over the 2015-30 period, it is important to bear in mind that the cost caused by one new HIV infection is higher in the “Fast-track” scenario, as opposed to the “Business-as-Usual” scenario. This scaling-up is behind the increase in the projected costs of the HIV response in the period through 2030 by US\$ 6.8 billion. However, the financial liability posed by the needs of people who become infected in 2015-30 is similar for the “Business-as-Usual” scenario and the “Fast-Track” scenario – the higher costs per HIV infection are offset by the lower number of new HIV infections. This means that, following the initial investments, the scaling-up “Fast-Track” scenario returns large gains in terms of reduced prospects of contracting HIV and enhanced life expectancy, at similar costs. Looking even further ahead, lower HIV incidence continues to cause a decline in the costs of the scaling-up scenario, so that their projected costs would fall below those of the Business-as-Usual scenario. However, in this analysis, owing to adopting the analytic period up to 2050 does not show this. It would only occur after 2070.

As commonly used in health economics, applying a given discount rate to the projected costs of the HIV/AIDS program, the present discounted value of the future costs of the HIV/AIDS program can be estimated.²⁴ Alternatively, if only the costs of services to people currently living with HIV/AIDS are counted (and the costs of meeting the demand for services arising from projected HIV infections are excluded), the liability posed by the costs of the national response to HIV/AIDS is calculable. While the latter is a very useful measure for policy analysis (new HIV infection add to it, so it can be used to analyse the cost-effectiveness of the HIV/AIDS program), it understates the full fiscal burden of HIV/AIDS as even with very optimistic assumptions regarding the effectiveness of the HIV/AIDS response new HIV infections continue to happen. Thus, for the analysis of the fiscal sustainability of the HIV/AIDS program, which is the focus of this thesis, it is therefore more appropriate to consider the former estimate, which also includes the costs of all projected HIV infections. As earlier mentioned, the consequences of this liability, in terms of committing current and future financial resources, are similar to those of a public debt, so the sustainability of the fiscal costs of the HIV/AIDS program can be analysed in a similar way as the sustainability of public debt (on which there is rich evidence and many precedents).

²⁴ Based on explicit estimates of the costs of the HIV/AIDS program over a 55-year period. After 2030, HIV incidence was assumed to remain constant, i.e., the number of new HIV infections grows in proportion to the population size. After 2093, the costs of the HIV/AIDS program were assumed to keep growing at a constant rate. Because of discounting, the assumptions made at the outer end of the project period play a negligible role.

The point of debt sustainability analysis is that for very high levels of public debt the costs of servicing this debt (interest, repayments) absorb so much of the government's fiscal resources that it can no longer fulfill its responsibilities. The analysis of the costs of the HIV/AIDS program suggests that this situation applies to Uganda – that the government would be unable to finance the costs of the HIV/AIDS program, in the absence of very considerable external assistance.²⁵ Moreover, the financial burden posed by the HIV/AIDS program does not seem to be moving to a more sustainable position any time soon (a consequence of the build-up in the costs of treatment). As a consequence, and in light of the discussions of the outlook on HIV financing in 1.2, the Ugandan national HIV response - under both analytic scenarios - is fiscally unsustainable in the absence of very substantial increases in fiscal resources. Moreover, while the availability of external resources is seen to be stagnating or shrinking globally, there is no obvious pathway for attaining a fiscally more sustainable position as the financial liability posed by the HIV/AIDS program by 2030 exceeds the projected available resources. In the absence of a functional cure and/or vaccine, implementing the national response to HIV/AIDS as envisaged under the emerging HIV/AIDS strategy (implicit in the analytic scenarios) would therefore require very substantial external assistance, not only in the short-term, but over the next decades.

In conclusion, the analysis presented in this chapter provides tools for analysing the consequences of alternative HIV/AIDS policies, or specific interventions, in terms of their cost-effectiveness, or in terms of their contributions to containing the costs of the national response to HIV/AIDS. In this context, cost-effectiveness is measured in terms of the outcomes of an intervention (e.g., lives saved, see 2.3) relative to the net costs of an intervention (its costs, minus any savings from reduced need for HIV/AIDS services). Importantly, the distinction between the costs and the net costs of an intervention is very important in the context of HIV/AIDS. In many countries, treatment coverage rates are now fairly high, and survival among PLHIV has improved accordingly. As a consequence, the cost-effectiveness of HIV interventions, measured conventionally (e.g., life-years saved, divided by cost of intervention), has generally diminished. On the other hand, high treatment coverage and long survival on treatment mean that HIV infections cause very high costs, even though the unit costs of treatment have come down in recent years. As a consequence, HIV prevention interventions increasingly become money-saving, rather than life-saving, interventions, and the next chapter takes into account this shift. Moreover, because of the high costs caused by HIV infections, HIV policies can turn out outright money-saving. In this case, it is possible to estimate the contribution of a policy containing the costs of the HIV program in its own right.

5.5. Conclusion

This chapter empirically estimates the magnitude of the fiscal costs of the national HIV response in Uganda. This is important as it provides indicators to assess the fiscal consequences of alternative policies (based on the quasi-liability associated with respective policies, for example). On the macroeconomic level, it presents estimates of the magnitude of the fiscal quasi-liability implied by the policy analytic scenarios. This, in turn, allows an analysis of the fiscal sustainability of HIV/AIDS programs, drawing on tools normally applied to analysis of the sustainability of public debt (such as debt-GDP ratio as used in DSA). Looking ahead, methodologically, this chapter illustrates how fiscal analysis could contribute to informing fiscal sustainability analysis of national HIV responses and the cost-effectiveness analysis of various HIV interventions. This could, in turn, inform the design of HIV/AIDS programs in several ways. First, by identifying the financial savings achieved by specific investments in HIV prevention, and informing about the cost-effectiveness of such investments, and their effectiveness in terms of containing absorption of fiscal space through the national HIV response. Second, by describing the consequences of alternative HIV policies

²⁵ In general, it would make sense to combine the analysis of the financial liability posed by the HIV/AIDS program with an assessment of the public debt.

under consideration in terms of absorbing fiscal space, taking into account actual spending over the projection period, but also future spending needs implied by new HIV infections

Finally, although what will happen in the future remains highly uncertain (as with all modeling studies), I contend that the issue of the considerable importance of the fiscal consequences of HIV/AIDS and investments in the national response to HIV/AIDS in Uganda is not questionable. Indeed, as John Holland (2002) notes, "To understand long-range projections is Promethean.....Still the challenge is hard to ignore". The consequences of HIV prevention interventions evolve over time and across the population, and transmission patterns are highly heterogeneous. Owing to the scaling-up of treatment, HIV/AIDS (hitherto a fatal infectious condition) has been transformed into a CCD. This, by extension, implies that the returns to investment of HIV prevention interventions have shrunk, but financial returns (in terms of savings in treatment costs, etc.) have become more pervasive. This chapter has presented estimates of the evolving attendant fiscal burden of the HIV/AIDS epidemic and response in Uganda. This, in turn, behooves us to think ahead to take into account and address these long-term fiscal challenges brought to the fore by HIV/AIDS.

Chapter 6

Financing the response to HIV/AIDS for a progressive fiscal and social contract in Uganda

6.1. Introduction

This chapter aims to critically analyse the various options used, including those with potential, to enhance the fiscal sustainability of HIV response in Uganda. Grounded in international public finance theory and practice, this chapter largely focusses on domestic resource mobilisation (DRM), which is predicated on the potential to create a transformative and legitimate fiscal and social contract. While as a policy field, HIV financing policy has so far primarily advanced at the practical level with some of the mechanisms in this chapter analysed in the Ugandan context (UAC, 2011; UNAIDS, OPM and Government of Uganda, 2014; Koseki, et al. 2015), to date there is limited analysis at the conceptual and theoretical levels given that academics and policymakers have always adopted an instrumentalist approach, whilst ignoring the theory.

The analytic focus in this chapter is motivated by two considerations. First, the narrative on HIV sustainable financing as it cascades into a set of questions about why investing in HIV? How much financing is needed? On what HIV interventions should Uganda invest? How will investment in HIV be utilised? How should investment in HIV be mobilized? Fundamentally, it is noteworthy that providing answers to the last question is the focus of this chapter. Second, in Uganda, DRM - as an alternative and complement to global public investment aid – is increasingly regarded as a central element in financing human capital development (including ending AIDS). Thus, besides its potential to bridge critical funding gaps, DRM has the potential to ensure a transformative change – anchored in a legitimate fiscal and social contract. This is because principally DRM enhances national ownership and strengthens citizen influence on the spending priorities of the government,

The changing dynamics of financing the HIV response call for sound science, economics, and politics. Specifically, as HIV/AIDS is “the quintessential long-wave event” (Merson M, et al, 2008; Merson and Inrig, 2018), I argue that more attention needs to be given to the question of *how* to assure fiscal sustainability. At its core, fiscal sustainability requires the government to manage public finances credibly. However, as Whiteside (2016) notes, over the last thirty-five (35) years, the global HIV response did lead to “a lack of local ownership and dependency mind-set”, instead of correct allocation of national and international responsibility. As has been shown in Chapter 2, the global health financing landscape is rapidly changing. In fact, it appears the world is entering a phase where financing for HIV response is moving from emergency crisis financing to a sustainable development financing phase. However, this financing transition erodes national ownership and responsibility for financing HIV interventions. Therefore, it is needful that Uganda explores adopts empirically grounded and theory-informed policy options for sustainable long-term financing of the HIV response

It is hoped that the findings of this chapter will aid Uganda and other low-income, high HIV-burdened countries facing fiscal sustainability challenges) to undertake long-range planning. Against this background, the rest of this chapter is structured as follows: Section 2 is a presentation of facts and clarity on the nature of the sustainability in question. Section 3 briefly outlines the data and methodological approach that was employed in undertaking this comprehensive literature survey and synthesis. The study findings are presented in Section 4. In Section 5, emergent conclusions are presented and discussed to inform policy review when addressing the issue of fiscal sustainability of HIV responses in Uganda.

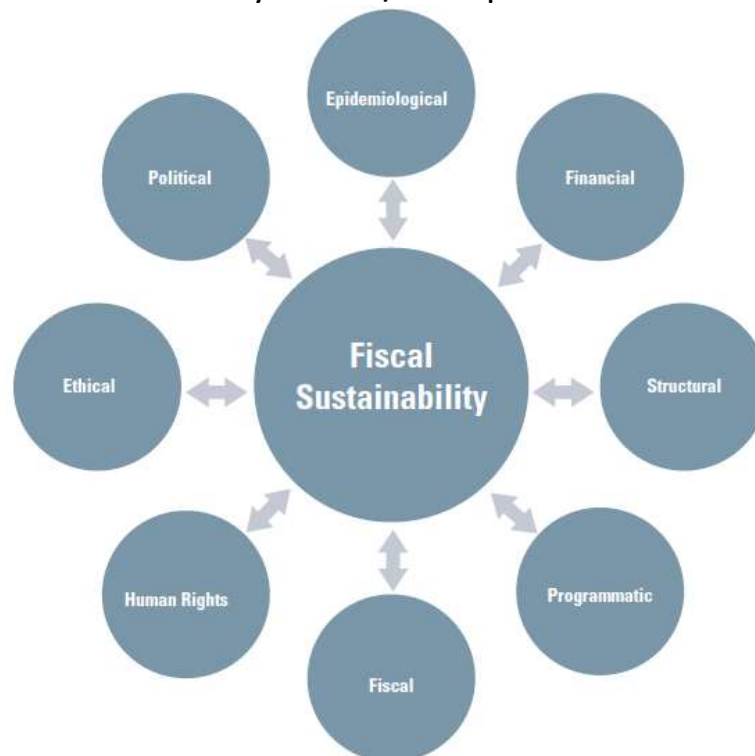
6.2. Main conceptual issues and stylised facts

6.2.1. Rethinking the definition of fiscal sustainability in the context of HIV/AIDS

To provide some context for the discussion, as earlier mentioned in § 1.3, in defining fiscal sustainability, it is important to note that it is not an objective in and of itself. It is best understood as a constraint that needs to be respected (Thomson et al., 2009). From the aforementioned, a few implications can be derived. First, how a government achieves fiscal sustainability matters rather than the process being a simple cost-cutting exercise. Second, in finding a sustainable fiscal path whereby PPG debt levels are kept under control, disagreements abound among economic experts modeling macroeconomic growth projections and tax revenues, and HIV policymakers and implementers (UAC, 2005). Whilst all agree that PPG debt levels should be fiscally sustainable, highly dependent on context and projections related to all kinds of other variables affecting the economy, they often disagree on a 'magic' threshold at which national PPG debt poses a threat to the economy and its underlying macro-fiscal fundamentals (Égert, 2014). Third, the quest for fiscal sustainability does not automatically preclude substantial increases in government spending on HIV (Kakaire et al., 2016; Zakumumpa et al., 2017).

Given the foregoing, drawing on Thomson et al (2009), three (3) complementary policy options to managing the fiscal sustainability challenge emerge: (1) increasing public revenue to the point at which fiscal obligations imposed by HIV can be met; (2) scaling down HIV-related fiscal liabilities or obligations to the point at which they can be met from existing (and/or projected) revenue; and (3) improving efficiency. Thus, there is a clear political dimension to defining, analysing and addressing fiscal sustainability. Haacker (2016) distinguishes between epidemiological, political and financial sustainability while Whiteside and Oberth (2016) propose a six-tenet conceptualisation of what sustainability means in the context of the HIV and AIDS response. The tenets are: (1) financial, (2) epidemiological, (3) political, (4) structural, (5) programmatic, and (6) human rights.

Figure 39: The tenets of fiscal sustainability of the HIV/AIDS response



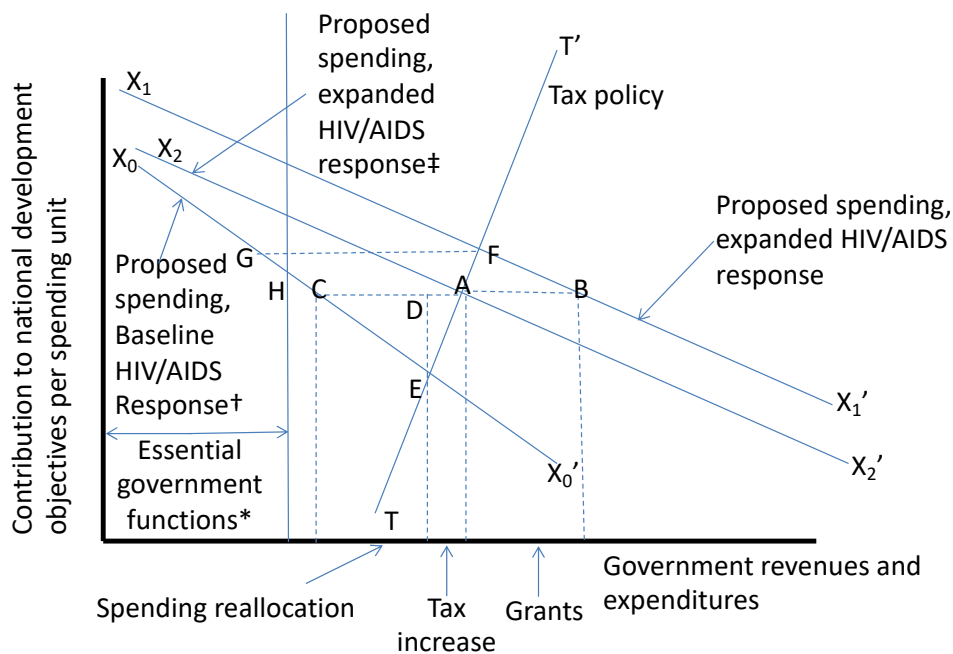
Source: Author's compilation

Finally, I conceptually frame human capital as social capital in all its ramifications. Among others, these include institutions, relationships, attitudes, and values. And they dictate interactions between people, and their attendant contributions to economic and social wellbeing (Collier, 1998)). Also, I argue that there is also a social sustainability imperative. Using social capital in a meta-framework, Wilmott (2016:11) contends that “social sustainability involves having the right combination of social capital, and other factors, in play at the right time, in the right place and in the right way to best facilitate (the) effectiveness of the response”. As used here, social sustainability is a function of social capital seeking to serve the HIV response and its sustainability. Piot (2015) opine that recognizing the criticality to balance science, economics, and politics - calls for the importance of identifying a problem and a solution. As Figure 39 shows, in defining fiscal sustainability, I show that social sustainability is – implicitly or explicitly – a function of the above-mentioned eight (8) tenets that span multiple rationales such ethical, pragmatic, theoretical and the users’ perspective ones. It is this broader framework that I adopt in defining fiscal sustainability.

6.2.2. A simple fiscal perspective on HIV/AIDS spending, financing and efficiency

The inter-relationship between HIV financing burden, fiscal sustainability, and the modes of financing raises three questions: which are can the HIV response be financed? Would the financing agents want to finance AIDS response?; How can AIDS response be financed? (Haacker, 2016). Currently, the policy discourse on domestic financing of the HIV and AIDS response is largely framed by the government’s policy objectives on expenditure and tax policy. As shown in Figure 40, the government’s expenditure policy currently includes a baseline only, shown by the curve X_0X_0' , which orders potential spending in declining order of its per unit of spending contribution to the national policy objectives. The Fast-Track approach, as expected, introduces new spending needs, as represented by a shift of the expenditure curve to the right (X_1X_1').

Figure 40: A fiscal perspective on HIV/AIDS financing



* These functions include allocation, stabilization and redistribution.

† Represents current potential spending (including baseline HIV response as is).

‡ Excludes HIV/AIDS grants

▣ Full proposed spending (including scaling-up the HIV response).

If external funding for HIV decreases, as is more likely, the curve that describes the government's effective spending opportunities and preferences shifts to X_2X_2' . The analysis would look very similar if external funding depends on the commitment of domestic resources (, in the case of a co-funding policy agreement such as GFATM's), as long as the activities underwritten by donors are broadly in line with the government's policy preferences, i.e. intra-marginal for instance in respect spending priorities and preferences summarized in the expenditure curves. The availability of domestic fiscal resources is summarized by the 'tax policy' curve TT' . This is upward-sloping implying that there is generally a willingness to increase taxes and some scope for raising additional revenues, however because of the economic and political costs, the government would do so only if the gains summarized by the expenditure curve outweigh these costs.

Without HIV/AIDS-related spending needs (necessitated by scaling-up) and related external support, the government would settle on point E, the point (at which expenditure policy X_0X_0' and 'tax policy' TT' are consistent). The actual domestic policy outcome (including the HIV response) is represented by point A, whereas and total expenditure including grant-financed HIV/AIDS spending is located at point B. In this situation, an amount equivalent to the distance CB is spent on the HIV response, of which CA is financed domestically, and AB through external grants. Compared to the counterfactual situation, the bulk of domestic HIV/AIDS spending in this example is financed by a re-allocation of expenditure from other sources (i.e. distance CD), and a smaller proportion from additional revenues (e.g. taxes, distance DA). Although Figure 40 does not capture the intertemporal aspects of HIV/AIDS spending and other expenditure and tax policies, it serves an important purpose as it illustrates some aspects of fiscal sustainability and the challenges of a transition to increased domestic financing. Also illustrated in figure 40 current HIV and other non-HIV priorities' spending is located to the left of point H. figure 40 shows that this is the case in the absence of external support, which therefore contributes to domestic financial sustainability by mitigating the fiscal consequences of HIV/AIDS. On the other hand, in the absence of external support, the policy outcome is represented by point F. The spending allocation between scaling-up HIV/AIDS and non-HIV/AIDS expenditures can be determined by drawing a horizontal line through point F. On this line, non-HIV/AIDS and baseline HIV spending is represented by the distance from the vertical axis and the X_0X_0' curve, HIV/AIDS spending (due to scaling-up imperative implicit in the fast-track strategy) is represented by the distance between the X_0X_0' curve and point F.

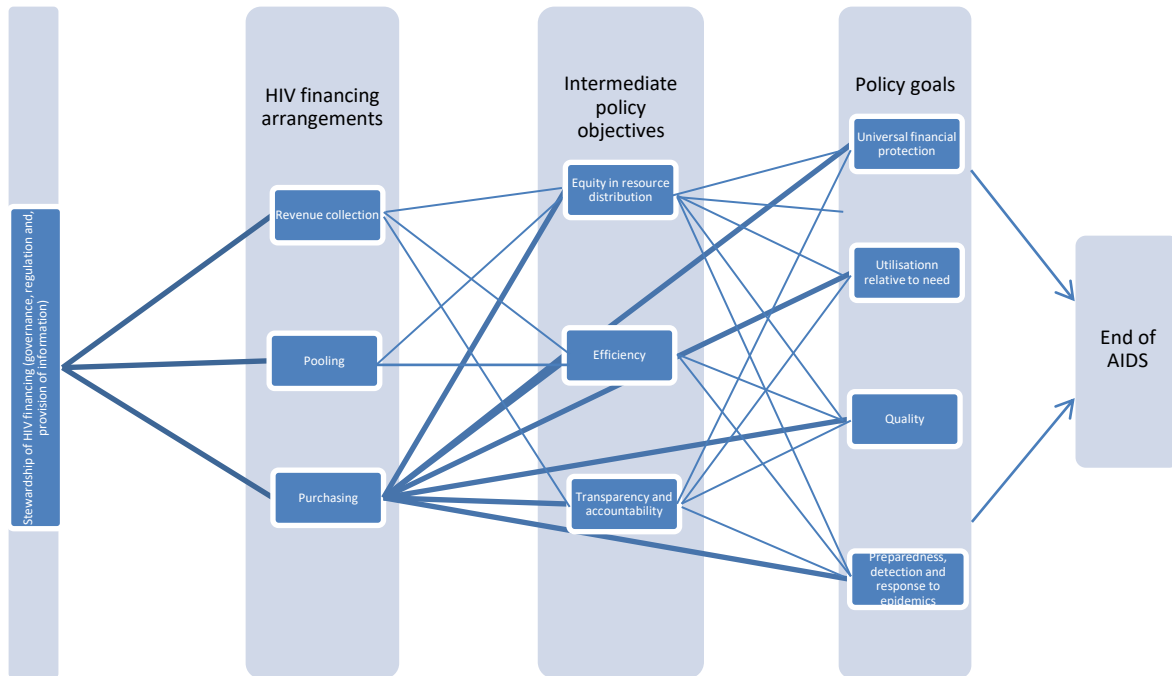
Finally, I contend that it remains complicated to answer the question on whether the HIV response is fiscal sustainable through a transition to increased domestic financing, as I show in Figure 4, A decline in external financing would shift X_2X_2' towards X_1X_1' , and the policy outcome from point B towards point F (and non-HIV/AIDS spending described by point G, so low that essential government functions could be compromised). Thus, to successfully transition to increased domestic financing, a combination of three things need to happen. These are progressing towards ending AIDS and, improving cost-effectiveness and realizing efficiency gains in HIV/AIDS services.

6.2.3. Framework for analysis of financing mechanisms

This section focuses on financing instruments that impact on fiscal sustainability of the HIV response by concentrating on methods of raising and pooling revenue for HIV as well as ways of using revenues that may impact on fiscal sustainability. To this end, in Figure 41, I delineate an adapted analytical framework that explicitly links HIV financing in terms of functions to a set of HIV and health financing policy goals. The framework draws attention to each function and policy goal – within the health financing triangle, health financing equation, and functions of the HIV response – a factor that is critical in facilitating analysis of HIV financing mechanisms. Adopting this analytical framework enables analysis of any country's financing system, possible, notwithstanding its varied

context. Collection, pooling, and purchasing are universal financing functions – that can be integrated

Figure 41: Framework for descriptive analysis of HIV financing mechanisms



Source: Author’s own compilation

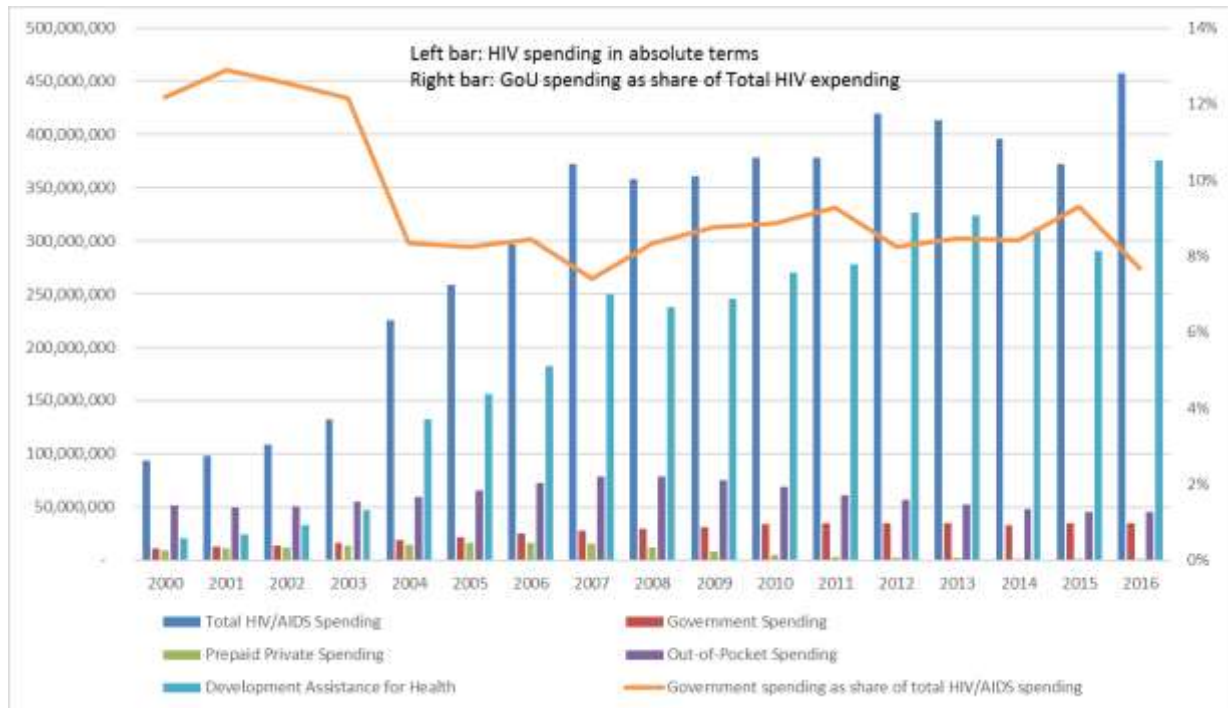
6.2.4. HIV spending in Uganda: past, present and future

Critically looking at the financing of the HIV response in Uganda, as has been demonstrated in Chapter 2, domestic HIV policy responses were driven mainly by international pressures and interests. Historically, domestic forces had a less significant role (Green, 2011). Drawing from the geopolitical positioning theoretical framework (Gómez, 2018), I contend that Uganda strategically responded to international pressures and policy criticisms. This was in addition to offers of financial and technical assistance. The country then utilized domestic policy innovations and high-level politics to engage in global health diplomacy to bolster the national resistance movement (NRM) political establishment’s international reputation. From the 1980s to the late 1990s, Uganda aspired to build a commendable reputation among elite nations by successfully using the HIV response as a ready way to demonstrate the political establishment’s aspirations. Among other factors, this strategic positioning attracted international investments in HIV/AIDS response.

On the other hand, from 2000 when civil and policy space started shrinking (Freedom House, 2018), the political leadership reacted slowly and ineffectively to the scourge of HIV. The above geopolitical dynamics had implications on Uganda’s national AIDS response and fiscal sustainability. As shown in Figure 42 external financing has been the mainstay of HIV financing, with almost 80% of HIV response resources from external sources. This has brought to the fore the donor dependency challenge. However, looking forward, external funding will not increase from traditional donors. Also, out-of-pocket (OOP) spending persists. Zeng and Shepard (2012) find this source to be inequitable, regressive, and impoverishing through catastrophic expenditure. Thus, in the future, it cannot be a key pillar of HIV financing strategy given HIV’s social dimensions (Haacker and Birungi, 2018). Finally, despite Uganda’s economy growing rapidly, due to a

“displacement effect” (Dieleman and Hanlon, 2014), this GDP growth has not been followed by a commensurate growth in domestic HIV spending.

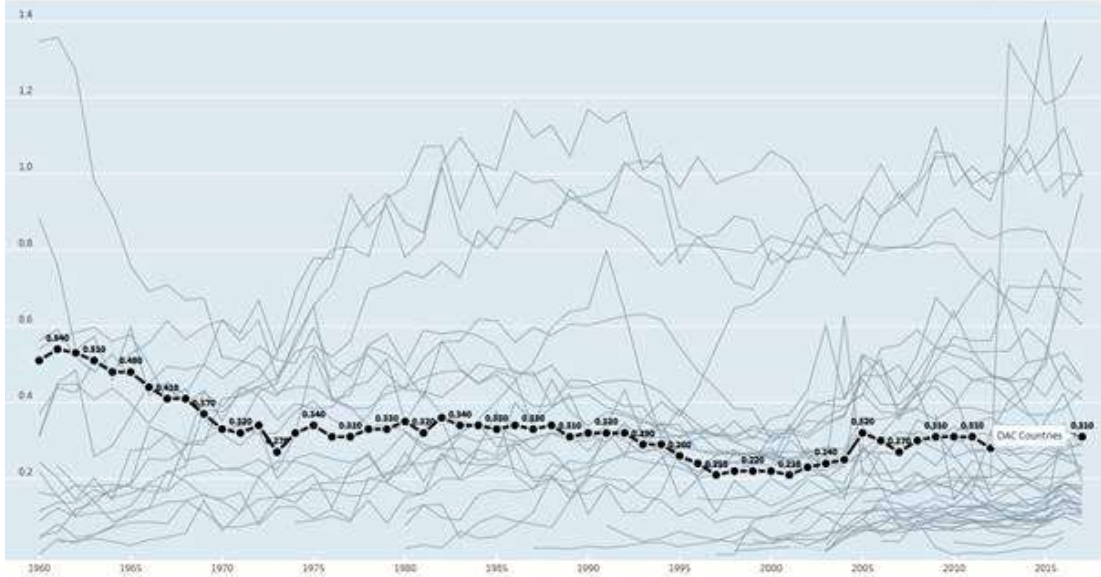
Figure 42: HIV/AIDS spending in Uganda, 2000 – 2015 (US\$ millions, 2017 PPP-adjusted dollars)



Source: Author’s own analysis from IHME (2018).

In response to the Pearson Commission recommendations, in 1979, developed nations committed to devoting 0.7% of their gross national income (GNI) to ODA through a UN General Assembly Resolution, in pursuit of a common secure future. However, by the end of 2017, only a handful of developed countries (6 out of 43), namely Denmark, Turkey, United Arab Emirates (UAE), Sweden, Luxembourg, and Norway fulfilled their ODA commitments. Overall, as shown in Figure 43, ODA commitments averaged at 0.31% of the combined gross national income (GNI) of DAC countries and this represented less than half of the pledged 0.7% commitment. Also, it is anticipated that ODA largely from traditional European donor countries and the USA is likely to remain static at best, but could further decline, due to many competing challenges. Thus, it is unlikely that Uganda will benefit from additional ODA commitments as a source of funding for the HIV response that is already heavily dependent on ODA. Therefore, this begs the question: if not from ODA, where will the money come from? This chapter seeks to address this question.

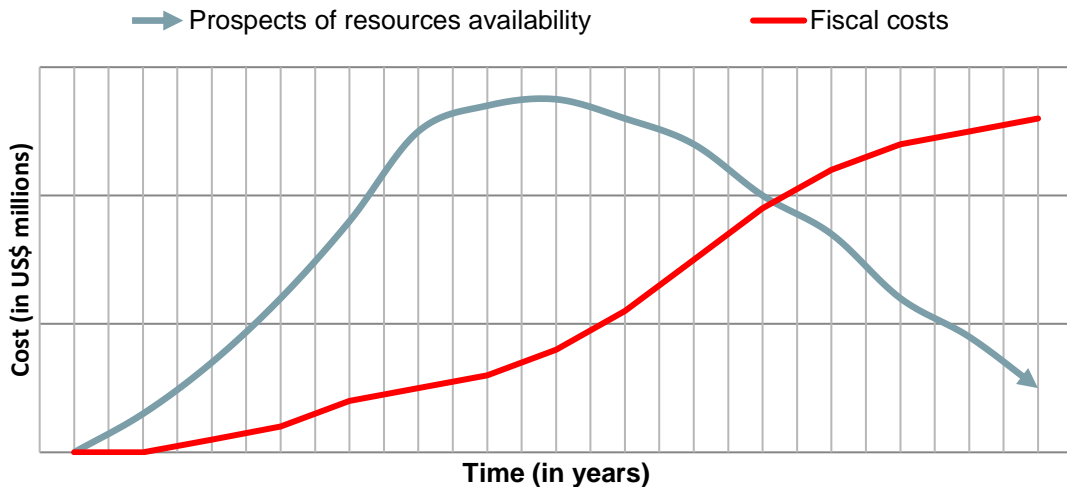
Figure 43: Net ODA (Total, % GNI), 1960 – 2017.



Source: Author’s compilation, using data from OECD (2018).

The global health financing landscape is rapidly changing. As Figure 44 shows, financing the global response to HIV/AIDS is an emerging policy dilemma and poised to remain a considerable challenge (Dieleman et al., 2018a and 2018b). Given IMF (2018)’s projected positive global economic outlook, it is safe to assume that the costs of the HIV response will decline in relation to GDP, so that the overall financing challenge abates over time. This is partly a reflection of declining HIV incidence while the population and the economy are growing. A second factor, the uncertain and negative outlook on the availability of external financing, will likely complicate the financing of the national HIV response. In the near future, this is dominated by the prospects for funding from the U.S. government and the Global Fund. In the Trump-Brexit era of strategic withdrawal, funding for HIV/AIDS, TB and malaria plus UHC and GHS (i.e. the so-called “ATM plus strategy”) is at risk.

Figure 44: Fiscal sustainability dilemma*



* This is an illustration and not drawn to scale.

Over the longer run, the benign economic outlook in OECD development assistance committee (DAC) countries means that the availability of external grants will diminish in general as GDP per capita – in current aid recipient countries such as Uganda - increases. This is more acute for countries expected to attain middle-income (MIC) status within the next couple of years (Ly et al., 2017; Silverman, 2018; Yamey et al., 2018). Uganda's target is to attain a lower-middle-income status by 2020 and aspires to become an upper-middle-income country by 2040 (Uganda National Planning Authority (NPA), 2017). DAH providers, owing to the aforementioned conditions and thresholds, often respond to the new income categorization and corresponding assumed prosperity by cutting aid. On the other hand, however, the affected country's public sector often does not quickly or automatically fill the emerging financing gap. As a consequence, households are forced to compensate, often through OOP spending or by missing out on life-saving services. Also, to the extent that national health and HIV/AIDS policies succeed in reducing HIV/AIDS as an extraordinary public health challenge, the rationale behind the prioritization of the HIV response will also diminish. Thus, as the importance of external financing declines relative to GDP, domestic financing needs are expected to increase.

Finally, do we accurately know how much external financing goes to financing the HIV response in Uganda? I argue that tracking ODA flows for HIV is complicated. From the 1960s, ODA as a measure of foreign aid effort has not always been perfect. The recent evolutions in the methodology of calculating and reporting ODA by the OECD's Development Assistance Committee (DAC) has further complicated matters. In its original conceptualisation, to qualify as ODA, the transactions had to be "concessional". This key distinguishing characteristic implies that it must give something of value away. It thus follows that under this definition, grants are 100 percent ODA. However, what has always been and remains controversial is to decide which part of loans and other financing mechanisms count as ODA. From a statistical point of view, this is trickier. A case in point are items such as the costs of scholarships for students in donor countries in which no resources are transferred to developing countries. As other analysts have shown (Atwood et al., 2018; Scott, 2019; Pipa, 2019), the DAC has recently changed ODA reporting rules. They now include transactions that do not necessarily require financial sacrifice. Effectively, this statistical change deprives ODA of its meaning as a gauge of aid effort. Additionally, it vitiates the point of setting the 0.7% U.N. ODA target. Thus, as a statistical measure, the ensuing incoherencies introduced by these changes makes it a somewhat faulty tool for monitoring and analysis as it does not meet the basic statistical quality standards. It is thus highly plausible that ODA for HIV is over-estimated.

6.3. Methods and data

For this comprehensive literature review in this chapter, I did not do a systematic review. However, I attempted to do as broad a search as time allowed. I searched PubMed, Web of Science (Science Citation Index and Social Science Citation Index), BIDS IBSS, ELDIS, HEED, and ID21. I limited my search to articles in English published from 1980 to July 2018. Keywords and MeSH terms included "econom*", "financ*", "health care", "access", "socio-economic factors" and "delivery of health care" "health care reform", "health services accessibility", "health care rationing", "health care costs", "health resources", "health services needs and demand" "health care surveys" "health expenditures". The search was not limited to research from any region. Additionally, the references of key articles and documents were examined. Grey literature known to the author or that was identified during the period of the search was also reviewed.

6.4. Results

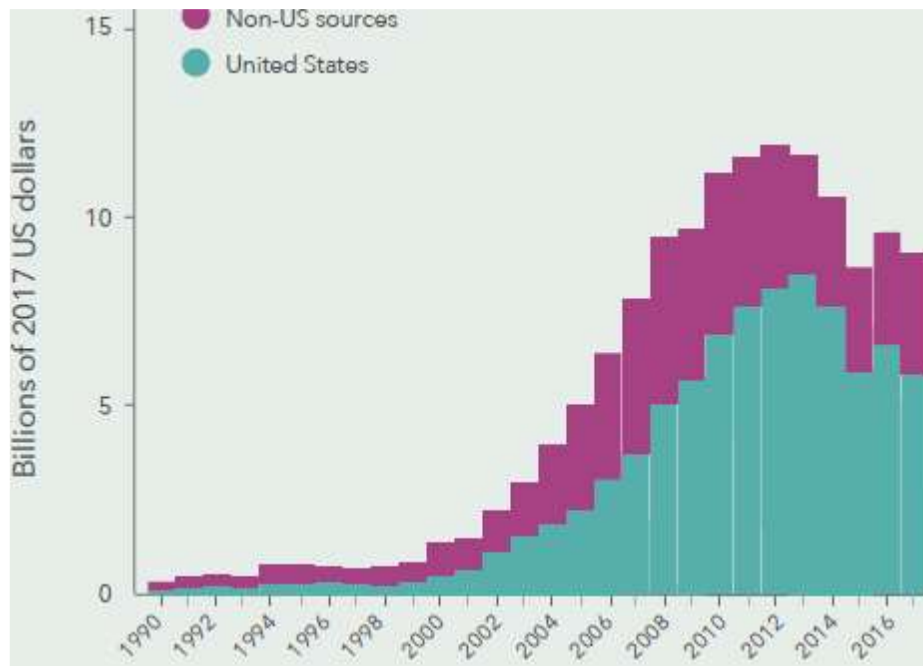
Building on and extending the previous section, first, I analyze external financing. The next section explores DRM. I argue that HIV/AIDS costs would feasibly be covered from the general resources account, as proposals to utilize various earmarked taxes are problematic from a fiscal perspective. Finally, proposals for funding HIV/AIDS services through the ATF and national health insurance are covered.

6.4.1. External financing

As the economics of aid in Uganda as elsewhere has been the subject of much academic scholarship (Kanbur, 2003; Addison et al, 2017), this section does not attempt to present an overview of the economics of international aid, including the attendant historical literature, the “trade-theoretic” and the “contract-theoretic” analytical literature, as well as the empirical and institutional literature. From the contemporary debates, there is a great degree of continuity in the policy concerns of the aid discourse in the 21st century. As such, this section focuses on how the above-mentioned literature has evolved to address specific HIV policy concerns. Specifically, this section sets out by addressing the role of external financing. This is relevant for three reasons.

First, while the death of aid has often been declared (see Moyo (2009), for example), I argue that the need for aid might not be as dead as its critics believe. In fact, global public investment is alive and well. External funding is key – albeit not the key - to averting and mitigating catastrophic health outcomes. This would apply in countries, such as Uganda, where HIV/AIDS exacerbates very low health outcomes (and which would generally receive considerable external assistance in other areas, too). Moreover, HIV is highly concentrated in a relatively small number of selected countries and, may result in a catastrophic reversal in health gains. Second, it enables the national HIV response where the costs would otherwise be unsustainable (drawing on the macroeconomic analysis of fiscal sustainability). This is the case in Uganda (and several least developed countries) where a moderate HIV prevalence meets very low domestic resources, but also certain MICs with very high HIV prevalence – the so-called “risky middle” (Debebe et al, 2018; Whiteside, 2019). Finally, development aid has played an important, if sometimes imperfect, role in furthering the global HIV response. In the SDG era, this begs the question of what vital and unique role international public finance will still have to play in the future. This chapter makes a compelling case for taking some important “next steps” in international financial cooperation. It is to this latter point that I now turn to.

Figure 45: Development assistance for HIV/AIDS by source, 1990 – 2017



Source: IHME, 2018

As earlier mentioned, the outlook on external financing is negative. As Figure 45 shows, after reaching a historic high in 2012, overall development assistance for HIV has plateaued and is now declining. In the context of the SDG era, there are high expectations that domestic resources and private capital will play an increasingly important role in the financing of HIV. These sources of finance are often touted as substitutes – or near-perfect substitutes – for the various types of international public finance (IPF), global public investment and, in particular, development aid. IPF, as used in this thesis, includes “financial interventions by a nation-state, or by a multilateral organization acting on behalf of nation-states, to secure desired public policy outcomes outside the boundaries of that state. It can consist of grants (i.e. transfers made in cash, goods, or services for which no repayment is required); loans (on both concessional and non-concessional terms); equity investments (often directed at the productive sectors); and, guarantees” (Glennie and Hurley, 2014:13). Despite the hype around IPF, I contend that it is its distinct *qualities*, rather than just its quantity, that makes it important for future sustainable HIV responses. IPF remains important to for AIDS response as it has potential to rapidly drive forward strategic investments in critical and riskier interventions, populations, and locations. Also, by leveraging the largely untapped private capital, it can enable response scale with speed and in a short period. As I show in Appendix 5, it is uniquely placed to fund GPGs, both regional and global.

However, Global Financial Integrity (2012) shows that for every 1 U.S. dollar of ODA coming into SSA in 2010, ten (10) U.S. dollars exited the region (to the rich countries) via the illicit financial flows (IFF) of a global ‘shadow economy’. This comprises tax havens, secret jurisdictions, disguised corporations, trade mispricing, and money laundering. The same is true in the case of trade where rich countries take more from poor countries via unfair trade ‘agreements’ than they give as aid. In fact, as I and colleagues show (Birungi et al, 2014), there is a growing body of literature that seems to suggest that ODA may help to mask the effects of IFF. Albeit unintentionally, it does this by “crowding out” domestic spending (see § 2.3), undermining local governments’ capacity to invest in critical social services, or, by propping up service sectors undermined by corrupt officials or governments. There is a need to confront the global political economy to yield a net positive effect on the structure of and impact on domestic policy-making. To this end, I question whether the theory behind IPF and the attendant structures that govern it are fit-for-purpose given the evolving financing landscape. Answering this requires new thinking.

As shown in Chapter 2, the modern development aid paradigm has its origins in the immediate post-World War II era. At its basic level, it is centered around the idea that aid represents a short-term transfer from the “haves” to the “have nots”. This effectively gives rise to the politics of giving and receiving (Whiteside, 2019). In other words, once the poor “catch up” with the rich, aid – at least in current form - will no longer be needed. Additionally, the current approach focuses on “development” as a process. It posits that this occurs (mostly) within the boundaries of nation-states. Applied to the HIV financing context in Uganda, it is imperative to ask how relevant this model for current and future realities? Unfortunately, ethnocentric nationalistic politics, among other factors, are “Trumping” age-old wisdom that it is axiomatic that infectious diseases do not respect borders. This thus requires that IPF for HIV focuses on supporting the transition to more sustainable low-cost, high impact interventions and service delivery platforms as well as funding global and regional public goods. In terms of a coherent global framework for health and HIV financing, as argued elsewhere (GFATM, 2016; Røttingen et al., 2014; Ottersen, et al., 2017), income per capita will be a less relevant determinant of countries’ eligibility for IPF. Rather, the focus will turn to where resources can be deployed to yield the biggest impact at the lowest cost. To realise this vision, I argue that funding for new innovative technologies, scientific research and development are essential be essential. Importantly, it needs to be rapidly scaled-up. This way, the much needed structural transformation can fast-track the end of the AIDS epidemic. Given Uganda’s low development prospects and high costs of the HIV/AIDS programme (as % of GDP) – estimated in this thesis at 33.4%, I contend that fiscal sustainability of the national HIV response

will continue to present long-term development challenges. Addressing these still requires more traditional forms of development support in the short to medium-term.

Of importance to the fiscal sustainability of HIV responses in Uganda, at a practical level, due consideration needs to be paid to how to increase the resource envelope for IPF for HIV in a more predictable manner. This relates to the two interrelated notions of budgetary and policy space. Hybrid innovative financing options offer a strategic opportunity to this end. To date, these have been small in scale. I argue that these can and should be scaled up in the future. To advance in this direction, for example, governments could commit to experimenting voluntarily with coordinated innovative taxation schemes to further international cooperation. These taxes could then be pooled into a Global Health Fund (Ooms and Hammonds, 2014). Additionally, and concurrently, governments need to think about how the above-mentioned voluntary commitments on international public finance for HIV can be made as stable and predictable as possible. To advance in this direction, several questions deserve answers. Three (3) such critical questions are: 1) is setting international targets the most effective approach for mobilizing the resources needed over the long term? 2) what are the lessons learned from peer-review mechanisms, and 3) are there alternatives to moral suasion? To the first question, country evidence suggests that there is no magic target for HIV and health spending (Jowett et al, 2016). Experience with spending targets such as the Abuja target has been very disappointing as their setting lacks empirical basis and has failed to garner political momentum. However, going by lessons from climate change (as addressing the same largely depend on voluntary actions on the part of parties to the 2016 Paris Agreement), there is little hope ‘voluntariness’ (in its classical sense) could work in practice though. To this end, I argue that applying behavioral economics-informed insights, specifically, interventions targeting to nudge global actors (i.e. networks, elites, and institutions (Madsen and Mikkel, 2016)) as well as interventions at the level of the community to mobilize political support and pressure, may accelerate progress, including tools for enhancing social cohesion (Tänzler and Grimalda, 2018).

To maximise the benefits of IPF, I propose an alternative novel approach that seeks to leverage in-country HIV financing. As a starting point, I assume (and rightly so) that donors are motivated by a moral responsibility to ensure that HIV funds are spent in the most efficient manner. Then, there is the imperative to “do most good”. This requires helping improve a lot of the intended beneficiaries to the greatest possible extent. This is the essence of allocative efficiency discussed in Chapter 4. However, departing from neoclassical economic theory, I argue that the traditional cost-effectiveness principle of ordering based on cost-effectiveness and proceeding down the list until the budget is exhausted is inappropriate. And it could lead to sub-optimal impact. A comparable view is held by Morton and colleagues (2018). The intuition behind my critique is that by so doing, the donor takes the pressure off the Government of Uganda to contribute its resources to achieve the intended benefit – the so-called “displacement effect” which I find to hold true in the case of Uganda (see § 2.3). Thus, in contrast, I propose two alternative resource allocation decision rules which target funding at what are to the Uganda government marginal HIV interventions. Under the first rule, a donor should fund only interventions that have cost-effectiveness which is worse than US\$ 300 per infection averted. The second rule requires that a donor should fund only interventions that have cost-effectiveness worse than US\$ 300²⁶ per infection averted and should do so only in part by subsidising them to bring the costs down to US\$ 300 per infection averted. To this end, framing the problem as a leader-follower game, below, in Table 9, I demonstrate these decision rules’ superiority.

²⁶ This is hypothetical and assumes Uganda makes its decisions on a cost effectiveness basis based on the opportunity cost of spending on other sectors. Specifically, this represents a spending value beyond which Uganda considers that spending of its domestic resources to avert a single HIV infection is not good value for money as it can achieve equivalent or more benefit (from its point of view) by investing the same amount in some other sector.

Table 9: Selected data on HIV prevention interventions in Uganda*

HIV prevention	Total Cost (in USD)	Number of new HIV infections averted	Cost per HIV infection averted (in 2019 USD)
1 FSW	39,575	2473	16
2 SMC	50,000	595	84
3 Safe blood transfusion	423,500	799	530
4 MSM	1,300,000	2434	534
5 PMTCT	500,000	862	580
6 AGYW	300,000	319	940
7 HTS	310,000	2661	116
8 Condoms	150,000	62	2419
9 PrEP	560,000	204	2745

* This is hypothetical data for illustration purposes only.

If Uganda uses cost-effectiveness considerations to invest in HIV prevention, it will then spend \$89,575 and avert 3,068 new HIV infections. On other hand, to inform smarter ways to invest external funding in preventing new HIV infections in Uganda, similar to the question posed in Bjørn (2012), supposing PEPFAR is willing to donate US\$ 1 million to Uganda to prevent new HIV infections, how should it allocate this funding? One option for PEPFAR would be proceed down the list of HIV prevention interventions and allocate funding to interventions in cost-effectiveness order (that is to say, the ratio of costs to benefits) until the money is exhausted. In this case, it would implement interventions 1 – 3 as well as 35% of activity 4 and then money would run out. This means that there are no remaining opportunities which have a cost effectiveness better than US\$ 300 per infection averted and Uganda will “enjoy a free lunch” and not spend any money on HIV prevention. As is apparent, under this scenario, US\$ 1,000,000 will be spent by PEPFAR on HIV prevention and 4,779 new HIV infections will be averted.

Undoubtedly, US\$ 1 million PEPFAR investment is being spent well. This is so because many new HIV infections are being averted. However, could this investment be smartly leveraged and more achieved (than currently)? This is the essence of “stretching a dollar” to realise a big bang for a buck. As I showed above, PEPFAR’s funding, as used in this illustrative example, takes the burden off (i.e. substituting for expenditure by) the Government of Uganda. This leaves Uganda free to spend her financial resources on other, even possibly undesirable, activities. It is to this free-riding problem (that leads to displacement effect) that I propose to apply the 2 game-theoretic rules to maximise PEPFAR aid benefit. Applying the first rule, Uganda will spend US\$ 89,575 on activities 1 and 2. This will, in turn, avert 3,068 new HIV infections. By extension, this frees up PEPFAR resources to fund intervention 3 and 44% (rather than 35%) of activity 4. This strategic investment choice prevents 1,878 new HIV infections. Overall, in total US\$ 1,089,575 will be spent by both Uganda and PEPFAR to prevent 4,946 infections.

Finally, applying the second decision rule, once the cost-effectiveness of an intervention is improved to the extent that it reaches US\$ 300 per infection averted, it now becomes cost-effective for Uganda to invest in the activity. As shown in Table 10, PEPFAR will spend US\$ 995,000 (and thus have a small residual fund) to subsidise activities 3, 4 and 5. Uganda will spend US\$ 1,228,500 of its resources on activities 3, 4 and 5, in addition to US\$ 89,575 on activities 1 and 2. Cumulatively, the total amount of investment by both Uganda and PEPFAR is thus US\$ 2,313,075. The corresponding total number of new HIV infections averted is 7,163. The rightmost

column of Table 10 shows the cost-effectiveness of the investment for PEPFAR. In conclusion, applying these proposed decision rules provides a basis for the allocation of aid money, which is efficient, fair, and sustainable.

Table 10: Data for selected HIV prevention activities in Uganda, with PEPFAR subsidies

No.	HIV prevention interventions	Original Total Cost (in USD)	Number of infections averted	PEPFAR contributions	Subsidised cost	% of cost met from subsidy	Subsidised cost/infection averted	PEPFAR \$/infection averted
3	Safe blood transfusion	423,500	799	183,800	239,700	43%	300	230
4	MSM	1,300,000	2,434	569,800	730,200	44%	300	234
5	PMTCT	500,000	862	241,400	258,600	48%	300	280
6	AGYW	300,000	319	204,300	95,700	68%	300	640
7	HTS	310,000	2,661	231,700	78,300	75%	300	888
8	Condoms	150,000	62	131,400	18,600	88%	300	2,119
9	PrEP	560,000	204	498,800	61,200	89%	300	2,445

Additionally, IPF for HIV needs to be much better targeted. Currently, income per capita largely influences decisions on how and where to allocate development aid. However, it is fraught with limitations. Despite similar income per capita levels, countries can have very different capacities to mobilize domestic and external resources. Also, they differ in their economic and environmental vulnerabilities and their social indicators. To this end, I propose that HIV resources allocation decisions should take into account social indicators (such as those contained in the UNDP’s Human Development Index (HDI), the World Bank’s Human Capital Index or the UN’s Human Assets Index) as well as environmental vulnerabilities (UNEP’s Environmental Vulnerability Index could be one measure). These should be combined with income per capita to provide a more holistic picture of countries’ specific needs.

In a nutshell, the post-2015 sustainable development agenda has shown there is an enormous appetite – from all stakeholders – to build a shared vision for the future. The Addis Ababa Action Agenda is one such effort underway directly related to the SDGs themselves. In this section, I have laid out what is a strong case for IPF to fund sustainable HIV responses in Uganda for the foreseeable future. It will not be “development aid” in the strict sense of the term; it will be less about “donors” and “recipients” and more about a common investment between equals in support of the common interest. As a corollary, this represents an important opportunity to build development finance institutions that represent *all* constituencies, are well resourced and deliver high-quality finance that supports internationally agreed objectives.

6.4.2. Domestic financing

6.4.2.1. Taxation

Tax is one of the principal lenses in measuring state capacity, power, and political settlements in Uganda. Designing tax systems that can provide incentives for growth, meet distributional demands, and increase revenue collection is central to state viability and effectiveness (Toye, 2000). Generally, as a policy field, taxation has advanced at both the practical political level as well as at the conceptual and theoretical levels (Smith, 2015). Accordingly, from the economics of tax policy perspective, it will be helpful to begin this section with a definition of taxation. Thereafter, I will briefly frame the tax-HIV nexus. Then, using insights from economic theory and empirical

research, I will explore the practical application of tax distortions and optimum tax theory considerations to the question of fiscal sustainability of HIV response in Uganda. Finally, I question whether the time is right for (more) health taxes and hypothecation.

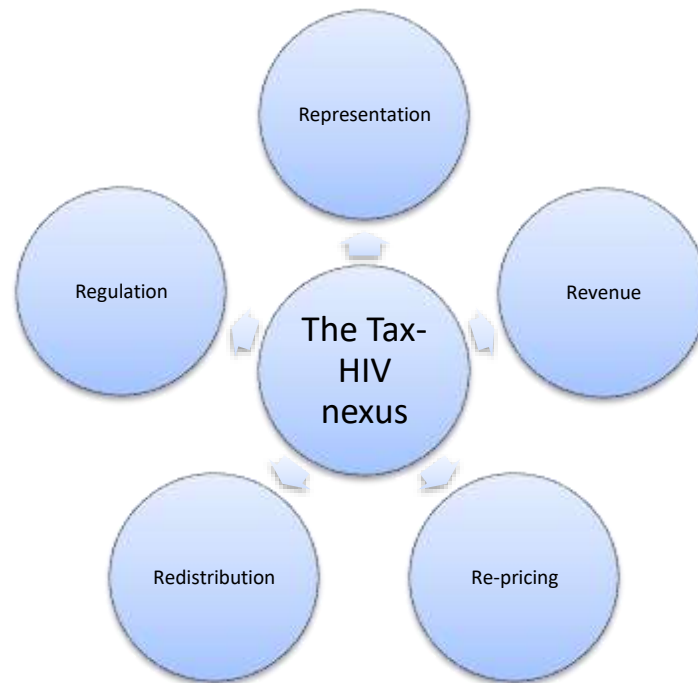
As a limitation of this analysis, though, the role that taxes play in a modern economy, the main taxes used by most developed and developing countries, and other key issues such as the question of where the burden of taxation lies, how taxation affects the economy, philosophical issues relating to tax, and the effects of tax evasion and tax avoidance are not discussed in this section as they have been extensively discussed elsewhere (Mirrlees et al., 2011; Smith, 2015; O'Neill and Orr, 2018). Generally, in the public finance literature, it is established that foreign aid weakens the incentives to build domestic revenue administration capacity and make sensible tax policy choices. Using this analysis as a springboard, the next chapter empirically assesses the gap between ability and effort in leveraging tax for DRM. Here, I will answer the following three inter-related policy questions: How much domestic revenues should Uganda be reasonably mobilizing? This seeks to assess the country's tax capacity. What are the reasons the government is not raising the tax and nontax revenues it needs? This seeks to get to the root of causes for the gap between capacity and performance. And lastly, what are the implications of the above issues for the Government of Uganda and her donors. Here, I aim to interrogate how should aid relationships change as Uganda approaches income transitions?

The term "taxation" is frequently employed in different contexts and with different meanings. Generally, it is used to denote – in the words of Smith (2015:4) – "compulsory payments, exacted by the state, that does not confer any direct individual entitlement to specific goods or services in return". Implicit in this attempt at a formal definition are two distinguishing features. First is compulsion. The compulsory nature of taxation distinguishes taxes from prices, fees, or charges. These could be levied on the sale of goods and services by the state or state enterprises. While these, too, can generate public revenue, the fact that something is supplied directly in return for payments means that they can be voluntary. The other key distinguishing characteristic is "parametricism". In other words, modern tax systems are formalized and governed by legislation. This helps define, in advance, the basis of individual²⁷ tax liability. These characteristics are necessary (though insufficient) for Uganda to progress towards establishing fiscal legitimacy. This is so because it does so through settled fiscal principles in global health financing.

In the second place, regarding the tax-HIV nexus, there has generally been little framing in academic literature despite various studies assessing fiscal space for HIV primarily focusing on taxation as a potential for domestic sources of financing. This section, albeit briefly, examines the general policy domain of taxation. It does so through the HIV lens with a view to describe its relevance to HIV and tax policymaking. I conceptualize tax policy as both an influence on health outcomes and a possible source of financing for global health. At national, regional and global level, this aims to encourage greater interest in the formulation of tax. In so doing, it intersects with the analysis of McCoy et al (2017) who conceptually frame the tax and health nexus. Within tax policy literature, previous studies have described various associations between tax policy and health. Here, with a specific application to HIV, I extend a unifying conceptual framework of 'Five R's' to stimulate awareness about the importance of tax to end AIDS as a public health threat.

²⁷ Used here to refer to a human person and entities with a legal personality.

Figure 46: The '5 Rs' as a conceptual framework of the tax-HIV nexus



Source: Author's compilation.

In a nutshell, as Figure 46 shows, in the first place, tax can improve representation and democratic accountability. This, in turn, helps make governments more responsive to the needs of its citizens such as PLHIV. Second, tax can create a revenue stream to publicly finance essential HIV and other public services. Third, progressive taxation, when combined with appropriate public spending, can help redistribute wealth and income. This mitigates social and health inequalities. Fourth, the re-pricing of harmful products (e.g. tobacco, alcohol, and sugar and sugar-sweetened beverages (SSBs)) can help reduce their consumption. These products are inextricably linked to HIV. For example, smoking is a risk factor for TB, one of HIV's opportunistic infections. Alcohol use (especially in high quantities) can disinhibit individual behaviors and judgment and result in high-risk practices such as no condom use in high risky sexual contacts (let alone correct or consistent use) as well as sharing needles during injecting drug use. Finally, as PLHIV are aging with HIV due to HIV treatment success and the attendant heightened risk of cardio-metabolic disorders due to life-long ART use, ultra-processed foods and SSBs increase the risk for non-communicable diseases (NCDs) – with HIV-NCD co-infection further threatening the fiscal health of Uganda. Fifth, taxation provides a route by which certain harmful industries and practices can be effectively regulated.

In terms of optimal taxation and enforcement, without claiming to be an extensive analysis, the barriers that hinder the full potential for taxation to be used to improve HIV and health outcome include weak tax administration, large 'shadow economies', international trade liberalization, tax avoidance, transfer pricing by transnational corporations and banking secrecy. To assure optimal taxation and optimal enforcement, I suggest that a greater awareness of the manifold associations between tax and HIV and health will encourage public finance and health practitioners to actively promote fairer and better taxation, thereby helping to improve health and reduce health inequalities. Below, I present a real-world application proposal to enhance the fiscal sustainability of HIV response in Uganda.

Globally, the main taxes are corporate income tax (CIT), personal income tax (PIT), value-added tax (VAT), customs duties, and excise duties. However, there is a growing proliferation of “sin” taxes (STAX Group, 2018). These address “externalities” and focus on “bads” such as sugar, sugar-sweetened beverages (SSBs), tobacco, alcohol, and ultra-processed foods. Whereas they are common in developed countries, their importance is growing in developing countries as NCDs increase. Available evidence suggests these taxes – as fiscal policy tools - have the power to save millions of lives. And, while secondary to the health gains, the additional revenue that can be obtained from such tax increases is substantial (The Task Force on Fiscal Policy for Health, 2019). However, among the key challenges with these taxes is the resistance from affected industries (the so-called “Big Industry”), the conceptual difficulty in defining unhealthy food for example (though this difficulty does not exist for alcohol or tobacco), as well as difficulties around enforcement and regulation. Some analysts suggest that they are progressive overall. Finally, from tax distortions and optimum tax theory, the tax system is central to the operation of Uganda as a nation-state and to how it interacts with individual Ugandan citizens. This way, taxes are used to fund the provision of public goods and services, to engage in direct or indirect forms of redistribution, and to (paternalistically) mould the behaviour of individual citizens.

Besides general taxation’s potential to expand fiscal and budgetary space, I argue that there is a role for earmarked taxes for health and HIV in Uganda. The “concept of hypothecation, where revenues from specific taxes would be ring-fenced for a particular expenditure purpose – and publicly communicated in this way – has traditionally been unpopular with many. This is because of the notable challenges, relating to complexity, transparency, and public perceptions, with which it is associated. However, there is an acceptance that hypothecation could act as a unifying tool and help engage people on tax, especially in the context of raising additional tax revenues and increasing public trust in the tax system” (COVI, 2018: 6). Particularly, there is a growing body of evidence suggesting that raising STAX is highly effective at reducing harmful consumption and saving lives (The Task Force on Fiscal Policy for Health, 2019). To this end, leveraging fiscal policies has the potential to yield improved HIV health outcomes as well as the added benefit of bringing in additional revenue. In other words, smart fiscal policy can save lives and help transform economies. The next section is devoted to this emerging area of public policy. While there is more action in this emerging area of public policy, there is a paucity of academic debates regarding health taxes.

In terms of lessons from health taxes, Wright and colleagues (2017: 12), in their systematic review, conclude that:

“if the primary policy goal of a health tax is to reduce the consumption of unhealthy products, then evidence supports the implementation of taxes that increase the price of products by 20% or more. However, where taxes are effective in changing health behaviors, the predictability of the revenue stream is reduced. Hence, policy actors need to be clear about the primary goal of any health tax and frame the tax accordingly. Not doing so leaves taxes vulnerable to hostile lobbying. Conversely, earmarking health taxes for health spending tends to increase public support so long as policymakers follow through on specified spending commitments”.

Relatedly, owing to increased interest in earmarked taxes for health in the context of revenue mobilization as exemplified in discussions of and policy work by the Joint IMF/WB initiative on DRM and Taxation Interagency Task Force on Financing Development as well as the Platform for Collaboration on Tax (IMF, OECD, UN, World Bank), in theory, there are 2 main considerations for health taxes revenue setting:

1. Level of tax: It is important to compare with neighbors because of base erosion due to smuggling.

2. Composition of taxes: These include specific (amount per quantity) and ad valorem (percentage of value). Generally, specific taxes are easier to manage, compatible with health objectives, and yield more stable revenue. However, they must be adjusted regularly (automatic adjustments procedure could be in the excise law). On the other hand, ad valorem taxes take inflation into account, and their base is easier to define.

Specifically, in terms of experience with health taxes, countries are overwhelmingly supportive of tax increases. There is a general preference for specific taxes in the case of tobacco (hence need for frequent adjustments) and ad-valorem for other health taxes, given the greater difficulty defining the tax base. However, these taxation efforts face stiff opposition from Big Industry (as they reduce the margin of industry). Additionally, owing to weak tax administration and preference for a gradual/simultaneous approach to a tax increase and capacity building, there is a strong concern for illicit trade among countries. Thus, to move from theory to practice, an understanding of what earmarking means is critical at this juncture. In simple terms, earmarking denotes the dedication of the proceeds of a tax to a specific expenditure. From public finance literature, earmarking takes two forms. First is hard earmarking which uses a formal process that more or less bypasses the budget. Secondly, soft earmarking does not use a formal process and thus proceeds from the tax transit through the central treasury account and is fully subject to annual parliamentary review. This dichotomy notwithstanding, in reality, the spectrum of earmarking practices range from very soft to very hard. Overall, earmarking plays a significant role in several countries in many contexts. These include wage taxes to finance social security and/or health in a pay-as-go system; medicare, multiple excises in the USA (e.g., fuel excises earmarked for transport infrastructure); excises to finance development funds (road, telecom infrastructure, etc.); and use of tobacco taxes to finance tobacco control and health spending in some countries. Best public finance management requires that discussions on earmarking are anchored in sound budget formulation. Budgeting – as a fiscal policy tool for policy direction, democratic controls, and transparency – is a difficult techno-political process that involves many compromises but also fosters dialogue, consensus-building, transparency, and democracy.

Table 11: Fiscal policy for health: a checklist for key consideration for earmarking for the HIV response

In considering earmarking for the HIV response, Uganda should address the following key questions. This checklist can guide discussions among health and finance policy-makers about when earmarking might be useful and minimize distortions.

<p>Support for the expenditure purpose</p> <ul style="list-style-type: none"> ▪ Does the policy or programme to be funded with the earmark support the country's objectives? ▪ Does the policy or programme to be funded with the earmark have broad-based support and commitment from politicians, policy makers and the public? ▪ Were finance authorities part of the discussion from an early stage? <p>Definition of expenditure purpose</p> <ul style="list-style-type: none"> ▪ Is the policy or programme to be funded by the earmark defined narrowly enough for the earmark to be enforced and broadly enough to be fixed? ▪ Does the expenditure purpose help advance certain health sector priorities without destructing from others? <p>Alternative revenue sources</p> <ul style="list-style-type: none"> ▪ Can revenue needs for the policy or programme be met through the existing budget process? ▪ Have alternative sources been explored for their revenue raising potential? <p>Impact on health sector efficiency and equity</p> <ul style="list-style-type: none"> ▪ Will the earmark improve or inhibit the government's ability to manage health expenditures, including implementing strategic purchasing approaches? ▪ Will the earmark facilitate pooling of health funds or introduce fragmentation and limit the ability to pool health funds across sources, leading to equity concerns? <p>Spending flexibility</p> <ul style="list-style-type: none"> ▪ Are mechanisms to ensure efficient spending of earmarked revenues? ▪ Can earmarked revenues be spent flexibly within the expenditure purpose, or are restrictions in place related to line-item budgets or other PFM rules? ▪ Can unspent earmarked revenues be carried forward into the next fiscal year? <p>Time horizon</p> <ul style="list-style-type: none"> ▪ Will the earmark be temporary or permanent? 	<ul style="list-style-type: none"> ▪ If the earmark is intended to be temporary, will it come with the "sunset clause" mandatory periodic reviews or transition plan? ▪ Will the revenue source be sustainable relative to the intended expenditure purpose? <p>Revenue expenditure link</p> <ul style="list-style-type: none"> ▪ Does the policy or programme to be funded with the earmark have sufficiently diversified revenue sources so it will not completely depend on the earmarked revenue? ▪ Will a release value or contingency option be put in place to reallocate earmarked funds if other urgent needs or priorities arise? ▪ Are expenditure management mechanisms in place to prevent overspending? <p>Fiscal and public financial management (PFM) impact</p> <ul style="list-style-type: none"> ▪ Will the earmark improve or impede the efficiency of the budget allocations? ▪ Will the earmark mitigate or exacerbate distortions or inefficiencies in the underlying revenue source? ▪ Have simulations and scenario testing been done to analyse <ul style="list-style-type: none"> • Impact on the health sector budget • Impact on total government budget • Broader fiscal, economic and social impact • Will the above analyses be updated periodically? <p>Managing earmarked funds</p> <ul style="list-style-type: none"> ▪ Will the funds flow through the treasury or a consolidated fund to an extrabudgetary agency? ▪ Will the institution that spends the earmarked revenues be prepared for the inflow of funds? ▪ Will the revenue fund or contingency fund be created to manage revenues in excess of expenditure needs? <p>Accountability</p> <ul style="list-style-type: none"> ▪ Have assessments been conducted at all levels of the system to ensure sufficient capacity to manage and monitor the flow of earmarked funds ▪ Can earmarked revenues be accounted for at every step, from collection to expenditure? ▪ How will the institution that spends the earmarked revenues be accountable for results or outcomes?
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Source: Author's adaptation from Cashin et al. (2017).

To bridge health and public finance perspectives, Table 11 presents a checklist with key considerations for the HIV response. Generally, regarding whether earmarking is sound policy advice for overall public finance management, there seems to be emerging consensus that it is not as it leads to the “Tragedy of the Commons”. As Tirole (2017) argues, as all seeking their own benefit leads to collective tragedy. As hard earmarking bypasses the budget, consequently, there is no or reduced parliamentary supervision. This leads to deficient democratic controls. Additionally, there is no full annual review, thereby introducing rigidities in public finance management as it heightens difficulty adjusting to short / medium / long term circumstances. Relatedly, by not transiting through the central treasury account, there is a general lack of transparency, a fact that raises governance issues. Finally, as experience elsewhere shows, there is no guarantee that earmarking will increase financing. This is mainly due to 3 main factors. First, earmarked funds are fungible. Second, earmarks can eventually be more easily reversed than a budgeted expenditure anchored in a broad social and political consensus. Lastly, higher financing at times of increasing overall revenue could be limited by the earmark.

A review of the country experiences lends credence to the above-mentioned 3 theoretical assertions. Regarding the fact that earmarking may complicate fiscal management, the experience of Ecuador in the late 1990s is informative. Earmarking of up to 50 percent of revenue (army, unions, local governments, etc.) hindered necessary fiscal adjustments (Jácome, 2004). Additionally, the experience of Latin America in the 1990s and 1980s with earmarking of central government revenue for transfers to provinces led to misalignment of revenue/expenditure, with the attendant public debt crisis (Ahmad and Brosio, 2008). Secondly, African countries (among others) best exemplify instances where earmarking reduces transparency and parliamentary controls. Earmarking of taxes for Road Funds, telecommunications infrastructure development, and airports among others have resulted in Ministries of Finance and Parliaments having no idea how funds are used. Finally, two examples best illustrate how earmarking may make reform much more difficult. In Europe, wage taxes hurt employment but remain difficult to reform because they generally finance health and social security. Additionally, eliminating taxes on investments in francophone Africa (e.g., *Patente*) is almost impossible, because part of the revenue is used to finance local governments.

The above limitations notwithstanding, I argue that there is a case for soft earmarking for the fiscal sustainability of HIV responses. There are two necessary conditions. First, there ought to be ideally, concurrent political commitment to increase tax revenue and funding for a specific purpose by the same amount. Second, open and flexible political commitment supports consensus building, improved allocation of resources, and budget transparency and flexibility. This has been the case in Guinea, Jamaica, and the Philippines which are promising experiences to this end. In 2015, in Guinea, there was a simultaneous commitment to increase tobacco taxes by 40 billion GNF and take 16 billion GNF of this revenue to improve customs enforcement (boats, motorcycles, weapons, etc.). In the case of Jamaica, in 2015, revenue from higher fuel prices partly dedicated to new energy sources. Finally, in the Philippines in 2012, there was a significant increase in health funding from tobacco taxes, while keeping annual budget controls and the possibility to reallocate funds (albeit within the health sector). It is, therefore, no wonder that Cashin et al (2017:3) argues that: *“Earmarking has been more effective when practices come closer to standard budget processes – that is softer earmarks with broader expenditures purposes and more flexible revenue-expenditure links”*.

In conclusion, from a techno-political perspective, taxation (including health taxes and excises) offers a promising policy option for ensuring the fiscal sustainability of HIV in Uganda. However, regarding hard taxes, while there is existing revenue-raising potential, it is limited, and probably not enough for a large scale increase in healthcare and HIV financing. From a broad public finance perspective, concerns on earmarking remain as hard earmarking violates many basic principles of sound budget formulation and have been and continues to challenge efforts to

strengthen budget processes, a core challenge for development and democracy. However, as shown, soft earmarking is more compatible with good budget processes. In all, a broader revenue mobilization effort is needed. This section has presented some conceptual, theoretical, and practical considerations for designing optimal taxation, including optimal enforcement. In the next chapter, I assess its feasibility and estimate the corresponding revenue-raising potential.

6.4.2.2. National health insurance

One of the options for raising additional domestic funding for HIV/AIDS services is to finance parts of HIV/AIDS services through the proposed National Health Insurance Scheme (NHIS), which is a mandatory scheme. This is more of a long-term option and as shown in Chapter 2, would therefore go some way in reducing social inequities in access to (prepaid) health services. To appreciate the implications of including antiretroviral treatment, for example, in the package offered by the NHIS, it is useful to distinguish the costs of services to PLHIV and the costs caused by new HIV infections. If the costs of services to PLHIV are shifted to the NHIS, it takes over the financial liability implied by the projected costs of treatment to members living with HIV. As a way of illustration, drawing on Haacker and Birungi (2016), for the case of Kenya, for all PLHIV in 2014, this financial liability is estimated at US\$ 12.2 billion (26 percent of GDP). In other words, if the NHIF takes on the responsibility of providing antiretroviral treatment to its membership (22 percent of the population), it assumes a financial liability of about 6 times its annual revenues, which would need to be financed from its surplus, members contributions, or a transfer (such as a subvention) from the government.

In the context of Uganda, for the optimal mix between these various funding sources, it is important to bear in mind that one of the objectives of current health financing reforms is to increase coverage of health insurance. Financing the current costs of HIV/AIDS services through contributions would mean that current and prospective HIV-negative members, through their contributions, would subsidize the costs of services to PLHIV. While risk pooling is at the core of the drive to expand the coverage of health insurance, the situation here is different, as the HIV status of people already living with HIV is a “pre-existing condition.” Moreover, financing the costs of services to people already living with HIV through contributions during the expansion of the coverage of the NHIS introduces the possibility of “adverse selection” – the package will become more attractive to people already living with HIV, but less for HIV-negative people, so a disproportionately large number of PLHIV might seek to obtain health insurance. It thus follows that NHIS should therefore be a comprehensive package for all health conditions to be appealing to all people

Additionally, a different matter is an insurance against the risk of contracting HIV (and the resulting costs), i.e., for people not already living with HIV. Here, the risk pooling argument applies, and the complications and implicit transfers from including HIV as a pre-existing condition do not arise. Finally, it is unclear how individuals not covered by the NHIS would access HIV/AIDS care and treatment. In a situation where treatment – as a matter of policy - is widely available for free, the inclusion of HIV/AIDS services in the NHIS package would simply shift treatment costs to contributors of the NHIS, who would pay for a service they would otherwise obtain for free. This cost-shifting to the private households would reduce the attractiveness of the NHIS package, and may compromise the goal of expanding access to health insurance. On the other hand, besides the operational complications, limiting free access to treatment to uninsured people would have very negative social consequences, and run against the objective of providing universal access to HIV treatment. However, given the high OOP prevalence in the Ugandan health sector, in as far as the insurance premia are less than the under-the-table OOP payments, the NHIS scheme could work even if (theoretically) care is already provided free at the point of use.

From both theory and practice, it is apparent that one of the most challenging problem in HIV/AIDS policy is how to equitably provide high-quality, affordable HIV care for all with

universal catastrophic coverage (UCC). This policy challenge is made harder still by the fact that insurance - in the traditional meaning of the term - is not an option for a large percentage of PLHIV in Uganda. They dismally fail to meet two standards of insurability. One is that an insurable risk must be the result of an unpredictable chance. In reality, though, HIV has transitioned into a chronic condition and many PLHIV individuals – owing to syndemics²⁸ - suffer from chronic conditions. Co-morbidities such as hypertension make the probability of requiring costly care for the rest of their lives tend towards unity (i.e. almost certain). The second standard of insurability is that the actuarially fair premium. An actuarially fair premium is one that is high enough to sufficiently cover the expected value of ensuing claims. This second standard states that it must be affordable. However, in Uganda, an actuarially fair premium for many people with costly chronic conditions such as HIV would exceed their entire income. This fact is made worse by the large income inequalities as represented by the worsening gini coefficient.

In the health economics literature, there are several partial solutions to the non-insurability of high-end health care risks, such as HIV. First, *guaranteed renewal*. Here, insurers are required to continue to issue policies to those who become ill, provided there is no break in coverage. Second, the *guaranteed issue*. This enjoins insurers to accept any applicants, regardless of pre-existing health conditions. Finally, *community rating* requires insurers to charge the same premium, based on average claims, to everyone in a general category regardless of their health status. A combination of the above can be used in Uganda. For one thing, as a downside, these solutions make the system vulnerable to adverse selection. Healthy individuals can elect to remain uninsured and only buy into the system when they become ill. Also, even with community rating, spreading health care costs evenly over an entire population can mean unaffordably high premiums for people with low incomes.

6.4.2.3. Enhancing efficiency of HIV response

Using recent policy-oriented work as a point of departure, in this section, I focus on the efficiency of HIV response, particularly the cost-effectiveness of and economic returns to HIV policies. In recent years, these have been greatly transformed by the arrival of highly effective ARVs and availability of these drugs at steep discounts across LMICs. The rest of the section discusses how to incorporate contract theory-informed insights into the design of efficiency-enhancing financing mechanisms.

Program efficiency

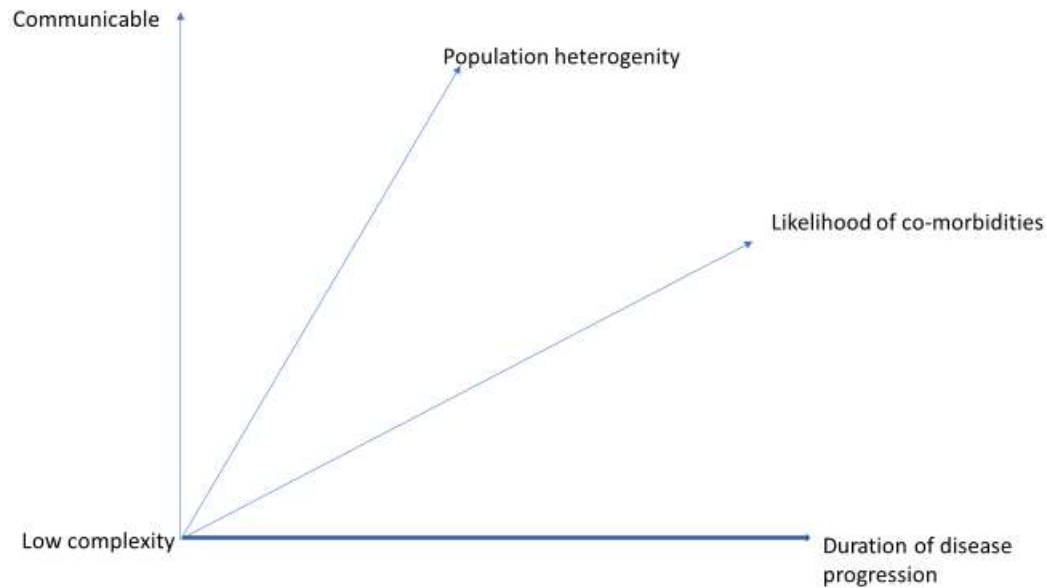
Learning from the global response to HIV/AIDS, as Vassall and colleagues (2013:5) argue, “advocacy pleas for continued funding for the HIV response will also no longer be sufficient without parallel demands for increased efficiency in their use.” The imperative to focus on (the) efficiency of the HIV response is motivated by three reasons. First, epidemiological aspects. HIV/AIDS has several properties which – alone and especially in combination – pose challenges for cost-effectiveness analysis. Second, relevance. HIV/AIDS and the attendant response have been among the dominant themes in global health and development policy over the last three decades. Finally, substance. For the above-mentioned reasons, a rich body of material (papers, well-developed underlying epidemiological and demographic models) to study how these challenges have been addressed.

However, the cost-effectiveness analysis of HIV/AIDS interventions is relatively complicated. As Figure 47 shows, HIV/AIDS scores high on these four dimensions of complexity.

²⁸ As used here, a syndemics framework examines the health consequences of identifiable disease interactions and the social, environmental, or economic factors that promote such interaction and worsen disease (Singer et al., 2017; Mendenhall and Singer, 2019).

First, like a communicable disease, cost-effectiveness analysis, needs to take into account direct effects and population-level effects. Second, as a sexually transmitted disease, infectious and tied up with individual risk behavior and social norms results in a very high degree of heterogeneity of infection risk and intensity of transmission across the population. Finally, slow disease progression implies a long lag between HIV infection and health outcomes, dynamic (population-level) effects of HIV prevention interventions unfold over long periods (decades), and the attendant long-term treatment needs and resulting costs.

Figure 47: HIV and AIDS complexity illustrated



Source: Author's compilation adapted from Haacker (2016).

HIV/AIDS has globally transitioned into a chronic disease. In other words, without treatment, asymptomatic period (usually about 5-10 years), followed by high mortality once symptoms of AIDS become apparent. Historically, steep inequities in access to treatment across countries motivated the drive towards universal access. This has now become a reality, at least where HIV/AIDS is a dominant health challenge. This transition of HIV/AIDS into a chronic disease has implications for the cost-effectiveness analysis of HIV prevention interventions. These, among others, include the fact that fewer people who become infected with HIV die because of AIDS. Moreover, those deaths spread over decades. In consequence, standard indicators of cost-effectiveness (e.g., US\$ per death averted) can look unattractive in policy evaluations. However, with disability-adjusted life years (DALYs) properly calculated, cost-effectiveness analysis still is 'fair' in comparison to other causes of disease. In contrast, the financial consequences of HIV infections (actual or averted) become more pervasive. As shown in Chapter 5, financial consequences are drawn out over decades. By extension, policy evaluations based on *current* costs are misleading (unless a very long time horizon is considered). For example, including an allowance for treatment costs saved is challenging as treatment and prevention are related (especially Treatment as Prevention (TasP)). Pragmatically, this would necessitate separating treatment costs within the policy period and spending needs beyond it.

Applied to program-level analysis, it seems simply comparing costs and outcomes over a conventional policy period (5-15 years)²⁹ is unsatisfactory as most of the consequences of changed HIV incidence occur later. Also, as earlier mentioned, explicit optimization is complicated by long lags and heterogeneity, due to many state variables and the difficulty of evaluating the endpoint of program analysis. As such pragmatic approaches aim to capture cost consequences beyond the policy period. The financial liability analysis, as applied in this thesis and elsewhere (Haacker, 2016; Connolly, 2016), is one such pragmatic approach. By way of conclusions, in terms of lessons learned, it is apparent that results tend to be highly sensitive to the time horizon of the policy period. Secondly, as shown in Chapter 5, financial liability analysis mitigates this sensitivity to the policy period. By capturing financial savings achieved by reduced HIV incidence fully, it returns lower estimates of (net) costs per HIV infection averted and produces more stratified estimates of cost-effectiveness across interventions. Thus, financial liability analysis is more efficient in identifying the potential for allocative efficiency gains. Thus, HIV/AIDS combines many factors complicating cost-effectiveness analysis (“communicable”, “chronic”, “heterogeneity” and “co-morbidities”). For these reasons (and because HIV/AIDS has been a dominant factor in global development and health policy in recent decades), a rich body of work has emerged addressing these challenges, including some explicit economic and financial analysis. Some of these issues are relevant to other health conditions.

Efficiency-enhancing payment mechanisms

Designing efficiency-enhancing payment methods are essential for the fiscal sustainability of HIV responses. Many researchers and policymakers have hypothesized that HIV financing models whereby payments are contingent on achieved and verified results - referred to as next-generation financing models in CGD (2015) - offer an opportunity to accelerate the efficiency of funding the HIV response as well as the impact on the epidemic’s trajectory. Whereas there are several typologies of performance-based financing (PBF), all do not work as efficiently, effectively, and equitably in any given setting. For example, see Figure 48. Below, drawing on economic theory, I attempt to suggest contract design features with the potential to yield more health for the money.

To attempt to answer this question, I apply lessons from the economics of contract theory by applying the economic theories of regulation and incentives to the contracts between global HIV and health donors (including domestic funding mechanisms such as the ATF) and service delivery organizations in Uganda (hereinafter referred to as recipient country in the context of ODA). As a starting point, some basic assumptions about global HIV and health traditional donors and recipients are necessary. First, as a matter of perspective, it is safe to view global health donors as entities mandated to purchase HIV services for and on behalf of beneficiaries in Uganda. Second, predicated on the notion of public sector (i.e. government) provision of health services, I adopt the assumption that the above-mentioned contractors from whom the donors purchase HIV services have monopoly and monopsony powers in the delivery of the services to their beneficiaries and their bargaining relationship with the donor(s) respectively.

²⁹ However, this period is not necessarily conventional in cost-effectiveness analyses as they do not necessarily look at lifetime horizons (at least in terms of outcomes) for those affected.

Figure 48: More impact for HIV financing: Some ways to condition payments on performance

A. Main theories underpinning results-based aid and financing

1. Pecuniary interests: Uganda will change her priorities because it needs the money promised by the results-based aid/financing agreement.
2. Attention: Generally, politicians and bureaucrats have limited time and attention span. As such, because funds are linked to outcomes, politicians and bureaucrats will pay more attention to results and manage things differently than they would otherwise.
3. Accountability: It is a truism that results-based aid/financing agreements make outcomes visible to citizens in funding and receiving countries, allowing them to hold their governments accountable for performance.
4. Recipient discretion: By linking payments to outcomes rather than inputs, funders give recipients wider latitude to design and implement strategies of their own making. Consequently, using this discretion is more compatible with responding to local knowledge, building local capacity, innovating, and adapting.

B. Incentivising value-for-money

Below is a brief strategy for improvement corresponding to four phases within most external funders' grant-making cycle: allocation, contracts, costs and spending, and performance and verification.

1. Allocation: Instead of responding to countries' requests for support of potentially non-optimal programs, the donors should create a menu of effective and cost-effective options from which countries could select what they need.
2. Contracts: The donors should revise current contracting practice to explicitly link funding to recipients' performance toward end-goals of the program, such as reduction in the number of new HIV infections.
3. Cost and spending: To stimulate yardstick competition, the donors should track the unit costs of services delivered, include that information in contracts, and publicize it to help reduce costs across the board.
4. Performance and verification: The donors should identify new, more rigorous tools to measure the effect of its partners' programs and hire an independent third party to verify the accuracy and quality of results.

C. Economics of HIV-inspired performance-based incentives for an epidemic transition

Using an incentive-based approach, HIV financiers can greatly strengthen prevention efforts, including through innovative links between prevention and treatment by focusing future HIV/AIDS prevention on six neglected strategies that show promise technically and politically. These are:

1. improved targeting of HIV prevention even in countries with generalized epidemics;
2. the mobilization for HIV prevention of the PLHIV on AIDS treatment;
3. the expansion of access to male circumcision;
4. the integration of family planning services into HIV testing and AIDS treatment facilities;
5. the use of AIDS treatment to suppress transmission to existing partners; and
6. the reorientation of HIV testing toward in-home services for couples, partially as a substitute for facility-based testing of individuals.

Source: Author's adaptation from CGD (2016), Perakis and Savedoff (2015) and Over (2013).

Han Ye (2016) and Liam Wren-Lewis (2016)'s path-breaking papers that informed CGD (2016)'s seminal work on next-generation financing models for health are instructive. Basically, under the above-mentioned assumptions, the donor's objective to ensure the delivery of quality and equitable HIV services to beneficiaries at the lowest sustainable cost is analogous to the problem of a regulator of a natural monopoly. Specifically, within the fields of mechanism design

and theory of regulation, the above principal-agent problem has received decades of attention in the economics literature. From this perspective, as CGD (2016) argues, the donor can safely be described as a “principal” and the contractor as the donor’s “agent”. By extension, given that the agent is more knowledgeable than the principal regarding the cost of quality service delivery and available opportunities for cost reduction, the relationship between the two can be characterized as one of information asymmetry. This is a major market failure.

In the first place, Han-Ye (2016) provides a broad survey of the incentive mechanisms proposed in the theory of regulation. It asks how each of the identified incentive mechanism could be efficiently adapted by a donor. In weighing the pros and cons of each mechanism, the corresponding tradeoffs between the power of each mechanism’s incentives and the cost of its information requirements are highlighted. As earlier shown in this chapter, the engagement of HIV donors in Uganda is likely to endure for a decade or more into the future. The information asymmetry highlighted above notwithstanding, it is in the best interest of both HIV donors and Uganda (as a recipient) to adopt contract designs that will enhance efficiencies and assure equitable access to quality HIV services over the long term.

On the other hand, Liam Wren-Lewis (2016) argues that contracting – at least as practiced currently - is essentially input financing with cost-reimbursement. A similar view is held by Moon and Omole (2017). This type of contract, from the agent’s perspective, has the advantage of minimizing financial risk. The challenge, however, is to find a contract design that value for money (VFM) for the donor and concurrently acceptable to the agent. To ameliorate this, a simple contract with only two payment options is proposed at the end of the contract period: 1) receive a conventional reimbursement of costs from the previous period or 2) receive a payment proportional to the number of verified units of output it had produced (up to a target output). Its simplicity notwithstanding, it provides an incremental path toward more powerful contracting with the potential to achieve up to 80 percent of the efficiency gains seen with more complex contracts.

Bringing it all together, in using the principal/agent relationship, it is plausible to consider that especially in those instances in which there are repeated contracts, the relationship could morph into a "stewardship" type of relationship in which there is a convergence of interests between the two parties. In many ways, this could already be the case for some ODA. This results in a much lower cost to the principal in terms of supervision and regulation – whereby the agent’s wish to establish and maintain reputational credibility is a stimulus for this type of relationship. To this end, the importance of risk-adjusted methods deserves attention. Specifically, contracting mechanisms for global health donors would be enhanced by more explicit consideration of the link between payments and cost variations due to either the characteristics of the beneficiaries or the quality of the services. Cid et al (2016) takes us partway in this direction and implies that, in the application, those negotiating for both the donor and the recipient selected from all of this theory and practice the best mix of contract features for the problem at hand.

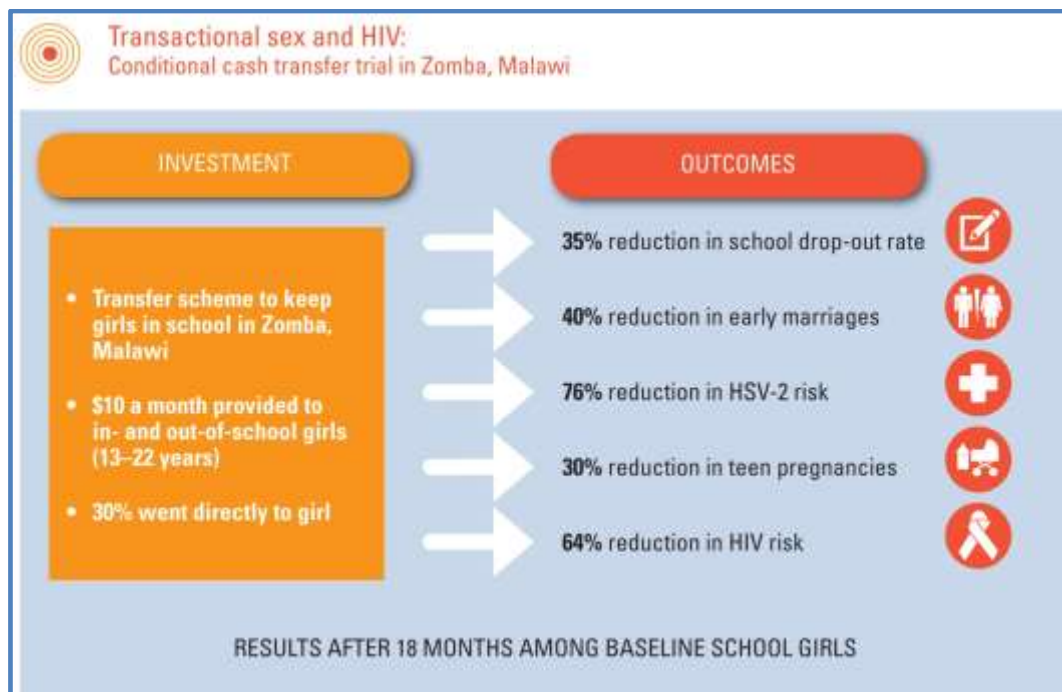
6.4.2.4. Co-financing approach: Expanding the HIV resource envelope by pooling budgets across sectors

A co-financing model is one option for expanding fiscal space for HIV in Uganda. Global evidence suggests that certain structural interventions such as cash transfers for adolescent girls and young women (see Baird et al., 2012) could effectively address the social and structural drivers of HIV such as socio-economic inequalities and the lack of social and economic incentives (see Parkhurst (2013) and Seeley et al (2012), for example) that continue to undermine the global HIV response. Yet, the HIV sub-sector may undervalue these upstream interventions, as their other non-HIV outcomes are often ignored. With flat-lining global HIV resources, it is critical to recognize these opportunities to leverage funding from payers with non-HIV objectives that have an interest in the same interventions, thereby generating synergistic efficiency gains. Although governments have

experimented with cross-sectoral co-financing in the health promotion field and beyond, there has been limited analysis to characterize these models, their operational modalities, effectiveness, enablers, and barriers.

Whereas conducting a comprehensive systematic review of both peer-reviewed, grey literature, and official policy documents, following PRISMA guidelines, as well as in-depth interviews with key global health and HIV financing policy actors to identify and analyse cases of co-financing is beyond the scope of this thesis, studies with data on interventions funded across two or more sectors (or budgets) are commonplace. Of the cases of co-financing well known, most are largely from high-income countries, though innovative models can be found in Nigeria and Brazil (Remme, 2018), among others. In terms of sectors, empirical studies are common in the health sector, the social care sector, and the education sector (Remme, 2018; UNDP, 2018). Asides from nascent work by Remme and colleagues (2014), to the best of my knowledge, there are no other known studies involving the HIV sub-sector specifically.

Figure 49: Multiple outcomes of the Zomba cash transfer to keep girls in school



Source: STRIVE, 2012 from Baird et al, 2012.

Generally, co-financing models could be characterized as pooled financing *at the source* or *post-allocation*, depending on whether resources were pooled before/after budgets were allocated to sectors or even virtually. Several cases tend to involve grants for the joint provision of multi-sectoral services for specific groups. Another common model in the academic literature is with regards to joint commissioning of services across the health and social care sectors. Interestingly, interventions are either implemented and governed by a single sector or delivered in an integrated manner with cross-sectoral accountability. In Uganda, some examples of these would include cash transfers for HIV prevention, secondary schooling, food assistance for PLHIV initiating ART. Enablers of co-financing, inter alia, include resource constraints and political relevance, while opaque roles and objectives represent barriers to success. Although there is a paucity of rigorous impact or economic evaluations, positive process measures are frequently

reported with some evidence suggesting that co-financing contributes to improved outcomes and cost-savings. One such case is the Zomba trial in Malawi illustrated in Figure 49.

In conclusion, co-financing is in an exploratory phase. Diverse models are being tested across sectors and settings. Modeling suggests that co-financing could contribute to realizing development synergies and optimizing HIV fiscal space. By incentivizing inter-sectoral action to addressing structural inequalities and barriers to care, co-financing mechanisms could contribute to the achievement of HIV and SDG-targets. This thesis – in Chapter 8 - empirically explores the potential of this policy lever in the Ugandan context. Looking to the future, ongoing work will provide real world evidence to further improve structural equation modeling (SEM) in applied health economics.

6.4.2.5. Borrowing

Here, I provide an overview of the role of borrowing (i.e. deficit financing) in financing HIV responses. Specifically, taking on from a discussion of the pros and cons of borrowing, I offer some modest recommendations and proposals on the use (and place) of borrowing in financing HIV responses. This section draws on and extends earlier work by the Haacker (2016). As a starting point, in the early years of the global response to HIV/AIDS, borrowing played an important part in financing the HIV response. However, lately, and thanks to the emergence of global health initiatives such as GFATM and PEPFAR, this has been succeeded largely by a grant-based funding model.

From a fiscal policy perspective, *per se*, borrowing does not create additional fiscal space. However, it is an important fiscal policy instrument in as far as it provides the government with additional resources earlier on, thereby effectively enabling frontloading of investments despite the binding constraint this imposes on its resources later on as the loan's principal and interest are repaid. Consequently, an increasing level of public debt service would progressively worsen the government's fiscal position by eroding its financial resources. Beyond certain thresholds, the ensuing high levels of government spending (from borrowing) would eventually become fiscally unsustainable. To this end, as a rule of thumb, high rates of borrowing to finance the government's regular operations are normally ill-advised.

Looking ahead, however, I argue that there is an economic and political case for debt financing of HIV response. Specifically, I posit that there are at least three (3) notable circumstances under which borrowing is a sensible fiscal policy of funding the HIV response by GoU. These conditions overlap, are mutually exclusive, and more than one can apply at the same time.

First, as past HIV spending patterns reveal, there have been critical junctures in the response that have necessitated rapid and large expenditures over a short period, particularly when introducing a new intervention such as VMMC or a health technology such as ART. Here, as a means to accommodate a shock to government revenues, a spike in expenditures, or both, borrowing may be a plausible policy choice to spread the ensuing response costs over a relatively long time as well as mitigate against a potential temporary squeeze in other expenditures. Such shocks may include other emerging pandemics or costs to cover a HIV vaccine. In other words, pragmatically, borrowing can be an efficient tool to manage spikes in the costs of the HIV response by spreading these over a longer period. This enables a gradual and seamless accommodation of a steep increase in costs of the HIV response. This would avoid sudden disruptions to expenditure programs in other areas.

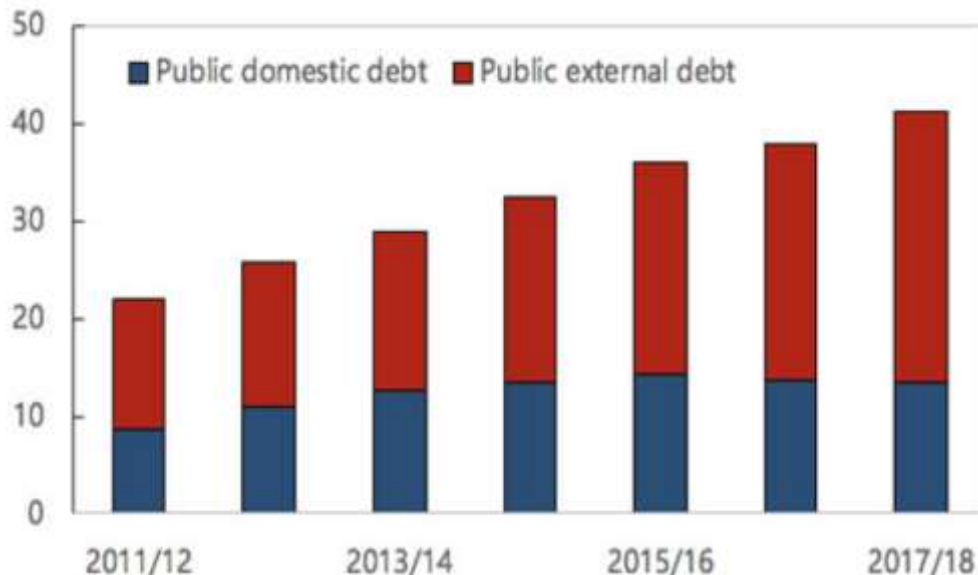
Second, the HIV response is characterized by varied inter-generational equity aspects. For example, as I show in Chapters 3, 4 and 5, the economic and other benefits of public spending to end AIDS are spread over long periods. Conceptualized this way, from an intergenerational equity perspective, deficit financing can serve as an effective means of eliciting or collecting a

contribution from some of the beneficiaries of current HIV policies, such as the next generation who – because of reduced HIV burden – would face a much-improved disease environment.

Third, the imperative to finance investments with a high rate of return is another circumstance justifying borrowing for HIV responses. Like public investments with financial returns (either directly or through increased tax revenues) that are more than enough to re-finance the initial sunk costs, HIV investments – realized through borrowing – can expand and sustain fiscal space. Improving productivity of the workforce – through access to ART - given lower burden from AIDS (see Resch et al., 2011, for example) and the attendant contributions to the national economy is one such example.

Bringing it all together, as I show in Chapter 4, the HIV fiscal sustainability challenge is linked with the issue of sustainability of public debt. This is because the implicit spending commitments under the HIV response (referred to as fiscal liabilities in this thesis) are analogous to a debt. A more extensive discussion of this point is presented in Haacker (2016). To illustrate the above point, the IMF – in her macroeconomic surveillance work - considers a public debt over 70 percent of GDP as problematic for fiscal and macroeconomic stability³⁰. Thus, by extension, an HIV “debt” of a corresponding order of magnitude is a very significant fiscal and political challenge as it necessitates fiscal adjustment required to fund these costs, say through expenditure cuts, assigning the bulk of new revenues to HIV responses among others. It is for these considerations that current DAH international practice prioritizes countries with both high HIV prevalence as well as low GDP per capita indicators. It is in these countries where the HIV “debt” relative to GDP tends to be high.

Figure 50: Public debt in Uganda (percent of GDP)



Source: IMF, 2019

Looking to the future, a debt deluge is in the offing. As shown in Figure 50, after receiving debt relief of close to \$5.5 billion from multilateral organizations and bilateral donors in the 2000s, Uganda’s public debt has been steadily growing. In addition to domestic debt, the country relied

³⁰ More precisely, the DSAs conducted by the IMF and the World Bank apply public debt benchmarks ranging from 38 percent of GDP to 74 percent of GDP for low-income countries (IMF, 2013a), and are estimated at 70 percent of GDP for emerging markets (IMF, 2013b).

initially on the World Bank and African Development Bank for financing. But the share of non-concessional loans from China has also been steadily rising in recent years. While PPG debt level remains at a low risk of debt distress, overall, debt metrics have weakened. Some public investments may not generate the envisaged RoI. Interest payments are rising. In fiscal year 2019-20, they are projected to take as much as 25 percent of revenue. This level typically only associated with countries at high risk, or in debt distress. To safeguard the hard-earned favorable debt sustainability rating, it is imperative to keep public debt levels below 50 percent of GDP in nominal terms over the medium term. In a final synthesis, I contend that a “debt storm” is gathering in Uganda as the country is on the brink of easily slipping into a debt crisis. In the (highly likely) event of another deadly pandemic that could trigger a health and economic crisis, the economy would likely collapse in the absence of rapid and large external support to weather the dual crises (colliding with HIV) as well as easing the debt-service burden.

In light of the above and given Uganda’s rising and unsustainable PPG debt, I question whether GDP-linked official lending can enhance risk management and resilience. GDP-linked official debt is a financial instrument that makes debt repayments contingent on economic conditions in the debtor nation (UNDP, 2015). By linking debt repayment to Uganda’s ability to pay, which is often shaped by external factors that are beyond her control, this innovation might offer a better chance of making inroads towards more widespread adoption of state-contingent financing. I suggest doing so by starting with external official lending as opposed to other forms of sovereign debt such as those involving private-sector creditors. Concludingly, in an exploratory tradition, it is unclear whether governments of both lending and borrowing countries would consider this type of development finance modality, as a way of contributing to improved debt sustainability and debt management, a situation that is exacerbated by HIV-induced contingent liabilities – analogous to a debt *de jure* - as shown in Chapter 5.

6.4.3. Innovative financing

As earlier discussed, DAH has plateaued and is very unlikely to rise substantially in the near future. Considering this new funding landscape, increasing reliance on domestic and innovative financing sources to fiscally sustain HIV programs in Uganda is the “new normal”. This section examines the so-called innovative financing instruments (IFIs). The World Bank (2018) defines them as “financing...that helps to generate additional development funds...enhance the efficiency of financial flows...[or] make financial flows more results-oriented”. The Leading Group on Innovative Financing for Development (2018) defines them as “[N]ew development financing [that] are closely linked to global public goods, and complements conventional...assistance”. Finally, the High-Level Taskforce on Innovative Financing for Health Systems (2012) defines them as “[N]on-traditional...overseas development assistance, joint public-private, or private mechanisms and flows that support fundraising by tapping new sources...or deliver financial solutions to development problems”. From the foregoing, it is apparent that innovative financing lacks a precise definition. They are rather defined by common objectives. These include mobilising resources outside traditional donor assistance, using self-replenishing resource pools to reduce donor-dependence, and ensuring long-term sustainability. Implicitly, they seek to compliment, but not displace or replace, traditional financing.

The Taskforce on Innovative International Financing for Health Systems (2009) provides an extensive overview of the full spectrum of innovative financing mechanisms on offer. These can provide Uganda with a menu of options to choose from. Globally, as Table 12 shows, the number of so-called innovative financing mechanisms on offer exceeds 100. However, for simplification, they can be classified into taxes, income, financial transactions, corporate, wealth, sector-specific (trust funds), etc), solidarity mechanisms, investment of dormant funds (and/or unclaimed financial assets), lottery, public to private mechanisms, matching programs, health bonds and loan financing, debt swaps, debt reduction development-contracts), impact investing (such as loan conversion and, social and development impact bonds) and, private sector participation.

Table 12: Selected examples of innovative financing options

<p>Advance market or purchase commitments Private equity investing with enhancements Angel/patient equity investing (SMEs or GBOs) Tax relief for donating key medicines Tripartite venture capital firms Market interventions for key medicines Microfinance (and tiers of support to it) Debt buy-downs (e.g.as in the polio campaign) Micro-enterprise development Result based sequences of loans/grants Blended value investing Infrastructure guarantee facility Electronic-billing based fundraising Risk insurance for natural disasters Performance-based aid Product development partnerships (e.g. MVI, IAVI, MMV, Aeras) Global health partnership institutions ((e.g., GAVI, GF, UNITAID) Franchising of primary health care or pharmacies Tobin/currency transaction tax Airline solidarity levy Taxes on arms trade Carbon/environment tax Bit tax/trade tax/etc. Initiatives to reduce tax evasion and close tax havens Trust funds for later distribution Endowments Increasing remittance benefits IMF Gold sale New special drawing rights (SDRs)</p>	<p>Public guarantees IMF's exogenous shocks facility (ESF) Social investment partnerships Reductions in demand for needed care due to high costs Concessions Incentives for continuous product improvement IP backed securities Innovative purchasing (e.g. PAHO revolving fund) Global pooled procurement Global supplier subsidies (e.g. ACT) Priority review vouchers Voluntary contribution via credit cards Cause-related marketing of products (e.g. RED) Concessional lending by foundations Aggressive use of foundation endowments Socially responsible investing 99ethical funds) Global lottery Global premium savings bond For-profit private ventures with cross-subsidy model “piggy-back” distribution systems Private finance initiatives (e.g. For UK facilities) Donor clubs for midsize philanthropists One-time donation drives (e.g. Idol Gives Back) Community insurance) risk pooling Structured investment funds Donor first loss funds Systematic analysis of existing medical products (drugs, etc) for alternative use Global development bonds</p>	<p>Bilateral aid for stabilization SWAps Risk-mitigation for private investment Programme-related investment of foundation endowments Blended capital funds International drug price negotiations (e.g. CHAI) IDA buy-downs Incubator for companies focused on neglected disease Investment fund for technology transfer Result based contracting Extension of employer health financing to broader populations Scale-up franchise model Voucher programs Social marketing Conditional cash transfers Bond issues for frontloaded programs Performance-based grants Aid-smoothing fund Binding long-term donor commitments Interest rate buy-down Cost-sharing of clinical trials Scientific risk insurance Development of business cases for investment Other risk insurance (e.g. crop prices) “use your balance sheet more” (for IFIs) Local currency lending Guarantees from bilateral or IFIs Enhanced management of voluntary giving International finance facility (IFF and IFFIm)</p>
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Source: Author’s adaptation from de Ferranti et al. (2008)

Specifically, this section conducts a rapid appraisal of a selection of innovative financing mechanisms and examines 'good practices' in designing and implementing them. This selection is informed by the author's assessment of the options against the following six (6) criteria: 1) positive impact on HIV outcomes (access, equity, quality of life); 2) the potential volume of additional finances; 3) replicability and scalability; 4) cost-effectiveness at scale; 5) sustainability and predictability; and 6) feasibility, ease, speed and transaction cost of implementation. These criteria, detailed in Table 13, were arrived at drawing on literature (de Ferranti et al., 2008; Fryatt, 2012; Atun et al., 2012; Atun, Silva and Knaul, 2017).

Table 13: Checklist for technically assessing innovative financing mechanisms in Uganda

No.	Assessment criteria	Score (1 – 5)*
1	Additionality: Can innovative financing instrument generate additional resources for HIV, health and development?	
2	Scalability and replicability: Can innovative financing instrument be scaled up and/or initiatives replicated in other contexts?	
3	Results for development: Can innovative financing instrument deliver concrete HIV, health and development results?	
4	Sustainability: Is innovative financing instrument sustainable over the longer-term?	
5	Aid effectiveness: Can innovative financing instrument accentuated issues related to fragmentation and coordination in international aid delivery?	
6	Aid effectiveness: Either add to or improve the quality of revenues originating from official sources such as Official Development Assistance (ODA).	
7	Country ownership: Can innovative financing instrument strengthened country ownership of the development process	
8	Ease of launch: Is the IFI hard to make happen?	
9	Sufficiency: Is the IFI sufficient to address the challenge?	
10	Reliability: Is the IFI offering a reliable solution?	
11	Economy: Does the IFI have high transactions costs?	
12	Fiduciary risk: Is the IFI at risk of "Splash and Fade"?	
13	Ease of running: Is the IFI straightforward to continue once started or ties up scarce capital?	
14	Revenue generation potential: Does the IFI have potential to generate large volume of funds	
15	If adding to ODA then the additional revenues must be raised via a suitable financial engineering scheme.	
16	Effectiveness: how the mechanism can ensure a better use of funds.	
17	Additionality: added value of the mechanisms once they are implemented	
18	Pro-poor: Target the poor or is it progressive (i.e. wealthy pay more)?	
19	Potential flows: What is the estimate yield?	
20	Timeframe: How long to implement and have impact?	
21	Political support: Does it have powerful sponsors?	
22	Value added: Does it bring additional funds or results?	
23	Technical feasibility: What are the known obstacles?	
24	Accountability: Does it foster transparency?	
25	Results: Will it yield results that can be monitored?	
26	Externalities: Are there potential good or bad side effects?	
27	Predictable: Will the funding be stable or volatile?	
28	Ownership and alignment: Does the initiative support national priorities?	
29	Sustainability: Can it be maintained in the long run?	
30	Additional: Will it crowd out existing sources?	
31	Costs: What is the cost of setting up and running?	
32	Sustainability and predictability: Is the IFI predictable in the medium to long-term?	
33	Side Effects: Does the IFI have side effects?	
34	Experience: Is there documented evidence of effect?	

Source: Author's compilation.

* Each financing instrument was assessed against these criteria, with each criterion given a score of 1 (very poor) to 5 (very good).

From the onset, the use of the term 'innovative' is contested. This is because the number of the hyped 'innovations' are not necessarily new let alone innovative. Some simply constitute regressive forms of taxation. For this study, I consider all non-traditional sources of financing for HIV responses to fall within the category of 'innovative' sources of financing. This particularly applies to those sources of financing that are implemented as shorter-term solutions to HIV responding funding needs while governments work to expand the tax base. The selected 'innovative financing mechanisms' are clustered into four categories: public sector revenue, capturing global resources, mechanisms to manage risk, and mechanisms that leverage citizen or private sector resources. Below, I critically assess seven (7) innovative financing mechanisms that are rated highly from the above-mentioned technical assessment, thereby signaling the potential for adoption in Uganda.

1. AIDS trust fund: See § 2.3.4 for an extensive analysis of the role of ATFs. As I show in Chapter 7, this may be one option for capitalizing the proposed NHIS (and consequently financing HIV program costs).

Whereas Kenya, Uganda, and Tanzania have or are establishing a trust fund, lessons from the Zimbabwe NATF are critical at this juncture to inform design features. The effectiveness and additionality of the above-mentioned AIDS levy largely depend on the macroeconomic climate of the formal sector. Specifically, the efficiency of the collection process is tied to the government revenue collection agency, the Zimbabwe Revenue Authority (ZIMRA). Particularly, ZIMRA's efficiency in assessing, collecting, and accounting for revenue is a key determinant of the AIDS levy's revenue raising potential. To date, there has been no rigorous evaluation of the NATF to offer lessons for countries establishing Trust Funds. Also, at the time of submitting this thesis, AIDS levy revenues have been grossly eroded by inflation since the end of the multi-currency and introduction of the Zimbabwean Dollar (ZWL) vide Statutory Instrument 142 of 2019 that came into force on 24 June 2019.

2. Remittances levy: To implement this, it is proposed that a levy is imposed on international remittances. Various proposals have been advanced to charge a small fee on all money transfers from abroad. This would then be channeled to finance HIV services. These remittances can formal or informal, depending on the channels through which they are made. Here, formal channels include domestic and international banks as well as money transfer service providers such as Western Union®, World Remit®, and Money Gram® among others. Overall, these are characterized by high transaction costs, exclude the "unbanked", stringent exchange controls and, the associated clearance times for money transfers are relatively long, thereby dampening the scope of money transfers. Informal channels encompass money sent through trains, boats, or cars across borders or that carried by migrants themselves or their families and friends. The above informal channels have both advantages and disadvantages. These, *inter alia*, include the generally lower costs. This is so because they easily evade official government taxes. Also, they do not require lengthy documentation. However, they are less reliable. Also, they are extremely difficult to monitor.

Consequently, considering the above considerations, this financing policy option would only effectively impact the formal sector transactions. However, this additional cost to transferring money may lead to a shift away from formal to informal channels. There are externalities associated with this. However, it is possible that if the diaspora is aware that the revenue from the extra charges are channeled to improve health in the countries of origin, they may be sympathetic. This could mitigate the shift towards informal remittance channels. The above notwithstanding, the importance of fully researching this policy option cannot be underestimated. Remittances are a key flow of funds to developing countries. They are now the largest source of external financing in LMICs (excluding China) (World Bank, 2019). They thus have potential to fill the HIV financing gap in Uganda.

In conclusion, in introducing such a policy change to remittances, caution must be exercised. Remittances are a safety net in times of hardship such as during economic downturns and pandemic outbreaks in countries of origin. In countries with large OOP health expenditures, remittances cushion individuals and households from catastrophic health expenditure. Relatedly, they prevent poor families from slipping into extreme poverty. They provide a vital source of income for the population.

3. Currency Transaction Levy (CTL) or Financial Transaction Tax (FTT): In its simplest form, a CTL is a tax on currency transactions. It is usually implemented nationally on a mandatory basis. Operationally, the levy can be collected on all trades using that country's currency worldwide by large-scale foreign exchange settlement systems, such as the Society for Worldwide Interbank Financial Telecommunication (SWIFT). Whereas there is no empirical basis for an applicable rate, most current policy proposals assume 0.005 percent tax and as a complement to DAH. However, as the Uganda Shilling plays an insignificant role in foreign exchange transactions, it is highly unlikely that this mechanism would raise substantial resources. Currently, this policy option is used in Argentina, Brazil, and Zambia. It is projected that India could raise US\$ 370 million per annum from a 0.005% levy. The next chapter estimates revenue-raising potential.

4. Consumption taxes: These are variously used. First is resource taxes as currently imposed in Botswana, Lao PDR, and Papua New Guinea. Luxury Taxes are applied in China, Bulgaria, and Viet Nam. Ghana and Chile have VAT for health. VAT is a broad-based consumption tax. Generally, consumption taxes tend to be popular. However, as leisure is often not taxed, consumption taxes may inadvertently disincentivize work. Tax design differences notwithstanding, consumption taxes such as VAT are often passed down from business to consumers. This can have a negative impact on low-income individuals and households. Ghana National Health Insurance Levy (NHIL) is financed by, among others, a 2.5% earmarked mark-up added to VAT. This, in turn, funds almost 70% of the NHIS. It is important to note that the NHIS is a pro-poor fund to reduce financial barriers to care. According to Akazili and colleagues (2012), between 2005 and 2009, it generated 751,359,211 Ghanaian cedis (GHC). Generally, consumption taxes are considered progressive. Many goods and services consumed by low-income individuals and households are exempted from such taxes.

5. Debt swap: 'Debt2Health' is one such example. It is a partnership between two countries. The creditor country cancels a bilateral debt in exchange for the debtor country to re-invest the equivalent amount of the cancelled debt in health. This could take the form of HIV projects through the GFATM. To this end, it helps channel resources of developing countries such as Uganda with high debt and disease burdens away from debt repayments towards life-saving investments in health. As has been recently innovatively used by the GFATM, donors grant debt relief in exchange for a commitment by the beneficiary country to invest an agreed counterpart amount in its national health programs. This is usually through an approved GFATM grant. As an innovative financing initiative of the GFATM, as of the end of November 2017, total debts swapped under Debt2Health agreements plus one framework agreement total close to 200 million Euros. This has been largely supported by Australia, Germany, and Spain. In operationalizing this, almost half of the above-mentioned amount was paid to the GFATM for investment in the beneficiary countries through the standard GFATM processes and systems. The other half was unconditionally written off by the said creditor countries. Whilst not much money is being raised at present through this instrument, it is highly feasible for Uganda and could be scaled-up easily.

Relatedly is the debt conversion instrument. It has features somewhat like a "debt swap". Here, a loan is provided to a developing country to implement a program. Upon

successful implementation of the funded project, the credits are repaid. Put differently, buy-downs convert credits to grants. This is often with conditions. Operationalizing these debt conversion instruments involves using a combination of schemes. Three (3) of these features prominently in economic literature. Bilateral conversion is one such scheme. Here, the lender simply cancels all or a portion of the loan or credit, upon successfully meeting the conditions for cancellation/forgiveness. The second one is the trilateral conversion. Under this scheme, the lender cancels or forgives all or part of a loan with the expectation that the debtor invests that portion in a multilateral institution such as the GFATM. The last scheme is where a third-party donor purchases all or part of a loan. This can either be conditionally or unconditionally. Also, largely due to the inclusion of additional institutions, the execution of the debt arrangement must occur ex-ante.

There is a growing experience with this policy instrument. Botswana's National HIV/AIDS Prevention Support (BNASP) buy-down of US\$ 50 million by the International Bank for Reconstruction and Development (IBRD) is one of the most prominent ones in recent memory. It was used to address implementation gaps in the domestic HIV response. The BNASP program also supported the implementation of a new national operational plan (NOP) for scaling-up HIV combination prevention. Through support from the European Commission, a buy-down of US\$ 20 million was later introduced. This sought to reduce HIV incidence (and consequently prevalence) among young adults. Specifically, the conversion was predicated on the national HIV program meeting key performance objectives and attendant indicators.

6. Mobile phone 'airtime' or telecommunications levy: From fundamental economic principles, a levy could be imposed on incoming and/or outgoing mobile phone calls. The first-order condition is that this levy should be sufficiently small not to distort demand. As there is very limited experience with this policy instrument, there is uncertainty around suppliers and consumers' response to a telecommunications levy. The introduction of an additional cost to using these services may have a detrimental impact on these services. This could more widely impact the economic development of these countries. This has happened in Uganda with the introduction of a tax on over-the-top (OTT) services (popularly known as the social media tax). A recent report found that such taxes are regressive. They penalize the poorer sections of society (Policy, 2019). It thus follows that by lowering taxes on mobile phones, millions of people can afford their usage. This increases the governments' receipts. Some countries such as the Philippines, Kenya, Zimbabwe, Uganda, Gabon, Ghana, Republic of Congo, Senegal, and Burkina Faso have or are contemplating the introduction of a telecommunications levy, despite the severe criticism this has elicited primarily due to its potential impact on the mobile phone industry and the knock-on effects on citizens' access, usage, income, and productivity. Furthermore, there is growing evidence that this tax places a disproportionate burden on the poor, particularly those in the lowest income quintiles. To this end, as a result of these complex factors, this option needs further and careful exploration before a decision is made. It is worth concluding that some options, like this one, should be off the table for now especially given the number of different possibilities and the need to focus on the most promising ones for Uganda.

7. Guarantees: These catalyze private financing. They do this by mitigating risks. Such risks include those of a political, contractual, or regulatory nature. These have their origins in the World Bank Group (WBG). By 2013, over US\$ 4.5 billion had been provided as 37 guarantees across at least 30 countries. Technically structured as Partial Risk Guarantees (PRG), Partial Credit Guarantees (PCG), or Policy-Based Guarantees (PBG), these guarantees were sourced from various "arms" of the WBG. These are the International Development Association (IDA), IBRD, International Finance Corporation (IFC) and the Multilateral Investment and Guarantee Agency (MIGA). Without obfuscating, in simple terms, PRGs support private sector investment. This includes public-private partnerships in health (PPPHs). On the other hand, PCGs support commercial borrowing in support of public investment

projects. Lastly, PBGs support commercial borrowing for budget financing or public sector reform programs. However, in terms of eligibility criteria, whereas PRGs are available to all IBRD and IDA countries, PCGs and PBGs are only available to IBRD-eligible countries. Besides multilateral development banks, private foundations such as the BMGF also provide guarantees.

Guarantees are beneficial in many ways. First, substantially reducing the default risk, this financing policy instrument helps improve the potential of a given country to secure loans. This stimulates additional investment. Second, guarantees can reduce the cost of capital. This is due to relatively lower interest rates afforded to the borrowing government via the guarantor's creditworthiness. A case in point is the World Bank's AAA rating. Third, governments are enabled to share the risk with the private sector for certain projects such as those implemented in the context of PPPs. Cognisant that all that glitters is not gold, guarantees create risks to guaranteeing entities. Additionally, the ongoing global economic crisis may further limit the potential for expanding the above-mentioned guarantees. The World Bank Group – through both IBRD, IDA, IFC, and MIGA guarantee – has mobilized over US\$ 2 billion for the African region. While these have not been direct to HIV or the health sector, given the multi-sectoral nature of HIV and AIDS, it is safe to argue that the HIV response has benefited. Explicitly though, and by contrast, the BMGF has issued credit enhancement guarantees. These seek to enhance the affordability of health technologies such as vaccines. Finally, as earlier analysed in this Chapter (see § 6.4.2.5), borrowing increases future financial liabilities for countries. As such, intuitively, by guarantees reducing the cost of borrowing, they can correspondingly significantly reduce the cost of servicing the debt burden. The benefits of guarantees can be further augmented if countries demonstrate economic returns from HIV treatment/prevention programs. This can be via reduced HIV incidence and enhanced labour productivity that benefit the economy.

6.4.4. Leveraging the private sector

The private sector's contribution to financing the national HIV response in Uganda remains dismal. As used here, the private sector refers to firms. I explore the role of corporate social responsibility (CSR) and bonds. In some high HIV prevalence countries such as Uganda, business coalitions have been formed to strengthen private sector responses to HIV/AIDS. As OPM (2012) notes, many businesses are voluntarily initiating workplace programs. Between countries, the level of investment widely varies. From private sector mainstreaming through CSR, it is estimated as much as an additional 0.15% of GDP per annum could be raised for financing HIV responses. Mauritius has a law mandating registered companies to contribute 2% of their book profit to CSR. This finances social services, including health and HIV. Relatedly, Indonesia has passed laws requiring private sector businesses to implement CSR programs, both inside and outside workplaces. However, as can be expected, mandatory CSR is fraught with challenges. Waagtstein (2011) documents growing opposition to this within the business community. They argue that the law is a deterrence to investment. They view it as a "philanthropy tax". In the case of Indonesia where no amount or types of programs to be set up with the said CSR allocation has been specified, it is hard to regulate compliance with the law. Finally, the legislation does not specify management, beneficiaries, or governance of the funds. I posit that there is scope in Uganda for such as CSR tax.

Secondly, in terms of bonds, for this chapter, three types of bonds are distinguishable: diaspora, social, and development impact bonds. First, a diaspora bond. This can be developed and floated either directly by a government or a state-owned bank. It can be set up to raise revenues continuously (annual issuance) or on an on-demand basis (opportunistic issuance). Also, it can take the form of a non-negotiable fixed-rate or floating-rate bonds. A variant of these is one denominated in multiple currencies. Fixed-rate bonds are inherently less volatile. They thus provide increased predictability to financing. Diaspora bonds are

beneficial to issuers in many ways. First, due to investors' "patriotic motivations", the issuer could conceivably offer a lower rate of return. This would, in turn, enable them to gain a "patriotic discount". Second, by creating a new funding source, they offer the issuer an opportunity to improve their sovereign credit rating. Benefits accrue to the investor as well. Besides enabling meeting personal motivations, they offer the flexibility to receive interest and principal in issuer currency. This can then be routed to meet liabilities in the issuing country, the country of origin of the investor. In practice, there are a few notable examples where these bonds have been used to good effect. In 1991, India's diaspora bonds were used to offset the country's balance of payment (BOP) crisis. Most notably, the Israeli diaspora bonds have financed various public works. These include seawater desalination, housing construction, and communication infrastructure. Though this comprehensive review does not find evidence of their use in HIV and health programs, there are numerous proposals of their use for these purposes. The characteristics of these instruments suggest that it could be a viable source.

These characteristics specifically in relation to Uganda, *inter alia*, include home-bias, impressive returns on investment, and patriotic discount. First, home-bias would encourage Ugandan citizens in the diaspora to view these bonds as a special opportunity to contribute their quota to the development of their home country, Uganda. Second, diaspora bonds can be very attractive. They offer high RoI. In contrast with entrusting their monies with relatives at home, these bonds serve as an opportunity for local investment. In Uganda, it is generally believed that relatives tend to sometimes make rather liberal use of diaspora relatives' monies. Third, they are usually shielded from harsh economic environments at home. For example, they are less sensitive to currency risk. Depreciation makes them relatively wealthier. Finally, the patriotic discount is an appealing feature. Diaspora is often more willing to purchase their home government's debt. This would make debt-raising relatively cheaper. It would also offer a more stable source of foreign exchange for Uganda. Unlike foreign direct investment (FDI) or portfolio flows, diaspora funds tend to be consistent across business cycles. As they usually have ears on the ground, the diaspora is less likely to flee with their capital at the slightest hint of trouble. Finally, similar to Eurobonds which is a form of external financing, it would minimize domestic investment crowding out.

To move from theory to practice in Uganda and make the diaspora bond proposal to work, the economics and politics must be right. Importantly, I argue that diaspora meaningful participation in the development of Uganda's economy and society exists in the space between investing and charity. To this end, framing will be important when marketing the bonds. For example, framing the diaspora bonds purely as an investment opportunity may erode the patriotic discount. On the other hand, framing them as a purely 'social good' may result in failing to convince people to substitute sending remittances back home to family. Worse still, and fueled by the diaspora general distrust of the Government of Uganda, if the diaspora bond is designed and floated as too uneconomic for potential investors, they are likely to turn away. To fix these and strike a balance, two factors are needed. The first is to tap into the diaspora's desire to stay connected to their home country. The second is to present a viable bankable project they can easily back.

On the other hand, social and development impact bonds are the other classes of bonds. They are a results-based financing mechanism that yields a financial RoI for private investors. This is based on improved social and development outcomes. In the case of a social impact bond (SIB), the government repays investors. However, for the development impact bond (DIB), the donor, development agency, or a philanthropic foundation repays investors. Generally, theoretical and empirical developments in the analysis of SIBs suggest that the jury is still out. Uncertainties remain regarding their relative effectiveness. Cautionary narratives have tempered the initial hype and excitement (Fraser et al., 2016). However, preliminary

independent impact evaluations suggest that SIBs are starting to produce some of the expected outcomes (Gustafsson-Wright et al. 2015).

Finally, more recently, impact bonds have gained prominence. They not only attract but also “crowd in” additional private capital to address social challenges. They offer the potential to maximize impact while protecting the issuer against risk. This may result in overall cost savings in implementing social programs with proven efficacious interventions. Usually, these need to fall within investor risk thresholds. In the health sector (and the HIV response for that matter), these bonds are most appropriate for preventative rather than treatment interventions. The cost of the latter should be met from operational budgets. As a best practice, borrowing through the above-mentioned bonds should be used to fund strategic investments and not operational expenditures. This raises ethical issues. Particularly, the ethics of targeting interventions with easy to measure outcomes rather than those with the potential to meet the most need is debatable.

While SIBs have proven successful in non-health sectors, such as education and housing, they are yet to be implemented at scale for HIV prevention and control. Several case studies show potential for their application in the health sector. This includes the implementation of TasP and TB programs in eSwatini. The same is true for malaria control programs in Mozambique. Another notable application is one where the United Kingdom’s Department for International Development (DFID) launched U.K.’s first DIB. Launched in April 2014, it seeks to invest in the prevention of sleeping sickness (or *human African trypanosomiasis*) in Uganda. The bond is designed to purchase veterinary drugs to treat infected cattle before the disease spreads (Berndt and Wirth, 2018). The Mozambique Malaria Performance Bond (MMPB) is a DIB. It addresses the funding gap for malaria interventions. It is a partnership between the government, the development consultant group Dalberg, the South Africa-based restaurant chain Nando’s, and the mining company Anglo American. In terms of the terms and conditions underpinning this bond, if the malaria interventions reduce incidence rates by 30 percent or more by year three, the MMPB will repay investor principal with 5 percent interest. If the interventions are ineffective, investors are repaid 50 percent of their principal, with no interest and funders no expected further commitment (Goodbye Malaria, 2014).

6.5. Discussion

The objective of this chapter is to identify and analyze the options variously used, including those with the potential to enhance the fiscal sustainability of HIV response in Uganda. To this end, two bodies of literature were reviewed – the literature on the use of these options in HIV financing, and the evidence on their potential use in public finance in Uganda. The review shows that the identified financing instruments are highly relevant for long-term financing of the HIV response in Uganda, with direct and indirect impacts on ending AIDS and other Global Goals and targets. The ensuing multiplier effects make them essential elements of the strategies that Uganda will need to design, reform, and implement as appropriate.

Uganda is committed to fast-track and make “the end of AIDS” real. This has heightened the search for more effective ways to accelerate progress. This has, in turn, spawned intense interest in exploring innovative ways of financing the national HIV response. Some of the most prominent mechanisms explored in this chapter are new or newly re-cast, financial instruments. However, some are not new. Others have broader relevance than health alone. Calls for debt relief for “risky-middle” countries is one such example. At the heart of these financing mechanisms, while they are not meant to be a substitute for traditional sources of DAH, they do have the potential to generate additional and sustainable revenues. These could then extend the impact of existing resources.

ODA for HIV is under pressure, largely as a consequence of an ongoing global shift from a unipolar to a multipolar world; economic crisis and low growth rates in Europe, US (who have traditionally provided the bulk of external HIV funding); rapid growth in other countries and regions; and the price of “democracy” which has resulted in less popular support in many traditional donor countries. The economic analysis in this chapter - by offering new ideas about how to strategically shift away from cost-reimbursement and / or input financing, to one where payments are made for verified outcomes to improve VFM - contributes to the broader economics literature on PBF. It is hoped that it spurs the growth of literature on the application of economic theory-informed and efficiency-enhancing mechanism design to HIV financing and global health generally.

Regarding innovative financing mechanisms, these hold the potential to raise additional and sustainable revenues to finance HIV responses. However, owing to economic and political constraints, actual revenue-raising capacity is limited. To date, overall, they have only made a very modest contribution to domestic financing for HIV responses. This is due to several factors. For example, concerning health taxes, some scholars and policymakers hold the view that they are regressive. As such, these types of taxes should therefore be implemented with caution. Such key issues that need to be considered include a comprehensive understanding of their respective impact on the economy, health, and the equity implications of the same. HIV (and health) financing is not simply about raising more money. It is as much about ensuring that revenue collection and spending is progressive. McIntyre and Meheus (2014), however, challenge this view. On the contrary, they argue that general wage-based taxation offers the greatest potential for progressive taxation. However, they admit that “where informal sectors are large, it is difficult to rely on wage deductions to raise government revenue.” To this end, they posit that “forms of indirect taxation are simpler to collect and serve as a means to ensure that everyone contributes pending the growth of the formal sector”.

The revenue-generating potential of the so-called innovative financing mechanisms continues to be consistently revised downwards. As such, while a valuable addition to the domestic economy, the funding generated through innovative financing instruments can merely serve as complementary to and not a replacement of the other sources. They are significantly insufficient to finance the required scale-up to end AIDS as well as other key objectives such as UHC and GHS. They can be particularly useful though. This is more so in contexts where the tax base is so small as to limit the effectiveness of traditional taxation as a source of public financing for health. However, such mechanisms cannot constitute the core of the DRM efforts or efficiency improvements to achieve development and health objectives. Rather, they out to be viewed as temporary gap-filling measures until overarching tax policy reforms are put in place and implemented. To this end, directly considering political economy issues that can play an important role in the decision to pursue such policies, as variously signposted throughout the chapter, offer practical guidance on pointers and factors for Uganda to consider before deciding whether to increase the use of innovative options need to be considered.

As shown in this chapter, the impact of earmarking on the level of funding for HIV/AIDS is found to be problematic. Besides being highly context-specific, it is largely dependent on a country’s political priorities and budget processes. Aside from the political economy considerations, this chapter shows that earmarking should not be relied on to provide significant and sustained increases in financing for the overall HIV response because initial short-term increases in resources can be quickly offset by reductions in other sources of revenues. Additionally, rigidities in the budget process can also become constraints on the efficient allocation of resources as sector priorities and needs evolve. As a result, a measured approach needs to be taken in considering earmarking as a component of a comprehensive

domestic resource mobilization effort. It is, however, important to note that these revenue considerations are different from other reasons to impose or increase “sin” taxes (for public health reasons), such as for tobacco, alcohol, ultra-processed foods, or sugar-sweetened beverages. For example, the primary objective of increasing alcohol taxes is to encourage heavy drinkers to reduce or quit altogether and discourage non-drinkers from starting. I posit that, in and of itself, this is a sufficient argument to raise such taxes in Uganda. As WHO (2015) shows, the evidence that increased revenues for health from earmarked taxes are sometimes offset by reductions in other revenue sources is not an argument against such public health taxes. It is, conversely, an argument for not letting the revenue impact of any one tax cause us to lose sight of the “big picture” and the need to engage in the overall level of public revenues coming to the health sector.

Finally, many analysts, experts, and countries have long bemoaned the issue of “silos” in health systems: different programs having their arrangements for funding, procurement, information, and sometimes even HR and service delivery. What has not been done, however, is to develop an approach to going beyond complaining and seek to analyze the problem systematically in a way that can become the basis for a reform agenda. The framework for analyzing and acting on improving the efficiency of the HIV response presented in this chapter aims to do just that. I contend that growing attention to the issue of sustainability and transition from aid requires us to not merely focus on increasing domestic revenues but also to improve the efficiency of health system resource use. On both sides of the sustainability issue, we need to take a system-wide perspective. This means, on the revenue side, every disease does not deserve its tax (we look at the broad fiscal framework and scenarios, and avoid things like “fiscal space for HIV” or “fiscal space for malaria”, etc.). The approach is grounded in one of the fundamental implications of UHC, which is to take a whole population/whole system approach as the unit of analysis, rather than that of the program. So for example, a country may have very well-organized programs for HIV, TB, immunization, etc., but if each has its procurement system, own information system, and own financing streams, the efficiency of the overall system is compromised (think of a parallel with multiple health insurance schemes). Though the focus is on the special nature of HIV and specific HIV financing mechanisms, the approach put forth in this chapter takes a system-wide approach.

This chapter has brought to the fore so many new concepts. Attendant new proposals have been advanced. Yet, so many new and old problems persist. They remain to be solved. Relatedly, so many questions have poured forth. These have been motivated by the quest to understand how everything fits together to address the HIV financing dilemma in Uganda. It remains unclear which options are right for Uganda. What is not in doubt though is that this chapter, in the tradition of ideation, has advanced very promising new nascent ideas. These deserve attention. I hope that the exposé in this chapter has shed more conceptual clarity. Confronted with tough policy choices as the national HIV response seeks to realise fiscal sustainability, the analytical tools I have presented here ought to help interested parties find a way through the complexities. In this chapter, I largely draw on lessons from the economics of contract theory. Without unnecessarily claiming to be exhaustive, I have outlined a more indicative list of the published work. As a next logical and useful step, I propose extending the search to more languages, over a longer time frame. Also, this would necessitate searching the grey literature in greater depth. I hope that it will serve as a useful resource for actors at forefront of the quest of getting more money for HIV and more health for the money. Certainly, this calls for consistently and constantly being conscious of the need for some sort of framework and guide. This would, among others, aid an understanding of the options. This would serve as a springboard to make informed decisions about the same.

In conclusion, by exploring the long-term institutional responses and mechanisms and providing an analysis of demand and supply economic and political factors underpinning the

development and use of financial instruments, the present study contributes to the literature in three areas. First, on the methodological side, anchored in an idealized social and solidarity economy (SSE), this methodological advance of analyzing health financing grounded in the economics of contract theory has the potential to re-orient and transform global economies and thus build a fiscal and socially sustainable funding model for HIV/AIDS. Additionally, in the tradition of applied economics, this chapter contributes to the literature on the application and design of efficiency-enhancing financing mechanisms in global health. Second, this study summarizes the latest available evidence regarding different aspects of financing HIV responses. As applied to HIV/AIDS, the concept of sustainability has largely advanced at the practical political level and less so at the conceptual and theoretical levels (Haacker, 2016; Whiteside and Oberth, 2016). Thus, this chapter re-defines the problem of fiscal sustainability of responses to HIV/AIDS – in light of IPF theory and practice. This serves as a springboard for developing a more systematic analytical framework that allows us to analyze which public policy instruments are best suited to prevent and correct risks of dual-factor - market and state – failure and the institutions that govern it.

6.6. Conclusion

Ending AIDS in Uganda will require significant and fiscally – and politically – sustainable investments in the HIV response. Yet this bold ambition to end comes during a period of plateauing DAH. Considering a rapidly changing health financing landscape, if Uganda is to raise the additional resources required to achieve its ambitions, significant new revenue will need to be raised from domestic sources. This will also call for making current mechanisms work better. Uganda's remarkable economic growth has been resilient over the previous three decades. This provides a ray of hope that at least some of the required resources can be funded domestically. This chapter has identified mechanisms to complement existing DRM mechanisms in Uganda. Through the inter-related concepts of fiscal, budgetary, and policy space, this chapter has shown that HIV financing is not simply about 'raising more money' to 'fill a funding gap' in the national HIV response. It is as much about ensuring that DRM and spending is progressive. I also find that ensuring that resources for HIV are pooled is critical. Primarily, this study has highlighted that the sources of fiscal space for HIV in Uganda. Also, it has underscored the fact that the design of an HIV/AIDS program, the financing burden, financial sustainability, and the modes of financing are interrelated. Relatedly, the findings in this chapter have wider implications for improving the efficiency of HIV investments. For example, the contract designs discussed here could be used to inform the structuring of the contractual relationship between a donor and a recipient – be it a government or non-governmental organization (NGO). The lessons from the economics of contract theory are transferable to other sectors.

Additionally, I have argued that fiscally prudent economic management requires the pursuit of fiscal sustainability of the national HIV response. This needs to be foregrounded in the local economic context. Also, what is not under dispute though is that the financing needs of the HIV response will remain substantial for many years to come. Current commitments are becoming increasingly out of line with future fiscal liabilities. To ameliorate this, a change in the economic approach is required. Taking on from increased domestic funding, improvements in efficiency and identification of innovative new funding streams are needed. Also, for organizations providing HIV services, this study implies that they must critically examine and justify their corresponding unit costs and priorities. They also need to become increasingly involved in strengthening RSSH, and find ways to simultaneously support accountable democratic governance to achieve wider development objectives. Lastly, there is a need for a renewed and compelling economic case. This, though, needs to be grounded in political and social realities. This way, a reinvigorated HIV response and a sustainable, long-term national and global financial commitment to ending AIDS can be achieved.

Chapter 7

A novel approach to the fiscal sustainability of the HIV/AIDS response in Uganda

7.1. Introduction

The main aim of this thesis has been to develop a novel approach to fiscally sustainable long-term financing of the AIDS response in Uganda. It is presented here and seeks to improve our understanding of how to “diagnose” AIDS-related long-term fiscal sustainability challenges, rationally “prescribe” ways forward, and inform strategy and public policy to “treat” the malaise induced by the above-mentioned challenges within a fiscal policy framework. I refer to this organizing framework of analysis and action as the Diagnosis, Prescription, and Treatment (DPT) Framework. Built around the different theoretical functions of health financing policy, the key distinguishing elements of this novel framework is its reliance on a set of core principles, behavioural economics-inspired, explicit political analysis and, a game-theoretic approach to address fiscal sustainability challenges.

The strategic approach implicit in this Framework is motivated and informed by four (4) inter-related considerations. First, it builds on the health financing sub-functions and policy areas (see § 6.2). From international experience, there are several guiding principles for strategic action to progress towards fiscal sustainability of HIV responses. However, it is important to note that whilst these do not constitute a “how-to” guide, but rather a set of “signposts” (to allow for adaptation to various contexts). These can be used to check whether reform strategies (and more importantly, health financing policy reform implementation) create an appropriate incentive environment for moving towards fiscal sustainability of HIV responses, and hence are pointing and moving in the right direction in terms of broader objectives and goals such as ending AIDS, and related ones such as UHC and, GHS.

Second, in the health economics literature and as shown earlier in this thesis (see §2.3), HIV financing policy reform often involves complex interactions among many stakeholders with varied positions, power, and influence. Critically, this relates to power within, power with, power to and power over the national HIV response and beyond. In other words, reform is politically contentious. Among others, it seeks to change multiple stakeholders’ sensitive distributions, entitlements and responsibilities (Reich and Campos, 2019). Despite the significance of political economy factors in such reforms, there is often limited explicit analysis of and attention to the challenges that arise, and the strategies needed to manage them. It is this gap that this Framework seeks to contribute to addressing.

Third, in public economics, game theory is recognized as a key strategic tool by academics, and policymakers, with extensive applications in scenario planning and strategic decision making (Gibbons, 1992; Hargreaves-Heap and Varoufakis, 2004; Dixit, et al 2015). To the best of my knowledge, there is a paucity of real-world applications to improving the fiscal sustainability of HIV response in Uganda. I show that the complex theoretical ideas from this field have the potential for application to address the long-term fiscal challenges of the HIV response considered in this thesis.

Finally, and relatedly, continuing the applied economics tradition pursued in this thesis and to move the fiscal sustainability policy discourse from analysis to action, I use behavioural economics-inspired insights to give stakeholders a nudge. Following Uganda’s recent increase

in debt-to-GDP ratios on the heels of the world's last economic and financial crisis, the problems of public deficits and debt growth are growing in importance. Applying a behavioral economics lens provides unique opportunities to drive decision-making in a direction that improves the fiscal sustainability of the HIV response. Underlying this multi-dimensional framework is a recognition paid to the dominant influence of policymakers and implementers. Thus, contrary to mainstream economics that posits "representative individuals making rational choices to optimizing behavior in anonymous markets" (Johnston, 2013), I contend – in the words of Le Grand (2003) – they are self-interested egoists - knaves, in the terminology of the 18th-century philosopher David Hume – rather than noble altruists defending the public service ethos (or knights). This resonates with previous paradigmatic shifts in development policy and practice. It is equally in tandem with developments within economics itself (Fine et al., 2016).

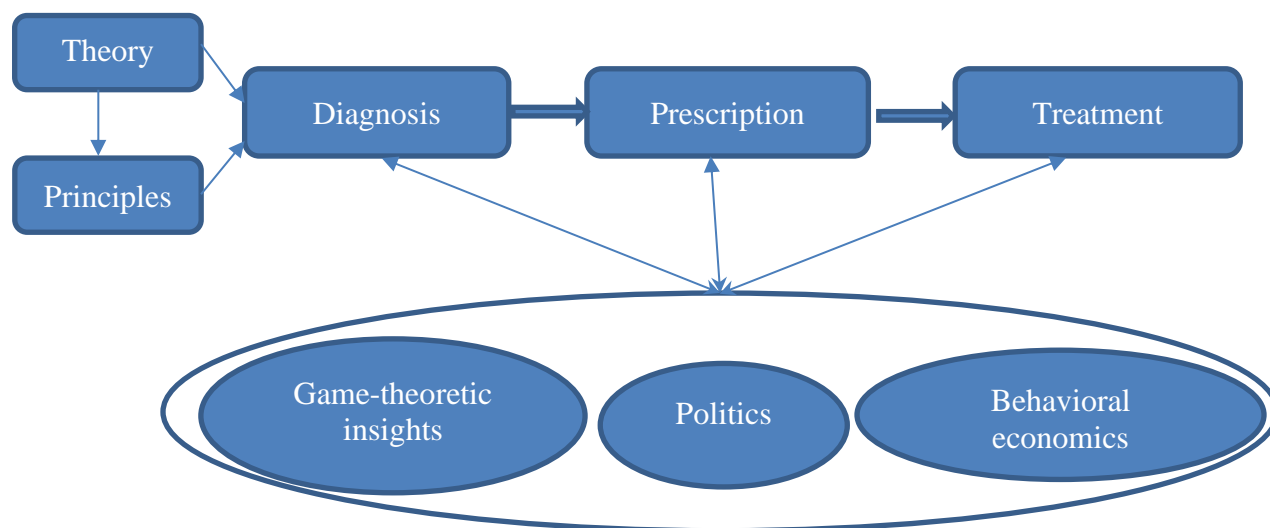
Although investments in HIV/AIDS are declining, yet fiscal liabilities continue to grow, it remains uncertain how fiscal sustainability of HIV responses can be assured, especially at the country, regional and local levels. In Uganda, questions surrounding the fiscal sustainability of HIV/AIDS policies are often obfuscated by incoherence between policy tools and policy objectives. Frameworks for analysing and improving fiscal sustainability of HIV responses have largely been technical, with minimal or no participatory and/or political component yet fiscal sustainability is also a political concept. In other words, fiscal policy analysis frameworks have largely been reductionist, and – in total disregard of the national and international politics of HIV financing and the attendant moral imperatives, for example – adopt a 'one-size-fits-all' approach to analysis and (generic) solutions. Thus, this framework is driven by the normative objective of addressing the fiscal sustainability of HIV response, including the political dimensions thereof to determine what a pragmatic approach would be. Gold et al (1996) offer potential attributes that are relevant to this end. These, *inter alia*, are the ethics; pragmatic; theoretical, and users' perspective.

This chapter aims to propose a novel approach to analysing and acting on fiscal sustainability challenges that the Uganda HIV response faces. Below, I will proceed in three broad steps. First, I present the pragmatic DPT integrated analytical framework for assessing and addressing fiscal sustainability for HIV response. It is intended to help Uganda to analyse the fiscal sustainability challenges and identify a coordinated set of policies to enhance fiscal sustainability of HIV response. The next section discusses the approach. The last section concludes.

7.2. The DPT fiscal sustainability framework

From the analysis undertaken in this thesis, evidence was found of core elements for moving towards fiscal sustainability. An empirically based and theoretically sound analytical framework of analysis and action is presented in Figure 51. It aims to: (1) increase public revenue to the point at which the national HIV response obligations can be met; (2) lessen those obligations to the point at which they can be met from existing (or projected) revenue. It is important to note that this is done by reducing HIV incidence, increasing efficiency, and reducing costs of treatment among others rather than by denying PLHIV treatment or reducing their entitlements; and (3) improve the capacity of the national HIV response to convert resources into value. By going beyond diagnostics (as most traditional fiscal policy analysis frameworks do), the novel approach in this framework entails (i) Diagnosis and monitoring the fiscal sustainability of the national HIV response, including a critical assessment of political and institutional factors, (ii) Prescription of financing policy reforms with greatest potential to enhance fiscal sustainability, and (iii) Treating the fiscal sustainability malaise afflicting the HIV response in Uganda.

Figure 51: The DPT fiscal sustainability framework



Source: Author’s own compilation

In summary, to diagnose fiscal sustainability challenges, Uganda needs information about HIV spending and funding sources. Tools that can help the government in this diagnosis include long-term forecasts. These consider demographic and economic factors. The other is pending requirements. The Government of Uganda can use these to set or shape her budgets. Timely information on actual spending is another tool. Finally, an evaluation of the evolution of possible revenue sources (taxes and/or contributions), as well as needs, is critical. On the other hand, to prescribe solutions to the “risk factors” to the fiscal sustainability of HIV response, it is important to note that several factors work together. These interact in complex ways and affect the fiscal sustainability of HIV response in Uganda. Thus, solutions need to be theoretically sound, politically feasible, and rigorously evaluated.

Finally, to treat the malaise with policy levers to ensure the greater fiscal sustainability of HIV responses, there are at least four (4) broad ways to promote greater fiscal sustainability of the national HIV response. First, on the supply side, provider payments that reward quality of outcomes, provider competition, pharmaceutical generic substitution, and reforms in purchasing policies could help contain costs (OECD, 2015). Second, on the demand side, expanded cost-sharing could adversely impact access to HIV services (Vera-Hernández and Nicolás, 2008). This is the growing consensus regarding the impacts of user fees in health care in Uganda (Yates, 2006; Nabyonga et al., 2011). Third, on the revenue side and as a response to rising expenditure pressures, care needs to be exercised in advocating ever-increasing revenues. Where additional revenues are required, a move towards broader-based models would appear appropriate. This broadens the revenue base through new or extended taxes. For example, “health taxes” have important public health effects. However, currently, they only play a modest role in financing health services (The Task Force on Fiscal Policy for Health, 2019). To this end, I argue that Uganda can best leverage these fiscal policies to yield improved health outcomes for her citizenry. This has the added benefit of bringing in additional revenue. Smart fiscal policy can save lives and help build and strengthen economies. Finally, from a fiscal policy perspective, whereas policy discourses on fiscal space tend to give the impression that there are two ways to increase fiscal space by either improving the efficiency of health spending and/or by raising additional revenue, I believe this view is narrow and

misses an important area: by improving the efficiency of other spending. It can generate more in new resources sometimes more than revenue measures. As Gupta (2018) concludes, it is pointless to collect more taxes if they are to be used to finance inefficient and ineffective programs.

In conclusion, among others, it is informed by three rationales. First is the theoretical rationale that recognises the contribution of economic theory to fiscal sustainability. Specifically, this rationale encompasses economic concepts and frameworks that provide normative guidance for fiscally sustaining HIV responses. Second, the pragmatic rationale (P) takes cognizance of the contribution of the empirical experience of fiscal sustainability to the ideal approach to fiscal sustainability. Finally, the users' perspective (U) pays attention to the contribution of the decision-makers' needs for fiscal sustainability. Below, I discuss in detail the various elements of the DPT framework, paying attention to how it could be applied in the real-world.

7.3. Discussion

To answer the research question on what would constitute a pragmatic approach to fiscally sustainable long-term financing for HIV and HIV response in Uganda, I have proposed a three-pillar analytical framework that spans diagnostics, prescription, and treatment dimensions. I have also stressed the importance of navigating the politics of policy implementation and applying insights from behavior economics and game theory. I hope that such a framework will prove useful in finding fiscally legitimate and novel mechanisms of expanding and sustaining fiscal space for the national HIV response in Uganda.

In the first place, that is "Theory" in Figure 51, this framework builds on health economics theory regarding health financing. It is this then that informs the underlying principles. It starts with a recognition that health financing policy encompasses a range of functions: raising revenue, pooling revenue (and therefore risks) across time, population sub-groups and locations, and resource allocation and strategic purchasing of HIV services. As elaborated elsewhere (see § 6.2.3), it also encompasses policies related to coverage, and benefits (Kutzin, 2013 and DCP3, 2017). It is important to note that how each of these functions and policies is carried out or applied can have a significant bearing on HIV financing policy goals. Some of these goals include financial protection, equity in finance, equity of access, transparency and accountability, rewarding good quality care, providing incentives for efficiency in service organization and delivery, and promoting administrative efficiency.

Second, in terms of "Principles" in Figure 51 above, taking on from and informed by the above theoretical foundation, I articulate guiding principles for HIV financing policy reforms in support of fiscal sustainability of the national HIV response (and potential pathways of moving towards UHC) in Uganda. These fit to inform analysis and action across the DPT domains. Given the unique context of each country, HIV financing policy reforms cannot simply be imported from one country to another. It thus follows that HIV financing policy reform options proposed in an HIV financing strategy (embedded in the country's fiscal policy framework) must address the corresponding underlying causes of long-term fiscal challenges. This notwithstanding, there are lessons from the literature that allow some guiding principles for reform actions that support progress towards fiscal sustainability of AIDS responses to be specified. Importantly, whilst these do not constitute a "how-to" guide, they offer a set of "signposts". They can and ought to be used to check whether reform strategies (and more importantly, reform implementation) create an appropriate incentive environment. In other words, they help point to and indicate if the country is moving in the right direction in terms of the objectives and goals in § 6.2.3. Below, in Table 14, I present these principles (read "signposts"), for each of the HIV financing sub-functions and policy areas.

Table 14: Selected guiding principles for HIV financing in support of fiscal sustainability of the HIV response

<ol style="list-style-type: none">1. Revenue raising:<ul style="list-style-type: none">• Move towards a predominant reliance on public/compulsory funding sources (i.e. some form of taxation)• Increase predictability in the level of public (and external) funding over a period of years• Improve stability (i.e. regular budget execution) in the flow of public (and external) funds2. Pooling revenues:<ul style="list-style-type: none">• Enhance the redistributive capacity of available prepaid funds• Enable explicit complementarity of different funding sources• Reduce fragmentation, duplication and overlap• Simplify financial flows3. Purchasing services:<ul style="list-style-type: none">• Increase the extent to which the allocation of resources to providers is linked to population health needs, information on provider performance, or a combination of both• Move away from the extremes of either rigid, input-based line item budgets or completely unmanaged fee-for-service reimbursement• Manage expenditure growth, for example by avoiding open-ended commitments in provider payment arrangements• Move towards a unified data platform on patient activity, even if there are multiple health financing / health coverage schemes4. Benefit design and rationing mechanisms:<ul style="list-style-type: none">• Clarify the population's legal entitlements and obligations (who is entitled to what services, and what, if anything, they are they meant to pay at the point of use). In other words, not only paying attention to cost-effectiveness considerations, but also to issues of politics and ethics to determine what's in and what's out in designing benefits for UHC.• Improve the population's awareness of both their legal entitlements and their obligations as beneficiaries• Align promised benefits, or entitlements, with provider payment mechanisms

Source: Author's adaptation from Kutzin et al. (2017).

Third, considering the aforementioned, to bridge global health and public finance perspectives, I propose a 6-point checklist to aid in navigating the DPT dimensions of the fiscal sustainability framework. Framed as a set of key questions, it is laid out below:

- 1. Understand your HIV epidemic and response:** This helps understand the current state of affairs and the projected future trajectory of the epidemic and response in Uganda. Chapters 1 – 4 in this thesis address this element and is relevant across all the DPT dimensions.
- 2. The macro-fiscal context and environment:** Understanding this is key to addressing the enormous and growing HIV and economic burden. As I show in Chapters 1 – 6, this step – relevant across the entire DPT dimensions – could help answer: what are possible economic and fiscal policy tools to improve health and consequently fiscal sustainability of HIV responses?

3. **Know your HIV spending:** This analytic step, relevant to the diagnosis element of the proposed framework, entails asking and answering a set of critical policy questions, namely: what are government funding priorities, including geopolitical positioning on the same? How are HIV spending projections carried out and used? What are the major drivers and escalators of HIV expenditure? Most critically, how do these interact and how can they be influenced? What is the state of pooling of funds and governance (including for external sources e.g. PEPFAR, GFATM)? Answers to this question are provided in Chapters 4, 5 and 6.
4. **Govern your HIV spending:** This is of relevance to both Diagnosis and Prescription elements of the framework. Specifically, this entails asking: How does Uganda manage health expenditure? Who are the main actors involved in managing HIV programmes in Uganda? How does Uganda budget for HIV (i.e. both process and form of budget)? As a balancing act, how does Uganda align the inherent incentives of different stakeholders? This is to ensure they build fiscal sustainability considerations into their decision-making and to weight these concerns along with quality, equity, efficiency, and access. Regarding strategic purchasing, what is the state of the art regarding efficiency and value for money for HIV investments?
5. **Fiscal space:** This analytic step, as I show in Chapter 5, 6 and 8, asks what are the options available to expand fiscal space for HIV? What are the long-term fiscal consequences of the HIV response? How are cost overruns monitored? How and what cost-containment measures implemented? How is performance of the national HIV response monitored and evaluated? How is VFM ensured? How is the regulatory framework used to coordinate and align incentives across actors? What revenues finance HIV costs? How is Uganda preparing to meet future costs of the HIV response? Is there a role and room for introducing and/or increasing earmarked taxes? What is the state of integration in delivery and health systems issues, including other systems issues for strengthening and capturing savings and efficiencies?
6. **Implementation of the HIV fiscal sustainability framework:** To bridge the know-do gap, while cutting across the framework, this step is of particular relevance to the Treatment dimension of the framework. It concerns self with the question: Why do we know so much and yet do so little in addressing the challenge? What are the barriers to action? From a politics, game-theoretic, and behavioral economics perspective, what levers are available to pragmatically address the fiscal sustainability challenge? I turn to the mechanisms and instruments in this direction below.

Lastly, in both analyses and moving the recommendations into action, three perspectives offer the potential to accelerate progress towards fiscal sustainability. These perspectives, while not exhaustive, are political, game-theoretic, and behavioural economics-informed.

To analyse the political economy challenges and solutions for health financing, Campos and Reich (2019) have developed a framework using six (6) dimensions of political economy. These are based on stakeholder groupings. I draw on this framework in Chapter 2. Whereas this conceptualisation is not exhaustive, and I do not expect that every political economy dimension will be central in every HIV financing policy reform, this framework offers a practical framework to analyse and act on the political economy challenges – as a springboard for devising solutions for addressing the fiscal sustainability challenge.

In addition to the above-mentioned six (6) political economy dimensions, fiscal politics, political revolutionism, and geopolitical positioning are worth considering. First, since

economics and politics are co-determined³¹, especially concerning fiscal politics and policy (Hayek, 1978; Gaspar et al., 2017), due attention ought to be paid to the fact that politics has a decisive influence on fiscal policy formulation and performance. The impact of elections and political divisions is particularly significant. Ideology also has an impact. Budget institutions such as MoFPED help soften the effect of politics on fiscal policy. Lastly, external constraints (i.e. the so-called supranational politics) work if owned by country authorities.

Second, to analyse what is at stake in case of fiscal unsustainability of HIV response, I propose applying two conceptual approaches from the social sciences. First, is the work on gridlock. Second is the concept of cosmopolitan moments. These offer an effective lens to assess the ability of a government to institute HIV financing reform. As I show in Chapter 2, gridlock can be broken open by a health crisis such as a pandemic. This, in turn, generates a political drive for change. The financing crisis opened a policy window to establish – at least in legislation – the ATF in Uganda. Also, I show that a set of cosmopolitan moments matter. These critical junctures have led to the introduction of the imperative of HIV in a range of policy arenas, effectively moving HIV into ‘high politics. Piot (2015) holds the same view. As such, in this framework, this perspective ought to be integral to the analysis if politically feasible and economically sound HIV financing policies are to be formulated and implemented.

Lastly, geopolitics in HIV matters. In Uganda, many dimensions contribute to the complexity of decisions on HIV resource allocation, including prioritisation. For example, as foreign aid is an essential element of foreign policy for many countries, it thus follows that its allocation has geopolitical ramifications. It is accepted that the politics of foreign aid are constantly evolving. This is largely due to emergent global trends as well as changes in political and economic systems within both donors and recipient countries. To this end, in this thesis, I argue that the proposed framework ought to use geopolitical positioning (Gómez, 2018). As I show in this thesis (see § 2.2), how - and when – Uganda responded to the AIDS epidemic was partly a matter of geopolitical positioning. As such, taking this perspective to analyse and address the fiscal sustainability challenge can be instructive. Put differently, throughout the DPT continuum (implicit in this framework), it is critical to look at how Uganda strategically repositions self in this changing landscape. As I show in this thesis, in the past, domestic policy responses were driven mainly by international pressures, and interests. Domestic factors while important only played a secondary role. In other words, Uganda responded (and continues to respond) to international pressures and policy criticisms. This was coupled with offers of financial and technical assistance. Uganda, in response, then utilized domestic policy innovations. The enabled the country to ultimately engage in global health diplomacy to bolster her international reputation and standing in the community of nations. This is not only true for HIV but also for reforms geared towards UHC and GHS. Based on findings in this thesis as well as elsewhere (Gómez, 2018), as a rule of thumb, I argue that budding leaders aspiring to build their reputations among elite nations have a ready way to demonstrate their status. The most notable ones is through quick and effective public health responses. They thus enact and implement HIV financing reforms that further this objective. On the other hand, in the case of leaders who scorn the international community (say on HIV and human rights issues as the Anti-Homosexuality Bill in Uganda brought to the fore), they tend to act and react slowly and ineffectively to the same type of crises (in this case the HIV fiscal sustainability challenge).

³¹ Unsurprisingly, in the 18th and 19th centuries, before the advent of the ‘mathiness’ in economics (Romer, 2015), the field we call economics today was known as ‘political economy’ and the corresponding body of theory and practice - political economy analysis (PEA) – largely concerned itself with the distribution of and contestations for power and resources, including how this affects the distribution of income and wealth.

The second perspective to adopt in this framework is game-theoretic. The fiscal sustainability of HIV responses is a game theory problem. Generally, recent trends in HIV financing are increasingly generating situations where the interests of donors and recipient countries such as Uganda may not necessarily align. As a result, each party is incentivized to act strategically according to their best interest. The displacement shown in § 2.3 is a case in point. This, sometimes, hampers fiscal sustainability. As a way forward, I argue that this situation can be best approached using game theory precepts. For example, when both donor and recipient countries act according to their respective individual strategic interests, which are not aligned, both “players” are worse off. To this end, everyone would be better off if the current “game” structure is changed to better align interests while rebuilding trust. I offer pointers in this direction in § 5.3. Of more significance is the need to focus on addressing the following four inter-related decision science dilemmas in resource allocation:

1. optimally balancing “vertical” investments in disease programmes (such as purchasing condoms for HIV) with investments which strengthen the health system as a whole (such as M&E systems);
2. deciding the correct balance of funding between a donor and a recipient country;
3. how to optimise a cross-sectoral co-financing approach to fiscally sustain HIV responses;
4. with GoU consistently having a poor track record of reducing domestic funding as foreign aid increases (referred to as “displacement” in this thesis), how to reverse this.

I argue it is critical to analyse how strategic interactions can lead to outcomes that enhance fiscal sustainability. To the first problem above, Morton et al. (2011) provide an appealing intuitive solution that captures the complementary benefits of funding both vertical projects and horizontal programmes. To the second problem, I provide a novel solution in § 5.3 that could maximise the benefits of development assistance for HIV. To the third problem, Remme (2018) shows that it may offer an important way to optimise HIV financing and efficiency, without crowding out other programmes that may have spill-over HIV benefits. Finally, as donors give less aid than they would ideally prefer and, by extension, how this trend could be reversed. To increase political prioritisation for domestic HIV financing, in § 2.3, I discuss evidence-based approaches to stimulating political prioritization of health within domestic budgets. Additionally, regarding donor stinginess, as Hvidsten (2010) finds, donor A may only want to provide aid on the condition of certain behavior by the recipient Uganda. In other words, if donor A believes or understands that Uganda does not conform to this behavior, donor A may restrict aid even though it would ideally prefer to give more. Additionally, donor A may see aid as a contribution to a public good, and as with all public goods, be tempted to free ride on the efforts of other donors.

Finally, in applying behavioural economics insights to analyse and design HIV financing policies to assure fiscal sustainability, I argue – as empirically shown elsewhere (Thaler, 2018) – that this approach can lead to the development of different policy tools. These are in position to better motivate desired behaviour change. In other words, they are more cost-effective than traditional policy tools. As I show in § 5.3, acting on cognitive biases through behavioural economics inspired interventions to have policy-relevant applications relevant to the fiscal sustainability of HIV responses. These, *inter alia*, could include re-design and use of traditional policy tools for behaviour change, such as improving domestic resource mobilisation by strengthening the domestic tax capacity as well as improving the efficiency of existing spending. Here, I propose to target two groups: 1) interventions at the level of the politician and 2) interventions at the level of the community to mobilize political support and pressure. The latter has more evidence on it. Another possibility for community-level intervention would be strengthening social cohesion identities so that the public is more supportive of public good investments (such as those in the national HIV response). Work which encouraged voting in

the US by appealing to an individual's state identity, worked, and could be tailored to advance this objective. On the other hand, for intervening on politicians, messaging using peer (e.g. other country or districts), social comparisons or reference dependence (setting inaction as a mortality loss instead of a gain) could be useful. Another idea is to test specific types of pressure campaigns (e.g. writing letters vs. internet vs. demonstrations) on politicians.

7.4. Conclusion.

A conceptual framework for the fiscal sustainability of the HIV response in Uganda is proposed. Informed by theory and established principles in health financing policy reform, this framework stresses three equally important components of fiscal sustainability: diagnosis, prescribing way forward, and actually “treating” the malaise occasioned by the long-term fiscal challenges. The framework pragmatically underscores the need for explicit political analysis, and application of behavioral economics as well as game-theoretic insights. Paying attention to and acting on these throughout the fiscal sustainability policy cycle, can help those charged with fiscal policy analysis, development, and implementation to drive policy into practice more effectively. Finally, this framework represents a coherent scientific and logical approach to determining the features of a pragmatic approach to address the fiscal sustainability challenges.

Chapter 8

Fiscally sustaining the AIDS response: proof-of-concept of an analytical framework using data from Uganda

8.1. Introduction

This chapter, as a proof-of-concept, empirically assesses the novel approach presented in Chapter 7. Specifically, I quantitatively assess the various elements of the framework – for fiscal sustainability and the related equity and financial protection implications. Importantly, if Uganda strategically chooses to scale-up effective interventions (as envisaged under the Fast-Track scenario), I find that the large intertemporal and intergenerational fiscal gaps that open up can be addressed via applying the novel approach proposed in this thesis. I compare the fiscal costs with fiscal revenue raiseable between 2015 – 2030. I proceed in 4 inter-related broad steps.

First, taking on from the HIV financing options explored in Chapter 7, I elicit preferences among a group of key HIV financing policy stakeholders regarding policy options for long-term financing of HIV services. This aims to understand the different degrees of acceptability between policy interventions and future funding options as well as their political feasibility. In the second step, moving beyond the normative approach (Heller, 2009), I empirically examine the potential to expand fiscal space for HIV from public financing options as well as those highly preferred and deemed politically feasible in the above step. Thirdly, positing that sustainable HIV financing can be a pathfinder to UHC, I conceptualize how a capitalized ATF can accelerate funding HIV services through the NHIS. Finally, noting that the first-order condition for the fiscal sustainability of HIV responses is consistency with a country's macroeconomic fundamentals such as equity, I provide a more substantial discussion of the corresponding economic implications of assuring fiscal sustainability – through the creation and use of fiscal space enabled by the proposed Framework. As the Framework enables GoU to finance HIV services irrespective of who is receiving it, I specifically undertake an extended cost-effectiveness analysis (ECEA) of universal public finance (UPF) for HIV services in Uganda.

Against the above background, the chapter is organized as follows. In the next section, the methods and data used are provided. In section 3, the results are presented and discussed. Finally, section 4 contains a summary of the main messages and provides some concluding remarks.

8.2. Methods and data

Below, I lay out the methods and data per sub-study.

8.2.1. Preferences on policy options for the fiscal sustainability of the HIV response

First, to elicit preferences regarding policy options for long-term sustainable financing of HIV responses in Uganda, an online survey collected key stakeholders' preferences on a variety of revenue-generating mechanisms, cost and demand reducing policies, and services delivery systems' capacity improving measures. These options are drawn from those I found to be technically feasible in § 6.4. Using a survey tool (see Appendix 13), I gained a wider and deeper understanding of stakeholders' stated preferences (i.e. agreement or disagreement)

with a series of statements regarding policy options for ensuring fiscal sustainability of HIV response in Uganda.

To obtain valid and reliable results, the online survey tool was pre-tested and piloted among 3 purposively selected HIV and health financing policy experts. Incorporating the received feedback, the tool was then refined and rolled out between October and December 2018 via a secure commercial online survey tool specially designed for academic research available at URL <https://ucl.onlinesurveys.ac.uk/hiv-financing-options>.

Table 15: Classification of respondents by professional affiliation³²

	Broad category	Constituent affiliations
1	Academia	Academia
2	Government	Judiciary, Government Ministry, Department and Agency, Executive, Legislature, International bilateral and multilateral organization
3	Civil society	Non-governmental organization, Person living with or affected by HIV, AIDS service organization Industry
4	Industry	Think-and-Do Tank, Consultancy and advisory firm, pharmaceutical industry, private sector association

A respondent list was generated in consultation with UAC and UNAIDS, with eligible participants selected from the health and HIV financing policy community in Uganda. See Table 15 for a detailed classification of respondents by affiliation. To improve the survey response rate (Cook et al., 2000), the selected individuals were then invited – via personalised email – to participate, with an additional request asking them in turn to nominate other individuals - the “snowball” technique. Theoretical saturation was assumed attained when no new names appear among the nominations and no new additional insights emerging from the open-ended question regarding “any thoughts or comments on the future financing of HIV response in Uganda” (see Q 11 of Appendix 13). Finally, to ensure no duplicates are entered and to prevent the online system from registering uninvited responses, a unique individual URL and login code was generated and supplied to each respondent. Additionally, to increase the probability of a high response rate, the survey ran for three (3) months, with email reminders sent to each respondent 3 weeks after the initial invitation, and thereafter 3 weeks after the last reminder.

Given that the survey tool used Likert scales that - by nature - are unidimensional and thus a non-comparative scaling technique, for each scale item in the survey tool, I first calculated the median response as a measure of tendency and then compared policy options between each other. However, noting that the median can assume only seven discrete values (as per the design of the online data collection tool) with no other standard methodologies for summarizing and comparing individual Likert item responses that are not normally distributed, using standard statistical tools, I further summarize the responses to each question using a weighted scoring algorithm. In applying this algorithm, as a starting point, the algorithm assigned uniformly distributed positive scores to ‘agree’ responses (1–3) and negative scores to ‘disagree’ responses (5–7) using the mapping $f\{1, 2, 3, 4, 5, 6, 7\} \rightarrow \{1, 2/3, 1/3, 0, -1/3, 2/3, -1\}$ ³³. With the resulting score for each question, I then ranked the policy options from most to least preferred. To check the sensitivity of the resulting ranking to variations in the scoring

³² Where “Others” was used, I re-classified this appropriately in any of the 4 dichotomy classes.

³³ As an illustration, with five respondents answering 1, 2, 3, 6, and 7 to a question, respectively. This would, in turn, result in that question having a summary score of 0.3, derived from $1*1 + 1*(1/2) + 1*(1/3) + 1*(-1/2) + 1*(-1)$.

function, I compare the results between different scoring functions. On the other hand, for the second set of questions, I apply a similar approach, but assigning diminishing positive values to respondent's top five preferences, explicitly: $f\{1, 2, 3, 4, 5\} \rightarrow \{1, 0.8, 0.6, 0.4, 0.2\}$.

8.2.2. A normative and empirical approach to fiscal space analysis

Here, building on the above analysis of stakeholders' preferences, I adopt a normative and empirical approach to fiscal space analysis. First, using a macroeconomic fiscal policy analysis framework³⁴ that explicitly considers current and projected macro-fiscal realities, I quantitatively analyse the revenue-raising potential of HIV financing policy options that were highly preferred and deemed highly politically feasible in the above sub-study. These are:

1. Finance HIV services from general tax revenues
2. Capitalise the ATF to finance HIV services
3. Finance HIV services through an NHIS
4. Invest oil revenues in a sovereign wealth and finance HIV services from interest gained
5. Increase tax on alcohol
6. Increase tax on cigarettes

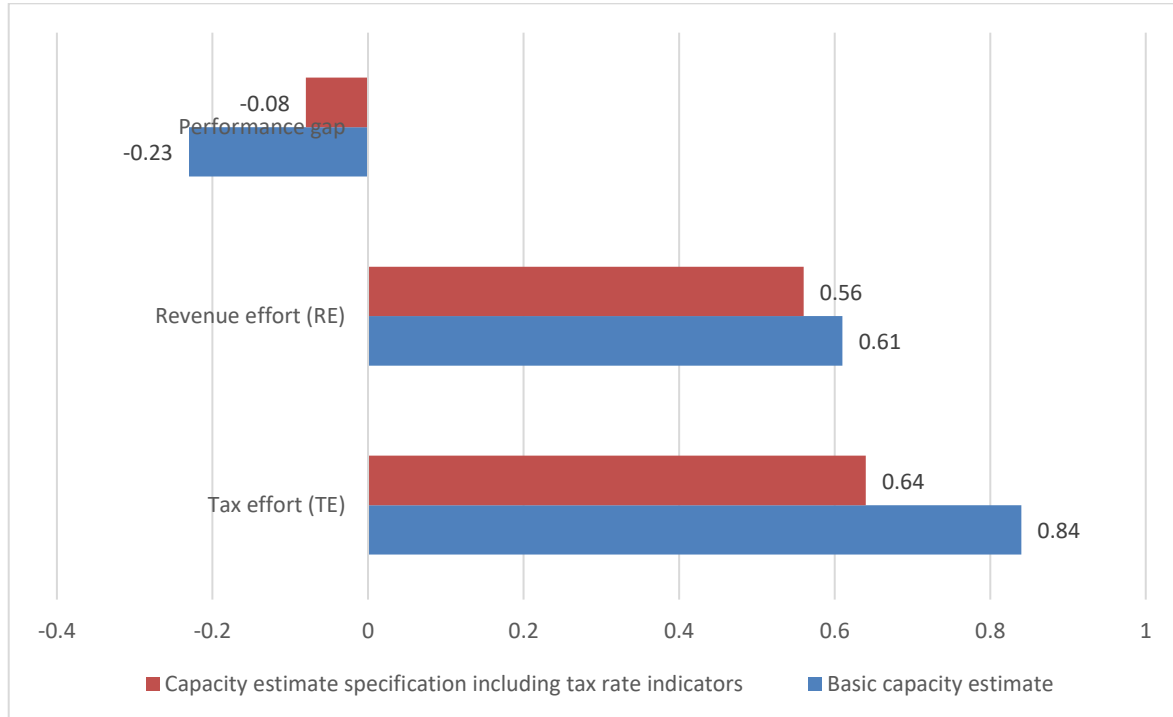
Beyond the above-mentioned preferred financing options, I empirically estimate the (realistically) potential increase in public HIV financing from economic growth, increased general tax revenue generation, greater HIV prioritisation, and efficiency gains. While the focus on DRM, I assume donor funding, OOP expenditure, and prepaid financing for HIV would remain constant (relative to the 2015 baseline) in the most optimizing scenario (referred to as "High" in this thesis). This is because of the outlook on external funding discussed in § 1.2, the undesirability of OOP (given its negative impacts on access and equity), and the perceived competition that NHIS will offer to private health insurance schemes (as per current design) respectively. However, for sensitivity analysis, I assume a 5% and 10% year-on-year decline across these sources for the "Medium" and "Low" scenarios. Specifically, the methods, data, and assumptions used in analyzing each option are laid out below:

1. **Potential efficiency gain:** This directly draws on earlier analysis in § 4.3. Recognising that measuring efficiency is complex and given the relatively simple approach I adopted in this thesis, to explore the sensitivity of the results, I compare my estimates with those variously arrived at by Remme et al. (2018). On the lower end, they estimate 15% lower annual average efficiency gains. On the other hand, the upper bound finds that average efficiency gains would be 27% higher. My estimates in this thesis lie within these bounds.
2. **Public HIV financing from economic growth:** Here, using IMF projected GDP growth rates, I assume this will lead to an equivalent percentage increase in HIV spending. However, as analysis of the elasticity of government spending with respect to GDP growth in § 2.3 shows, this is more unlikely. It is for this reason that I undertake sensitivity analysis by assuming the status quo and another scenario assuming realising 50% of potential owing to applying the approach in this thesis to increase political prioritisation for HIV financing from domestic budgets.
3. **Increased general tax revenue generation:** As a way of background, while Uganda tax-to-GDP ratio has increased over the last 15 years, at 13.1% as at the end of 2016, it remains lower than the average (18.2%) for 21 SSA countries (OECD, 2019). To estimate how much domestic revenues should Uganda be reasonably mobilizing (that is, its tax capacity), using tax data from Uganda Revenue Authority (URA) for 2015 as

³⁴ This financial programming framework for normative analysis of overall fiscal space (and policy and budgetary space for HIV), as applied in this Ph.D., is extensively described elsewhere in OPM (2012).

a baseline, I use Glenday et al. (2018)'s cross-country comparative study of tax capacity and effort and gaps to estimate potential from this option. Figure 52 shows the gap between ability and effort in DRM for Uganda.

Figure 52: Average Tax Effort (TE) and Domestic Revenue Effort (RE) in Uganda



Source: Author's calculation from Glenday et al. (2018).

To estimate the potential increase in public spending for HIV from increases in tax revenue, based on the projected 23% potential domestic revenue (%GDP) growth from 2015 (as baseline), I assume this will lead to a proportionate percentage increase in public HIV spending. However, as I show in §6.2.1., DRM from this policy option is constrained less by societal preferences and more by economic structure, administrative capacity, and policy choices (Besley and Persson, 2009; Glenday et al. 2018). While all above-mentioned three (3) constraints can be altered by government policy, I assume that they can be expected to change over varied time horizons. First, economic characteristics changes over long periods. On the other hand, state capacity can realistically be increased somewhat more quickly. Lastly, public policy choices tend to be altered even quicker. For sensitivity analysis, as the share of domestic revenues in GDP ranges between 15 and 35 percent among LMIC economies, it is these values I use.

4. **The ATF:** As approved in the HIV/AIDS Prevention and Control Act, it is to be capitalized from a 2% beverage tax. Using fiscal year 2015/2016, as a baseline, URA collected UGX 733,536,252,756. Thus, I estimate 2% of this figure. For forward-looking projections, I assume a 5% year-on-year increase. This is based on the average increase in annual tax collection rates by URA observed over the last 10 years. For sensitivity analysis, I vary this by 2.5% to account for potential fluctuations. Additionally, recognizing two types of Trust Funds, that is a development-focused one set up to accept revenues to be held and disbursed per the agreed terms. The other is the private sector focused one comprised of a variety of assets (as in endowment

funds) intended to provide benefits to individuals or organisations. I thus model the revenue generation potential for each of these “current account” and “investment account” types of ATF respectively. Additionally, in the first type of ATF, I assume that collected revenue is used in that respective year. On other hand, for the latter type of ATF, I assume the ATF continues to grow until 2030 when Uganda could realistically expect to not receive AIDS funding.

5. **The NHIS:** As a starting point, feasibility analyses show that when implemented for the formal public sector, it would have the potential to generate UGX 202 billion in 2015 (Runumi, 2009; Basaza et al., 2013). I assume that these revenues would increase at 5% year-on-year with more enrolment from the formal private sector and informal sector. Additionally, I assume that about 30-35% of the raised revenues will be allocated to HIV services, in line with estimated HIV spending’s share in total health expenditure (UAC, 2014). However, owing to a very large informal sector, during the sensitivity analysis, I assume a 2.5% year-on-year growth on the lower bound. According to the Uganda Bureau of Statistics (UBOS) (2014), up to 80% of the labour force works in the informal economy, contributing over 50% of GDP. For the upper bound, though, I assume a possibility to experience a 7.5% year-on-year growth if approaches to cover Ugandans in the informal sector are implemented. These could include subsidies for premia (with these resources, for example, coming from cutting subsidies in other health-harming industries such as fossil fuels), exemptions to indigents, and a big NHIS pool at the national level (to spread risk and keep premia low).
6. **Earmarking oil revenues to fund HIV services:** In 2009, commercially exploitable reserves of oil were found in the Albertine graben in Uganda. As an oil exporter, Uganda faces the challenge of using the new resources to advance its development agenda, while avoiding the pitfalls oil and other natural resource tend to have on governance. In considering the tradeoffs and potential impact of alternative uses of the oil rent, I propose a 2% earmark of projected oil revenues in a sovereign wealth fund (SWF) to be used to finance HIV services. This approach towards absorbing rents has potential direct impacts on growth and living standards and, indirectly, on governance – particularly given Uganda’s already deteriorating governance and mounting corruption (Gelb and Majerowicz, 2011). This raises questions about its capacity to wisely invest oil revenues. Key assumptions underpinning these projections are that between 1.4 and 1.7 billion barrels are recoverable (out of the 6.5 billion barrels in place within the 40 percent explored areas in the Albertine Graben) at US\$ 44.7 per barrel (as observed from a time series covering the last 74 years) over the next 30 years.

I assume a 2% fixed fee as standard hedge funds management cost, and a 20% incentive fee and a high watermark like LIBOR. In other words, as per practice in managing SWFs, the manager thus receives 2% fixed fee of net assets per year and 20% of gains above a flexible market rate. The high watermark provision is designed to incentivize management to recoup the earlier losses before the 20% premium on gains is paid. Accounting for year-on-year volatility, I assume an overall 10% return over the period 2015 to 2030, in line with the current CBR. This is in line with realized returns adjusted for inflation and management cost observed in other SWFs (Prisikar, 2014). For sensitivity analysis, I vary this by 5% upward for the “High” scenario and lower by 5% in the “Low” scenario than the “Medium” one. However, as a limitation, as commercial oil production has not commenced, the profit margin in Uganda’s oil industry cannot be established. What is known though is that estimates show that up to US\$ 15 billion will be required to commercialise the oil resources. An earmark on the profit would have been the most appropriate to base on these estimations. Here, however, I use

margin crudely defined as the total revenue potential less than the costs of commercialization. Second, data on returns from the Petroleum Revenue Investment Reserve (or Uganda Petroleum Fund), an SWF founded in 2015, is not readily available. Using benchmarks from this would have yielded more plausible estimates. However, even in the absence of this data, I contend that a 2% earmark on revenue as well as benchmarks from empirical reviews of other SWFs is not unrealistic.

7. **Health taxes:** I construct a mathematical model to simulate the impact of excise taxation on tobacco and alcohol for revenue generation and disease prevention. Like Stacey et al. (2018), the model assumes that the additional tax included on the above-mentioned products is passed onwards through to the retail price facing consumers. For Uganda, this is corroborated elsewhere (Ntale and Kasirye, 2018). As detailed somewhere (see Stacey et al. 2018), the model as applied explicitly simulates consumption changes in response to tax-induced price changes. On the other, by extension, the epidemiological simulations estimate the change in mortality associated with reduced use of the corresponding taxed products (owing to shifts in the distribution of a related risk factor). Table 16 details data sources.

Table 16: Data sources for health taxes modeling

Model input	Source
Population age-sex structure	UNPD (2019)
Population age-specific mortality rates	IHME (2018)
Product prices	UBOS (2015)
Existing excise duties	URA (2018)
Product price elasticity	URA and MoFPED (2017)
Smoking prevalence and intensity by age and sex	2014 NCD Baseline Survey
Beverage intake	2014 NCD Baseline Survey
Mortality relative risk	IHME (2018)

In terms of scenarios modeled, for each tax intervention studied, I simulated the revenue and health benefits for 3 different tax rates: low, medium, and high. Details of scenario models are presented in Table 17. It is these that I use to undertake sensitivity analysis.

Table 17: Modeled scenarios for health taxes

Product	Baseline	Intervention scenario		
		Low	Medium	High
Cigarettes	31%	50%	60%	70%
Beer	30%	35%	40%	50%
Spirit	60%	66%	70%	75%
Wine	20%	24%	35%	40%

Finally, taking on from the above, as a last analytic step, moving beyond a normative approach to examine the realistic potential to expand public HIV financing from the above options, I draw on recent empirical analysis by Remme et al. (2018). Based on cross-sectional econometric analysis of most recent HIV expenditure in select SSA countries, Uganda

inclusive, they empirically estimate how much of the potential revenue estimated from the above normative approach is most likely to translate into tangible public financing. A key assumption here is that past behaviors of LMICs continue into the future. Thus, by comparing the maximum annual fiscal space estimates under the normative approach (as one used here) to the fiscal space estimates based on the responsiveness found in the ordinary least squares (OLS models, with only GDP per capita, health, and HIV prioritization being brought up to their forecasted levels or targets, they find between 57% median (with uncertainty intervals between 4% and 80%) less potential public finance in the selected countries. Here, I apply the 57% median in my analysis. The rationale for this analytic choice is two-fold. First, it is a recent analysis, using the most up-to-date data available. Second, the analysis includes Uganda. In other words, in empirically estimating fiscal space potential through 2030, it will be less by 57% of the potential identified in the normative approach. This way, by adjusting my estimates above by this factor, I empirically estimate fiscal space potential through 2030. To address the shortcoming that the analysis focuses on the medium-term, i.e. the next 15 years (2015 – 2030) given the uncertainty around the macroeconomic and political context in the longer run, in § 8.4, I explicitly discuss the implications for addressing the substantial political economy challenge of financing HIV services in Uganda in the long-term.

8.2.3. Financing of HIV treatment costs through NHIS in Uganda

Here, recognizing the call by The Lancet Commission (Piot et al., 2015) for HIV services to be delivered along with other health services as much as possible, I engage in ideation on how HIV treatment – the largest fiscal cost escalator for the HIV response in Uganda – could be financed as part of the broader health system, leveraging the power of the special funds preferred and deemed politically feasible. This analysis draws on the fiscal analysis of the HIV program undertaken in Chapter 5 and spans comparable dimensions as in Haacker and Birungi (2016).

8.2.4. An ECEA of UPF of HIV/AIDS in Uganda

From the above, a pragmatic approach to the fiscal sustainability of the HIV response in Uganda calls for a move towards predominant reliance on public funding sources. I refer to this as UPF. In other words, it is government financing of an intervention irrespective of who is receiving it. As the financing pathway for the fiscal sustainability of the HIV response in Uganda and noting that HIV is a disease of inequality (necessitating “leaving no one behind”), I apply ECEA (Verguet et al., 2016). This provides a methodological framework of economic evaluation to determine the distributional and financial risk protection consequences of HIV financing policy in Uganda.

CEA, that has traditionally been the gold standard in economic evaluations of HIV interventions, is limited by its inability to examine the context in which an intervention is implemented and its effect on distinct groups of people – factors that are very relevant to the HIV/AIDS epidemic and response in Uganda. Also, owing to the increasing chronicity of the HIV/AIDS disease, the cost-effectiveness of HIV interventions has been greatly altered by the pervasiveness of financial returns (say as a result of savings in treatment costs) on one hand and the shrinking returns on investment of HIV prevention interventions (Haacker, 2016).

As implicit from the above, UPF for HIV interventions entails consequences in multiple domains. Thus, fiscal sustainability through UPF– as a means - enhances access to services (and the attendant health and productivity gains), and given the implicit inbuilt universal health financing principle, it crowds out private out-of-pocket (OOP) expenditure for HIV. This way, explicitly, the financing approach put forward in this thesis – serving as an insurance cover – averts catastrophic expenditure and prevents a disease that, in its absence, would plunge households into poverty. It is in this context that an ECEA was conducted.

Table 18: Main data sources and assumptions used in conducting ECEA

Parameter	Source / assumptions
individual income (defined here as GDP per capita)	IMF (2019)
HIV incidence (defined here as the number of persons newly infected with HIV during a specified period, in this case, a year)	Fast-Track scenario output (as modeled in Spectrum model in § 3.2)
HIV incidence (by income quintile)	2016 UPHIA;
Cost of ART per capita per annum	As used in § 4.2
Probability of privately purchasing HIV treatment	OOP expenditure as estimated in GoU (2012)
Commercial lending rates	The central banking rate (CBR) from Bank of Uganda (2019)
Personal discount rate	3% as traditionally used in CEAs in the health economics literature.

Using an MS Excel model and data on a number of plausible values (see Table 18 for data source of key parameters), I assessed: 1) the level and distribution across wealth quintiles of the burden of HIV disease averted (and consequently lives saved); 2) magnitude and direction of OOP expenditures crowding out (and compare these to the costs to sustain the program estimated in Chapter 4) and, 3) using the money-metric value of insurance afforded, gauge the financial protection provided by the proposed approach to the fiscal sustainability of HIV response in Uganda. In this analysis, I take individuals' perspectives to assess this public policy. I conducted a literature survey to obtain most of the required data for this analysis. Additionally, expert opinions were sought from other experienced economists to validate the plausibility of data used and assumptions made on some of the parameters. Below, I detail the analytic approaches used to address the above-mentioned three (3) domains.

Analytic domain 1: Lives saved: Building on epidemiological modeling undertaken in Chapter 3, for this strand of analysis, I assumed that the probability of dying from AIDS disease (which in itself is conditional on having it, d_a is a function of two variables - 1) probability of obtaining ART³⁵, $u(y)$ and 2) assuming the undetectable viral load is equal to no transmission (i.e. the so-called U=U, see Eisinger et al. (2019), for example), the 'cure rate'³⁶, s . Functionally, this implies,

$$d_a(y) = u(y)(1 - s)d_o + (1 - u(y))d_o \dots\dots\dots (4)$$

As earlier indicated in § 3.2, the Spectrum mathematical model used here is a dynamic HIV transmission model that adequately captures such epidemiological consequences. Thus, utilising first-order estimates of the size of the effect, I calculate 'lives saved' by 2030 (from a 2015 baseline) as the difference between cumulative numbers of deaths with and without ARV. This way, using the "AIDS Impacts" tab within the AIM model, these projections yield the magnitude of deaths averted and life-years gained by ART and PMTCT.

Analytic domain 2: Consequences on OOP: Here, drawing on data from Zeng and Shepard (2012) and UAC (2012), I estimated the magnitude of OOP crowded out by the introduction of the proposed pragmatic approach to the fiscal sustainability of the HIV response in Uganda. As a starting point, conditional to having AIDS, I posit that the OOP expenditure averted per capita is:

$$e(y) = cu(y)b_c(y) \dots\dots\dots (5)$$

³⁵ In this study, I interpret this variable as pre-existing ART coverage rate and prevention of mother to child transmission of HIV (PMTCT).

³⁶ Used here given the improved health outcomes, with no ill-health due to AIDS and no onward infection.

Where b_c is the probability of privately purchasing HIV treatment and c is the total cost of HIV treatment. In other words, the aggregate amount of OOP expenditures averted E , is:

$$E = \int_{y_l}^{y_h} p(y)e(y)f(y)dy \dots\dots\dots (6)$$

Solving equation (6), yields the aggregate treatment costs incurred, TC , from the public sector perspective:

$$TC = \int_{y_l}^{y_h} cp(y)f(y)dy \dots\dots\dots (7)$$

As options explored in this thesis shows, it thus follows that the financing of TC could be through a combination of the financing mechanisms in the proposed novel approach and/or with a tax, of constant rate t , for example.

Analytic domain 3: Monetary value of insurance accorded³⁷: Drawing on health economics literature (Drummond, M. et al. (2005); Collier et al. (2015 a and b); Atun et al. (2015), I applied a standard utility-based model that assumes that when faced with the risk of uncertain adverse events, risk-averse individuals value protection. This money-metric value is most appropriate when faced with fiscal sustainability challenges as it confers financial protection. This, in turn, enabled me to estimate the expected value of the gamble associated with the eventuality of HIV disease treatment with probability P and cost c (narrowly defined in this study as the OOP cost of HIV treatment). As is clear by now, given the analytical perspective employed here, a principal limitation in this analysis is the exclusion of other costs such as the costs implied by lost productivity due to AIDS illness (as this is addressed elsewhere in this thesis (see § 4.3)).

In light of the above, I specifically constructed and utilised a constant relative risk aversion utility function, similar to that by Verguet and others (2015):

$$w(y) = \frac{y^{1-r}}{1-r} \dots\dots\dots (8)$$

where $r > 0$ and $r \neq 1$. Also, y is income and r is the Arrow-Pratt coefficient of relative aversion.

Importantly, when $r \rightarrow 1$, then, $w(y) \rightarrow \ln(y)$. In other words, in the absence of the proposed novel approach to the fiscal sustainability of HIV response, the expected value of y to an individual of the gamble concerning the cost of treating AIDS in the uncertain scenario is denoted by:

$$y_p = (1 - P)y + P(y - c) \dots\dots\dots (9)$$

$$\text{Transposing Equation (9), then } P(y) = p(y)u(y)b_c(y) \dots\dots\dots (10)$$

On the other hand, in the certain scenario, the 'certainty equivalent'³⁸ (y^*) is given by

$$y^* = w^{-1}[(1 - P)w(y) + Pw(y - c)] \dots\dots\dots(11)$$

$$= [[(1 - P)y^{1-r} + P(y - c)^{1-r}]]^{\frac{1}{1-r}} \dots\dots\dots (12)$$

By extension, a risk premium at the individual level, $v(P, y, c)$ is:

$$v(P, y, c) = y_p - y^* \dots\dots\dots (13)$$

³⁷ In social welfare and protection literature, a number of indicators have variously been used to measure financial protection conferred by insurance. This study will use the money-metric value of insurance as, in my considered view, the most appropriate measure of financial protection when faced with fiscal sustainability challenges.

³⁸ Interpreted in this study to refer to the income an individual is willing to have in order to have the outcome certain.

$$= (1 - P)y + P(y - c) - [(1 - P)y^{1-r} + (y - c)^{1-r}]^{\frac{1}{1-r}} \dots\dots\dots (11)$$

In conclusion, I will therefore derive the aggregate money-centric value of insurance (i.e. risk premium), V , using Equation (14) below:

$$V = \int_{y_l}^{y_h} v(P, y, c) f(y) dy \dots\dots\dots (14)$$

8.3. Results

Below, I present the key results corresponding to each of the above-mentioned four (4) steps.

8.3.1. Preference elicitation of policy options for long-term sustainable financing of HIV/AIDS responses in Uganda

Table 19: Respondent characteristics

	<i>n</i>	%
Age (years)		
< 30 years	4	3%
30 – 44 years	82	55%
45 – 64 yeas	60	40%
> 65 years	4	3%
Affiliation		
Academia	26	17%
Judiciary	0	0%
Other	6	4%
Think-and-Do Tank	12	8%
Government Ministry, Department and Agency	10	7%
Consultancy and advisory firm	24	16%
Executive	2	1%
Legislature	0	0%
Non-governmental organisation	38	25%
International bilateral and multilateral organisation	22	15%
Person living with or affected by HIV	2	1%
AIDS service organisation	4	3%
Industry (e.g. pharmaceutical industry, private sector association etc)	4	3%
	150	100%

As shown in Table 19, a total of 150 responses (54% response rate) were received, with the majority (55%) in the 30 - 44-year age bracket. Approximately one-third (33%)³⁹ represented civil society. While the response rate was slightly higher in the group representing academia (44%) than the group representing government and civil society. When compared with the expected response (based on sample size), the difference was not statistically significant at the 5% level. Additionally, there is no evidence of bias in the respondent sample.

³⁹ 4% of the respondents that reported “Other” as affiliation were from civil society organization but working part-time in academia. They are thus classified as civil society for purposes of this sub-study.

At the start of the survey, 134⁴⁰ selected key stakeholders were invited – via personalised email – to participate with an additional request asking them in turn to nominate other individuals - the “snowball” technique. A total of 291 invitations were sent out. However, during data cleaning, 13 of these were expunged as they were the same individuals but using different email addresses. This survey attained theoretical saturation within 3 weeks of launching the survey when no new names appeared among the nominations and no additional new and unique insights emerging from Q11 that sought for any thoughts or comments on the future financing of HIV response in Uganda.

Respondents were faced with statements on various scenarios across revenue generation, cost reduction, improving efficiency, and political feasibility measures to which they stated level of agreement on a 7-point Likert scale. Figure 53 below depicts the distribution of responses from ‘strongly agree’ to ‘strongly disagree’ across the sample. Whereas the respondents’ classification in Table 15 above was based on the hypothesis that the private sector would present different views from the other stakeholders, this did not hold across all the dimensions of the survey. Neither were there any significant differences between any of the other groups though. For this reason, I do not present the results on differences in preferences.

The median statistic for Likert items (in Figure 59) gives a relatively crude ordering of preferences as it can assume only seven discrete values. To gain better resolution, responses to each statement in section 2 of the survey were aggregated by a weighted scoring algorithm, assigning a diminishing score for lower levels of agreement such that each statement was mapped to one real value. Statements were ranked from highest (agree most) to lowest (disagree most) based on this score. In this study, the resulting ranking confirms the order of preference determined by the median. Across all stakeholders, in order of preference, the topmost preferred options for revenue generation (i.e. with a score above the median of 53%) are:

1. raising additional funding by raising excise taxes on tobacco, alcohol, and sugary beverages;
2. ordinary tax revenues;
3. capitalising a national AIDS trust fund;
4. investing oil revenues in a sovereign wealth fund and finance HIV services from interest gained; and
5. compulsory corporate social responsibility; NHIS and social and development impact bonds.

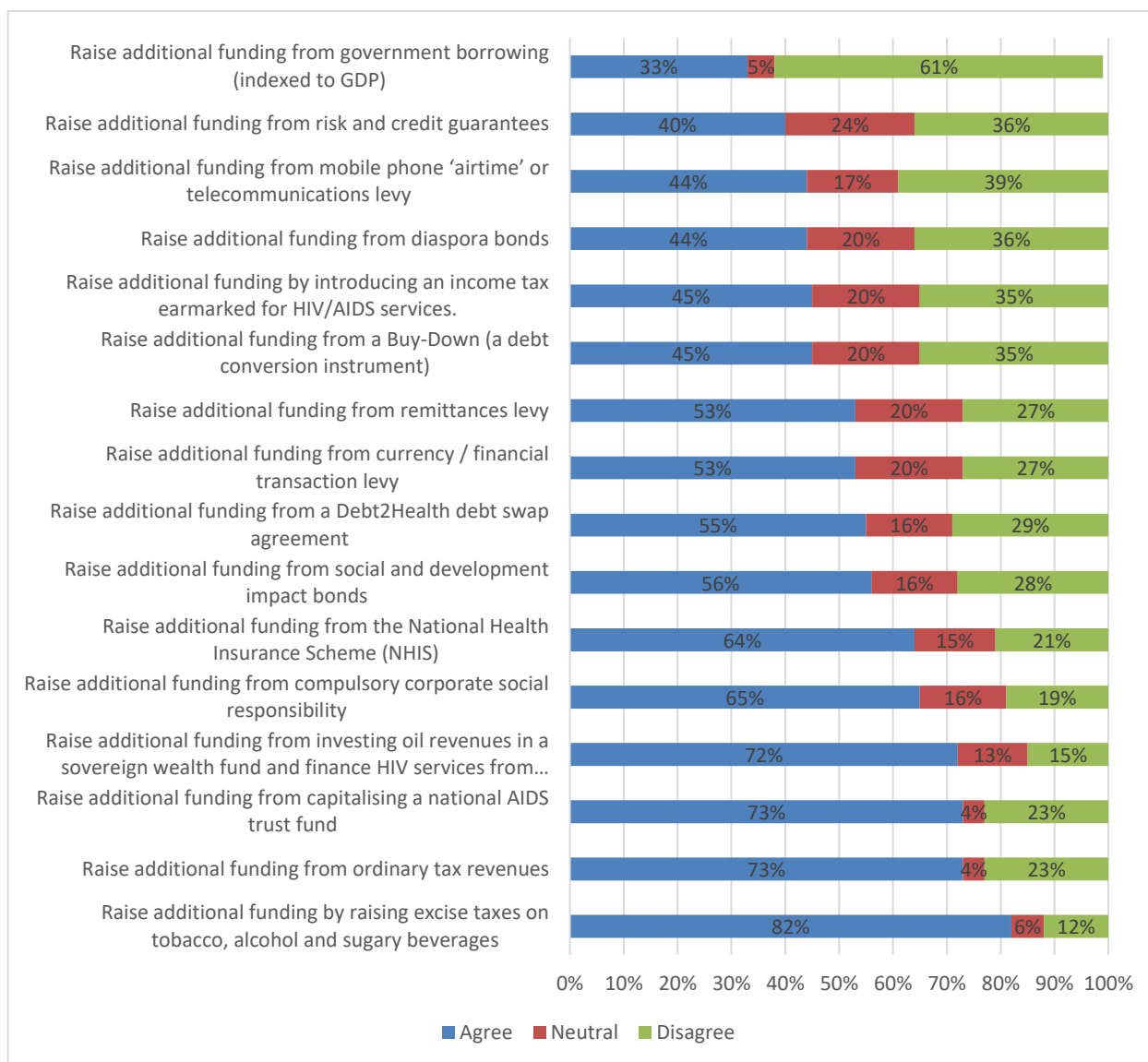
On the other hand, the least preferred options are:

1. raise additional funding from government borrowing (indexed to GDP);
2. mobile phone ‘airtime’ or telecommunications levy;
3. diaspora bonds; risk and credit guarantees;
4. Buy-Down (a debt conversion instrument); and
5. Debt2Health debt swap agreement.

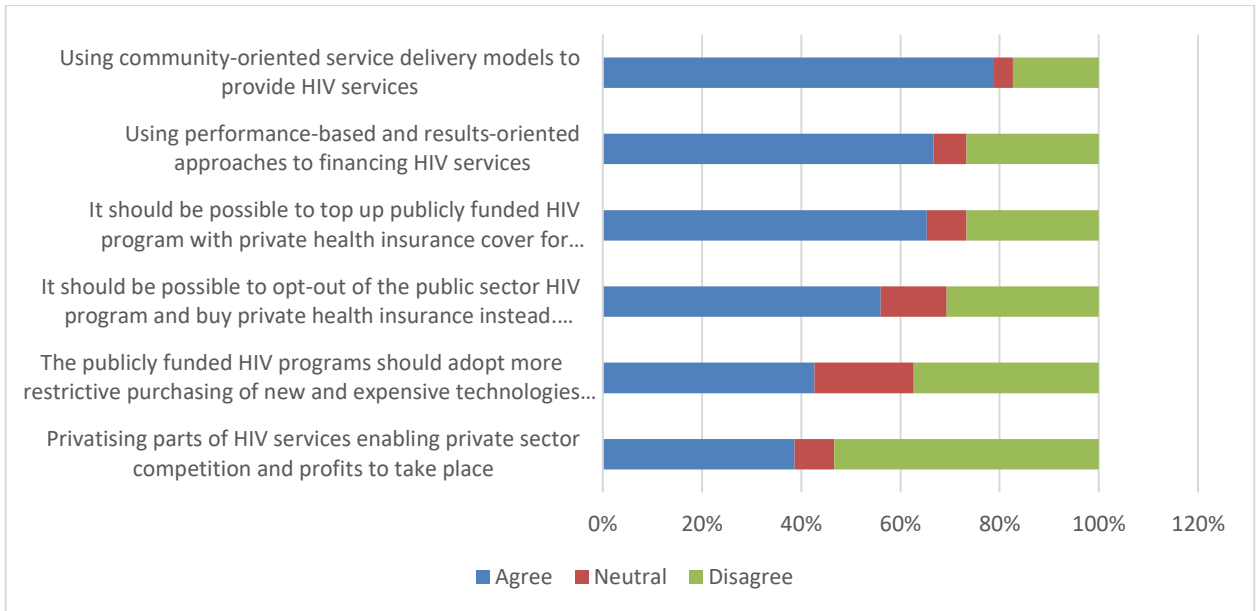
⁴⁰ 91 of the original 134 responded.

Figure 53: Responses to the questions eliciting agreement/ disagreement on a Likert scale

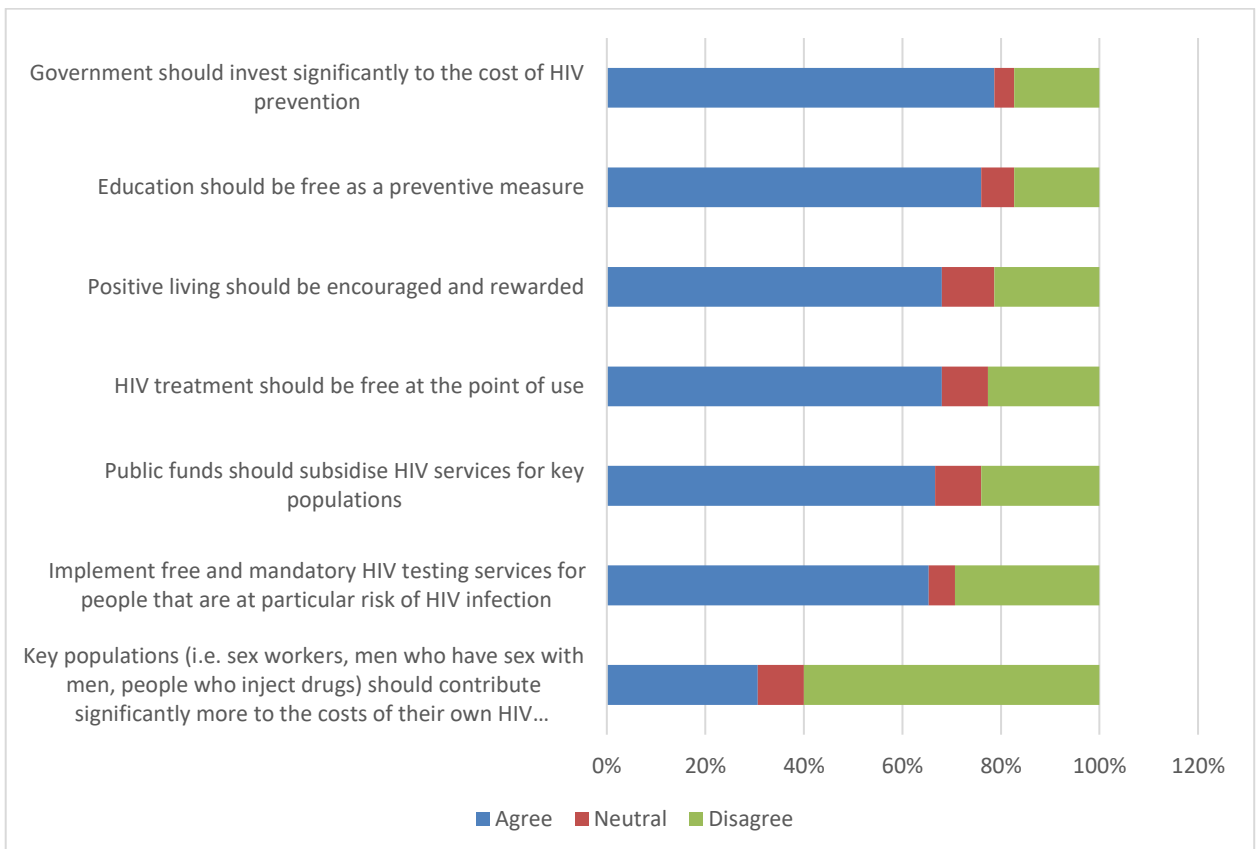
Revenue generation



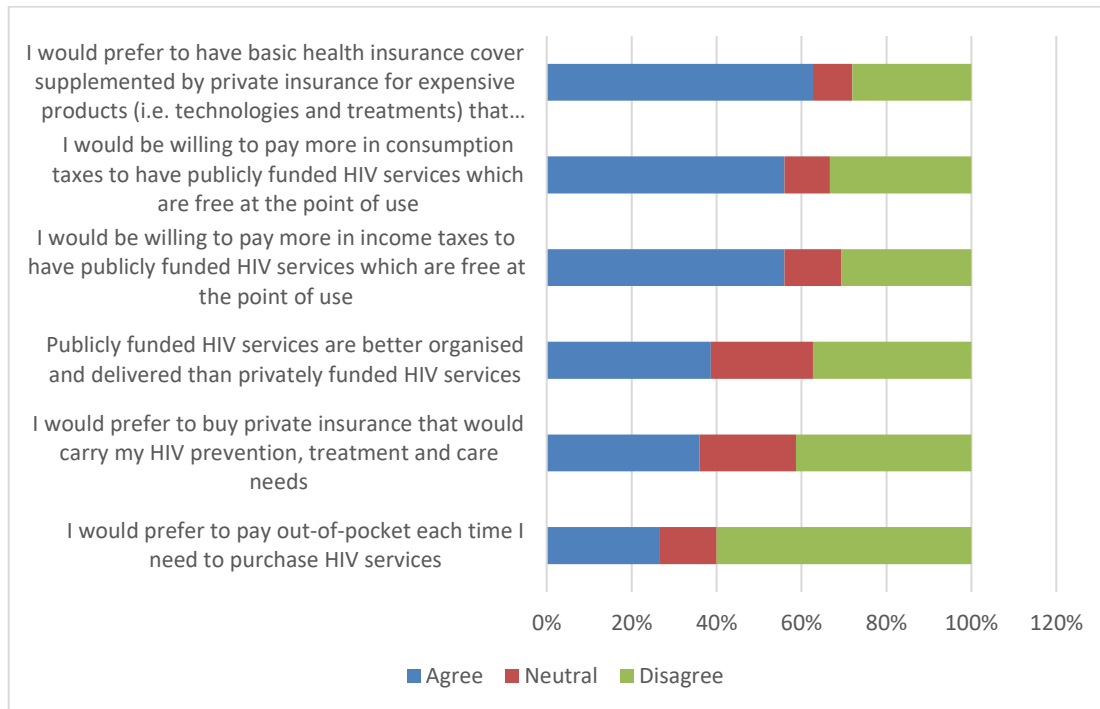
Program efficiency



Effective interventions

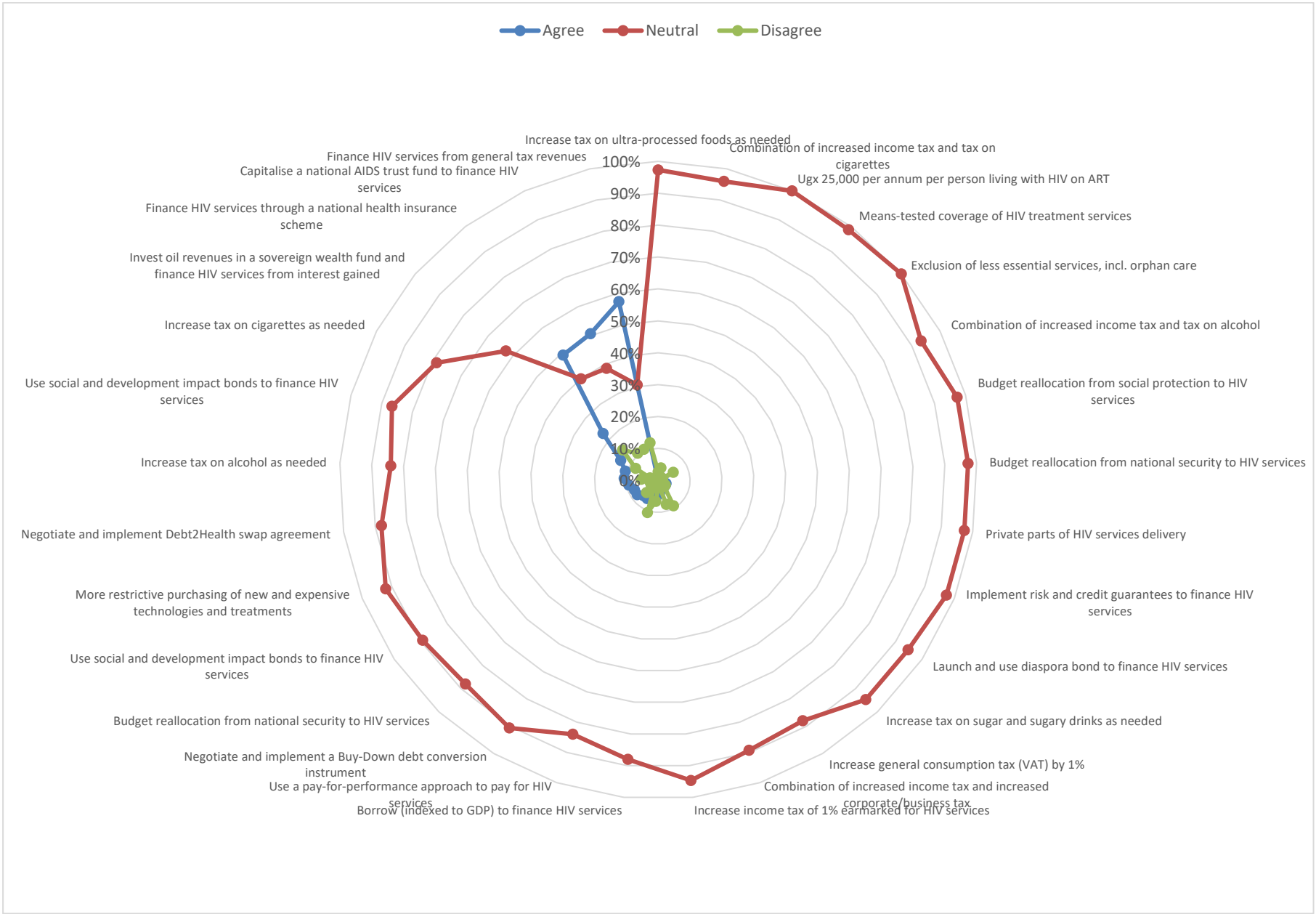


Personal preferences



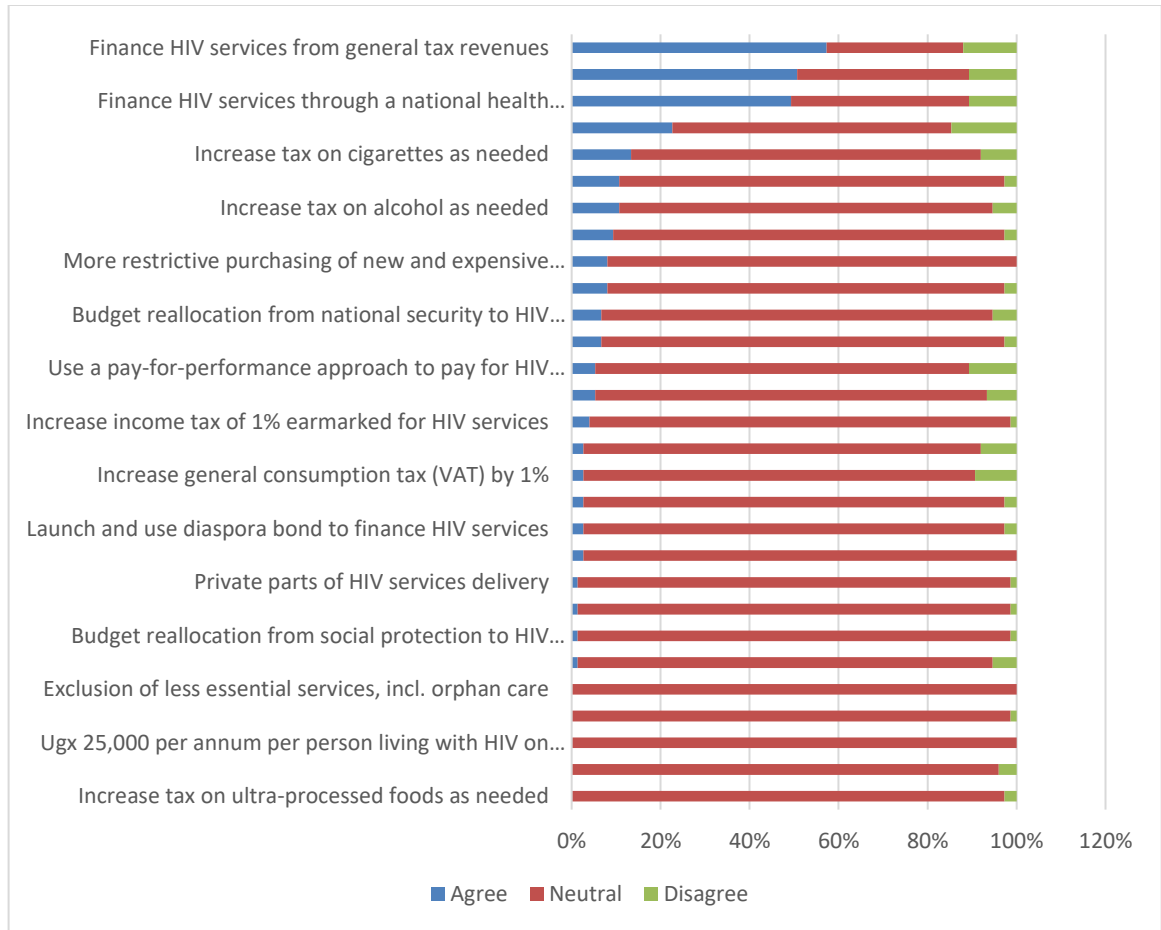
Finally, in terms of political feasibility (assessed here by the relative desirability of each policy option (in a manner like assessment above) by assigning higher positive scores to policy options ranked higher by respondents). As shown in the radar plot in Figure 54, a striking level of agreement across all stakeholders is seen for STAX when considering political feasibility. This is also viewed as far more politically feasible than all other policy options.

Figure 54: Radar plot showing responses to ranking questions when respondents were asked to consider political feasibility



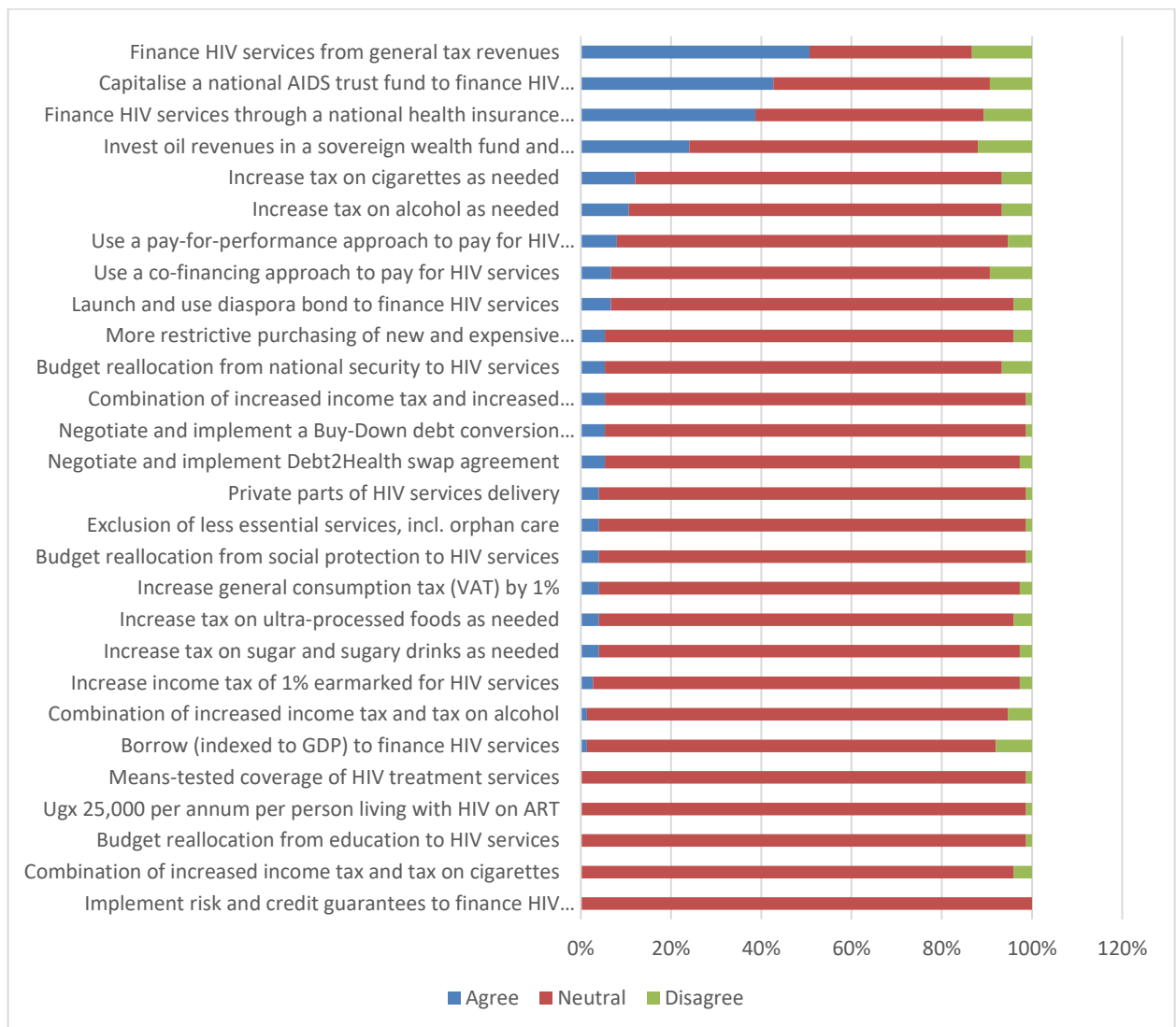
In terms of political feasibility, some options are on the “fence” – rated as neutral – and could thus become preferred through strategic action. Below, for clarity, in (a) I re-present the political feasibility analysis of the various options in Figure 55. Corresponding personal preferences are presented in Figure 55 b.

Figure 55: Political feasibility



e

Figure 55b: Personal preferences



Conclusion

Above, I have surveyed the views and perspectives of a comprehensive sample of HIV financing stakeholders on likely future financing policy options in the wake of concerns about the fiscal sustainability of the HIV response in Uganda. Policy options that are broadly acceptable across stakeholder groups with different inherent interests do exist but are somewhat limited. Interestingly, these options seem to elicit near-universal support. Methodologically and related to the evidence thresholds presented, the survey minimized the risk of bias as it achieved theoretical saturation (and a high response rate, 54%), including an almost identical distribution – in terms of professional affiliations – between the list of invitees and eventual respondents in aggregate terms. I contend, however, that this typology (as shown in Table 15) is based on a high-level classification of HIV stakeholders. As such, as a study limitation, I do not rule out a risk of bias at a finer level of aggregation. Based on the results presented, however, the risk of significantly divergent conclusions would appear to be limited. It remains to be seen how these options can assure the fiscal sustainability of the HIV response. This is the aim of the next sub-section.

8.3.2. A normative and empirical approach to financing HIV services

a) Revenue (and health) impact of excise taxation on alcohol and tobacco

Results show that adopting a 20% increase in the excise tax rate on alcohol would result in a gain of 672,485 life-years, with 30,386 deaths averted. Adopting an excise rate of 60% on cigarettes would result in a gain of 7,545,350 life-years and 485,528 death averted. This is largely a function of reduced consumption due to price elasticity discussed in the methods.

In terms of revenue, as shown in Table 20, a total of US\$ 9 billion (LB: US\$ 5.22 – UB: US\$ 12.6 billion) could be raised from the above-modeled scenarios. Importantly, when I conducted a sensitivity analysis by altering the excise tax rate, the gains in revenue from tobacco use start decreasing largely arising from gains in per unit revenue being offset by falling consumption (in the “High” scenario).

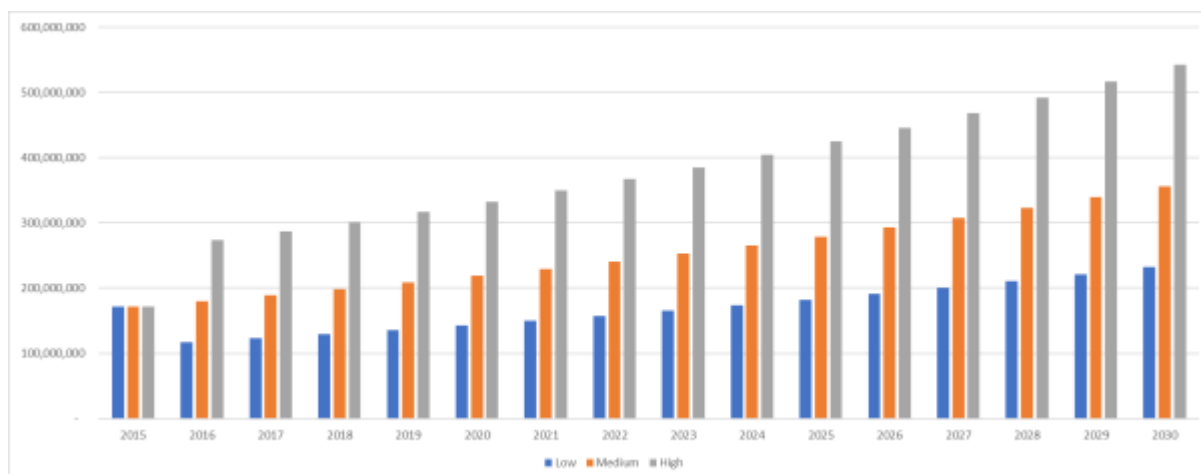
Table 20: Increases in revenues (in US\$), 2015 – 2030

	Intervention scenario		
	Low	Medium	High
Alcohol	5,110,749,914	8,996,489,336	12,532,973,645
Cigarettes	72,885,504	95,765,955	48,377,711
Total	5,183,635,418	9,092,255,292	12,581,351,356

As the modeling suggests that non-trivial revenues could be raised from the fiscal policies preferred by stakeholders, I conclude that a more aggressive excise tax policies on tobacco and alcohol in Uganda could result in meaningful improvements in population health and raised revenues. A key policy implication is that taxes levied on health-damaging commodities, such as alcohol, and tobacco could present an opportunity for GoU to curb the incidence of non-communicable diseases while raising large-scale and stable resources to support the HIV response and broader UHC agenda.

b) Raising revenue through general taxation

Figure 56: Potential revenue generated from tax (in US\$), 2015 – 2030



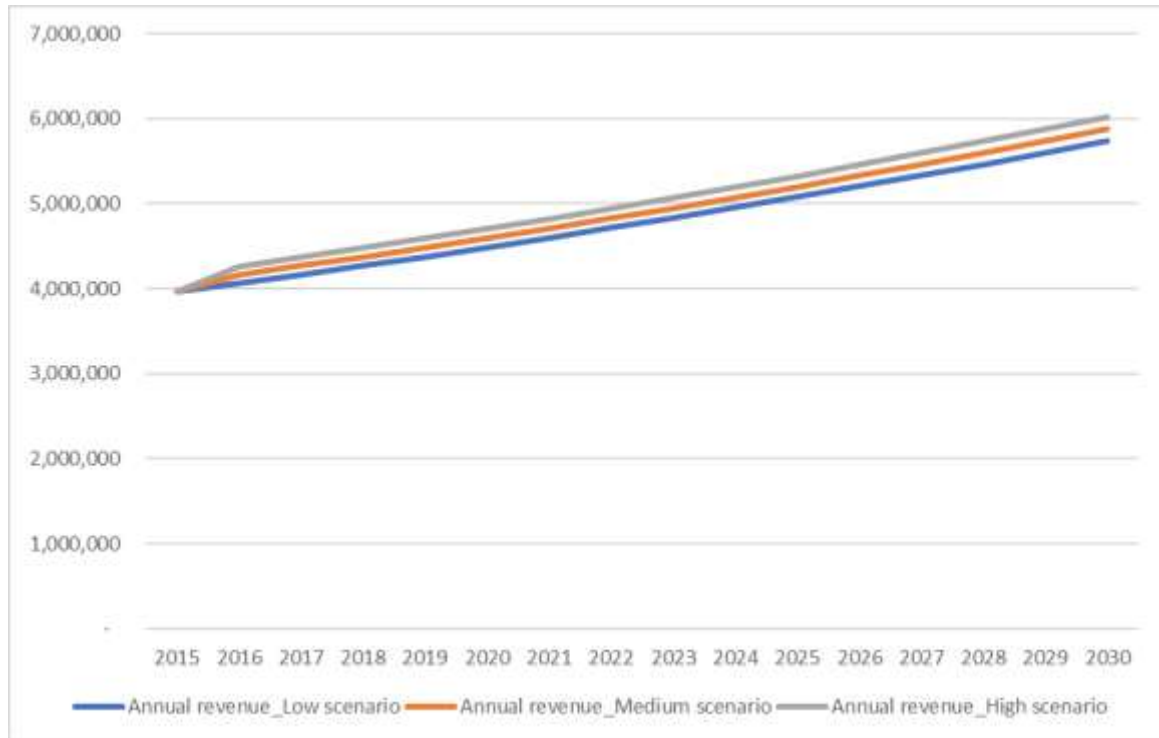
Currently, only 2% of the Government budget is allocated to HIV. In terms of potential revenue increments in domestic resources from this option, the analysis finds potential in the ranges of 8% to 23% by 2030. This is in line with a 9.8% increase in domestic revenue (% GDP), from both tax and nontax revenues as seen in countries such as Uganda transitioning from low to lower-middle-income country status. As shown in Figure 56, this would result in US\$ 4,052,531,745 (with estimates ranging between 2,702,538,145 and US\$ 6,755,069,890 for the “Low” and “High” sensitivity analysis scenarios respectively) between 2015 and 2030. In real terms, this is equivalent to 5% of total tax revenue raised in the same period.

In conclusion, some useful pointers for fast-tracking improving DRM through taxation are helpful. These, *inter alia*, include: the use of credit and debit cards, improved regulation of businesses, and simpler and publicly accessible tax procedures to potentially bring taxable entities and hidden transactions into easy reach; improving the efficiency of existing instruments and applying them correctly could rationalize tax exemptions to ensure that the criteria is defined and properly enforced; reducing tax expenditures to minimize revenue foregone arising from tax exemptions; improving efficiency and effectiveness of revenue administrations such as the Uganda Revenue Authority, local governments (for own-source revenue), state-owned enterprises (for investment income) and ministries, departments and agencies (non-tax revenue); and, enhancing public awareness, transparency, and civil society engagement to increase voluntary tax compliance.

c) The ATF

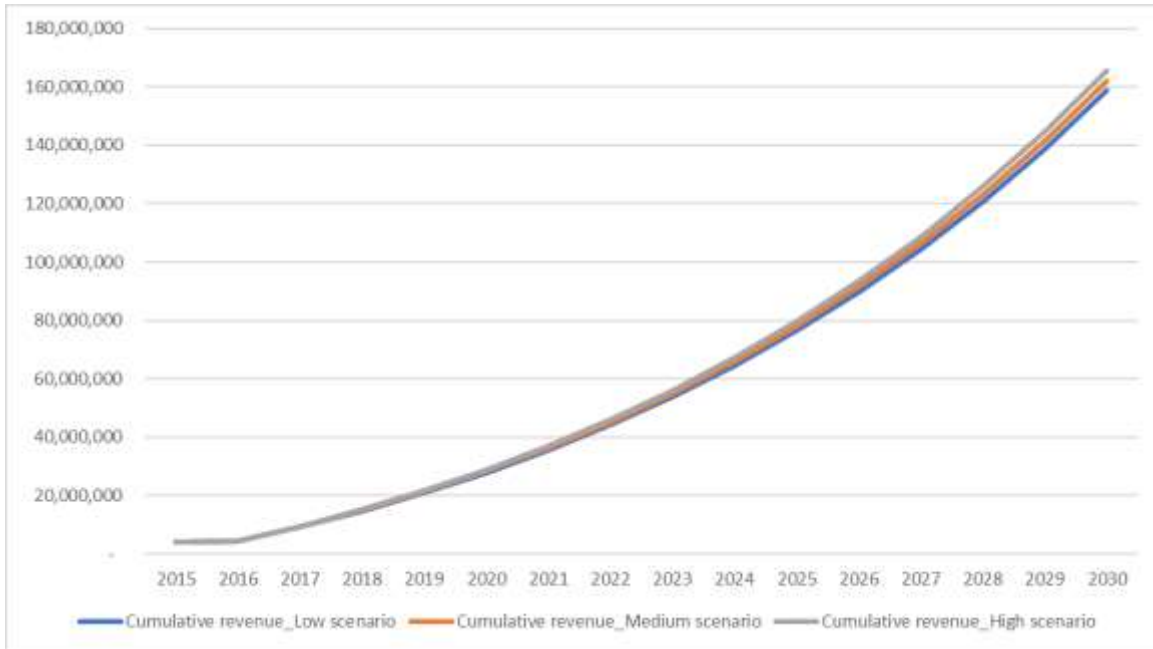
Operated as a current account, over the period 2015 to 2030, the ATF would raise a total of US\$ 78,631,403. As Figure 57 shows, this averages approximately US\$ 5 million per annum.

Figure 57: Annual revenue raised by the ATF in Uganda (in US\$), 2015 – 2030



However, as Figure 58 shows, this could grow by a factor of more than 2 in case a policy choice is made to grow the ATF (as happens with endowment funds) to a total of US\$ 162,187,567 by 2030.

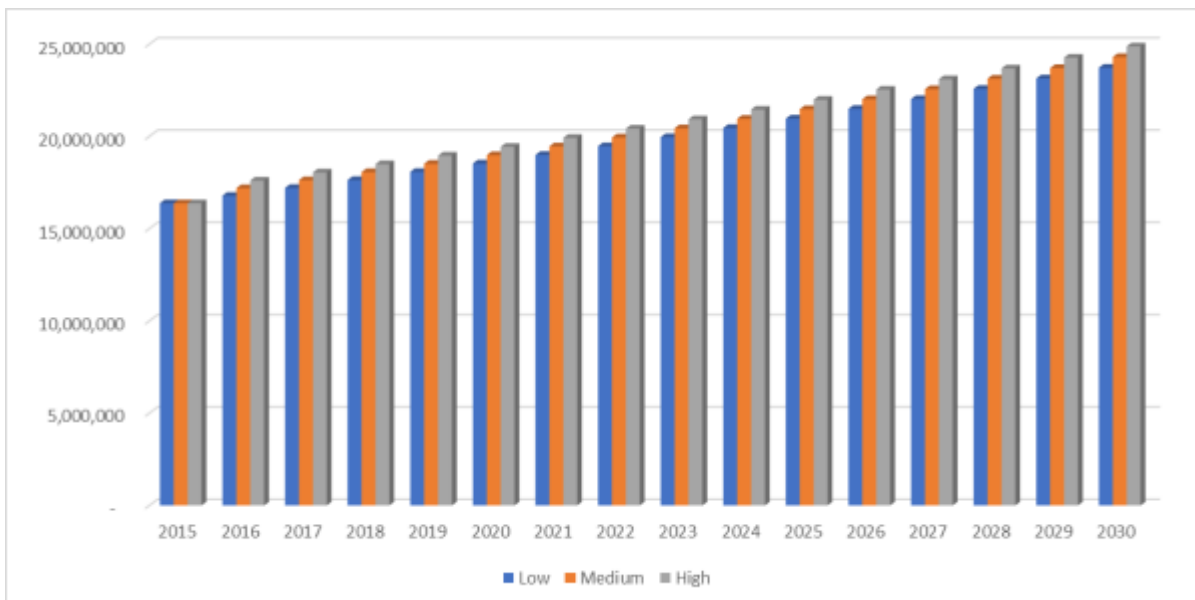
Figure 58: Potential cumulative revenue raised by the ATF (in US\$), 2015 – 2030



c) The NHIS

Regarding the NHIS, as Figure 59 shows, an average of US\$ 20.3 million could potentially be raised per annum for the HIV response. Over the period between 2015 and 2030, the total revenue raised would range between US\$ 317,416,655 and US\$ 642,175,708.

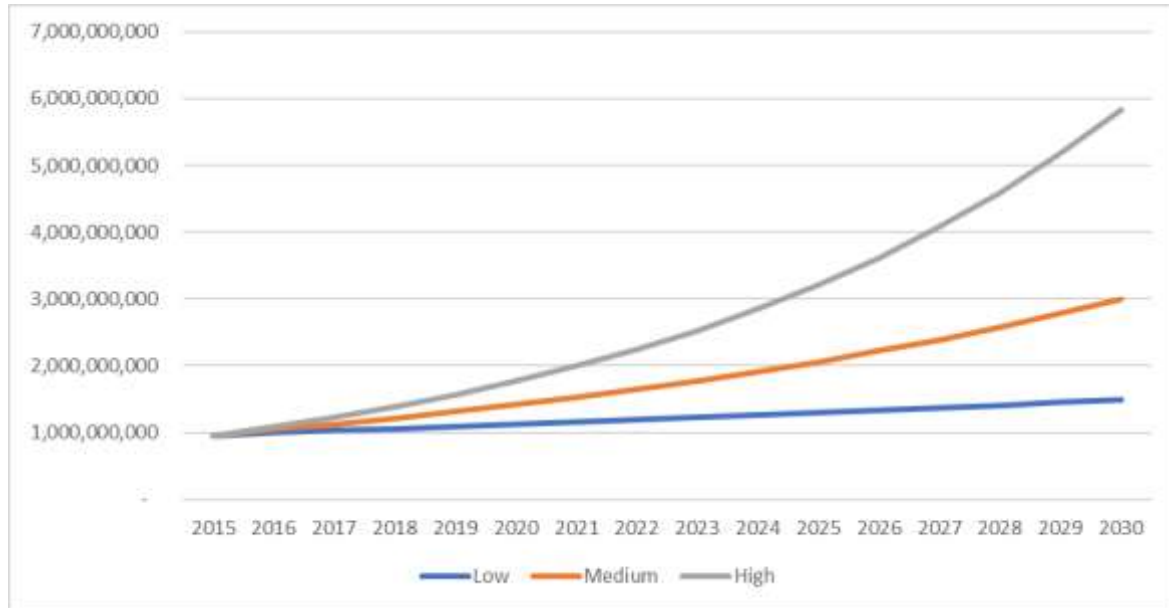
Figure 59: Revenue projections from an NHIS (in US\$), 2015 – 2030.



d) The SWF

Between 2015 and 2030, as shown in Figure 60, approximately between US\$ 1.5 billion and US\$ 5.8 could be raised.

Figure 60: Revenue projections from an SWF (in US\$), 2015 – 2030.



Bringing it all together, between 2015 and 2030, the normative approach suggests that if all fiscal sources were simultaneously leveraged, public HIV spending in Uganda could raise a total of US\$ 24,004,952,569. This could rise to US\$ 25,066,909,106 if private sources (i.e. Prepaid private health insurance and OOP expenditures) are included. See Table 21.

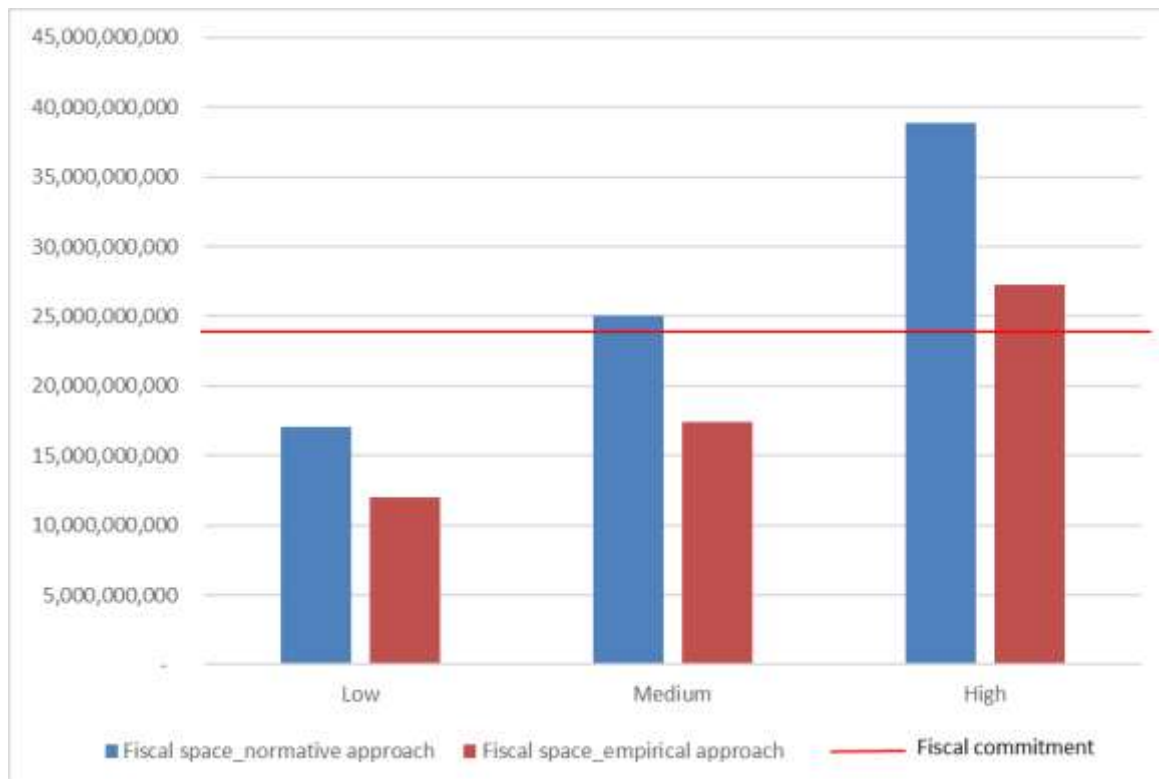
Table 21: Total projected fiscal resources per financing option, normative approach (in US\$)

	Low	Medium	High
SWF	158,720,367	162,187,567	165,654,767
NHIS	317,416,655	324,759,052	642,175,708
Excise duty on cigarettes	72,885,504	95,765,955	48,377,711
Excise duty on tax	5,110,749,914	8,996,489,336	12,532,973,645
Trust Fund	76,853,645	78,631,403	80,409,161
Tax	2,702,538,145	4,052,531,745	6,077,522,146
Efficiency	3,292,934,140	4,052,531,745	7,345,465,885
Donor	4,541,554,263	6,242,055,765	8,919,240,000
Prepaid private	7,299,694	10,032,930	308,141,000
OOP	765351724.4	1051923607	2743738000
Total	17,046,304,051	25,066,909,106	38,863,698,022

However, the empirical results suggest that less fiscal space could be created even if bold measures are taken. Overall, from a fiscal perspective, as Figure 61 shows, the above options

could cover the fiscal commitments implied by the national HIV response under the Fast-Track scenario for the period 2015 – 2030 under the “High” scenario.

Figure 61: Fiscal commitments and available fiscal space, 2015 - 2030 (in 2015 US\$)

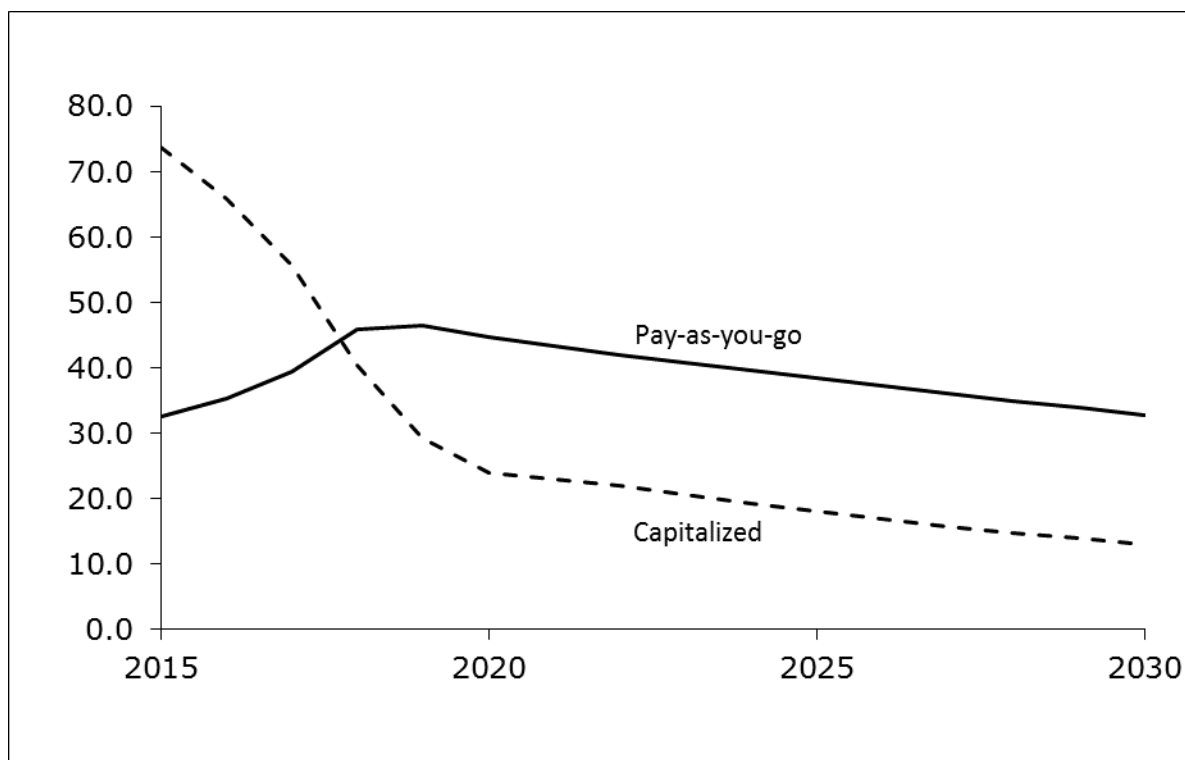


8.3.3. Ideation: financing of HIV treatment costs through NHIS in Uganda

As is apparent from the above analysis, UPF is the chosen path for financing HIV services in the long-term. In June 2019, Cabinet approved the NHIS Bill and is one of the long-term options considered for the financing of the national HIV response. Additionally, it is viewed as a pathway to UHC. Currently, total spending on HIV accounts for a large proportion of THE. It is important to note that whereas the HIV/AIDS-attributable burden of disease is projected to come down over the next years, the number of PLHIV receiving treatment and the corresponding costs are set to increase (see §3.3). In other words, the disease burden and financial costs of HIV/AIDS pose significant challenges to expanding coverage of the NHIS and finance at least part of the costs of HIV/AIDS treatment through this scheme.

In light of the above, this section addresses the question: if the NHIS were to assume the financing of treatment for its members, it would assume a potentially large financial liability not funded by current contributions. As I show in §3.3, thanks to the national HIV response, health prospects of PLHIV have greatly improved. With the Test and Treat policy and the ensuing high treatment coverage and improved eligibility of treatment, individuals who become infected with HIV now can realistically expect to survive for several decades (instead of just about 10 years when access to treatment was the exception). Put differently, from a fiscal perspective, this means that each HIV infection causes a spending need that extends over several decades. The projected cost caused by one HIV infection is discussed in §5.3.

Figure 62: HIV premiums required in pay-as-you-go and capitalized health insurance (US\$)
(Percent of Population, Ages 15-64))



Second, there are broadly two ways how these costs could be financed under health insurance – a pay-as-you-go system and a capitalized system. In summary, under the pay-as-you-go system, current premia contributions (from all insured) finance the current costs of treatment. Drawing on the empirical analysis in §5.3, and assuming that there are two beneficiaries for each insured person and that the average annual costs of HIV treatment are US\$ 250 per annum, and considering that the number of people receiving HIV treatment is projected to decline from 3.9% of the adult population (aged 15-64) in 2015 to 3.% in 2030, then an annual premium required to cover the costs of HIV treatment would rise from US\$ 32.6 in 2015, peaking at US\$ 46.5 in 2019 and thereafter decline to US\$ 32.8 in 2030. The alternative is a capitalized system in which current contributions cover the risk of contracting HIV in a given year. With projected costs caused by one HIV infection estimated at US\$ 24,000 (undiscounted), a risk of contracting HIV of 0.41% in 2015, and assuming that there are two beneficiaries per contributor, the premium required to cover the risk of contracting HIV is US\$ 73.8, but this would decline to US\$ 13 by 2030.

I contend, as argued elsewhere (Haacker and Birungi, 2016), that there are some good reasons to adopt a capitalized HIV/AIDS insurance. Over the coming years, the insurance premium required under a pay-as-you-go system will remain high at over US\$ 30, whereas it declines to about US\$ 13 in the capitalized system. That means that in the pay-as-you-go system, a large chunk of the premium is cross-subsidizing PLHIV receiving treatment, without an expectation that the payee would correspondingly benefit to the same extent. The higher premium, not justified by current HIV infection risk, could also compromise the objective of expanding access to health insurance. Politically, a capitalized system is attractive because it directly links insurance payments to the success of HIV prevention programs, whereas in a pay-as-you-go system the

consequences of HIV infections are paid by contributors in subsequent decades. Thus, it could help to build a social consensus about national HIV prevention policies.

However, the immediate disadvantage of the capitalized system is that the costs of people already living with HIV/AIDS would need to be financed from other sources. On the other hand, “dumping” this liability as a kind of tax on the contributors to the health system would be problematic for equity reasons and against the objective of expanding the coverage of the insurance system. As such, financing this liability from projected financial reserves of the NHIS would be unfeasible. Provided that a capitalized HIV/AIDS insurance is desired, shifting the financial liability posed by the responsibility for covering treatment needs for people already living with HIV will therefore need to be funded. Considering the magnitude of the liability, this is no mean feat, and clearly cannot be done out of current government revenues (of about 25 percent of GDP annually – i.e., the HIV/AIDS liability is similar in size to total annual government revenues).

In conclusion, in light of this, a gradual – but phased - transition to funded health insurance including HIV/AIDS services would be required. One such policy option to this end is utilizing the ATF as seed financing towards more comprehensive health insurance. Here, the ATF would initially channel current financing to the NHIS. However, in parallel with a transition to an NHIS, taking over the responsibility for funding treatment for people currently living with HIV, and a projected gradual decline in the costs of the national HIV response relative to GDP, the ATF could eventually be utilized as a vehicle for accumulating the funds required to fund the HIV/AIDS liability once the most pressing current spending pressures subside. Finally, as a cautionary note, there is a possibility that insurance might increase moral hazard, and consequently, people take less HIV prevention. To this end, for the fiscal sustainability of HIV responses, I recommend robust monitoring systems to mitigate against this and minimise potential cost escalation.

8.3.4. An ECEA of UPF of HIV/AIDS in Uganda

Table 22: Estimated gains and distribution across income quintiles

Outcome	Total	Income Quintile I	Income Quintile II	Income Quintile III	Income Quintile IV	Income Quintile V
Deaths averted with 90% ART coverage	357,797	119,266	89,449	59,633	59,633	29,816
Private expenditures crowded out	2,030,885,574	617,916,503	519,049,863	362,511,015	358,391,572	173,016,621
Potential for Catastrophic (>15% Annual Income)	0	YES	YES	YES	NO	NO

As shown in Table 22, economic evaluating the consequences of the proposed UPF approach in each of the above-mentioned domains (i.e. access enhancement, crowding out of OOP, and catastrophic HIV expenditure aversion), I find that a total of 357,797 avoidable AIDS deaths and US\$ 2,030,885,574 private expenditure averted over 15 years (i.e. 2015 – 2030). Additionally, using the money-metric value of insurance, poverty alleviation benefits are concentrated among the poorest population groups. In other words, the distributional impacts of UPF (implicit in the proposed novel approach) are pro-poor. Specifically, the intervention being evaluated here is public financing (arising from the approach developed and assessed in § 8.3.2. As a policy implication, in the practice of and the policy discourse on the sustainable financing of UHC, trust funds for financing priority health programs could play a catalytic role. Finally, methodologically, ECEA offers the potential to inform cross-sectoral resource allocation as it allows examining distributional consequences and priority setting beyond the health sector.

8.4. Discussion

A novel approach has been proposed and, using Uganda data, validated as capable of addressing the fiscal sustainability challenge the HIV response in Uganda is facing. Achieving of fiscal sustainability of HIV responses is complex. To this end, a complex multidimensional approach is elaborated to cope with long-term fiscal challenges. Looking ahead, scope exists to put the HIV response on a fiscally sustainable path, and the related progress towards UHC.

The chapter has presented a more realistic, but still optimistic picture of improved fiscal sustainability of the HIV response. As part of the novel approach, political economy insights, game-theoretic strategies and behavioural economics interventions are required to move the findings of the empirical approach into real-world applications. These are discussed in §2.2 and §4.2. This is important more so to realise the identified potential fiscal space. Here, for example, development partners can and ought to support efforts to realise the identified fiscal space through a more coherent engagement across health and social development investments, a continued focus on efficiency, and a longer-term approach to co-financing national HIV responses within broader health financing frameworks (Remme, 2018).

In qualitative research, there are several issues that can affect the sample size. However, the concept of saturation should be a key guiding principle. Whereas this concept has been extensively explored in the academic literature by several scholars, it is still hotly debated, and – unfortunately – little understood. Mason (2010) in his seminal work analysed a sample of Ph.D. studies using qualitative approaches, and qualitative interviews as the method of data collection. Results showed that the mean sample size was 31; however, the distribution was non-random, with a statistically significant proportion of studies, presenting sample sizes that were multiples of ten. These results, when discussed in relation to saturation, suggest a pre-meditated approach that is not wholly congruent with the principles of qualitative research. In light of this, Fusch and Ness (2015: 1413) conclude, as a matter of principle, that a small study such as this online survey will reach saturation more rapidly than a larger study. Importantly, among others, they conclude that “Data saturation is reached when there is enough information to replicate the study when the ability to obtain additional new information has been attained...”. Similarly, in a paper by Tordrup et al (2013), spanning comparable dimensions as this present study bar for health financing options in 28 European Union (EU) member states as well as Norway, Iceland, Switzerland, Australia, Russian Federation, Canada, and New Zealand, saturation was achieved with an average of 14 respondents per country, and no evidence for the statistically significant country and stakeholder groups’ bias in the respondent sample. In light of this, I argue that the results presented in this section are not merely “modest claims” but are valid study results.

In the context of the move towards UHC, I contend that it will be important that those working in HIV join the call for increased health prioritisation in the context of UHC, and work to identify tailored country-specific approaches to proactively leverage broader development investments. This will be central to expanding access to HIV prevention and treatment in a way that is sustainable and in line with the post-2015 development agenda.

The proposal for a national health insurance scheme has gained traction and is preferred by key stakeholders in Uganda. However, it is fraught with challenges. It is thus highly unlikely that Uganda could realise the potential to financial elements of the national HIV response, such as HIV treatment, through this financing instrument. Here, I discuss the risks involved in including in the overall proposal. First, given the long, winding and tortured road of the NHIS proposal spanning over three (3) decades, it is safe to hypothesise that realisation of this proposal is somewhat unlikely. Second, drawing on the evidence presented in Chapter 6, I argue that as NHIS is not *conditio sine qua non* for realising UHC. As such, seeking to realise the fiscal sustainability of the HIV response through the NHIS could be jeopardised in an era of “taking AIDS out of isolation”. Consequently, I contend that tax-based public financing is the best option. Third, based on a

synthesis of recent research that makes the case against labor-tax financing of health care in low- and low-middle-income countries, I find very little evidence to justify the pursuit of labor-tax financing for HIV. Contrarily, I find growing evidence suggesting that such policies could lead to increased inequality and fragmentation of the national HIV response and broader health system (Savedoff, 2004; Barasa et al., 2018; Yazbeck, 2000). To this end, I recommend Uganda heeds the evidence on labor-tax financing and seek alternative approaches to health financing: primarily using general taxes or, depending on the context, general taxes combined with adequately regulated insurance premiums. Finally, given the politics of HIV – especially with regards to key populations programs – that have heightened moralisation of sex and sexualities, I argue that current proposals for NHIS do not explicitly embed ethics and equity considerations in the health benefits policy design, specifically to determine “what’s in and what’s out”. For a multi-dimensional national HIV response that requires a multisectoral response, non-health as well as certain interventions, such as programming for key populations, may have to continue to need to receive external support even if NHIS is enacted. As a way forward to minimise the risk, I recommend the need to consider the many dimensions of governance, institutions, political economy, and ethics that are needed to decide “what’s in and what’s out” (in the health benefits package).

The rationale for the idea of the SWF to manage the oil and natural resource rents is rooted in the Permanent Income Hypothesis (PIH). This theory posits that an economic actor will aim to smooth their consumption and expenditure out between income peaks and troughs, and essentially expend the average of their expected total lifetime income. As Aguiar and Hurst (2008) suggest, when applied to Uganda’s oil or gas wealth, the PIH implies that a government will spend only the equivalent to the interest of their country’s total oil and gas wealth. Meghir adds that this is typically achieved through investing all oil and gas revenue externally in a sovereign wealth fund, which then generates interest. For Uganda, given evidence of deteriorating governance and mounting corruption (developments that in turn raise questions about its capacity to wisely invest the oil revenues), I contend that this could prevent the resource curse (Gelb and Majerowicz, 2011). The Petroleum Revenue Investment Reserve (or Uganda Petroleum Fund) is an SWF, founded in 2015, as a move towards this direction. It is important to note that this vehicle is still in infancy. Consequently, assessing its yield is not possible at the time of writing this thesis.

As Barroy et al (2017) show, over the past ten (10) years, the concept of fiscal space has been applied in research and policy in over 50 LMICs. In this thesis, I build on this vast experience. Recognizing the rapid shifts in the global health financing landscape, particularly in the SDG era, this chapter, in looking forward, largely focuses on domestic financing sources. Novel here, this chapter examines the potential to expand public HIV financing, and – through the empirical approach to fiscal space analysis - the extent to which the GoU has been utilizing these options.

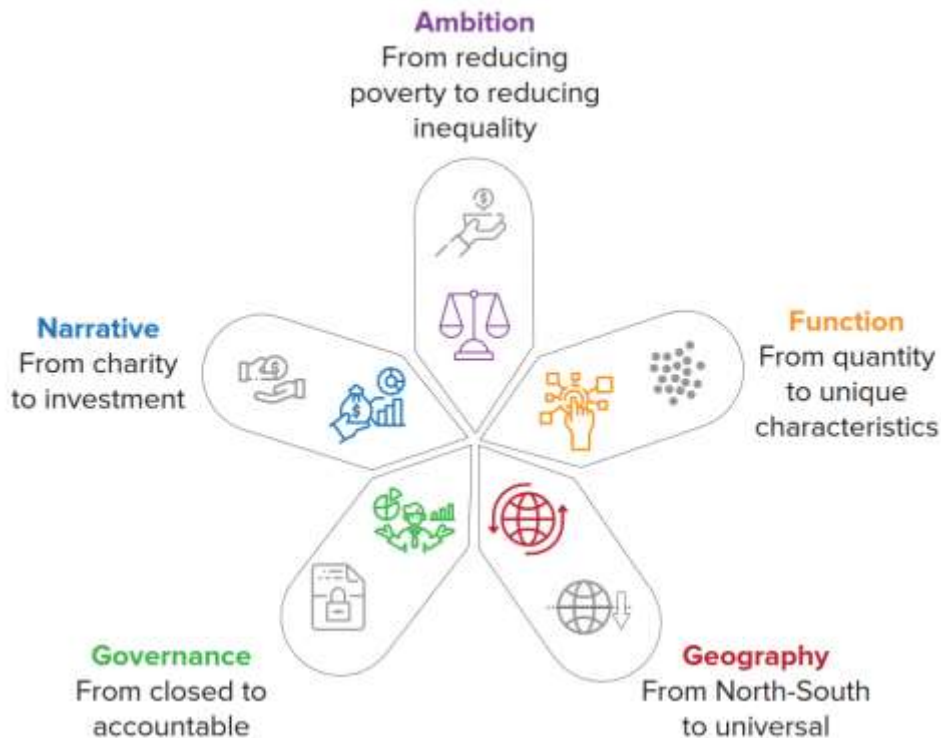
Advances in the conceptualization of fiscal space for health made during the MDG era have helped structure analysis and situate health financing reforms within macro-fiscal environments. Fiscal space for health studies shows significant alignment on the potential for economic growth, budget reprioritization, and efficiency improvement measures to drive fiscal space for health expansion. However, even then, a more contextualized approach to fiscal space analysis is required that focuses on key sources of fiscal space for health expansion and includes efficiency enhancements. Additionally, fiscal space analysis should be systematically embedded in domestic budgeting processes and explicitly consider both technical and political feasibility of assessed options. By adopting this approach, this chapter offers considerable potential for optimizing government budget and expenditure decisions and more effectively support progress toward UHC.

Realising the fiscal sustainability of the HIV response is a complex strategic interaction. Thus, to progress from theory to action, a political analysis of reform implementation will need to be iteratively undertaken. These have been discussed already in this thesis. The pillars proposed

in Ramos and Reich (2019) offer a good starting point as §2.5. shows. Additionally, the behavioral economics insights (discussed in §3.4), and games of strategies (discussed in §7.2, for example on optimizing donor funding) will need to be deployed at scale. This, will in turn, positively impact the economy, through improved labor productivity as PLHIV on treatment recovers their full human capital potential (see Resch et al., 2011). As Kabajulizi and Ncube (2017) find, UPF has welfare implications, particularly through expanded healthcare services, improved population health, higher sectoral growth, and reduced poverty. As I show in §2.4. financing HIV has positive impacts on labor productivity and the broader economy. However, as the empirical analysis assumes that the increased fiscal space will partly be financed from increased national tax levels (particularly excise taxes on tobacco and alcohol), there are certainly tax burden implications. However, these are offset by the gains in life-years (and the attendant productivity gains and treatment costs saved).

Relatedly, regarding debt and fiscal balance, the ratio of public debt to GDP is not affected within as the borrowing option is not preferred in Uganda. On the other hand, the fiscal balance is projected to improve over time as per IMF and GoU targets. Thus, the projected path for the fiscal balance is not disrupted. Finally, in terms of the effect on discretionary expenditures. As the fiscal space analysis assumes that the government will increase budget allocation to HIV/AIDS through a rise in the proportion of discretionary current expenditures provided to the sector, the small rise from 2 to 3.6%. This, in turn, will then reduce the availability of discretionary expenditures for other sectors from 98 to 95.4%. This is not expected to have serious implications for the macroeconomy other than creating a more productive and healthier workforce.

Figure 63: Five paradigm shifts for a new era of aid



Source: Author's adaptation from Glennie (2019)

Importantly, development assistance for HIV will remain an important lever for the fiscal sustainability of the HIV response in Uganda, but not as aid as we know it today. It will need to shift away from charity as implied in the words “donor” and “recipient” to global public investment (GPI). As used in this thesis, drawing from Glennie (2019), GPI refers to concessional international public finance intended to promote sustainable development. It includes ODA and South-to-South Cooperation. I posit that this represents a much-needed paradigm shift for a new era of aid – spanning five (5) key dimensions: ambition, function, geography, governance, and narrative. Figure 63 illustrates these shifts. The idea of controlling HIV epidemics is at the heart of this shift. As Glennie (2019: 4) argues:

“Just as citizens accept the concept of taxation to pay for national public goods, and just as European countries invest regionally for the good of all, so we can develop an approach to support such investments at a global level - Global Public Investment. The institutions and modalities will be very different, as will the challenges faced, but the fundamental concept is the same.”

Grounded in political economy realities and anchored in a right to health perspective, this alternative paradigm to financing the HIV response in Uganda is both needed and feasible. The framework proposed in this thesis is one step to advance in this direction.

Below, I delineate some limitations of the framework proposed. First, fiscal space analyses tend to be one-directional, with no or limited consideration of the feedback loops through which higher government spending could have supply-side effects, such as relaxing key bottlenecks or creating additional productive capacity, leading to economic growth and thus additional fiscal space in the medium to long run. Spending now could also offset potential costs and entitlements in the future. Although the report to the Development Committee of the World Bank and IMF recognised that “the sustainability of policies to create fiscal space is a function of what the fiscal space is used for”, Roy and Heuty (2009) remark that the focus is still on short-term macroeconomic stability, whereby the short-term acts as a binding constraint on the long-term.

A second limitation is an apparent disconnect from the issue of absorptive capacity, which constrains effective fiscal space. Systemic bottlenecks and weak capacity are mentioned as a key area to use fiscal space to invest in, but they are not considered to be determinants of effective fiscal space. The focus in the development and public finance literature tends to be on budget management and revenue mobilisation capacity, not the other binding resource constraints in sectors like health. A country’s ability to create effective fiscal space for HIV or health more broadly is closely related to its absorptive capacity, which depends on factors such as the availability of skilled human resources, physical resources (infrastructure), and good governance. Low absorptive capacity and the annual under-spending of health budgets in many low-income-countries have been thought to explain the reluctance of ministries of finance to allocate more resources to health and the channeling of development assistance through vertical programmes. Given other structural binding constraints, large increases in funding may not be enough to ensure programme scale-up. To address this, I undertake medium-term sensitivity analyses in this thesis, as appropriate.

In line with the aspirations of Uganda’s Vision 2040, the second National Development Plan (NDPII) is designed to propel Uganda towards middle-income status by 2020. Whilst this ambition is not backed by empirical evidence other than political rhetoric, it brings to the fore the policy discourses on moving HIV financing from silo to sustainability. Generally, while the transition to higher-income status is a positive step forward for countries, however, this transition brings with it the prospect of declining external assistance, both in general and in particular for HIV responses. As shown in Røttingen et al (2014), most health donor agencies rely at least in part on an income threshold to establish eligibility for support. It thus follows that such a donor transition implies that government is increasingly responsible for the financing of a health programme and its supported

interventions. In this thesis, I argue that, however, focusing attention only on replacing external assistance with domestic revenues for the programmes concerned is problematic in two ways: firstly, this approach limits the sustainability question to revenues, and secondly, it limits the scope for action to the specific health programme that was receiving external support. The commitment countries have made to UHC is an opportunity to reframe the transition agenda towards sustaining coverage results rather than externally funded programmes per se. This perspective has implications for the overall approach to transition taken at both national and global levels. Looking at transition through a UHC lens implies three shifts: building consensus that what is to be sustained is increased effective coverage of priority health interventions; that sustainability requires acting on both revenue and expenditure issues; and that such actions must be done system-wide rather than programme by programme. As Kutzin and colleagues (2018: 1513) argue: “A UHC lens means looking at these challenges from the perspectives of the health and finance ministers rather than simply those of each programme manager.....”.

8.5. Conclusion

This chapter empirically assesses the proposed novel framework for analysis and action on the fiscal sustainability of HIV responses. The debate on fiscal sustainability of AIDS is critical, and reflective of the importance of clarifying ways to facilitate the expansion of long-term financing options – to not only foster economic growth through strategic investment in social services but to finance programmes vital for overall human capital development, particularly those related to HIV and AIDS. To this end, countries experiencing “long wave” events such as AIDS need to continually explore the scope of increased fiscal sustainability. The approach proposed here is intended to complement technical decisions around health financing reform design and implementation. It lays out key technical questions and issues to be addressed through reform measures to each of the interrelated health financing functions. By using this multi-dimensional approach as part of the overall health financing reform process, the likelihood that technically sound policies are adopted and implemented should increase.

Finally, in an age of austerity, the questions surrounding the fiscal sustainability of HIV/AIDS policies are often obfuscated by incoherence between policy tools and policy objectives. Bringing together evidence so far collected, this chapter attempts to address this problem by providing an analytical framework - that is driven by the normative objective of addressing the fiscal sustainability of HIV response. Importantly, I posit that analysis of fiscal sustainability using this pragmatic framework ought to highlight the interactions of various policies and the need for a coherent package of coordinated reforms, rather than a focus on particular options.

Part IV

Conclusion

I simply wish that in a matter which so closely concerns the wellbeing of the human race, no decision shall be made without all the knowledge which a little analysis and calculation can provide.

- Daniel Bernoulli, 1760

Chapter 9

Conclusion

9.1. Introduction

This thesis contributes to the economics of HIV financing in the face of fiscal sustainability challenges, with a focus on Uganda. In this final chapter, I bring together all the strands of this thesis, combining the theoretical, methodological, and empirical work in the previous chapters to assess what can be learned regarding the application of economics insights to address the long-term fiscal sustainability of the HIV response but also more broadly, learnings relevant to coping with long-term fiscal challenges in general. I draw on the literature on the political economy of HIV financing in Uganda (§2) and my empirical work estimating the future trajectory of the AIDS epidemic (§3) and the corresponding long-term resource needs of the national HIV response in Uganda (§4 and (§5)) as well as the economics of financing HIV policies, focusing on DRM, now popular in health economics (§6), and my theoretical work proposing a novel analytical framework for the fiscal sustainability of the HIV response in Uganda (§7) as well as the proof-of-concept empirical work assessing the validity of the pragmatic approach to fiscally sustainable long-term financing for the HIV response in Uganda developed in this thesis (§8). In what follows, I begin this chapter with a reiteration of the principal findings. Following this, the thesis is discussed in terms of its empirical, methodological, and theoretical contributions to the field. Thereafter, I discuss some ideas for future research and provide brief concluding thoughts in relation to these contributions.

9.2. Main findings and contributions of the thesis

9.2.1. Principal findings

Each of the individual chapters in this thesis, containing qualitative and quantitative data and analysed using a variety of approaches, provide in-depth narratives and insights contributing to the understanding and addressing the fiscal sustainability challenges facing the HIV response in Uganda.

Chapter 2 sought to set the scene by analysing the political economy of HIV financing. Data confirmed that politics has always and remains at the heart of HIV financing in Uganda. Specifically, through the exceptionalism and normalisation lens, the politicisation and depoliticization of HIV financing have led to corresponding increases and declines in the volume of HIV financing resources. I find evidence of the “displacement effect” (Dieleman and Hanlon, 2014). For the period 2000 – 2015, in terms of elasticity of HIV expenditures to GDP in Uganda, a 1% increase in GDP has not been matched by a corresponding growth in HIV expenditure as would be expected but rather by a 5% decline in government HIV spending and 10% increase in development assistance for HIV (see Figure 6). This is suggestive that Uganda has de-prioritised HIV financing and now relies on external funding more heavily which, rather than being additional (Ooms and Hammonds, 2018), has instead displaced domestic financing. To reverse this trend, in this thesis, I propose evidence-based approaches to stimulate political prioritization of health within domestic budgets.

I find, however, evidence of ongoing efforts to repoliticise HIV financing to reverse this trend. One such geopolitical positioning strategy is the establishment of an ATF. It has played an important role in the recent and current ongoing policy (and political) discourses on domestic HIV

financing policy, particularly in response to the ongoing strategic shifts in the global health financing landscape. However, I find a paucity of evidence on what we know about ATFs. To address this gap in the academic literature, in a primer (see 2.3.4), I profile what is known about them to draw lessons for Uganda. Additionally, in a political analysis of the establishment of the ATF in Uganda, as enacted in law in 2014, I find a particular misnomer is an idea that distance from government necessarily equals sustainable sources of funding. However, investment funds will always be subject to the vagaries of financial markets. On the other hand, budgetary vehicles will survive for as long as the government remains committed to giving them revenues, which may vary as economic circumstances change or views about tax policy changes. To this end, I conclude that it is perhaps not helpful to argue whether the ATF is in principle a good or a bad thing but to consider the individual ATF architecture on her merits. Based on what is known about the Uganda ATF, I conclude it has considerable work that remains to be done. Finally, owing to the implicit international consensus that fast-tracking the “end of AIDS” is a GPG that requires a collective international response, I empirically establish that financing the AIDS response is a good deal with the potential to contribute accelerate Uganda achieving a “grand convergence” in global health – used here to refer to a “reduction in the burden of infections and RMNCAH disorders in most high-mortality low-income and middle-income countries down to the rates presently seen in the best-performing middle-income countries (eg, Chile, China, Costa Rica, and Cuba, conveniently labeled the “4C” countries)” (Jamison et al., 2013: 2-3). This is key to stymying inequalities.

Chapter 3 used mathematical modeling to test whether by adopting the UNAIDS Fast-Track strategy Uganda could “end AIDS” – used here to refer to significant declines in the number of new HIV infections and AIDS-related deaths decline by 90% between 2010 and 2030 (UNAIDS, 2014). Findings demonstrated that the Fast-Track approach could reduce new HIV infections by 80%, AIDS deaths by 68% but will not end AIDS. Also, due to improved survival prospects, I find evidence of “greying of AIDS” - the aging of PLHIV on ART and the emergence of age-related NCDs – and these co-morbidities will have implications on fiscal sustainability of health systems. Additionally, by not investing in implementing the above approach and acting now on the socio-political factors that drive the epidemic, I project a deadly new wave epidemic around 2020 largely due to recrudescence. Novel in this analysis is the use of outputs from another mathematical model, Optima, which directionally confirms the forward-looking estimates and projections. From a political economy perspective, I find the menu of options under the Fast-Track approach so narrow as they ignore and do not confront the broader factors that sustain and increase HIV incidence in Uganda. Critically, whereas the notion (and usage of) “end of AIDS” was originally politically framed to signal to donors that the end was indeed near due to “game-changers” such as the Fast-Track approach, I find its usage problematic and dangerously exaggerated as it could signal that “AIDS is over” and the attendant defunding that follows when the job is done. As such, in the context of Uganda, the self-congratulatory declaration implicit in the Fast-Track approach is premature, not backed by science, and ignores ecological constraints that impact infectious epidemics.

In Chapter 4, adopting the cost analysis approach, I estimate that the discounted incremental cost of implementing a Fast-Track approach (relative to the “Business-as-Usual” scenario) is US\$ 1,435 million. However, owing to health impacts that accrue to the population, these are offset by discounted productivity gains amounting US\$ 1,836 million as PLHIV who are too sick to work due to AIDS and related opportunistic infections can recover their productivity through ART (Resch et al., 2011). Thus, from the perspective of the total economy, the net additional costs of achieving the Fast-Track targets would be US\$ 401 million and the net cost per QALY would be US\$ 79. Additionally, empirical allocative efficiency analysis of the national HIV response finds room to optimise and maximise health gains. Specifically, I find that current health outcomes could be produced with a budget that is less by 29% (see Figure 25). To realise these efficiency gains, I advance several behavioural economics inspired insights using communication,

commitment tools, and a game of strategy that decriminalises corruption (on the part of a bribe giver) to minimise resource leakages could go a long way

Chapter 5, using fiscal policy analysis tools traditionally used to assess debt sustainability, pointed to a significant growing fiscal burden of AIDS. Empirically, I estimate fiscal liabilities implied by the HIV response – as HIV spending is an indexed debt (or, more precisely, they are a commitment of future fiscal resources in real terms), i.e., they can't be inflated away - ranging between 150% and 200% (in 2015 GDP terms) for the “Business-as-Usual” and “Fast-Track” scenarios respectively. Departing from past comparable analyses (Lule and Haacker, 2011; Atun et al., 2015) novel in this fiscal analysis, I accommodate costs of attaining an increased rate of viral suppression, as well as savings in average unit costs of treatment as more people become virally suppressed. From a macroeconomic perspective, these findings are significant as they show the full extent of the fiscal burden caused by HIV, and financing this is complicated by other long-term fiscal developments such as epidemiological and demographic shifts among others.

In Chapter 6, comprehensively surveying the literature, this study pointed to a few options that technically could be leveraged to finance the HIV response in Uganda. Here, the analysis confirmed that the outlook on external financing for the HIV response is not positive. Contending that there is a role for citizens to play in calling for fair financing of the HIV response, I find that intuitive game-theory applications could maximise value for money for donors. Finally, while there is potential for ‘health taxes’ as a fiscal policy to save lives and raise revenue for HIV and health more broadly, I find it less used in Uganda and thus offers potential to contribute to fiscal sustainability.

In Chapter 7, I develop a novel approach to fiscal sustainability, the DPT Framework. Drawing on earlier analyses in the thesis, it seeks to aid diagnosis of fiscal sustainability challenges in the HIV response, prescribes solutions, and support “treatment” of the fiscal sustainability malaise through decision and delivery support to the actual implementation of these solutions (read reforms) to set the country on a path to the fiscal sustainability of the HIV response. Relatedly, in Chapter 8, I empirically test this pragmatic approach. Here, through an online survey eliciting stakeholders’ preferences regarding HIV financing policy options, across all stakeholder groups, I find highest preference for public financing policies. Additionally, there was a broad consensus on the political feasibility to raise additional funding by STAX revenues (i.e. excise taxes on SSBs, tobacco, and alcohol); capitalising a national AIDS trust fund; investing oil revenues in a sovereign wealth fund, and finance HIV services from interest gained; and compulsory corporate social responsibility; NHIS and social and development impact bonds. On the other hand, the least preferred options and those deemed to be politically infeasible were those that sought to use deficit financing as an option. Findings demonstrated that ‘health taxes’ on tobacco and alcohol could yield between US\$ 5.2 billion and US\$ 12.6 billion over the period 2015 to 2030. I find price elasticity is not null and thus this excise duty – as a fiscal policy tool - saves lives. Public financing using the above-mentioned is pro-poor and, through an extended cost-effectiveness analysis of UPF – I estimate a total of 357,797 avoidable AIDS deaths and US\$ 2,030,885,574 private expenditure averted over 15 years. Finally, using a normative and empirical approach to fiscal space analysis, the novel approach to fiscal sustainability developed in this thesis is found able to meet the fiscal liabilities of the national HIV response through to 2030.

Finally, the concept of fiscal sustainability is redefined. This thesis questions how fiscal sustainability can and ought to be defined in relation to the HIV response in Uganda. As I show in § 1.3, most definitions of the concept of sustainability relates to public expenditure on HIV, thereby excluding items such as OOP payments in private healthcare markets. This study argues that this is inadequate, illusory, and irrelevant to the sustainability of HIV responses. Currently, HIV financing policy reform efforts are heavily focusing on fiscal imperatives such as increasing DRM. In Uganda, this narrow view is important as resource needs are increasing at a faster rate than

available donor funding. This is more important, especially, with increased treatment coverage. However, current measures of fiscal sustainability often tell very little about the actual sustainability of the national HIV response. The same is true for the corresponding specific HIV programmes as well as disease trajectories and enabling environments. This is problematic. I argue that for poor yet high HIV-burdened countries, such as Uganda, for the HIV response, fiscal sustainability is not necessarily an objective in and of itself but ought to be best understood as a constraint to be respected (Thomson et al., 2009). Thus, rather than fiscal sustainability being simply a cost-cutting exercise, how governments achieve it matters. To this end and cognisant that definitions of fiscal sustainability – as variously applied currently - lack both clarity, breadth and depth, as shown in Figure 39, I offer a relatively new seven-tenet conceptualisation of what fiscal sustainability means in the context of the HIV and AIDS response: (1) financial, (2) epidemiological, (3) political, (4) structural, (5) programmatic, (6) human rights, and (7) social capital. Through stakeholder stated preferences, these multidimensional elements proved far more important and comprehensive than the classic definitions of fiscal sustainability in literature.

9.2.2. Thesis contributions

This thesis set out to fill important theoretical, empirical, and methodological gaps in coping with the fiscal sustainability challenges of the HIV response in Uganda. The value-add of this thesis lies in its contributions to this end.

Theoretical

In Chapter 7, I developed a novel theoretical framework for addressing the long-term fiscal sustainability of the HIV response in Uganda. Informed by theory and established principles in health financing policy reform, this framework stresses three inter-related and equally important components of fiscal sustainability: diagnosis, prescribing way forward, and actually “treating” the malaise occasioned by the long-term fiscal challenges. The framework pragmatically underscores the need for explicit political analysis, and application of behavioral economics as well as game-theoretic insights to address fiscal sustainability challenges. Traditionally, frameworks for analysing and improving the fiscal sustainability of HIV responses have largely incorporated a technical component, with minimal or no participatory component. This way, current frameworks have largely been reductionist, and – in total disregard of the national and international politics of financing and the attendant moral imperatives – adopt a ‘one-size-fits-all’ approach. As an implication, this theoretical framework takes into consideration and seek to address many of the contextual factors that affect the fiscal sustainability of the HIV response. From the proof-of-concept, this proposed approach not only expands fiscal space for domestic HIV investment but also aids the exploration of long-term domestic and international sustainable financing mechanisms. Looking into the future, this approach will have implications for how other HIV burdened countries confront the potential fiscal consequences of HIV and other long-term liabilities (such as those arising from non-communicable diseases – alone or along the HIV-NCD nexus).

Additionally, this thesis contributes to the economic literature on the theory and practice of Trust Funds for financing HIV responses. This thesis by comprehensively analyzing and discussing the role of trust funds in the practice of and the policy discourse on the sustainable financing of HIV responses, contributes to the academic literature on fiscal policy in the context of health financing.

It has been variously argued that HIV financing can be a pathfinder to UHC. Here, I make a theoretical contribution regarding how HIV treatment costs could be financed through the NHIS. Like Haacker and Birungi (2016), I find that there are broadly two ways how these costs could be financed under health insurance – a pay-as-you-go system and a capitalized system. This, in turn, provides a useful framework for decision-making and strategy planning to further the integration of financing HIV programmes in varied contexts, as well as advancing UHC and GHS.

This Ph.D. study conceptually frames HIV control as a global public good. Anchoring the provision of HIV services within globalisation discourses, this study represents the first explicit revisiting of the concept of GPG in health within a communitarian claim and offers it as an alternative paradigm for the fiscal sustainability of HIV responses. Historically, “moral duty” arguments - used interchangeably with “duty to rescue” in this thesis - have been at the heart of motivating investments in HIV responses in Uganda. I find that the narrow usage of the common law notion of “moral duty” is inappropriate. Whilst this concept has been a driver of the “universal access to treatment” agenda, given that prices of HIV drugs have come down to very low levels, its application is limited. This, however, does not necessarily obviate a moral ‘duty to rescue’. For example, the notion of humanity would justify rescue even between strangers. Globalisation makes this quite possible. The other is utilitarianism, reasoning that posits that those actions are right that best maximise happiness and reduce suffering. Finally, natural law rule that urges us to treat others as we would wish to be treated (with an implicit assumption that we would wish to be treated well). In this same vein, Piot (2015:46) argues that "The concept of a global public good provides a strong foundation for an international response." This may have been correct early on - e.g., reflecting concerns about HIV/AIDS spreading globally, and the economic and security implications of this, and some aspects of the HIV/AIDS spreading globally, and the economic and security implications of this, and some aspects of the HIV/AIDS response (essentially, research funding) provide a public good. However, to motivate global investments in HIV prevention, care and treatment across developing countries through a GPG argument, it is required that there are strong interdependencies or spillovers, either economically (which is implausible given that most countries with high HIV prevalence carry a very low economic weight, and HIV/AIDS has not destabilized any country economically so far), from a security perspective (but HIV/AIDS is no longer a significant concern in the security community) or in the area of health: What is the role of cross-border transmission in the spread of HIV/AIDS? E.g., are investments in HIV prevention in Africa or the Caribbean effectively reducing the spread of HIV/AIDS in donor countries, and more so than HIV prevention policies in donor countries? To this end, by conceptually framing HIV control as a global public good, this thesis makes a theoretical contribution. Anchoring the provision of HIV services within globalisation discourses, this study represents the first explicit revisiting of the concept of global public health within a communitarian claim and offers it as an alternative paradigm for the fiscal sustainability of HIV responses.

Empirical

From the perspective of the government, this study presents an in-depth outlook of the epidemiological, economic, and fiscal consequences of the HIV/AIDS epidemic and response in Uganda. It fills a knowledge gap regarding how to pragmatically address the fiscal sustainability challenges faced by the HIV response in Uganda. Specifically, using mathematical modeling techniques, I estimate the future course of the HIV/AIDS epidemic in Uganda through 2030. Whereas a “Fast-Track” analytic scenario shows that it is possible to achieve drastic declines in new HIV infections and AIDS deaths relative to a “Business-as-Usual” scenario, the findings suggest that it is not possible to end the AIDS epidemic as a public health threat – owing to lack of an efficacious vaccine and/or a functional cure as well as several ecological limits. The real-life experience over the last 100 years or so of medical intervention has been that it is highly unlikely that we will be able to sustain sufficiently high rates of testing and successful ART across SSA and the rest of the world that we can bring HIV to elimination. I find that the most (optimistic) likely scenario will be that of a 'controlled' epidemic where HIV transmission continues in the background at low levels with occasional flare-ups when and where ART coverage drops and political economy issues that affect incidence are disregarded. Overall, the HIV population may indeed reduce in size to much more manageable levels, but this in turn will probably lead to program and investment fatigue. The main underlying problem with HIV is the extremely long latency period where people go round infecting others (and re-infecting themselves) without knowing they are infected unlike some of the other infectious diseases where we are standing a much better chance of elimination

(e.g. guinea worm, chancroid, etc.). Additionally, empirically, Chapter 3 projects a deadly new wave epidemic. Although the AIDS epidemic has been slowing down, I project that it will inevitably rebound unless the country embarks on a fast-track and break the epidemic now. Come 2020, the stage will be set for another deadly epidemic – and, unlike in the past, the government will lack the tools and finances to manage it. This projected new epidemic is largely driven by a flawed HIV control strategy, demographic and epidemiologic shifts and a resource crunch. Most critically, it may be exacerbated by global health security threats and a growing health burden from NCDs.

This thesis undertakes a political analysis of the ATF in Uganda. To the best of my knowledge, this is the first political analysis of an ATF in SSA. The findings illustrate the interplay between domestic and international actors in the context of HIV financing and provide a rich insiders' perspective on the machinations around the ATF. I conclude that national-level politics was one of the most fundamental drivers for the establishment (at least in legislation) of the ATF. As an implication, considering the theory of geopolitical positioning, the ATF needs to be operationalized, as an instrumental AIDS diplomatic strategy, to effectively boost Uganda's public health as well as foreign policy images.

Additionally, this thesis represents the first application of Optima HIV⁴¹ in Uganda for HIV allocative efficiency and sustainability analysis. This way, in the tradition of applied health economics, this thesis contributes knowledge to decision and delivery science regarding the investment choices between different types of interventions to determine how allocation of HIV funding can be optimized across a combination of HIV interventions to yield the greatest health impacts and – by extension by assuring epidemiological sustainability – improve the fiscal sustainability of the national HIV response.

To the best of my knowledge, it provides the first available extensive analysis of the political dimensions of fiscal sustainability of the HIV response in Uganda by eliciting preferences among key stakeholders on the issue of long-term HIV financing policy options. This not only improves our understanding of the varying degrees of acceptability between policy interventions and future funding options but also their political feasibility. This thesis highlighted that there exist health financing policy options that are broadly acceptable across stakeholder groups, their different inherent interests notwithstanding. Across all stakeholder groups, the highest preference was for public financing. Also, there was a broad consensus on 'health taxes' on sugar-sweetened beverages, tobacco, and alcohol products as the most politically feasible options by far.

Finally, along with an improved understanding of how to pragmatically address the fiscal sustainability of the HIV response in Uganda, this thesis empirically reiterated the "displacement effect" on domestic resources by donor funding. For fiscal sustainability, this trend needs to be reversed so that donor funding can be "additional". This finding will be discussed further in relation to future research and implications for practice.

Methodological

In terms of methodological contributions, this study refines methods for forward-looking estimations of HIV resource needs. Traditional resource needs estimation approaches have rarely considered efficiency gains nor explicitly used time-variant flexible unit costs to account for economies of scale and scope (Shepard et al., 2007; Stover et al., 2016). This research project demonstrated the feasibility and usefulness of applying these methodological advances to quantify resource needs in Uganda. The use of these methodological advances to quantify future financing resource needs in Uganda is novel. The resource needs estimates from using this method are less than what UNAIDS (2016)' global price tag estimates yielded for Uganda as well as the NSP

⁴¹ In a nutshell, Optima HIV is a mathematical model of HIV transmission and disease progression. It innovatively uses an integrated analysis of epidemic, program and cost data to determine an optimal allocation of investments (Kerr et al. 2015).

costing, though close to the recent 2018 NASA spending estimates. I conclude that many assessments overestimate future resource needs, and Uganda does not necessarily need an average of US\$ 1 billion per annum for the HIV response. Rather approximately an annual average of US\$ 550 is needed.

Another area in which this study contributes to economic analysis methodologies is the application of “extended cost-effectiveness analysis” (ECEA) to evaluate HIV financing mechanisms. To the best of my knowledge, this is the first academic study to apply ECEA to UPF mechanisms for HIV/AIDS response in Uganda. By prospectively evaluating the potential impact of UPF using a consistent modeling approach, this study departs from the normative literature. It confirms public financing as pro-poor. As an implication for future economic evaluations of health policies, this novel approach permits the inclusion of non-health benefits such as financial risk protection and distributional consequences. This methodological choice is well suited to address overlapping and intersecting inequalities and inequities.

Finally, this thesis synthesizes existing evidence and mathematically simulates the health and revenue impacts of excise tax policies across tobacco and alcohol products in Uganda. These findings are significant as fiscal sustainability of the HIV response will in part depend on effective disease prevention. As I show in Figure 46, fiscal policy tools like ‘health taxes’ provide an opportunity to not only prevent diseases (such as NCDs) that will become important in the era of “greying of AIDS” as projected in Uganda in this thesis, they provide an opportunity to raise revenue.

9.3. Ideas for future research

This section discusses some ideas for future research. One of the main findings of this thesis is that HIV is not only a disease of inequality but so is the response with regards to HIV treatment access across geographies. An implication of this is that fiscally sustainable financing mechanisms need to address these inequities by recognizing the unequal access depending on economic geography. To date, the social gradient to HIV treatment has only been established for Kenya. It is unclear if this generalizes. This hypothesis can readily be tested by a cross-sectional empirical analysis of social correlates of the national response to HIV/AIDS by using treatment coverage as a dependent variable, applying instrumental variables to address certain error-in-variables and reverse-causality issues regarding HIV prevalence. Many high HIV-burdened countries readily have data on sub-national HIV estimates, treatment coverage, and other socio-economic variables to conduct such analyses. This would improve our understanding of social correlates of the national response to HIV/AIDS, which would in turn provide insights on obstacles to scaling-up and inform policymakers on social aspects of current or prospective HIV/AIDS policies. To the extent that the situation in other countries resembles that found in Kenya, there are also some potential lessons to be learned for the global response to HIV/AIDS.

The fiscal analysis approach for assessing the fiscal impacts of investments in the HIV response can be used to conduct many types of public policy evaluations in other health conditions, particularly those with intergenerational consequences. For instance, the method can go further in Uganda and provide an estimate of the fiscal consequences of investing in preventing and treating NCDs and preparedness for and responding to GHS. Also, the method can be used to evaluate new approaches in HIV control that have not yet been widely adopted and/or being introduced. From a government perspective, this would go a long way in addressing the value of health and healthcare investments, using a coherent fiscal health analytic framework that not only captures how changes in morbidity and mortality influence tax revenue and but also affect transfer costs such as ongoing and recurrent HIV care costs.

This thesis aimed to develop a novel approach to the fiscal sustainability of HIV responses in Uganda and, through a proof-of-concept, explore its applicability. It has provided some initial

applications. There is ample ground for future research in this area by testing the proposed framework on other health conditions and different contexts. Relatedly, how to increase the political prioritization of health (and HIV) within domestic budgets is another emergent area for future research. Since 2000, in Uganda (as across low-income countries as a group), health has been deprioritized and this group has become increasingly reliant on external assistance for health. In 2.2, I have proposed evidence-based pillars in this direction. These are not comprehensive. To contribute to reverse this trend, I do hope other contributions towards a framework to increase political prioritisation of HIV and health financing will be forthcoming.

Uganda has a large informal sector, accounting for about 50% of GDP (UBOS, 2014). And as a limitation in this study, it remains a puzzle in many ways. First, for fiscal sustainability, as I show in this analysis, general tax revenues will need to grow. However, how to pragmatically reform the tax system and expand the tax base into the informal economy is a gap that still needs to be filled. Relatedly, for NHIS to be efficient and equitable and advance UHC, there is a need to bring the informal sector on board. While I have advanced ideas to this end, I suggest future research to explicitly test some of the policy ideas as well as advance more to make this a reality.

Finally, the thesis has highlighted the centrality of focusing on spending efficiency for fiscal sustainability. This would, among others, require that Uganda periodically reviews her HIV spending patterns. Relatedly, beyond strengthening tax systems there is a need to enhance the quality, efficiency, and equity of spending. Whereas traditional economics assumes rational actors, however, in daily decision-making, decisions are often influenced by our cognitive biases and beliefs. These can be consciously or unconsciously, resulting in sub-optimal outcomes. This is a deviation from the standards of rationality assumed by economics. In this thesis, combining insights from human psychology with a practical understanding of economics, including incentives and market behavior, I have advanced some modest behavioral economics-inspired proposals to harness the power of economics to give policymakers and programme implementers among others a nudge. As an area for future research, there is a need to pilot-test (and rigorously evaluate the impact of) the nascent ideas presented in this thesis.

9.4. Concluding thoughts and way forward

This thesis has applied economic analysis to address the long-term fiscal sustainability of the HIV response in Uganda. By way of conclusion, here, I reflect on implications for policy and practice as well as the strategy for dissemination. First, for policy and practice, as earlier mentioned, this thesis has several conceptual and practical implications. Conceptually this thesis highlights the notion of HIV quasi-fiscal liabilities as analogous to public debt. It is this “hidden” debt that I have unmasked and proposed a pragmatic approach to addressing. However, this concept is yet to be considered fully in Uganda and other poor and high HIV burdened countries when analyzing the fiscal sustainability of health programs or other long-term fiscal challenges. As public debt continues to grow in these countries, I hope this finding and the approach I have developed will begin to shift the paradigm of how fiscal policymaking takes into account these HIV-induced contingent liabilities.

In terms of practical implications, for those who conduct policy analysis *for* policymaking, including the practice of political analysis, this thesis observed minimal political analysis to HIV financing policy reform and implementation. HIV financing is inherently political. However, to date, addressing fiscal sustainability has largely been addressed as a technical issue. To lead to changes to confront the politics of HIV financing and assure fiscal sustainability, this gap should be addressed and bring back the ‘political’ in health financing policy, including in fiscal policy analysis.

Finally, for a thesis addressing an applied economics challenge as fiscal sustainability of the HIV response, it deserves a dissemination strategy to facilitate knowledge translation. To this end, I plan to return to Uganda and, through UNAIDS and UAC, organise a dissemination workshop to country-level actors. Relatedly, to contribute in persuading the Treasury to invest in health, I will write elements of my results in a punchier and more coherent policy brief to make these points seen and understood and applied. Also, I plan to write at *International Health Policies* to offer personal reflections on researching addressing fiscal sustainability in the health sector. I will email a brief synopsis of this thesis to all respondents to the online survey (in 7.3). Additionally, all respondents will receive email alerts to eventual journal articles from this thesis. As shown in my Research Student log, at the global and regional level, I have already presented most of these results in several scientific conferences and academic fora. Building on this, I aim to submit most of my results for publication in academic journals, particularly targeting those that will reach a wide range of audiences. Lastly, while the datasets used in this thesis have been deposited at UCL Research Data Repository, I plan to program to all the analytic approaches in an easy-to-use language, including a simplified how-to-use tutorial, so that interested users can apply comparable methods and even improve them further.

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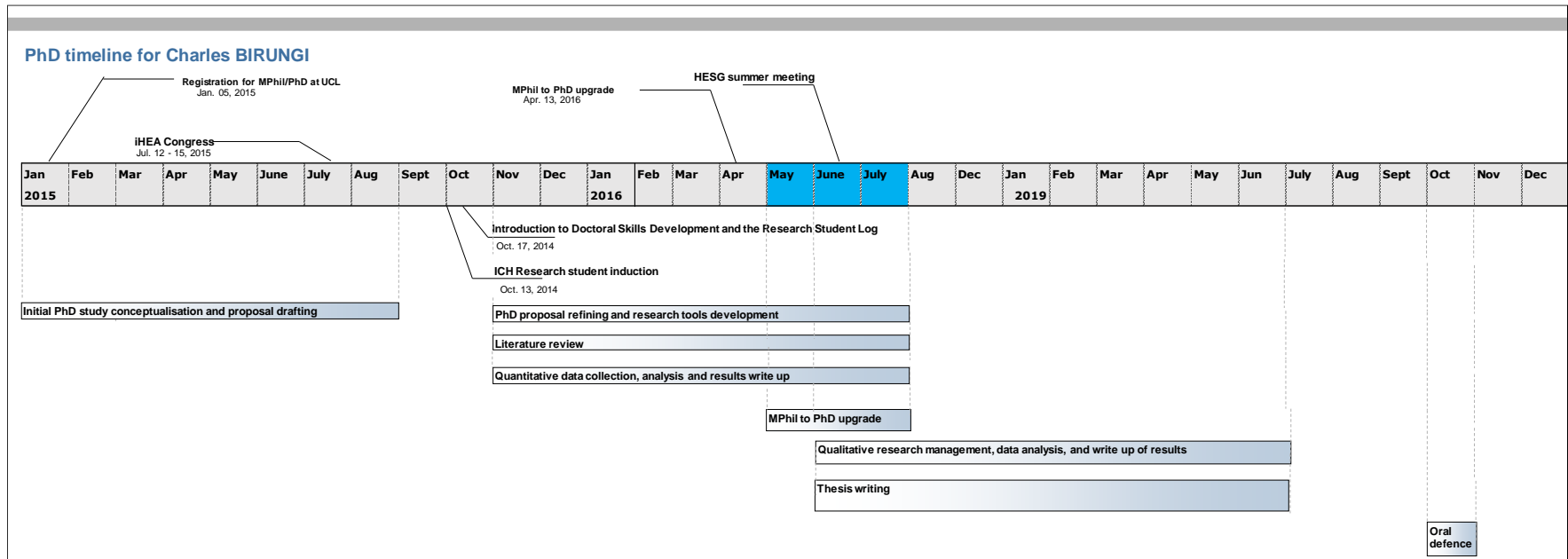
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Appendix 1: PhD study timeline

This Ph.D was completed between 2015 and 2019. The timeline of this study is shown in the Gantt chart below:



Appendix 2: Research student log

UCL Research Student Log

https://researchlog.grad.ucl.ac.uk/index.php?section_id=3&

Training Summary

Total points: 195

My Upcoming Courses

Contact
Us

Skills >

Course	Points	Date/Time
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Courses Attended

Course	Points	Attended	
Review Writing - Per Review Reviewed Organized Sessions for the Sixth Global Symposium on Health Systems Research.	1	2019-11-01	[Cancel]
Peer Reviewing a Paper for a Journal Peer reviewed a heterodox economics paper linking exploring a job guarantee and global health for the British Medical Journal (BMJ).	2	2019-09-23	[Cancel]
Peer Reviewing a Paper for a Journal Peer reviewed a cost-effectiveness analysis of the universal test and treat strategy in an African country for the African Journal of AIDS Research	2	2019-08-18	[Cancel]
Writing a Paper for submission to a Journal - Per Paper Wrote a paper on political prioritization of health within domestic budgets. It is under revise and resubmit at BMJ.	4	2019-08-12	[Cancel]
Review Writing - Per Review Served as an abstract reviewer for the 20th International Conference on AIDS and STIs in Rwanda (ICASA 2019) that was held in Kigali, Rwanda from 2nd to 7th December 2019. I reviewed a total of 24 abstracts.	1	2019-08-10	[Cancel]
Writing a Paper for submission to a Journal - Per Paper Wrote a paper entitled "Long-term liabilities of HIV financing = debt sentence? The fiscal impact of HIV and AIDS in Uganda". It is under revise and resubmit status at a journal.	4	2019-08-08	[Cancel]
Peer Reviewing a Paper for a Journal Peer reviewed a an economic evaluation methodological paper for the African Journal of AIDs Research.	2	2019-07-03	[Cancel]
Peer Reviewing a Paper for a Journal Reviewed a paper on HIV self-testing among female sex workers for the African Journal of AIDS Research (AJAR).	2	2019-05-14	[Cancel]
Attending Training - 4 days Participated in the "Scientific and Journal Writing Short Course" organised by the African Journal of AIDS Research and Wilfrid Laurier University. It took place in Cape Town, South Africa.	8	2019-04-02	[Cancel]

<p>Conference - Paper Presentation Presentation a paper on stakeholder preferences on policy options for ensuring fiscal sustainability of the national response to HIV/AIDS in Uganda at the 5th AfHEA Scientific Conference, Ghana.</p>	1	2019-03-13	[Cancel]
<p>Conference - Paper Presentation Presentation of a paper on an extended cost-effectiveness analysis of the AIDS Trust Fund in Uganda at the 5th AfHEA Scientific Conference, Ghana.</p>	1	2019-03-12	[Cancel]
<p>Conference - Attendance Attended the 5th AfHEA biennial scientific conference in Accra, Ghana.</p>	2	2019-03-11	[Cancel]
<p>Conference - Paper Preparation Prepared a paper on eliciting stakeholders' preferences regarding options for long-term sustainable financing for HIV/AIDS response in Uganda for presentation at the 5th AfHEA biennial scientific conference, Ghana.</p>	2	2019-03-06	[Cancel]
<p>Conference - Paper Preparation Prepared a paper on "an extended cost-effectiveness analysis of the AIDS Trust Fund in Uganda" for presentation at the 5th AfHEA biennial scientific conference</p>	2	2019-03-01	[Cancel]
<p>Writing a Paper for submission to a Journal - Per Paper Wrote a paper on the politics of the AIDS Trust Fund in Uganda and submitted the same to the the African Journal of AIDS Research. It was published in 2019 and is accessible at: https://www.tandfonline.com/doi/abs/10.2989/16085906.2019.1689148</p>	4	2019-02-01	[Cancel]
<p>Attending Training - 5 days or more Attended a World Bank and UCL-organised training on "Big data, artificial intelligence and decision science in health and nutrition" in Pretoria, South Africa. I focussed on Big Data Analytics for Improved Health Outcomes.</p>	10	2018-10-01	[Cancel]
<p>Conference - Paper Presentation Presentation a paper on fiscal space for responses to HIV/AIDS in Africa at the "Economic Impact of HIV Symposium: Economy wide costs and consequences of reduced HIV financing" in Cascais, Portugal.</p>	1	2018-09-20	[Cancel]
<p>Conference - Attendance Attended a symposium on "Economic Impact of HIV: Economy wide costs and consequences of reduced HIV financing" in Cascais, Portugal.</p>	2	2018-09-19	[Cancel]
<p>Conference - Paper Preparation Prepared a paper on "Case study of African fiscal space" for presentation at the "Economic Impact of HIV Symposium: Economy wide costs and consequences of reduced HIV financing" in Cascais, Portugal.</p>	2	2018-09-09	[Cancel]
<p>Conference - Attendance Attended the 22nd International AIDS Conference in Amsterdam, The Netherlands</p>	2	2018-07-23	[Cancel]
<p>Conference - Paper Presentation Presented a paper entitled "Long-term liabilities of HIV financing = debt sentence? The fiscal impact of HIV in Uganda" at the 10th International AIDS Economics Network (IAEN) Pre-conference in Amsterdam, The Netherlands.</p>	1	2018-07-21	[Cancel]
<p>Conference - Attendance Attended the 10th International AIDS Economics Network Preconference in Amsterdam, The Netherlands</p>	2	2018-07-20	[Cancel]

Voluntary Work Per Term Volunteered on the BMJ advisory group on health & economics for the special issue on "Health, wealth, and profits"	1	2018-07-17	[Cancel]
Conference - Poster Preparation Prepared a poster entitled "A policy and political analysis of the HIV/AIDS Trust Fund in Uganda" for presentation at the 10th International AIDS Economics Network Pre-conference in Amsterdam, The Netherlands.	2	2018-07-13	[Cancel]
Conference - Paper Preparation Prepared a paper entitled "Long-term liabilities of HIV financing = debt sentence? The fiscal impact of HIV in Uganda" for presentation at the 10th International AIDS Economics Network (IAEN) Pre-conference in Amsterdam, The Netherlands.	2	2018-07-05	[Cancel]
Writing a Paper for submission to a Journal - Per Paper Wrote, as a co-author, a paper on the interesections between universal health coverage and global health security. Paper is published in BMJ Global Health. It is accessible at https://gh.bmj.com/content/bmjgh/4/1/e001145.full.pdf	4	2018-06-30	[Cancel]
Conference - Attendance Attended the inaugural workshop of the Working Group on Global Health Security & Universal Health Coverage in Edinburgh, Scotland.	2	2018-05-23	[Cancel]
Conference - Paper Presentation Drawing on my PhD research, I presented a paper exploring the following questions: When pursuing universal health coverage and health systems strengthening how relevant is global health security to those goals? Or the other way around? What aspects of health systems do we need to be aware of based on your research drawing on country examples?. It was presented at the "Achieving Global Health Security and Universal Health Coverage" Symposium in Edinburgh, Scotland.	1	2018-05-23	[Cancel]
Conference - Paper Preparation Drawing on my PhD research, I prepared a paper exploring the question: When pursuing universal health coverage and health systems strengthening how relevant is global health security to those goals? Or the other way around? What aspects of health systems do we need to be aware of based on your research drawing on country examples?. It was for presentation at the "Achieving Global Health Security and Universal Health Coverage" Symposium in Edinburgh, Scotland.	2	2018-05-04	[Cancel]
Conference - Poster Preparation Prepared a poster titled "At what cost? An estimation of resource needs for HIV and AIDS epidemic control in Uganda" for presentation at 2018 INTEREST Workshop in Kigali, Rwanda. Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/abstractbook/2018/abstractbook_INTEREST2018.pdf	2	2018-05-01	[Cancel]
Conference - Poster Preparation prepared a poster titled "A mathematical modelling analysis to improve the allocative efficiency of the response to HIV/AIDS in Uganda" for presentation at 2018 INTEREST Workshop in Kigali, Rwanda. Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/abstractbook/2018/abstractbook_INTEREST2018.pdf	2	2018-04-10	[Cancel]
Conference - Poster Preparation Prepared a poster titled "HIV financing as a pathfinder for Universal Health Coverage? An extended cost-effectiveness analysis of the AIDS Trust Fund in Uganda" for presentation at 2018 INTEREST Workshop in Kigali, Rwanda. Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/abstractbook/2018/abstractbook_INTEREST2018.pdf	2	2018-03-07	[Cancel]
Conference - Paper Presentation Presented a paper entitled "Determinants of access to antiretroviral therapy across Kenyan counties: a cross-sectional empirical analysis" at the International Health Economics Association (IHEA) Congress in Boston, U.S.A.	1	2017-07-10	[Cancel]

<p>Presentation at an External Seminar - Per Presentation Presented as a discussant for Global Health Cost Consortium (GHCC) reference case at its global launch in Boston, U.S.A.</p>	1	2017-07-09	[Cancel]
<p>Attendance at an External Seminar - Per Term Attended the launch of the "Global Health Cost Consortium (GHCC) reference case for estimating the Costs of global health services and Interventions" in Boston, U.S.A.</p>	1	2017-07-09	[Cancel]
<p>Conference - Attendance Attended the International Health Economics Association (IHEA) Congress in Boston, U.S.A.</p>	2	2017-07-08	[Cancel]
<p>Attending Training - 2 days Attended a training on "Applied Vaccine Economics", organised by John Hopkins Bloomberg School of Public Health and Teaching Vaccine Economics Everywhere (TVEE)</p>	4	2017-07-07	[Cancel]
<p>Conference - Poster Presentation Presented a poster titled "The end of AIDS: a possibility or pipedream? Modelling the future trajectory of the HIV epidemic in Uganda". Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	1	2017-05-18	[Cancel]
<p>Conference - Poster Presentation Presented a poster titled "Coping with the challenge of long-term liabilities of HIV financing: a fiscal analysis of the national HIV program in Uganda". Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	1	2017-05-17	[Cancel]
<p>Conference - Attendance Attended the 2017 annual INTEREST Conference in Lilongwe, Malawi. This is the premier scientific conference for HIV in Africa and brings together scientists involved in HIV treatment, pathogenesis, and prevention research from around the world.</p>	2	2017-05-16	[Cancel]
<p>Conference - Poster Presentation Presented a poster titled "Assessing the Prospects for Fiscal Space for HIV and AIDS in Malawi". Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	1	2017-05-16	[Cancel]
<p>Conference - Paper Preparation Prepared a paper entitled "Determinants of access to antiretroviral therapy across Kenyan counties: a cross-sectional empirical analysis" for presentation at the International Health Economics Association (IHEA) Congress in Boston, U.S.A.</p>	2	2017-05-07	[Cancel]
<p>Conference - Poster Preparation Prepared a poster titled "Assessing the Prospects for Fiscal Space for HIV and AIDS in Malawi". Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	2	2017-05-05	[Cancel]
<p>Conference - Poster Preparation Prepared a poster titled "Coping with the challenge of long-term liabilities of HIV financing: a fiscal analysis of the national HIV program in Uganda". Its abstract is published in journal Reviews in Antiviral Therapy & Infectious Diseases, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	2	2017-04-09	[Cancel]
<p>Writing a Paper for submission to a Journal - Per Paper Wrote a paper on the social dimensions of the intersections of poverty, inequality and HIV. Paper is published in the African Journal of AIDS Research. It is accessible at https://www.ajol.info/index.php/ajar/article/view/174877</p>	4	2017-04-06	[Cancel]

<p>Conference - Poster Preparation Prepared a poster titled "The end of AIDS: a possibility or pipedream? Modelling the future trajectory of the HIV epidemic in Uganda". Its abstract is published in journal <i>Reviews in Antiviral Therapy & Infectious Diseases</i>, accessible at http://regist2.virology-education.com/Abstractbook/2017/11interest.pdf</p>	2	2017-03-03	[Cancel]
<p>Voluntary Work Per Term Volunteered as an Affiliate with the The Center for Health Trends and Forecasts (CHTF), University of Washington, U.S.A. The Center aims to develop a strong international network of emergent leaders in research from across social sciences who are using health data alongside data on social determinants, economics, and a host of other potential sources to develop valuable findings that could not be derived simply from within one discipline.</p>	1	2017-02-09	[Cancel]
<p>Voluntary Work Per Term Volunteered as member of the Global Burden of Disease Health Financing Collaborator Network.</p>	1	2017-01-10	[Cancel]
<p>Attendance at an External Seminar - Per Term Attended the Global Health Cost Consortium (GHCC) Stakeholders Group meeting to technically contribute to development of a reference case. The meeting took place in Seattle, WA, U.S.A. A reference case has since been finalised and is accessible at https://ghccosting.org/pages/standards/reference_case</p>	1	2016-11-09	[Cancel]
<p>Voluntary Work Per Term Volunteered as member of the Global Burden of Disease (GBD) collaborator network.</p>	1	2016-10-04	[Cancel]
<p>Conference - Attendance Attended the 4th Biennial Scientific Conference of the African Health Economics and Policy Association (AHEA), held from 26 to 29 Sept 2016 in Rabat, Morocco</p>	2	2016-09-26	[Cancel]
<p>Attending Training - 1 day Attended training on "Health Technology Assessment for Universal Health Coverage Package Design" in Rabat, Morocco. It was organised by the International Decision Support Initiative (IDSi) and PRICELESS South Africa</p>	2	2016-09-26	[Cancel]
<p>Attending Training - 1 day Attended training on "Why and how to approach universal health coverage (UHC) from a public finance perspective in Africa?" in Rabat, Morocco. It was organised by the World Health Organisation (WHO).</p>	2	2016-09-25	[Cancel]
<p>Conference - Attendance Attended the 21st International AIDS Conference, held between 18 and 22 July 2016 in Durban, South Africa</p>	2	2016-07-18	[Cancel]
<p>Conference - Paper Presentation Attended the 9th International AIDS Economics Network (IAEN) pre-conference, held on 15 and 16 July 2016 in Durban, South Africa. I presented a fiscal space analysis paper.</p>	1	2016-07-15	[Cancel]
<p>Conference - Attendance Attended the 9th International AIDS Economics Network (IAEN) pre-conference, held on 15 and 16 July 2016 in Durban, South Africa.</p>	2	2016-07-15	[Cancel]
<p>Conference - Paper Preparation Prepared a paper to be presented at the 9th International AIDS Economics Network (IAEN) pre-conference, held on 15 and 16 July 2016 in Durban, South Africa. It draws on methodology for fiscal space analysis developed in the context of my PhD and applied to Malawi context. It is summarised at http://www.heard.org.za/wp-content/uploads/2016/06/Assessing-prospects-for-fiscal-space-for-HIV-AIDS-in-Malawi.pdf</p>	2	2016-07-04	[Cancel]
<p>Preparing For Your Viva 22 April 2016</p>	2	2016-04-22 @ 09:30:00	

+C1			
Think-Write: Conference Abstracts and Posters 22 Apr 2016	N/A	Waiting-List	
+A2 +D2			
Poster Presentation Skills 21 April 2016	N/A	Did-Not-Attend	
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Critical Thinking and the Researcher: An Exploration 19 Apr 2016	N/A	Waiting-List	
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Finishing your PhD. What Next? Developing skills for your new step 18 Apr 2016	2	2016-04-18 @ 10:00:00	
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Conference - Attendance Econometrics for public policy, methods and applications conference, organised by the Institute for Fiscal Studies.	2	2016-04-15	[Cancel]
Attending Training - 5 days or more Attended "Optima HIV Training Course to Conduct HIV Efficiency and Sustainability Analyses" held on February 8-12, 2016 held in Washington DC. It was facilitated by University of New South Wales and the World Bank Group	10	2016-02-08	[Cancel]
Writing a Paper for submission to a Journal - Per Paper Wrote a paper on framing the "end of the AIDS epidemic" as a global public good, with a view to be submitted to the African Journal of AIDS Research	4	2016-01-01	[Cancel]
Academic Writing 12 Nov 2015 Academic Writing Hand-out	2	2015-11-12 @ 09:30:00	
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Format your Thesis 9 Nov 2015 - Windows session Format Thesis	1	2015-11-09 @ 13:30:00	
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The PHD Movie 2 with Jorge Cham 9 Nov 2015 Full directions can be found here: http://www.blizard.qmul.ac.uk/contact.html	1	2015-11-09 @ 16:00:00	
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<p>Format your Thesis 9 Nov 2015 - Mac session</p> <p>Format-your-thesis_May15</p> <p>+A1 +D2</p>	N/A	Did-Not-Attend	
<p>Giving Departmental Seminar - Per Presentation</p> <p>Presenting preliminary results of fiscal analysis at PhD seminar to the Economics of Health and Development group at UCL. The presentation was entitled "Coping with the challenge of long-term liabilities of HIV financing: a fiscal analysis of the national HIV program in Uganda".</p>	1	2015-10-29	[Cancel]
<p>Giving Departmental Seminar - Per Presentation</p> <p>Delivered a departmental PhD seminar to the UCL Centre for Global Health Economics, focussing on the fiscal sustainability of responses to HIV/AIDS.</p>	1	2015-10-29	[Cancel]
<p>Peer Reviewing a Paper for a Journal</p> <p>Peer reviewed a manuscript analyzing stakeholder perspectives on power and agenda-setting in health policy in a low-income country context. Reviewed for the International Journal of Health Policy and Management</p>	2	2015-10-11	[Cancel]
<p>Conference - Paper Presentation</p> <p>Presented paper at the International Health Economics Association (IHEA) Congress. The paper was entitled "Social dimensions analysis of HIV/AIDS, treatment access and poverty in Uganda"</p>	1	2015-07-12	[Cancel]
<p>Attending Training - 5 days or more</p> <p>Attended the WHO organised "Advanced Course on Health Financing for Universal Coverage". It discussed how health financing policy can be used to improve health system performance in support of the goals of universal health coverage. The training took place in Barcelona, Spain.</p>	10	2015-05-08	[Cancel]
<p>Teaching & Supervisory Support</p> <p>UCL is committed to ensuring that research students receive recognition for the teaching and/or supervisory support they provide for undergraduate and postgraduate taught students. This may include informal teaching, lab demonstrations and/or supervision of office- or lab-based projects. Carrying out these types of activity will help research students gain experience, confidence, and enable them to acquire teaching and supervisory skills which will promote their professional development and future employability. Students who wish to use this course to record their teaching experience and/or supervisory support are encouraged to complete the UCL Arena One training. Students can claim 1 training point for each ½ day of teaching/supervisory support they provide (up to a maximum of 5 training points). I successfully supervised a MPH dissertation at Uganda Christian University (UCU), Uganda.</p>	1	2015-04-01	[Cancel]
<p>Review Writing - Per Review</p> <p>As a member of the Scientific Committee for the 11th World Congress on Health organised by the International Health Economics Association (IHEA), I reviewed 41 abstracts.</p>	1	2015-02-04	[Cancel]
<p>Attending Training - 5 days or more</p> <p>Attend international training Financial Programming and Policies, Part 1: Macroeconomic Accounts & Analysis (12 weeks) starting 2nd Feb 2015. The course is offered online by the IMF Institute for Capacity Development. It will take approximately 50 hours total to complete.</p>	10	2015-02-02	[Cancel]
<p>Peer Reviewing a Paper for a Journal</p> <p>Reviewed an econometric analysis paper for The Lancet Global Health on the relationship of PEPFAR Abstinence and Faithfulness Funding to HIV Risk Behaviors.</p>	2	2015-01-25	[Cancel]
<p>Extended Library / Archive Research - Total 3-6 Months</p> <p>Undertake extended library research on the economics, politics and philosophy of financing HIV in Uganda.</p>	10	2015-01-19	[Cancel]

<p>Attending Training - 2 days Attending international Training Econometric Estimation of Frontier Functions and Economic Efficiency, 12-13 Jan 2015. Run by UCL Econ Dept, Institute for Fiscal Studies and Centre for Microdata Methods and Practice (cemmap)</p>	4	2015-01-12	[Cancel]
<p>Conference - Paper Preparation Prepare paper - drawn from my literature review on the politics, philosophy and economics of HIV - for presentation at the 9th Panp-European Conference of International Relations. The paper entitled "Global solidarity and shared responsibility as an approach to financing HIV and AIDS: a global public goods perspective" is accepted for presentation. The conference will take place from 23 to 26 September 2015 in Sicily, Italy</p>	2	2015-01-05	[Cancel]
<p>Basic Statistics for Research: e-learning Course 2014-15 Please use the enrolment key: 2014and15 when prompted. Once you have completed your training, please log your points here.</p> <p><input type="button" value="+A1"/> <input type="button" value="+A2"/></p>	5	2015-01-01	

Political prioritization of health within domestic budgets

Standpoint: The global health financing landscape is changing. Charles Birungi and colleagues discuss evidence-based approaches to stimulating political prioritization of health within domestic budgets.

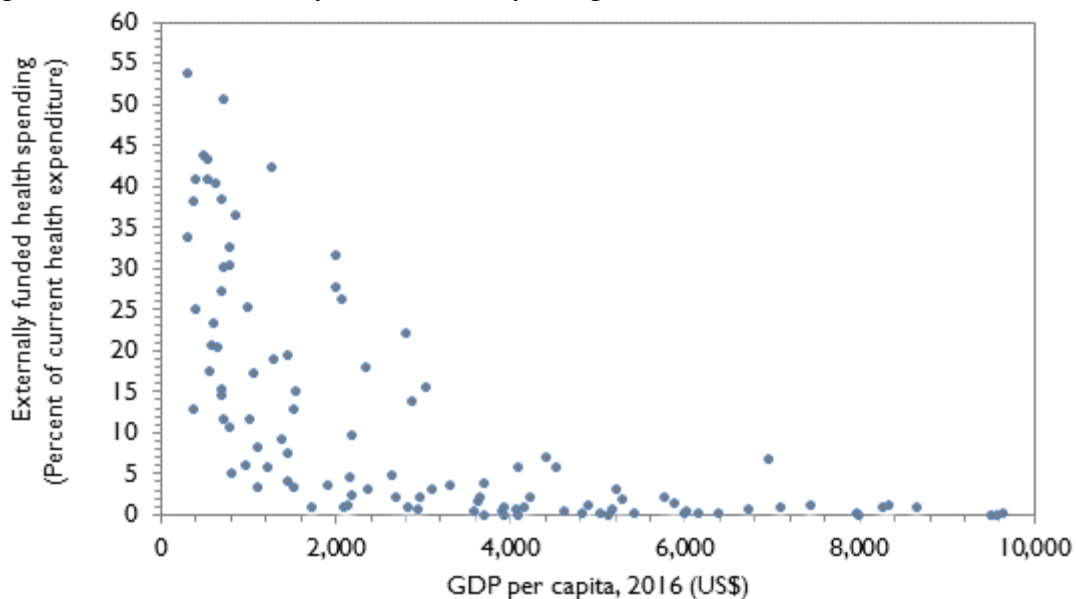
Introduction

The health financing landscape across low- and middle-income countries (LMICs) is changing. As countries develop economically, the role of public health spending is expanding, while the share of external funding in health expenditure declines. The drive towards universal health coverage (UHC) reinforces the need for additional domestic health spending. The COVID-19 pandemic has made health financing challenges - and opportunities - even more complex. One implication of these developments is that the policy discourses on health spending frequently involves decisions on expanding the weight of health in government spending and reducing the shares of other sectors accordingly. In this setting, it is important that policy advice effectively “speaks to” domestic decision makers at and beyond Ministries of Health, or support a Ministry of Health to effectively compete for domestic budgetary resources (Anderson, Maliqi, Axelson, and Ostergren (2016)). This need is reinforced by the epidemiological transition and the growing burden of disease, where effective interventions are often outside the health (care) sector. In this context, we discuss the role, and the design, of economic evaluations in support of decisions on investment in health, in particular if decisions are embedded in a broader development narrative.

Background

As countries develop economically, the role of external funding (in the form of development assistance) of public expenditures declines. Managing this transition is particularly challenging in the health sector, where the rate of external funding tends to be relatively high. This decline in the role of external funding in the health sector is particularly acute between low-income and lower-middle-income countries (LICs and LMICs). While external support accounts for 28 percent of total health spending in countries with GDP per capita below US\$ 1,000 (the approximate threshold between LICs and LMICs), this rate is only 13 percent in countries with GDP per capita between US\$ 1,000 and US\$ 2,000, and plays a subordinate role for upper-middle-income countries, i.e., countries with GDP per capita above US\$ 4,000, approximately (Figure 1).

Figure 1. The Role of Externally Funded Health Spending

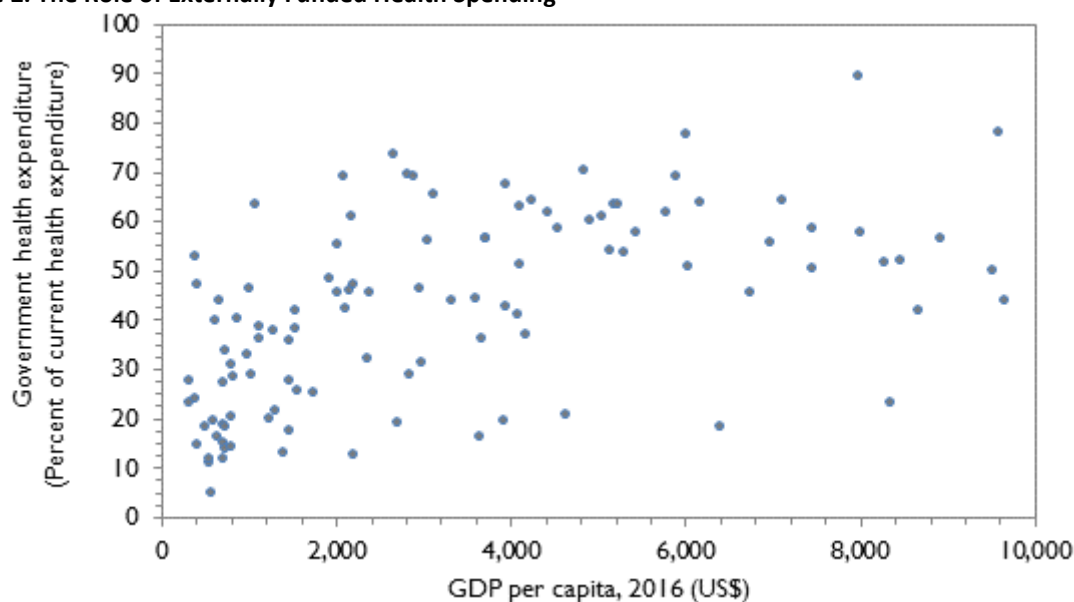


Source: WHO (2019) for health expenditures, IMF (2019) for GDP per capita.

For several countries, the challenges are compounded by the ongoing transition in global HIV financing, in particular as the U.S. government is gradually withdrawing from supporting current spending of HIV programs. HIV-related development assistance accounted for [23] percent of development assistance for health in 2019 (Dieleman and others, 2020), and relatively more in countries facing a severe HIV burden. Consequently, external funding of health spending overall plays a relatively large role in several countries facing a severe HIV burden shown in Figure 1 (e.g., Malawi, Zambia), and the challenges of managing the economic transition are therefore compounded by the HIV-specific funding changes.

Meanwhile, the role of domestic public health financing increases with GDP per capita. This increase may in part be related to the drop in external financing at low levels of GDP per capita (around US\$ 1,000), but it is more sustained. Between GDP per capita of US\$ 1,000 and of US\$ 5,000 (at levels where the role of external financing is already marginal), the share of public health financing in total health expenditure increases from about one-third to one-half. This increase reflects an increase in the weight of health spending in public finance – government revenues (and thus the weight of domestically financed public spending in GDP) also increase relative to GDP as countries develop, but at a much smaller rate.

Figure 2. The Role of Externally Funded Health Spending



Source: WHO (2019) for health expenditures, IMF (2019) for GDP per capita.

These transformations in domestic public health financing linked to economic development suggested by the cross-sectional data will be accelerated over the coming years through the drive towards UHC and attaining the Sustainable Development Goals (SDGs). This would require additional investments which would roughly treble total health expenditure in current (as of 2016) low-income countries, and over 40 percent in lower-middle-income countries (Stenberg and others, 2017)⁴²

In summary, much of the policy discourse on public health financing – in the context of economic development or of a policy on achieving UHC and attaining the SDGs – is about increasing the weight of health public health spending both in total health expenditure and in total government spending.

This requires engaging with policy makers beyond the sphere of health on the role of health in the country’s development strategy. Compelling evidence and projections on the health outcomes that can be achieved through additional investments in health are of course the foundation of calls for additional

⁴² This interpretation of the projections by Stenberg and others is a back-of-envelope calculation.

resources – policy makers at the Ministry of Finance or the Presidency do value improved life expectancy or reduced child mortality. On the other hand, the country’s development strategy is often centered on *economic* development, and Ministries of Finance would also be concerned with the implications of investments in health for the state of public finance.

Aligning Health Economic Analyses with Policy Context

The contribution of health economic analyses to promote and guide political prioritization of health is well recognized. However, while there are well-documented guidelines on good practice in cost-effectiveness in health and medicine (Neumann and others (2017), or Wilkinson and others (2016) with a stronger global health focus), these are predominantly geared towards improving decision-making within the health sector rather than positioning health across domains of government.

The most common approach to link results of health economic analyses with policy context is the classification introduced by the WHO, following the Commission on Macroeconomics and Health (2011), whereby interventions costing less than three times GDP per capita are considered “cost-effective,” and those costing less than one times GDP per capita “highly cost-effective.” This approach has been used by [add rate] of cost-effectiveness analyses captured in the Global Cost-Effectiveness Registry, but the classifications per se have proven largely irrelevant in informing implementation decisions – while health economic analyses predominantly describe “cost-effective” interventions, there is no apparent link to implementation decisions. Indeed, one attempt to base a package of health services on such classifications was quickly abandoned because it turned out inconsistent with the budget context.

Two approaches have been utilized to resolve this dilemma. One involves estimating actual thresholds from implementation decisions [e.g., ref to study on NICE] or expenditure data [York study]. Such studies typically return lower thresholds (e.g., about one-half of GDP per capita) for high-income countries, but extrapolation of such findings to LMICs (where no such studies are available so far) is not straightforward. The alternative is the use of league tables of interventions ordered by cost-effectiveness. This approach is more robust as a league table could be populated just from available estimates for a specific country (or augmented from similar ones). However, to inform thresholds, league tables need sufficient data on marginal interventions, whereas the bulk of data may relate to intra-marginal interventions, with cost-effectiveness ratios well below any critical levels for implementation.

Considering Fiscal Repercussions

Beyond “unrelated costs” within the health sector (sometimes captured by “budget impact analysis”), the government may consider additional fiscal costs or gains associated with poor health or changes in survival. The most important category of government spending affected is social spending associated with poor health (e.g., disability pensions or grants) and old age. In countries where there is an extensive social safety net, these costs can be of a similar order of magnitude as the costs within the health sector (see Haacker and Lule (2011) for an example on South Africa). While these costs do not play a significant role in economic evaluations in global health, it is plausible that they (just like “unrelated” costs) will become more pervasive because of the ongoing epidemiological transition, i.e., the increasing presence of chronic diseases and survival into old age.

Additionally, economic gains (see below) generate additional fiscal resources through improved government revenues. For example, these fiscal gains can be approximated by applying the tax share in GDP to output gains. To the extent that these output gains reflect increased survival, though, it is necessary to take into account that an increased population also requires increased government services across the board, i.e., it represents a fiscal cost. In this setting, only a proportion, and possibly a small one, of tax revenue gains represents additional fiscal space which can be considered as an offset to the fiscal costs of investment in health (Weinstein, 1986).

Health Investments Supporting Broader Economic and Developmental Policy Objectives

National development strategies frequently focus on *economic* development. Investments in health contribute to economic development if better health results in higher productivity or contributes to mitigating socio-economic inequities. To position health effectively in this context, it can be helpful to include estimates of the economic benefits – in addition to the direct health effects – in a health economic evaluation.

To this end, two general approaches have been used. Benefit-cost analysis integrates outcomes of different dimensions by transforming them into a monetary evaluation. It is thus able to capture economic as well as health effects, although the focus of most applications of BCA in health has been translating the health effects per se into an economic evaluation (in this, it is closely related to the thresholds based on GDP per capita discussed above). More rarely, other types of gains are sometimes transformed into equivalent health gains using similar methods ([Sculpher et al. paper].)

In contrast, "impact inventories," as recommended by the Panel on Cost-Effectiveness Analysis) provide a framework for accounting for and documenting different types of economic effects included in an evaluation, without necessarily transforming them into a single measure. While the former approach is necessary to rank policies according to their health and economic benefits (requiring some weighting across different types of benefits), the latter enables policy makers to arrive at a decision in line with their objectives and constraints across the different types of effects, without imposing a specific valuation.

Either approach requires estimating the economic effects. In part, this requires identifying and estimating the different cost and savings to the affected population – e.g., transport costs, time costs of care and accessing health services, and lost incomes (see, e.g., Sanders and others, 2016). Interpreting the macroeconomic consequences – e.g., on GDP and GDP per capita – is more challenging. Some of the costs to affected households (e.g., lost incomes) may be gains to others (e.g., new employment opportunities), and some broader economic gains (e.g., from changing demographics, or behavioural responses to improved health outlooks) can play an important role if the time horizon is sufficiently long. Moreover, for the interpretation of the economic gains, it is important to distinguish productivity gains (from improved population health) and higher economic activity because of improved survival. While productivity gains can be considered additional resources and interpreted as offsets to the cost of a health intervention, survival gains to a large extent are absorbed by the cost of living of the surviving population. This distinction is sometimes blurred in the health economic literature, where "productivity gains" often include and are dominated by survival gains (provide examples).

Health inequities are generally interlinked with socioeconomic inequities – health policy therefore is potentially a cornerstone of mitigating socioeconomic disparities and reducing poverty. Evaluating health gains, costs, and their respective distributions poses challenges different from evaluating different types of effects and costs, but the basic approaches – informing on the different dimensions of results or utilizing some framework to rank the outcomes overall – are similar. "Extended cost-effectiveness analysis" disaggregates benefits and costs across socio-economic categories (e.g., wealth quintiles), elucidating the contributions of a policy to alleviating socioeconomic inequities. In contrast, Cookson and others [several papers] illustrates how distributions of outcomes can be ranked depending on societal preferences on inequality.

Conclusions

The role of domestic public financing in health is expanding across LMICs. This reflects a declining role of external financing at low levels of GDP per capita, but also higher levels of domestic public financing across middle-income countries where the role of external financing already is marginal. Such shifts in the composition of public spending mean that health expands against other sectors and means of attaining the government's overall development objectives. To support decision makers in this setting, or for advocacy, it is particularly useful to capture the economic and developmental implications of investments in health explicitly in health economic evaluations, and align evaluations with the changing budget context.

We outline a number of tools which have been applied or recommended to capture such implications – for public finance, broad economic development indicators such as GDP per capita, and distributional aspects. While no consistent approach has emerged, we see this as a reflection of the multitude of the economic and development aspects of health, and of the specific needs of decision makers. However, shortcomings exist in at least two areas. First, the fiscal context – in the form of relevant thresholds or of the fiscal repercussions of health investments – is rarely captured in health economic evaluations. Second, common practice in health economic evaluations often conflates productivity and survival gains, although these impacts have very different economic interpretations.

Credits: CB and MH contributed equally to this paper and are joint corresponding authors. CB conceptualized the study. CB and MH prepared the first draft. All authors revised the draft.

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It's politics, stupid! A political analysis of the HIV/AIDS Trust Fund in Uganda

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The role of trust funds in the practice of and the policy discourse on the sustainable financing for health and HIV is growing. However, there is a paucity of political analyses on implementing trust fund arrangements. Drawing on a novel meta-framework – connecting multiple streams and advocacy coalition frameworks to policy cycle models of analysis – to politically analyse HIV financing policy design, adoption and implementation as well as insights from public finance literature, this article critically analyses the politics of the AIDS Trust Fund (ATF) in Uganda. We find that politics was the most fundamental driver for the establishment of the ATF. Whereas HIV financing is inherently both technical and political, enacting the ATF was largely a geopolitical positioning policy instrument that entailed navigating political economy challenges in managing multiple stakeholder groups' politics. With the mandated tax revenues earmarked to capitalise the ATF covering only 0.5% of the annual resource needs, we find a very insignificant potential to contribute to financial sustainability of the national HIV response per se. As good ideas and evidence alone often do not necessarily produce desired results, we conclude that systematic and continuous political analysis can bring meaningful insights to our understanding of political economy dimensions of the ATF as an innovative financing policy instrument, thereby helping drive technically sound health financing policy proposals into practice more effectively. For Uganda, while proponents have invested a considerable amount of hope in the ATF as a source of sustainable domestic funding for the HIV response, substantial work remains to be done to address a number of questions that continue to beguile the current ATF architecture. Regarding global health financing policy, the findings suggest the need to pay attention to the position, power and interests of stakeholders as a powerful lever in health financing policy reforms.

Keywords: Africa, Uganda, trust fund, universal health coverage, health finance, fiscal policy

Introduction

This article undertakes a political analysis of the AIDS Trust Fund (ATF) as a public policy instrument for financing the HIV response in Uganda. Health and HIV financing is inherently political. Economics and politics are co-determined, especially with regard to fiscal policy and politics, so this article analyses HIV financing in Uganda from a political economy perspective. It offers insights into "the politics of health policy change, the interests and actors driving the processes through which policies are developed and implemented" (Gilson, 2012, p. 22). Understanding the political dimensions of HIV financing is critical for devising effective strategies to improve the sustainability of the national HIV response. However, there is a paucity of such evidence to inform current discourse on trust funds in domestic HIV and health financing.

Thirty-five years since the first HIV case was identified and documented, Uganda – one of the countries hardest hit by HIV in the world – has changed the trajectory of the AIDS epidemic. New HIV infections and AIDS-related deaths are at an all-time low, declining since 2010 by 51% and 45%,

respectively (UNAIDS, 2018). At the end of 2017, 90% of all people living with HIV (PLHIV) who knew their status were on life-saving antiretroviral therapy (ART; UNAIDS, 2018). ART is indubitably one of the great successes of global health, reducing AIDS-related morbidity and mortality and slowing onward HIV transmission. Decades-long impacts of HIV/AIDS on mortality, as mirrored in declines in life expectancy, have been reversed. However, as global health history shows, a global epidemic has never been ended without a functional cure or vaccine. Wilson and Görgens (2016) argues that HIV is no exception. Relatedly, it is highly unlikely that Uganda will achieve the 2020 UNAIDS fast-track targets to achieve an epidemic transition. In fact, as funding declines and political commitment wanes, there is no end to AIDS in sight, as Wilson and Whiteside (2016) argue. This state of affairs has long-term developmental and financial implications as new infections remain stubbornly high and treatment costs rise inexorably.

In Uganda, HIV spending accounts for 37.5% of total health expenditure. As Figure 1 shows, on the one hand, domestic public financing for HIV has remained dismal, averaging 9% over the last 17 years. On the other hand, external funding

has been and remains the main source of funding for the national HIV response. However, it is important to note that external funding is currently at a crossroad and faces an uncertain outlook (Booth & Whiteside, 2016; Haacker, 2016; Whiteside, 2019; Whiteside, 2016; Johnston, Deane, & Rizzo, 2018). Previously unprecedented global support for financing global interventions in the 1990s to late 2000s is waning, primarily due to five main factors.

First, the 2007/8 global economic crisis exerted fiscal pressure on high-income Organisation for Economic Cooperation and Development (OECD) countries' aid budgets (Dieleman et al., 2018). Second, changes in the global health financing landscape are heightening uncertainties around future aid flows. Due to relatively high economic growth in a number of countries with a high HIV burden, there is more focus on domestic resource mobilisation for HIV and health as some countries graduate from low- to middle-income country status, a transition that changes their eligibility for accessing some multilateral and bilateral development assistance. Third, some analysts (Moszynski, 2010; Grépin, 2012) have attributed this trend to "donor fatigue", i.e. donors capping, reducing or withdrawing spending commitments to HIV responses because they have been involved in the HIV response for long and/or AIDS is over. As the historiography of HIV financing in Uganda shows (Birungi, 2019), most aid is still largely charity, as the words "donor" and "recipient" imply. Thus, under this changing funding paradigm, long-term commitments to future aid are difficult for many donor governments who face legislative constraints and also cannot commit their successors. Donors also wish to retain some flexibility to react to current events and are reluctant to tie up significant portions of their budgets

in long-term commitments. Finally, ending AIDS is a global public good and thus calls for global responsibility. However, growing populist national politics is anathema to international cooperation and mutual solidarity, the very values needed to end AIDS as a global public health threat (Gostin & Ó Cathaoir, 2018). In light of the above, Uganda should expect foreign aid to fall, particularly as it transitions from being categorised as a low-income to a middle-income country. It is imperative to make an honest effort to reduce Uganda's dependence on outside aid.

From a political economy perspective, the state of HIV/AIDS financing presents a policy dilemma. National programs are a long-term financial commitment (Over, 2008; Haacker, 2016). On the one hand – with 1.3 million PLHIV in Uganda in need of life-long ART – there is a rise in overall costs of HIV/AIDS programmes due to a commitment to achieving universal access, and growing need for services. On the other hand, there are limited domestic public funds available while external funding – on which the national HIV response has largely depended – is declining. Such dynamics pose a challenge to the sustainability of the national HIV response. It is in this context that the national AIDS Trust Fund (ATF) was conceived as an innovation for domestic resource mobilisation and to get associated legislation passed.

Globally, proposals for establishing health trust funds have featured in recent and current policy dialogues about domestic HIV/AIDS financing. This has, in part, been motivated by shifts in the health financing landscape. These changes include the move to achieve universal health coverage and the sustainable development goals; the need to increase pooled, prepaid financing and move away from

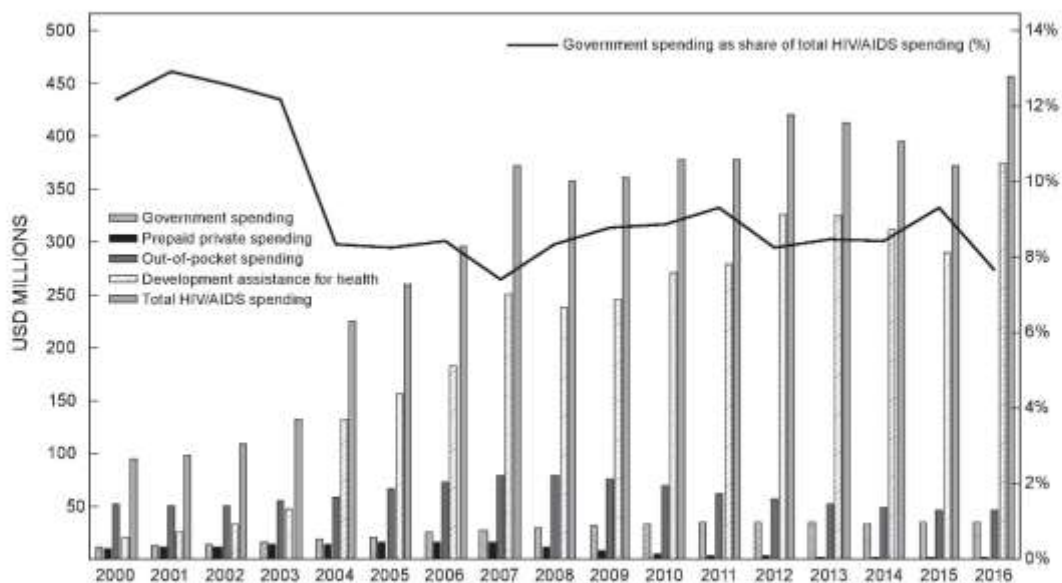


Figure 1: HIV spending in Uganda, 2000–2016 (in 2018 purchasing power parity-adjusted USD (Source: Adapted from IHME, 2019)

out-of-pocket expenditures; and reduce dependence on external development assistance as countries cross income-related eligibility thresholds or as donors gradually withdraw from specific programmes such as HIV-related funding). In the literature on public financing of health and HIV programs, trust funds have been part of the policy discourse on the sustainable financing of the HIV response for many years, but mainly on the global level.

The Global Fund against HIV/AIDS, TB and Malaria (hereafter the Global Fund) – the most significant multilateral funding agency – is a trust fund. As used in this article, trust funds refer to extra-budgetary funds for dedicated purposes (Haaecker, 2016; Kumar & Bhawalkar, 2016; Birungi, 2019). Trust funds have been discussed in recent years in the context of increased domestic responsibility and a decline in donor commitments. In practice, however, trust funds are seen as policy instruments for isolating the HIV response from the annual domestic budget process by enhancing autonomy in investment decisions, introducing flexibilities into public finance (such as enabling rolling money over one year to the next) and, establishing an inviting environment for new forms of finance. However, experience with HIV/AIDS trust funds is thin. Zimbabwe's AIDS levy, which has been operational since 2000, provides one example of a fully developed trust fund supporting the domestic HIV response. Uganda and Tanzania have also recently established ATFs. In Kenya, despite strong advocacy and cabinet approval in 2012 to establish a trust fund for HIV and priority communicable diseases, it is yet to be translated into policy and receive parliamentary approval. While there are other examples of health and disease-specific trust funds, such as the Hong Kong AIDS Trust Fund and Bhutan Health Trust Fund, among others, these are conceived as endowments, that is, funding key health services from investment income rather than from government allocations or other contributions. It appears that recent trust fund proposals conflate investment funds with extra budgetary funds. Generally, there is a paucity of literature on trust funds as a health financing mechanism. It is this gap that our article aims to fill by exploring how the ATF got onto the political agenda in Uganda.

The body of this article is structured in four sections. First, we present the methods used in our study. Second, results are presented. Here, we consider the critical influences on HIV financing policy processes in Uganda – power in policy change, the national context, and global health actors and national policy-making. In particular, we present an analysis of how the ATF got onto the political agenda. This offers particularly valuable insights for countries seeking to reformulate their own health financing policies. The third section discusses the results in light of the original rationale advanced for the ATF, as well as key design features as approved by Parliament. It includes pointers to the cost-benefit analysis of this innovative domestic resource mobilisation instrument. To place the ATF revenue raising potential in context, we compare it to national HIV response resource needs.

Analytical framework

This article employs a process tracing methodology, guided

by the Five-Stream Framework of the Policy Process (Howlett, McConnell, & Perl, 2016). In policy studies, various analytical frameworks have been developed since the 1980s. These approaches to understanding policy processes include, amongst others, the stages of policy cycles, multiple streams, and the Advocacy Coalition Framework. While they all have analytical value, used alone they have attracted substantive criticism. For example, given its overwhelming focus on agenda-setting, Kingdon's model (Kingdon, 1984) cannot simply be transplanted directly to explain non-agenda-setting dynamics. Additionally, the Advocacy Coalition Framework – at least in the form developed by Sabatier and others – is unable to offer satisfactory insights into important aspects of policy-making such as mechanics of ratification or rejection of policy options, or the administrative politics of programme implementation. To this end, as both John (1998) and Cairney (2013) have argued, one way out of the conundrum of multiple, competing frameworks attempting to explain the same set of facts, is to stop viewing them as mutually exclusive or competitive constructs. As Figure 2 shows, to advance thinking about policy-making, the hybrid meta-framework used in this article addresses the above criticisms and draws on both John and Cairney's advice.

This framework represents a methodological advance for assessing policy developments because it recognises and incorporates the intertwined nature of policy-making and the influence of political agendas on the process. Additionally, it emphasises how the above are integrated from the start (the step to create a policy) and occur during that part of the process and even in the making of policy, and during implementation. In light of this, each confluence point brings something new – new actors, new tactics, new ideas, new resources – in the flow of policy-making events. Where each stream intersects, the merger point represents a "window" in Kingdon's sense (Kingdon, 1984) and yields a different configuration of policy inputs that generate a distinct policy pattern through each particular juncture, much as the "rounds" style of policy-making theories have suggested (Howlett, McConnell & Perl, 2016). At an applied level, at each policy stream, we critically asked the following four inter-related questions: (1) Who participates in the issue? (2) What do the participants want and why? (3) How does the decision process work? (4) What determines each player's relative power in the decision-making process?

Results

Adopting a policy-oriented approach, we present the results in terms of actors involved (and their relative power); how, where and what interests emerged; and the role of ideas, issues, interests, ideology, institutions and information. In health economics and policy literature, the policy-oriented approach primarily seeks to understand how the machinery of the state and political actors interact to produce public action (John, 1998; Poku & Whiteside, 2006). Here, the links and interplay between sources of disruption are more important than individual factors taken in isolation. To this end, the context of Uganda circa 2010 (when the policy of establishing an ATF policy process began in earnest) is important to why it was approved. As the chronology

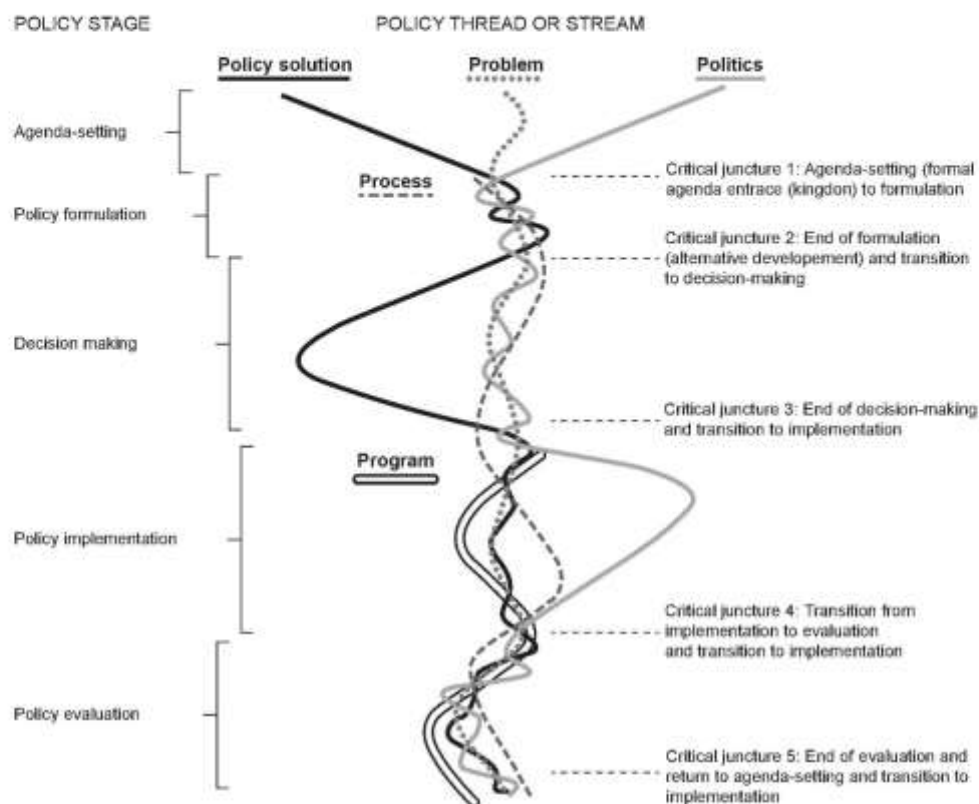


Figure 2: Five-stream framework of the policy process (Source: Howlett, McConnell & Perl, 2016, p. 9. Reproduced with permission)

of HIV financing policy presented in Appendix I shows, in the context of huge budget constraints and the big burden of preventable and infectious diseases, it is interesting to study how HIV financing (a long-term fiscal sustainability challenge whose full magnitude and evolution was not fully known) got onto political agenda. Below, we present the context, players, processes and outcome.

As shown earlier, at the global level, the health financing landscape was undergoing rapid changes. Importantly, the period leading to the enactment of the ATF coincided with one of declining external funding and concomitant increasing demand from donors – in the spirit of counterpart funding required under “shared responsibility” principles – to mobilise domestic funds for the HIV response. In this global context, the limited explicit understanding of what trust funds mean notwithstanding, the Ugandan proposal of the ATF, as contained in the Uganda AIDS Commission policy note (Uganda AIDS Commission, 2017), was meant to be an entity within the public sector dedicated to funding AIDS-related spending. The objectives were broadly defined in terms of enhancing self-sufficiency as well as leveraging donor and private sector contributions.

In Uganda, the financing of HIV services has evolved progressively. Four distinctive but overlapping phases are discernible. First, from the start of the epidemic in the early 1980s, individuals and households paid out-of-pocket for essential care. Second, out-of-pocket payments were complemented by government and faith- and community-based organisations financing home-based care, orphan support, and treatment of opportunistic infections in the late 1980s. This period was followed by some minimal external support from the Global Programme on AIDS, among other donors. During the third phase starting in the early 2000s, substantial HIV funding emerged with the advent of global health initiatives such as the 2002 Global Fund and the US President’s Emergency Plan for AIDS Relief (PEPFAR) in 2003. Finally, the current phase since the global economic crisis of 2007/8, is marked by the challenge on how to sustain HIV programmes given declines in external funding and changing donor aid agendas. In addition, given the risk of losing control of the disease (in terms of reducing HIV incidence substantively), this challenge is exacerbated not only by the costs of treating already-large numbers of PLHIV but also sizeable numbers of newly infected people in the years ahead.

Noteworthy, during this latest phase – owing to weak institutions and governance challenges – HIV financing has been exposed to fiduciary risks. First was the mismanagement of Global Fund resources in 2006 and the ensuing (temporary) suspension of grants. Additionally, the period from 2008–2013 witnessed forensic audits that unearthed financial misappropriation at the Partnership Fund as well as the Civil Society Fund (see Appendix A). These, in turn, exerted pressure on the Ugandan AIDS Commission. Key actors such as Healthcare Development Partners Group and the AIDS Development Partners Group – funding the broader health sector and the HIV response, respectively – capitalised on these fractures to call for stronger fiduciary measures. These micro-politics that were part of the process over several years, among other factors, have heightened the fiduciary risks in Uganda's national HIV programmes. This is the context in which the AIDS Trust Fund policy was enacted.

Power was an important driver of how the ATF got onto any agenda. Uganda is a bureaucratic society; as a result, power vested in an individual – the director general of the Uganda AIDS Commission (UAC) – went a long way in getting (sustainable) HIV financing on the political agenda. As Sadan (1997) previously argued, power refers to the probability that an actor within a social relationship would be in a position to carry out his will despite resistance to it. Conversely, resistance to this sort of power may provide a strategic opportunity. The period of advancing the ATF coincides with a period when donors suspended financial support to the UAC. Thus, resistance by international donors, which could have been interpreted as questioning of the director general's authority and threatening to bring his legacy at the UAC into disrepute, provided an opportunity for him to champion the establishment of the ATF. This is very similar to how a tough tobacco control bill was passed in Thailand following the country being forced by the General Agreement on Tariffs and Trade to open up the cigarette market. It was a matter of "national pride and 'face'" (Chantornwong & McCargo, 2001). Another champion worth mentioning is the chair of the UAC, a renowned researcher and academic who previously worked on innovative financing at the Global Fund. His personal close relationship with the President of Uganda enabled navigating "leadership politics" (Campos & Reich, 2019 p. 231).

Positively, development partners influenced ATF policy. Here, as in most low-income countries heavily dependent on external funding (Kapiriri & Norheim 2004; Colenbrander, Birungi, & Mbonye, 2015), external development partners played a part in enabling national policy processes, such as providing technical and financial support to develop the concept note on the ATF. However, we observed that such influence and the power it reflects is often hidden from view through various practices of effacement or concealment that downplay foreign agency and attribute it to national or local actors. Partners preferred, and continue to prefer, to be described as just one of many actors who contributed to policy development. Particularly, they sought to take a back seat and keep a low profile, preferring the government to clearly remain in the driver's seat, even going so far as to request their contributions remain anonymous in the policy note that first proposed the ATF.

To better understand the key political economy dimensions navigated in enacting the ATF in Uganda, below we analyse some key stakeholders and whether they were supportive or not. First, the United Nations (especially UNFPA, UNDP and UNAIDS) strongly supported the establishment of the ATF. As part of the UN Joint Programme of Support on AIDS, they provided technical support for developing the policy note that informed the ATF. Additionally, the development partners (including UN agencies), self-organising under the AIDS Development Partners Group, supported this nascent proposal. This unequivocal support can be explained by four main factors.

First, a number of these development partners had positive experiences with the *modus operandi* of trust funds (out of the HIV and health sector). In fact, during the 2012 AIDS Partnership Forum, development partners had participated in a round-table discussion and advocated (strongly) for the establishment of an ATF (e.g. Birungi, 2012). Second, the experience of the Zimbabwe AIDS levy (which was a relatively well-known as an early success story of moves towards sustainable innovative domestic financing of health and HIV services) was gaining recognition in policy circles. It was envisaged that, if adequately capitalised and professionally managed, the ATF could fill the financing gap in case donor funding ceased. Finally, cognisant of the three functions of health financing (i.e. raising, pool and strategic purchasing; WHO, 2010), and given the fiduciary assurance issues unearthed by the forensic audit referred to earlier (see Appendix A for details), donors hoped the designed features of the ATF would, besides innovatively raising domestic resources, encompass pooling and strategic purchasing functions. Using the ATF to strategically purchase antiretroviral drugs was seen as a possible option. With prudent governance and adroit management, it was envisaged that this would strategically facilitate this new financing vehicle (i.e. the ATF).

On the other hand, owing to the well-known shortcomings of trust funds from a public finance perspective, such as constraining government's fiscal operations, by reducing the capabilities of policy makers to respond to changing circumstances and shifting priorities (Potier & Diamond, 1999), one would naturally have expected opposition from the custodians of both monetary and fiscal policy, namely the Treasury and World Bank and the International Monetary Fund (IMF).

In contrast, the World Bank strongly supported the establishment of the ATF owing to their deep appreciation of the fiscal dimensions of HIV. Partly drawing from their own commissioned analytical work (Lule & Haacker, 2011), they called for sustainable financing of HIV-induced fiscal liabilities and the ATF was seen as one step in this direction. The Ministry of Finance, Planned and Economic Development (MoFPED) – thanks in part to personal relations between then Director General of the UAC and then Secretary to the Treasury (who is the permanent secretary and thus accounting officer of the MoFPED) – favourably assessed the pros and cons of the policy proposal and provided a clean certificate of financial implications which signalled to the Bill drafters (and eventually Parliament) the MoFPED's in-principle endorsement. Also, key incumbents of the executive and legislative arms of government

were in support of the ATF, in principle, because the policy resonated with the interests and ideas of the ruling coalition. The ATF was a means to advance aspirations of self-reliance and resource mobilisation for development.

Additional support came from civil society. Organisations such as the Uganda Network of AIDS Service Organisations, Centre for Health Human Rights and Development, Alliance of Women Advocating for Change, International Community of Women Living with HIV/AIDS, AIDS Healthcare Foundation, and Health Global Access Project, among others, strongly argued that this policy development represented an important opportunity to generate additional revenue to augment Uganda's effort towards "ending AIDS". However, on the ground, those involved in HIV financing policy negotiation, formation, and implementation, in the spirit of activism, raised five critical areas of concern:

1. The revenue raised by the ATF should be sufficient to contribute meaningfully to the goal of ending the AIDS epidemic in Uganda;
2. The ATF board should be an independent body with actual or perceived conflict of interest aggressively managed;
3. Civil society and other stakeholders should work to ensure transparency, accountability and freedom from corruption;
4. The ATF should be a multi-stakeholder body; and
5. The revenues raised should be strategically invested in programme areas with direct impact on preventing new HIV infections and averting AIDS deaths, and verifiable.

Unexpectedly, the main opposition to the proposal was from the Ministry of Health (MoH) although, most times at least, this was expressed diplomatically behind the scenes. The planners and policy makers in the MoH were heavily influenced by priority setting using burden of disease data and thus contended that HIV/AIDS was no longer a top priority because mortality and morbidity had greatly declined due to ART. This view was contrary to the required long-term perspective that frames HIV as a long-term fiscal liability for which the imperative to find sustainable financing solutions was key. The MoH actors argued that sustainable financing should be for the broad health sector and not a single disease. It is important to note, however, that behind these technical arguments there was a long-standing rivalry between the MoH and the UAC due partly to overlapping mandates – and the attendant competition for funding from treasury and donors for HIV interventions.

There are two issues worth mentioning in an attempt to explain the opposition from the MoH which would otherwise have been a natural supporter. First, the ministry had proposed a national health insurance scheme (NHIS) and a corresponding fund whose design was facing challenges; among these a 2001 presidential decree abolishing user fees at point-of-use at public health facilities. Elements within civil society, government and the general citizenry questioned what risk NHIS would cover given the free health care policy enacted. Technically, there is not necessarily a contradiction between free health services and an NHIS; however, the framing of and reaction to the NHIS displayed the internal politics of ATF supporters seeking to discredit the NHIS. Thus, at the time the ATF was proposed, it was unclear how and if the two funds (i.e. the ATF and the NIH

fund that was proposed to pool and strategically purchase health services using the NHIS premiums) could efficiently and effectively synergise with each other. In the face of this lack of clarity, a number of actors within the MoH opted to oppose the ATF until clarity was provided. It is important to note that whereas the NHIS was contradicted by the presidential decree, MoH continued advocating for the NHIS long afterwards and, by the late 2000s, was advocating for the NHIS as an equitable mechanism to help finance costs incurred for free health services.

Second and related to the above is the role of the Health Development Partners Group (HDPG) whose membership was often different from the AIDS Development Partners Group (ADPG) with minor overlaps between these coalitions. The HDPG supported the position of the MoH for the above reasons but also contended that the ATF would further verticalise the HIV response, yet the move was to integrate the same into broader health systems (and run a resilient and sustainable horizontal health system).

Positing that political analysis is an essential part of policy analysis, we also highlight the critical importance of analysis and engaging with power vested in institutions, which is not absolute as it depends on the rules of the game in those key institutions. Additionally, sources of power in institutions include knowledge, resources, reputation, control of key procedural check-points, and self-awareness. To this end, as the Parliamentary Committee on HIV and AIDS is silent about the approval of the ATF operational guidelines, this could safely be interpreted to signal the dynamics between power and politics between the legislature and MoFPED in resourcing the ATF, and partly explain why operationalisation of the ATF has taken longer since the departure of the DG at UAC.

Finally, we show that major policy change is preceded by dramatic events. The ATF as an HIV financing policy instrument did not get onto the agenda out of the blue; there had been action behind the scenes, some very quietly. As a key lesson to managing the attendant politics of health financing for universal health coverage, this article highlights the key political economy challenges that need to be analysed and addressed for sustainable HIV and health financing.

Discussion

The financing of HIV services in Uganda has a unique political history; the politics of HIV financing is inextricably linked to the politics of AIDS in Uganda (Tumushabe, 2006). Using a theoretical framework called geopolitical positioning (Gómez, 2017), we contend that Uganda – as a nation – responded to international pressures and policy criticisms. HIV financing having been criticised for "displacing" other funding for health and development (Shiffman, 2008), the country strategically utilised the ATF as a domestic policy innovation to ultimately (re)engage in global health diplomacy in order to bolster its international reputation. It is worth mentioning that this was also partly a response to offers of financial and technical assistance from, for example, the Global Fund and was thus projected to raise revenues to meet the co-financing policy requirement.

Efforts to push for the ATF were domestically driven primarily with calls for additional revenue; unfortunately, there was little focus on how the money should be spent. Buoyed by enthusiasm about raising private and public capital, we argue that the ATF conflated budgetary vehicles with investment funds. This is an important policy consideration that remains unanswered. Conflating these two models is problematic as it signifies a lack of clarity on whether the ATF as an investment fund (such as in the case of the Bhutan Health Trust Fund (BHTF) seeks financial independence from government altogether or, as a budgetary vehicle seeks temporary breaks from government interference on spending while relying on government revenues. Second, as shown earlier, the ATF seeks earmarked sources of revenues. From a public finance perspective, while the case for hypothecation is well argued with all pros and cons systematically analysed elsewhere (Cashin, Sparkes, & Bloom, 2017), for the Ugandan ATF a key question remains: can it spend money more effectively than other government bodies? Finally, calls for integrating HIV services with other health services as practicable have been made. We argue that the ATF runs a risk of prioritising spending with direct HIV outcomes and less for structural interventions with long-term benefits for health. Relatedly, as AIDS spending is often delivered through structures parallel to the health system, it is highly likely that the ATF risks compounding verticalisation. These are important considerations for rethinking the current architecture of the ATF.

In relation to the role of individuals, preferences within individuals are relatively fixed and slow to change. In navigating the politics of evidence-informed policymaking, as one of the strategies of influential policy actors, it is acknowledged that preferences get activated by how individuals interpret the context (True, Jones, & Baumgartner, 2007; Parkhurst, 2017). One thing that was done in Uganda was to extrapolate and interpolate global evidence on the looming global HIV financing crisis due to end of the era of solid global aids funding support for HIV responses (referred to as the end of the "golden age" elsewhere (IHME, 2010). This mobilised the support of the general public and the political leadership, particularly the executive, legislature and civil society. Specifically, during the public hearings on the proposal in Parliament, the ensuing big turnout and related advocacy efforts served as subtle indications to policy makers that there was support from below.

Relatedly, the individual policy entrepreneur is critical to the policy process. The policy entrepreneur recognises a window of opportunity when it opens and is quick to act. They are described as "not mere advocates of a particular solution; they are power brokers and manipulators [that word again]...they are persistent, skilled at coupling, they are able to attach problems to their solutions and find politicians [or health policy makers] receptive to their ideas" (Zahariadis, 2007, p. 74). In Uganda, having a politically astute UAC DG, who took this on and worked persistently to get the ATF on the agenda, taking advantage of all opportunities that arose, was critical to getting ATF on the agenda. Key attributes of the policy entrepreneur are key to this. Three of these stand out. First, having actively participated in *The aids2031 AIDS Consortium's* costs and financing Technical Working

Group (TWG), he was well aware of the looming financing crisis for the global response to the AIDS epidemic and the need to act swiftly. Second, within the ruling coalition, Parliament and the Executive, he had earned the trust of the actors therein. In the process of championing the ATF, he capitalised on this goodwill and exploited it to advance the proposal. Third, having been at the helm of coordinating the national HIV response for more than two decades, he had a good appreciation of potential potholes for the proposal as well as requisite framing language to connect with the various actors.

Beyond the role of the policy entrepreneur who takes advantage of a policy window opportunity, attention ought to be paid to collective action. Here, mass mobilisation, sensitisation and awareness sessions during the Partnership Forum and through the various self-coordinating entities' engagement platforms, HIV-related national and sub-national events (such as the Candlelight Memorial and World AIDS Day) and advocacy from and within the loose umbrella entity "Uganda HIV Advocates", played a significant role in getting ATF policy proposal approved. Specifically, here, the various calls for the ATF during speeches as well as written memoranda such as those on draft Statutory Instruments before Parliament helped galvanise support to get it approved.

In policy studies, institution is defined as "the context within which individuals act" (Schlager, 2007), including "national mood" (Zahariadis, 2007, p. 73). The euphoria in Uganda after years of sustained peace, with development indicators improving, the fight against AIDS as a global "success story", the sense of being able to hold heads high again, that mood was important. The mantra of "Ugandan solutions to Ugandan challenges" has been growing in importance. The ATF policy proposal, in effect, was deemed to offer domestic financing solutions to HIV.

It thus follows that the importance of the policy entrepreneur being strategically positioned in an institution cannot be overemphasised. As additional micro-political aspects of the policy process show, the DG of UAC was institutionally located in the Office of the President (and directly appointed by the President), and so indirectly, the power inherent in the institution (the Presidency) was reflected in the policy entrepreneur. The Presidency, having led the early efforts in the fight against HIV/AIDS, still has the mandate to develop HIV financing policy (see Presidential Fast Track Initiative to End AIDS in Uganda, Government of Uganda, 2017, for example). Some observers, noting that the DG's son was groomsman during the wedding of the President's son, have contended that he was politically connected and powerful. Additionally, being related (by blood) to the Secretary to the Treasury who controlled a powerful tool, fiscal policy (that is currently underutilised by the government and leaders to finance health) was key to assenting and granting a certificate of financial implications for the Bill in which the ATF proposal was embedded.

In designing policy and driving its adoption and implementation, we find that multiple stakeholders may use similar strategies or a mix of overlapping strategies to promote, block or slow down policy design, adoption and implementation. The policy reform entailed navigating six dimensions of political economy. These are in line with

those proposed by Campos and Reich (2019). As shown in Figure 3, in no particular order, the policy process entailed navigating competing interest groups' politics. For example, civil society activists sought to minimise losses, whilst maximising gains from reform. The contentions with Ministry of Health ably illustrate bureaucracy politics. In particular, this entailed contestation of reform to protect or expand authority, interests, budget, personnel, or influence. Whereas overall tax administration and collection, as well as revenue allocation typically lie with finance authorities, managing budget politics influenced reform as negotiations between UAC and MoFPED regarding budget allocation and expenditure mechanisms showed. In terms of leadership politics, here electoral cycles, party politics, and context shaped opportunities for reform. Particularly, to the political leadership, this reform was positively viewed as conferring political legitimacy through the delivery of socioeconomic progress. In terms of beneficiary politics, the analysis shows that ideas and ideologies matter. In the case of the ATF in Uganda, this entailed navigating the reform complexities through alignment with national values and identities, including public opinion. Finally, it is generally accepted that external actors can be very influential. Thus, in terms of external actor politics, external donors did lend support to this policy. In a nutshell, this study of the politics of HIV financing demonstrates the complex politics involved.

Methodologically, the framework used in this article is well suited to analyse the micro-politics of HIV financing reform. Current policy theory has not moved very far beyond the original ideas advanced in the writings of the 1980s and 1990s. Applying this novel framework, as we do in this article, is one way out of the conundrum of multiple,

competing frameworks attempting to explain the same set of facts. We posit that the research possibilities involved in working with this new framework are enormous, once we begin to see the value in adapting and combining the core insights of stages, streams, and coalition approaches, rather than seeing them as mutually exclusive. Specifically, it allows us to meld together analytical approaches that focus on different stages of policy processes, the interplay of multiple forces that shape these processes, and the competition between different sets of actors (and beliefs) as they vie for influence.

In conclusion, globally, proposals for establishing trust funds have played a role in the recent and current policy dialogue on domestic HIV/AIDS financing. This has, in part, been motivated by the need to increase domestic financing for HIV and health, in response to shifts taking place in the global health financing landscape. Among others, these changes include the move to achieve universal health coverage and the sustainable development goals; the need to increase pooled, prepaid financing and move away from out-of-pocket expenditures; and the transition away from, or reduction in, development assistance, as countries cross income-related eligibility thresholds or as donors gradually withdraw from specific programs (e.g. in HIV/AIDS-related funding). However, to the best of our knowledge, there is a paucity of literature on the politics and economics of trust funds as health financing mechanisms. This article attempts to fill the gap by contributing to the academic literature on the politics and role of trust funds for fiscally and politically sustainable financing of HIV responses. While not detracting from the value of this analysis, in interpreting our results, it is important to bear in mind one limitation. At the time

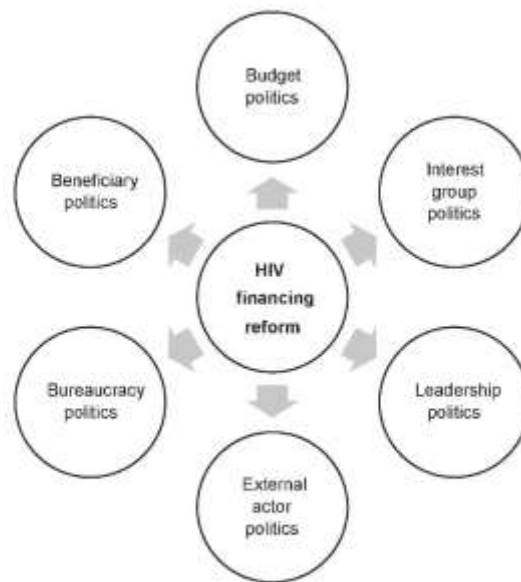


Figure 3: Key political economy dimensions navigated in enacting the ATF in Uganda (Source: Adapted from Campos & Reich, 2019)

of writing this article, the ATF — despite being legally established in 2014 — was not yet fully operational as to enable a full benefit-cost analysis of this policy instrument. What is known, however, is that its revenue raising potential from some tax revenues directly assigned by law to the ATF account for about US\$ 2 million (translated into around 0.5% of annual total HIV/AIDS-related spending) (Birungi, 2019).


Conclusion

In this article, we have analysed the political economy of the ATF as a health financing policy instrument. While the ATF was a technically sound health financing policy, its design, adoption and implementation were and continue to be influenced by political economy factors. Also, while technical arguments were used, the article finds that these are insufficient in explaining Government of Uganda's decision to pursue the enactment of the ATF as a domestic policy tool for sustainable financing of the national HIV response. Instead, the findings suggest that politics was the factor that plausibly explains this health financing policy reform to get the ATF policy on the political agenda. As the revenue raising potential of ATF from the mandated sources is very insignificant, covering a paltry 0.5 per cent of annual resource needs (before netting out the ATF's administrative costs), the findings illustrate little evidence on likely positive contributions of the ATF to ensure the financial sustainability of the national HIV response per se. As a key lesson to managing the attendant politics of health financing for universal health coverage, to stimulate thinking and working politically, this article highlights the key political economy challenges that need to be analysed and addressed to design, adopt and implement sustainable HIV and health financing policy reforms that could move Uganda towards universal health coverage.

Disclaimer — This article does not represent the official views of affiliated organisations but rather the personal views of the authors.

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Appendix A

Table A1: Chronological developments of HIV financing policy in Uganda

Period	Key events	Source
1982–1986	Very minimal domestic public financing for HIV sensitisation	Stulkin et al., 2006; Okware et al., 2000
1986	President Museveni takes over power and thereafter sends 60 soldiers for further military training to Cuba. Upon Cuba testing and diagnosing a number of them with HIV on arrival, President Fidel Castro relays the potential threat to the army to his Ugandan counterpart. Consequently, the potential threat that AIDS posed to the army, which was Museveni's primary power base (as he lacked a political base to govern Uganda then) led to pragmatic actions such as the set-up of the AIDS and STI Control Program in October 1986, government's open policy towards HIV and government domestic financing of HIV services (including external resources mobilisation for the HIV response)	Tumushabe (2006)
1986–1989	Reinvigorated domestic financing for Abstinence and Behaviour Change (AB) programs	Green and Witte (2006)
1988	Government of Uganda appeals for international support to control the epidemic	Kaleeba et al., 2001
1989/90–1995	Global Programme on AIDS (GPA) funds AB and Condoms use (ABC)	Okware et al. (2000)
1996	Ministry of Health commissioned the first feasibility on health insurance and some limited community-based health insurance schemes were piloted	Basaza et al. (2013)
1995–2000	USAID sexually transmitted infector (STI) project and World Bank multi-country HIV/AIDS program (MAP) implemented	Greene (2011)
1989–2000	Generous debt relief from the international community (i.e. the Paris Club, International development association (IDA), multilateral debt fund (Uganda) and, heavily indebted poor countries (HIPC) Initiative (including Enhanced HIPC)	Mijumbi (2006)
2001	Government of Uganda (GoU) abolishes user fees in all public units with the exception of the private wings of public hospitals	Kirunga Tashobya et al (2006)
2001	The Director General (DG) of Uganda AIDS Commission (UAC) participates – as a member – of the aids2031 Costs and Financing Working Group ¹	
2002	At global level, the Global Fund to Fight AIDS, Tuberculosis, and Malaria (GFATM) is established. At national level, the Partnership Fund (PF) was established as a pooled source of funds from Uganda's AIDS Development Partners. It has been the major source of funding for the HIV/AIDS coordination and management efforts of UAC and other national level stakeholders referred to as Self Coordinating Entities (SCEs)	
2003	U.S. President's Emergency Plan for AIDS Relief (PEPFAR) authorised	
2004	Fiscal reforms (such as fiscal consolidation, partly through strict adherence to budget ceilings) usher in a new economic paradigm and entrench the same in the Poverty Eradication Action Plan (PEAP), the overall framework that guides all the sectors to plan in the context of poverty eradication	Odaga and Locharo (2006)
2006	Reported misappropriation of GFATM monies and fallout with major donors	
2007	The Civil Society Fund (CSF) is established in June 2007 as a partnership involving the UAC, development partners and civil society	
2007–2008	Global economic crisis	
2008–2013	The donors freeze the funds in Partnership Fund and appoint Deloitte Uganda Limited as financial manager ²	
2009	A forensic audit launched at the UAC amid allegations of mismanagement of funds. KPMG Kenya conducted the audit that was funded and led by the donor community, which contributes US\$ 2–4 million annually to a basket Partnership Fund to provide financing to UAC for HIV/AIDS coordination activities. The audit uncovers serious malfeasance, which further damages Uganda's already-shaky reputation as a committed partner in the fight against HIV/AIDS	KPMG (2010) and KPMG (2013)
2011	Globally, in 2011, the GFATM faces a crisis of confidence triggered by some negative media articles. In November 2011, the Board cancelled Round 11	Rivers and Garmaise (2011)
Circa 2010	At a time when the effort against HIV/AIDS is slipping in terms of rising prevalence and drug shortages, there is growing recognition by the Government of Uganda needs to do much more to ensure that the substantial inflows of donor money are protected and used for their intended purposes	Kakaire et al. (2016); Lule and Haacker (2011); Birungi (2012) and Okwero et al. (2010)
Circa 2010	Owing to fiscal pressures on UAC, Kassami (the Permanent Secretary of MoFPED and Secretary to the Treasury) authorises (albeit informally) flexibilities within the public finance management policies to allow UAC to undertake virement of the development budget to cover for recurrent expenditures (as a stop gap measure)	
2011	A policy note entitled "Justification for increased sustainable financing for HIV/AIDS in Uganda" is elaborated proposing establishment of an AIDS Trust Fund	

continued on next page

Period	Key events	Source
2014	The HIV and AIDS trust fund was established in the (otherwise controversial ¹) HIV and AIDS Prevention and Control Act passed by Parliament in May and assented to by the President in July 2014	Republic of Uganda (2014)
2014–2017 ²	Contentions within and between several fields of power ³ (including negotiations) regarding the architecture for the ATF	Various CSOs (2017); UAC (2017) and Ministry of Health (2017)
2014	Uganda AIDS Commission developed the HIV and AIDS investment framework titled "A case for more strategic and increased investment in HIV/AIDS programmes for Uganda 2015–2025". The purpose was to bridge the gap between programme needs and investments in the response especially from domestic financing	UAC (2017)
April 2017	Uganda AIDS Commission developed the National Multi-sectoral HIV and AIDS Resource Mobilisation Strategy 2015/16 – 2019/2020 with ATF estimated to raise 2 billion UGX per year. This was in the interest of compelling the GOU and ADPs to operationalise ATF as a sustainable HIV financing mechanism	UAC (2017)
2017	Parliamentary Committee on HIV and AIDS received from Cabinet and reviewed the ATF guidelines for approval	
2017 – ff	Operationalisation of the ATF delayed	
2018	As part of rationalisation of government ministries, departments and agencies (MDAs), on 10th September 2018, cabinet made decision to dissolve UAC and merge its functions under the Ministry of Health	

Notes

¹ The Costs and Financing Working Group of the *aids2031* project – an initiative named for the year marking a half-century after the discovery of HIV – rigorously looked at the tough questions now facing policy makers about the future costs of AIDS.

² This move, to some extent, led to UAC inaction with coordination functions at national and subnational level suffering. This inaction was largely a subtle resistance to external pressures on UAC (and by extension the Government of Uganda) to repay mismanaged resources (as unearthed by the above-mentioned forensic audit), layoff UAC staff, and create new positions (beyond the GoU approved establishment for UAC), including what was deemed as a personal attack on the person of the Director General who had not been found criminally liable in the audit but rather "charged" with the offence framed as "managerial culpability" (see letter by the Chair of the AIDS Development Partners Group (ADPG) to the Attorney General, and this – in some circles – was viewed as witch-hunt of a confidant of the Head of State). Additionally, in November 2012, UAC issued an internal audit report indicating that they had concerns about how the Partnership Fund was being managed. KPMG was requested by the AIDS development partners to conduct a special audit of the Partnership Fund and the CSF. KPMG's findings, presented as expenditure verification for the period 1 May 2010 to 31 December 2012, were that both the UAC and the Financial Management Agent were not strictly adhering to the financial management guidelines.

³ Among other measures, this law criminalises willful and intentional transmission of HIV and requires victims of sexual offenses, pregnant women, and partners of pregnant women to undergo mandatory HIV testing "for the purpose of prevention of HIV transmission." (Id. § 14.). Whereas the legislation requires that the results of an HIV test be kept confidential and that they be released only to the person tested, there are a number of exceptions to the confidentiality rule.

⁴ At the time of undertaking this analysis, the ATF was yet to become fully operational. The criticism stems, in part, from the fact that Uganda's Parliament by and large excluded the input of advocacy groups and experts.

⁵ The key stakeholders involved are: Ministry of Finance, Planning and Economic Development (MoFPED); Uganda Revenue Authority (URA); Ministry of Health (MoH); Parliament (especially the Committee on HIV/AIDS and other related matters); Uganda AIDS Commission (UAC); Civil Society Organisations (CSOs); and AIDS Development Partners (including the United Nations system).

Ending the AIDS epidemic: a global public good?

Abstract

This paper addresses a growing body of literature on the global public goods (GPG) theory as applied to global health, and the use of this unifying framework to equitably fast-track ending the AIDS epidemic as a public health threat by 2030. Recognizing that the global response to HIV/AIDS has been unprecedented in the history of global health, with the international community acting in solidarity to ensure the responsibility for financing the same a shared one, I argue that if ending AIDS is subject to economic analysis, it is imperative to classify what type of commodity it is as different HIV services need to be classified differently. Policy issues like HIV services delivery and financing are linked to this debate on classification. Thus, owing to a paucity of research into this political economy theory's applicability to the global response to HIV/AIDS, I aim to pragmatically delineate how such a framework could be applied, and its potential policy and practical implications, focusing on the goal of ending AIDS as enshrined in the 2030 Agenda for Sustainable Development. Finally, owing to critical critiques, the paper concludes by questioning the appropriateness of using the GPG theory to end AIDS. This, in the context of global solidarity and shared responsibility, helps lay the foundation for evidence-informed and theoretically grounded policy debates on the fiscal sustainability of HIV responses.

Key words: global public goods; economic theory; HIV; critical policy analysis; global health.

1. Introduction

This paper critically engages with and addresses a growing body of literature on the global public goods (GPG) theory as applied to global health, and the use of this unifying framework to equitably fast-track ending the AIDS epidemic as a public health threat by 2030. Recently, largely due to priority accorded to solve international collective action problems such as controlling infectious disease pandemic outbreaks, among others, there is renewed interest in and attention to GPGs as a mechanism for addressing supranational challenges. Some operational definitions, as used in this paper, are important at this juncture. First, canonically, a GPG is a good or service whose consumption and benefits extend across borders, from which no one individual can be excluded. Second, ending AIDS – like Galvani et al. (2018) – is defined as a transition in the HIV epidemic to incidence of less than one in 10, 000 people per year.

Historically, the GPG concept has its origins in the works on public goods by economic philosophers such as Adam Smith, David Hume, Paul Samuelson, and Mancur Olson. However, it was not until 1999 – through the seminal book by the United Nations Development Programme (UNDP) (Kaul, Grunberg and Stern, 1999) - that the concept of GPGs garnered the much-needed attention in international cooperation. Motivated by development policy and practice, the GPG concept was proposed as a new economic rationale, framework, and tool for prioritization in international development cooperation. Since then, the policy-related discourses - grounded in the economic theoretical framework of GPGs – have gained traction and entered the academic and policy circles of various actors and sectors in HIV, health, and development. Recently and more prominently, in the quest for practical approaches to sustainably financing the global response to HIV/AIDS, questions have arisen regarding (re)considerations of public, private, and merit goods aspects of HIV care. However, despite a growing body of literature, research into ending AIDS through the lens of this framework has been limited in academic circles. It is this gap that this paper seeks to fill.

Several scholars have commented on selected elements of the global response to HIV/AIDS and concluded that it can safely be implicitly classified as a GPG (UNAIDS, 2016; Piot, 2015). This notwithstanding, there has been little deep and explicit analysis of the theory's applicability to the control of the HIV epidemic, which I interchangeably refer to as the "end of AIDS" in this paper. While analysing healthcare, Kaul, Conceicao, Le Glouven and Mendoza (2003: 45) classify it as a service that is 'public by design'. Relatedly, Piot (2015) asserts that:

"The concept of a global public good provides a strong foundation for an international response."
(46-47)

As I show in this paper, this may have been correct early on, for example, reflecting concerns about HIV spreading globally, and the economic and security implications of this, and some aspects of the HIV/AIDS response (essentially, research funding) provide a public good. However, currently, I find this a very questionable proposition. I will return to this point later. The policy brief by the United Nations Joint Programme on HIV/AIDS (UNAIDS, 2016), framed within discourses on shared responsibility for financing the global HIV response, concludes – in a bit of a "can't see the forest for the trees" situation – that response to HIV is a diverse set of activities, with some components regarded as 'public goods'. These justify a publicly financed HIV response. On the other hand, others fulfill the definitions - by global consensus - of 'merit goods'. These justify public intervention in the market, and therefore public and shared responsibility to help.

This paper builds on and expands these discussions, by not only showing how the control of HIV epidemics as a GPG ought to be defined but also – and most importantly – deducing possible policy implications of the same. In pragmatically evaluating the applicability of the GPG theory, I provide certain critiques of its use. From a temporal perspective, I question the usage of the GPG argument to motivate global investments in HIV prevention and treatment across developing countries. Besides distortions to the original, canonical theory of public goods, from a post-colonial perspective and grounded in Southern theory, I contend that the use of the GPG framework is questionable. This is because the agendas, areas of focus (referred to as priority areas in this paper), and the gaze largely determine and define what essentially qualifies as a GPG, and is often driven by Northern institutions and actors. Thus, the GPG theoretical construct is (pessimistically) considered to be 'western-centric' in some circles, seeking to entrench a form of economic globalisation (and neocolonialism) which disproportionately tends to favor Global North nations. Finally, in terms of its foundation, the GPG framework is deeply rooted in neoclassical market economics. Thus, by extension, policies based on the notion of GPGs tend to potentially undermine other non-economic justifications for (financing) the public provision of certain goods and services. As can rationally be expected, this, in turn, results in under-provision of the same. Additionally, this raises and brings conceptual tensions to the fore. It is in this context that I question – and rightly so - whether controlling HIV epidemics can and ought to be defined as both a GPG and a human right. This paper - while not seeking to present a normative argument in favour of defining ending AIDS as a GPG – provides a critique of the GPG framework as a tool to galvanise global solidarity and shared responsibility for financing the global response to HIV/AIDS. This is the gist of this paper.

2. Initiating the uninitiated: the basics of the theory of (global) public goods

Historically, although the distinction between public and private goods was well understood by economic philosophers such as Adam Smith as early as 1776, a rigorous economic expression was given to the same by Paul Samuelson only in the 1950s. I must hasten to add that in between these two types of goods, there are another one, merit goods, whose provision is need-based rather than based on ability and/or willingness to pay. Even though the distinction between public and merit goods is well established in economic theory, both terms are often used interchangeably and not easily distinguishable from each other in practice. It is these two types of goods that I explore in detail here.

As a point of departure to critically evaluating the proposition of ending AIDS as a GPG, an exposition of the theory of public goods – both traditionally as well as from its recent reformulation in the

literature – is critical. First, as defined by Adam Smith (1994[1776] p.779), public goods are certain products “which though they may be in the highest degree advantageous to a great society are, however, of such a nature that the profits could never repay the expenses to any individual or a small number of individuals, and which it therefore cannot be expected that any individual or any small number of individuals should erect”. Simply put, public goods are defined by economists in terms of two (2) important attributes:

1. Non-rival: These can be shared by additional consumers without necessarily reducing the quantity being consumed by existing consumers.
2. Non-excludable: Here, the producer cannot prevent people from consuming them once they have been provided.

In economic history, the seminal 1954 paper, ‘The pure theory of public expenditure’, by economic philosopher Paul Samuelson is regarded as the foundation for the theory of public goods as it is here that it was first presented. Thereafter, further refinements were substantively made by other influential economists such as Richard Abel Musgrave, James M. Buchanan among others (Kaul, Grunberg, and Stern, 1999). In its simplest form, public goods theory – used primarily to classify goods and services - helps describe those that can (and cannot) adequately or efficiently be provided by the market (and the public sector). Herein lies the risk of conflating public goods with publicly-provided goods. For the avoidance of doubt, a public good must embody non-rivalriness and non-excludability, as the two (2) major distinguishing properties.

Deductively, the classification of a public good can equally logically be made based on what it is not: a private good. This is a type of good or service that is both rivalrous and excludable. Given this description, it is increasingly clear that this understanding is underpinned by market economics, and notably rooted in neoclassical economics. As noted by Coussy (2005) and Moore (2004), this is partly the foundation for some of the critiques of the GPG theory, particularly as recently reformulated (see Francine (2009) for example). In real life, however, many goods are neither purely rival nor purely excludable. Consequently, they can only be provided through public sector intervention. This takes the form of either direct provision or subsidisation or regulation. The extent to which there is a normative “responsibility” on the part of the public sector to intervene in financing the supply of these public goods depends on the extent to which the services in question are regarded as important, desirable, or essential. This, in turn, leads to considerable overlap with another category, referred to as “merit goods” in economic literature.

Simply put, merit goods are provided by a free-market system, albeit not in sufficient or desirable quantities. Analysts (OPM, 2013) often argue that this condition applies to ending AIDS, but also to health care. Specifically, the under-provision in a free market is a net effect of the following two main attributes:

1. Merit goods usually confer long-term benefits to the consumer. However, at the time of consumption, the full benefit to the person consuming the good is not always fully recognized – often because these benefits lie in the future, and therefore cannot be regarded as certain.
2. Merit goods usually generate significant benefits to others, or society as a whole – not only to the person consuming them. For example, both health and ending AIDS lead to benefits to the immediate families of the people receiving the services, and to improved productivity and economic benefits in the future – these accrue to the whole of society as “positive externalities”.

From the foregoing, as Desai (2003) - among other scholars - shows, the public goods theory has undergone fundamental reformulation over the last few years, partly due to recent scholarship in this area (Gazier and Touffet, 2006; Kaul, 2006; Kaul and Mendoza, 2003). They argue that the above-mentioned characterization is overly narrow and – through oversimplification - ignores engaging with complexity, such as social, moral, and political factors. For example, recognising that some goods and services are (and can) easily (be) described without any reference to either their consumers or providers, Kaul (2006:14) argues that:

“publicness in consumption does not depend only on nonrivalrousness or non-excludability. It is often a social construct, that is, human induced”.

Relatedly, the consumption of goods and services is also dependent on policy shifts, such as some private goods that may be made ‘public by design’ (Kaul, Conceicao, Le Goulven and Mendoza, 2003). It is important to note that pure public goods - embodying the non-rival, non-excludable properties naturally, without human intervention - is quite rare (Stiglitz 2000). Consequently, this assertion gives rise to the notion of impure public goods. These partially meet the criteria of the public good, benefit both the individual and the public, but could safely be considered as private goods. From the foregoing, it thus follows that the canonical, traditional theory of public goods neglects the status of impure public goods. It is these critiques that have, in turn, led to recent attempts at a reformulation of the traditional definition of public goods. Notable is the one advanced by Kaul and Mendoza (2003) spanning the three (3) dimensions as laid out briefly below:

1. Goods are *de facto* public if they are nonexclusive and available for all to consume;
2. Goods have a special potential for being public if they have non-excludable benefits, nonrival benefits, or both; and,
3. Global public goods are goods whose benefits extend to all countries, people, and generations.

In conclusion, it is this extended definition I will use in this paper as a framework for an analysis of ending AIDS. Taking on from the above relatively new reformulation of a public good as a springboard, in what follows, I argue it is possible to sketch a definition of a GPG – in many ways similar to Inge Kaul (2000: 2) as one “whose benefits reach across borders, generations and population groups”. As is apparent, this considers the limits of a (narrow) nationalistic conceptualization, owing to globalisation trends. By extension, similar to public goods, as I show, many GPGs are not pure. Rather, and contrarily, they are often ‘kept or made nonexclusive’ by international policy mandates and law. Put differently, as Kaul and Mendoza (2003) argue, they are goods made public by design on a global scale.

The following section, to provide more context to the analysis of the potential classification of ending AIDS as a GPG, shows how HIV as a global epidemic has mobilized a global response and still requires one, including financing motivated by global solidarity and shared responsibility principles.

3. HIV/AIDS: a global epidemic requiring a global response (and financing)

The global HIV/AIDS epidemic requires a global response as it remains a profound health, economic development, and fiscal challenge. Over the past 40 years since HIV was first recognized, the global response to HIV/AIDS has been and remains unprecedented in the history of global health and development (Altman and Buse, 2012). Investments in the response to HIV/AIDS have borne exceptional returns on investment (UNAIDS, 2015). Before the advent of antiretroviral therapy (ART) in 1995-96, HIV infection was comparable to a death sentence as the odds of survival were almost zero (Palmisano and Vella, 2011). However, concerted global action has bent the trajectory of the AIDS epidemic. More than ever before, there is global consensus - the reasonableness of the same notwithstanding – that the world is on the cusp of a historic achievement to “end the AIDS epidemic as a public health threat” by 2030 (UNAIDS 2015).

In the history of global health, the global community has repeatedly mobilised to address global health crises only to lose interest prematurely, or even declare victory too soon. Undoubtedly, this comes with catastrophic impacts. The chequered history of malaria eradication attests to this. In this paper, I question whether this tragic story will be repeated with AIDS. Historically, the HIV policy discourse has combined – in various constellations – three elements – a human rights perspective (UNAIDS, 2020), a teleological (goal-oriented) approach whereby HIV strategies are designed in line with overarching objectives such as “ending AIDS” or meeting the SDGs (such as the forthcoming UNAIDS 2025 targets), and an economic perspective which emphasizes returns to investment, framing HIV policies as good investments and highlighting the most effective and cost-effective components. To this end, global HIV policy discourses have largely looked to politics (Piot, 2015), economics (Haacker, 2016; Johnston, 2013), and human rights (Meier et al., 2012) in framing the global response to HIV/AIDS.

In the context of the post-2015 development framework, there are substantial shifts in the globalised discourses on health and development (Piot P et al., 2015). This paper contributes to further this

discourse by exploring the appropriateness and application of the GPG theory to provisioning and financing the fast-tracking of the HIV response in this new health and development agenda. It represents an explicit revisiting of the concept of GPG within a communitarian claim and offers it as an alternative paradigm for the fiscal sustainability of HIV responses. Long and Woolley (2009), commenting on the use of the broader application of the GPG concept, contend that “such banalities belong in a political manifesto, not a piece of analytical research”. Albeit paucity of GPG research - as applied to HIV - that goes beyond conceptualization, I argue that the broader application of the GPG concept does belong in analytical research. In other words, in ways very similar to the human rights and security argument, the “ending the AIDS epidemic” as a GPG argument might be more useful as a framework to examine the validity of other arguments and to highlight their relevance. Importantly, the tragedy of the global AIDS epidemic cannot be appreciated without taking into account its global public badness characteristics. Thus, by extension, the goal to fast-track the end of the AIDS epidemic cannot be imagined if not conceptualised as GPG.

Epidemics and pandemics of infectious diseases are recorded from as early as 429 – 426 BC. In the middle ages, the scarlet fever plagues wiped out native populations in the Western hemisphere. However, it was not until the nineteenth century that epidemic control became an established area of public policy action, with health viewed as a public good given that everyone gained from the ensuing effective responses. This is important to the GPGs that serve the common interest, but would otherwise not be provided or distributed if left to the forces of demand and supply (herein referred to as ‘market forces’) as a result of lack of effective incentives. As is apparent, at the national level, the government largely has to assure their provision. However, owing to the absence of a sovereign global government with a duty to undertake a comparable role in the provision of public goods, “global public goods” – a relatively new and somewhat fuzzy concept – are often ignored yet they are an important aspect of multilateralism and globally distributed vulnerabilities. Globalisation has increased interdependence with its attendant challenges, ranging from preventing and mitigating climate change, combating terrorism to ending the spread of communicable diseases among others. Increasingly, there is a realisation that no single country can provide and finance such goods on its own or that doing so for its population is a strategy doomed to failure. This has, in turn, brought to the fore the need for a global public policy response to address common vulnerabilities posed to international development by globalisation. HIV/AIDS is one such global challenge that requires global action.

HIV/AIDS affects people indiscriminately and is a disease of inequality (Göran, 2009). Specifically, it disproportionately affects individuals and states with the fewest assets than those with access to private or national means to reduce structural risks and effectively respond. Thus, to adroitly address the myriad challenges HIV/AIDS poses, to end the AIDS epidemic, it is critical to rethink and reorient global public policymaking to address the pressing global HIV/AIDS challenge in light of the above-mentioned interdependence and globalisation realities. As a corollary, in this paper, I frame the bold goal of “ending the AIDS epidemic as a public threat” as a global public good and contend that it has implications for policy and practice in global HIV/AIDS policy.

HIV/AIDS is a classical quintessential global challenge that requires global action. It is a global epidemic affecting millions of people in all regions of the world. Compared to other known epidemics, undoubtedly, the HIV/AIDS epidemic is one of the worst public health disasters in human history. It is a humanitarian crisis of extraordinary scale. It disproportionately affects people in the prime of their lives. Given the intersections between SDGs and the HIV epidemic and response, there is a global consensus by the international community that HIV/AIDS is a major obstacle to the achievement of the SDGs. It thus follows that the achievement of the SDGs, in high HIV burdened countries, will be won or lost at the HIV response front.

Thankfully, to date, the combination of science, economics, ethics, political leadership, and activism has halted and reversed the spread of HIV (as committed to in the Millennium Declaration). The international response to HIV has been unprecedented in the history of public health, culminating in the world achieving and exceeding the AIDS targets of MDG 6 - halting and reversing the spread of HIV (UNAIDS,

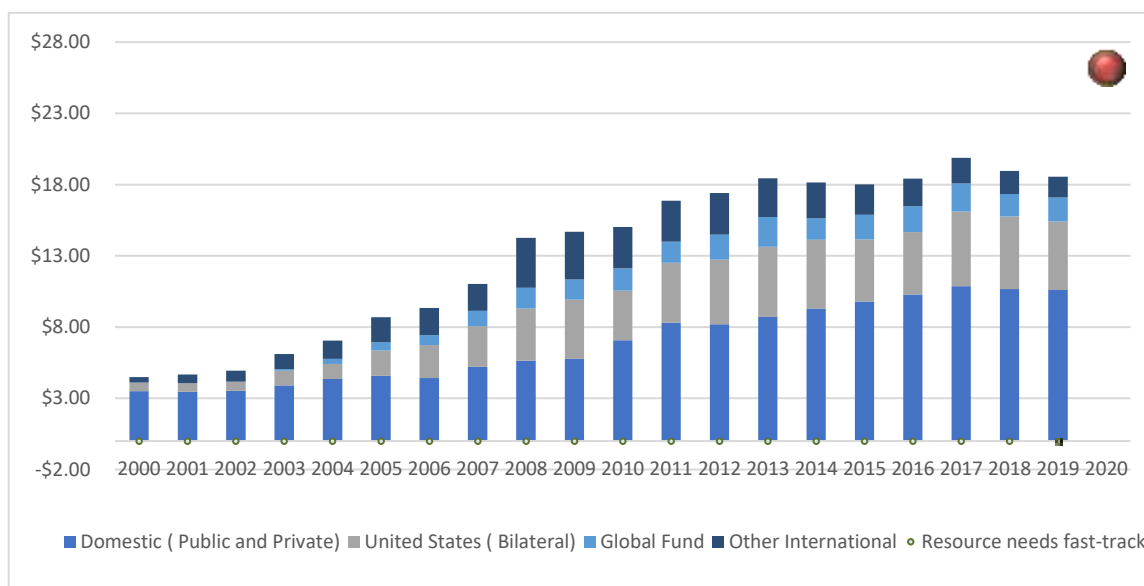
2015a). The response to HIV has been and remains one of the smartest investments in global health and development, generating historic measurable results for people and economies (Forsythe et al., 2019; Lamontagne et al., 2018). Importantly, over the past 15 years, the financing of the response has increased from millions to billions of US dollars, not only from high-income Organisation for Economic Cooperation and Development (OECD) countries but also domestically from the affected country governments themselves. In other words, the responsibility for financing the global response to HIV is, in reality, a shared one. A critical analysis of the financing architecture is pertinent.

While the availability of external funding has been flat and is expected to decline, the demand for HIV treatment and prevention services continues to increase. The “AIDS exceptionalism” narrative (Oppenheimer and Bayer, 2009; Whiteside, 2009) that, to some extent, accounts for the dominance of HIV as a global development issue over the last few years is falling. AIDS became exceptional because activists made it exceptional. Therefore, the AIDS exceptionalism narrative is not the explanation of the global response, rather it is a description of it. On the other hand, however, the rhetoric of donor commitment to HIV financing – hitherto a dominant source of HIV financing for most affected countries in sub-Saharan Africa (SSA) – continues to feed optimism with promises of achieving the end of the AIDS epidemic.

In the new health and development agenda, however, a quadruple squeeze is casting a shadow over this rhetorical optimism to finance the HIV/AIDS response. In the first place, the 2007/8 global economic crisis has exerted pressure on OECD countries’ aid budgets. Second, changes in the global health landscape are characterised by reprioritised donor budgets. There is evidence of donor reprioritization – more money for maternal and child health in particular, but also more focus on TB, malaria, Ebola, and now Zika. However, not only has there been reprioritization in health aid there has also been reprioritization in donor aid more generally, first toward environmental sustainability and now, at least in Europe, toward the refugee crisis. This heightens uncertainties around future development assistance for health and HIV. Third, due to economic growth, there is an increasing focus on domestic resource mobilisation for HIV and health. Also, there are other emerging priorities, notably climate change and global health security, that are in competition with HIV for financing. Finally, owing to the ongoing GDP rebasing in several of most affected countries, there is a shift of some low-income countries (LIC) to middle-income country (MIC) status. This change in income status changes their eligibility for accessing some multilateral and bilateral development assistance. Thankfully, this latter issue is being extensively analysed by the Equitable Access Initiative (EAI) of the Global Fund against HIV/AIDS, TB and Malaria (GFATM) among other players.

As shown in Figure 1, three key features emerge from an analysis of the HIV financing architecture. First, international financing for HIV leveled off between 2008 and 2011, after many years of steady growth. This is largely due to the 2007 global financial crisis and what some analysts have referred to as “donor fatigue” (Grépin A.K., 2012) as well deprioritization of HIV. Second, the bulk of HIV financing is from bilateral aid, with almost half of the total amount coming from the United States President’s Emergency Plan for AIDS Relief (PEPFAR). Given the increasingly volatile geopolitical dynamics, as nationalistic ethnocentrism grows, there is an inherent fiduciary risk posed by this state of affairs. Third, domestic financing is increasingly becoming an important feature of the financing landscape (and is poised to remain so). It has continued to grow steadily since 2005. From the above, it is clear that resource availability is in danger of falling short of global commitments. To this end, given these global patterns, it behooves us to explore a possible basis in economic theory for addressing the questions whether the above-mentioned shared responsibility for the provision of HIV services refers ultimately to whether or not HIV service provision – and the attendant goal of “ending the AIDS epidemic” - might be regarded as a “public good” or “private good”.

Figure 1: Resource availability for HIV in low-and-middle-income countries 2000-2019 and 2020 target resource needs (in constant 2016 US dollars billions)*



Source: UNAIDS (2020)

*All figures are expressed in constant 2017 US dollars.

4. Ending AIDS as a GPG

In a nutshell, as traditionally defined, ending AIDS – viewed from the individual interventions that contribute to its realization - is not considered a pure public good. Some HIV services can only be consumed by one person, thus making it excludable. On the other hand, viewed as a private good, the consumption (or utilization) of HIV services by one individual not only affects the quantity (and/or quality) received by another but also affects the cost. Taking on from the above, however, I contend that it is safe to classify ending AIDS as an impure public good insofar as, while retaining its privateness, it has various publicly consumable benefits (or positive externalities). Ending AIDS can help the individual, but it also has broad societal effects and benefits. It presents a unique case of a service where the consumption, while always private, is also argued to benefit the public. To this end, in this paper, ending AIDS presents a unique classical case where a private good is also a public good – by definition. The same is true for basic education (Francine, 2009).

From the foregoing, normative considerations are central to the definition of merit goods – they are under-provided in relation to a subjective public perception of what is desirable or essential. Because of this, many governments intervene in the market for merit goods because of this social consensus, either by taking measures to increase their supply or to increase the demand for them. Coming to terms with complexity, in assessing whether the HIV response is a public good or a merit good, as a point of departure, I argue that the response to HIV involves a diverse set of activities that are delivered in diverse circumstances by diverse actors. As a result, it is not generally possible to classify the entirety of the HIV response as being a purely public good – as indeed, some components of the response, are clearly private goods that are both rival and excludable and would thus best be provided by a free market. Using the UNAIDS Investment Framework (Schwartländer B et al, 2011) categories, Table 1 attempts to give an illustration of how one might classify the principal components of the response, based upon their respective degrees of rivalry and excludability.

Table 1: A possible classification of the HIV response as a public good

	Non-excludable	Weakly Excludable	Strongly Excludable
Non-rival	Purely Public Goods Mass media Public campaigns Political advocacy Legal reform Human rights	Public Enterprise Goods Research and innovation Economic benefits of treatment and prevention	ART
Weakly Rival		Community mobilisation Synergies with development sectors	Club Goods Vulnerable population outreach Youth programmes
Strongly Rival	Common Pool Goods		Purely Private Goods Commodities – ART drugs, condoms, vaccines Services – PMTCT, circumcision, VCT

Source: Author’s adaptation from OPM (2013)

Worth further elaboration is the ART provision that is poised, in the absence of a functional cure, to remain an important feature of the AIDS response in the new agenda. ART is on the spectrum of the public to private. I argue that it is closer to the public. First, ART has both private therapeutic benefits and public prevention benefits. Similarly, although ART is not free, ARVs can ordinarily be produced at a relatively small marginal cost. Finally, there is massive market failure in the distribution of ARVs in the patent-based market system because rightsholders demand monopoly prices that exclude many if not most. The explanation for the monopoly is the innovation incentive, but there are other ways to provide that. Thus, in Table 2, ART can move up both because of prevention benefits towards non-rival and non-excludable based on more affordable pricing, thereby rendering HIV treatment as a merit good that has long-lasting and positive externalities.

Three conclusions can be discerned from this illustration. First, differing opinions about whether the various AIDS response components are correctly classified in this table notwithstanding, there is no single pure definition that covers all of the responses. From an economic viewpoint, a number of the response components can be thought of as primarily public goods, while others are primarily private goods. Second, the components that satisfy the attributes of private goods also satisfy the attributes of merit goods – in as far as they generate significant externalities in the form of economic benefits to individuals and society as a whole such as productivity gains to the economy, full-income and improved health environment (partly due to move towards “herd immunity” as HIV disease environment improves, and would be under-consumed in a purely private market. In an era of “treatment as prevention”, this applies to many of the core treatment and prevention programmes of the HIV response. Finally, the key policy implication from an economic standpoint is that there is a clear justification for public-sector intervention in the response to HIV. This implies in turn that the responsibility for the response is a public one. Put differently, the responsibility for providing and financing the HIV response is shared across the whole of society within affected countries.

This conclusion raises and - at the same time - seeks answers to an important question: can the quest to end the AIDS epidemic be classified as a “global public good”? As a starting point, it is instructive to look at the work of the International Task Force on Global Public Goods (Kaul and Conceição, 2006). In summary, the International Task Force on Global Public Goods arose from discussions at the 2002 Monterrey International Conference on Financing for Development, and the 2002 Johannesburg World Summit on Sustainable Development. Its objective was to provide a concrete definition to the idea of a GPG,

identify which goods and services were included within that definition, and how they might best be financed and implemented. The definition, as finally published in 2005, entailed three criteria that would need to be met if a public good is to be considered as being global. These are:

1. It is broadly conceived as important to the international community;
2. It cannot or will not be adequately addressed by individual countries acting alone; and,
3. It is defined through a broad international consensus or legitimate decision process; and,
4. GPs are synergistic, in other words providing one of them would make it easier to provide others.

None of the above-mentioned criteria follows the standard nomenclature used in economic literature to define public goods. Instead, all the first three criteria are more reminiscent of the definition of a merit good. The argument is that there is an international consensus that certain goods are desirable or essential and that they will be under-provided or under-consumed because of lack of resources in the countries that need them most. The third of the criteria is particularly relevant to the arguments put forward in this section – it is an explicit statement that global public goods should entail a shared international responsibility for their provision.

So far, I have argued that the response to HIV cannot be regarded as a purely public good, but that the parts of it that constitute private goods satisfy the criteria applying to merit goods, and justify public intervention as well. This idea is inherent in the definitions given by the International Task Force, which blur many of the traditional economic considerations. The distinction between public and merit goods is therefore not central to the decision to intervene. The question of whether HIV constitutes a GPG perhaps depends on the degree to which the positive externalities that result from the public intervention are likely to spill across borders. Put differently, is ending the AIDS epidemic a benefit to all of humanity, rather than only to the most affected countries? Whereas this issue is not prominently debated in public policy discourses, it is my considered view that its resolution is implicit in the actions of the international community and – in economic speak - perhaps constitutes a “revealed preference”.

To date, the international community has treated the HIV response as a public good, and thus regarded as sufficiently important to commit levels of international resource that are unprecedented in the area of global health. Several United Nations declarations, from the UN General Assembly declaration in 2001 to the 2015 Political Declaration on Ending AIDS are a reflection of this broad consensus. In other words, they reflect an international perception that the HIV response is important, and therefore both constitute an internationally accepted decision process as defined by the above-mentioned third criterion of the International Task Force. Besides from the purely economic definitions, in this respect, shared responsibility is already a long-standing and accepted principle within the international community regarding the HIV response, including the bold goal of “ending the AIDS epidemic”. In conclusion, while there are ominous signs that this perception is weakening in the new health and development agenda, there is clearly a more pressing concern that the available resources cannot adequately address all of these priorities at once, and that the balance between them is no longer optimal. In other words, while the most pertinent question is not whether responsibility should be shared, the “how” of better sharing this responsibility to maximise its effectiveness is critical at this juncture. It is this question that the next part of this section attempts to address.

Asserting that ending AIDS is a GPG is at best fluid. At least not directly. Rather, it can be theoretically defined as such only in terms of four (4) rationales. Firstly is its consumption by all persons in need – without taking into account their corresponding ability to pay - due to legal and policy directives (i.e. the so-called “public by design”), say through universal access policies. Secondly is due to both its individual and broad societal benefits. As shown above, as an impure public good, no one is (and can be) excluded. Third, ending AIDS is important not necessarily for its own sake but other public goods as well – such as the education - which is dependent upon it as joint products, for example, ART reducing absenteeism in school and consequently improving education outcomes as well as broader human capital development. Lastly, at least drawing on the history of the multisectoral and multilateral global response to HIV/AIDS so far, its status as a good which is globally non-exclusive and affects cross-border and intergenerational populations qualifies

as a GPG *sui generis*. In conclusion, I argue that ending AIDS embodies all the properties laid out in the three-fold reformulated definition of a GPG (Kaul and Mendoza, 2003). Firstly, it has ‘a special potential for being public’ due to its non-excludable benefits. For example, HIV treatment - through ART access – for an individual is beneficial as Treatment as Prevention (TasP). Secondly, as the history of the global response to HIV/AIDS over the last four (4) decades has shown, it is often public *de facto* due to being non-exclusive and available for all to consume, socio-economic status notwithstanding, particularly in countries where there is universal access to HIV services – such as Treat All policies - to contribute to and accelerate ending AIDS. Finally, it safe to consider ending AIDS as globally public as the ensuing benefits accrue to and extend to all geographical locations, populations, and generations. Thus, thanks to the reformulation of the theory, the classification of ending AIDS as a GPG – at least as presented in this paper - is plausible.

5. Key policy implications

As a starting point to delineate policy implications, a critique of this concept is necessary here. While an extensive treatment of this is beyond the scope of this paper (as it has been dealt with elsewhere, see Menashy (2009), for example), overall, while the GPG has had a positive reception, it is not free from criticism. First among these is ‘theoretical laxity’, which Coussy (2015) argues distorts the canonical theory of public goods. Public goods have very strict properties. However, as I have shown above, the malleability introduced by new reformulation ignores any meaningful restrictions, leading to what Carbone (2007:185) refers to as a “catch all to which people can attach anything they want” scenario. This is exacerbated by the “public by design” notion. Consequently, through this theoretical laxity, all sorts of public goods can and have been created. Following the “public good by design” argument articulated above, all that is needed is for a policymaker to refer to a good or service (which in most cases is always a publicly-provided private good or service) as ‘public’ and it automatically (and unquestioningly) becomes one.

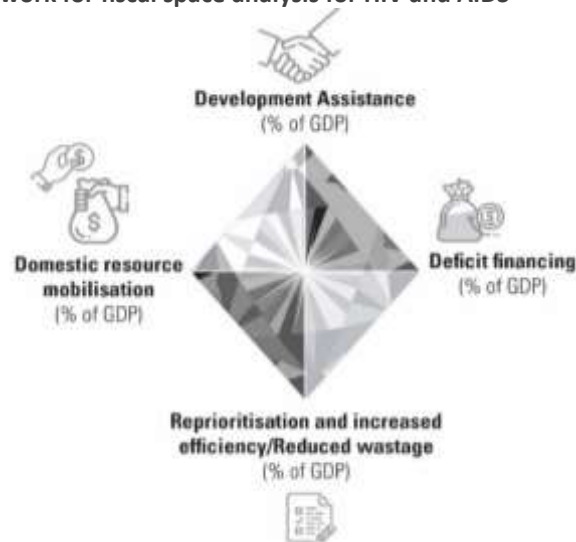
Second, as Francine (2009) argues, who decides what counts as a GPG needs to be interrogated. In light of the complexities of governing global health (Clinton and Sridhar, 2017) and given that the issues of squeezed policy space, policy learning, and agency are some of the major failures in global development, there is a very strong likelihood that powerful individuals and institutions in the Global North set the guidelines and – by extension – decide what qualifies as a GPG. Lastly, but not least, the neoclassical economic theoretical foundations of the GPG concept have been variously criticized, particularly with regards to failed attempts to apply free-market principles to the financing and provision of social services (such as HIV) in an imperfect market, as this harms and undermines equity among other goals. Among other factors, social justice considerations historically drove the global AIDS response (Gostin, 2014). Thus, this way, the notion of using a neoclassical economic theory to support the provision of ending AIDS may be problematic as it does not pay attention to equity, among other key principles, yet it has been and remains a key pillar for ending AIDS.

Historically, the HIV policy discourse, such as the one on ending AIDS, has combined – in various constellations – three elements: a human rights perspective (UNAIDS, 2020), a teleological (goal-oriented) approach whereby HIV strategies are designed in line with overarching objectives such as “ending AIDS” or meeting the SDGs (such as the forthcoming UNAIDS 2025 targets), and an economic perspective which emphasizes returns to investment, framing HIV policies as good investments and highlighting the most effective and cost-effective components. From the aforementioned, it is apparent that the GPG framework can serve to undermine a rights-based rationale for ending AIDS. Here, appears to be an inherently incompatible tension between the two notions - i.e. GPG and human rights – as they are rooted in fundamentally very different paradigms and disciplines. On one hand, ending AIDS as GPG is based on economics disciplinary foundations. On the other hand, ending AIDS as a human right is firmly rooted in legal foundations. Consequently, these two (2) disciplinary bases engender different definitions of – and approaches to - ending AIDS. An economics-informed GPG notion views it as a service given certain benefits and/or externalities, while a rights-based perspective, on the other hand, views it as a legal right conferring entitlement to rights holders and -at the same time - enjoining duty bearers with an obligation to assure the realization of this right.

Piot (2018: 46-47) argues that "The concept of a global public good provides a strong foundation for an international response." This may have been correct early on, for example reflecting concerns about HIV/AIDS spreading globally, and the economic and security implications of this, and some aspects of the HIV/AIDS response (essentially, research funding) provide a public good. However, to motivate global investments in HIV prevention and treatment across developing countries through a "public goods" argument, it is required that there are strong interdependencies or spillovers, either economically (implausible, most countries with high HIV prevalence carry a very low economic weight, and HIV/AIDS has not destabilized any country economically so far), from a security perspective (with HIV/AIDS no longer a significant concern in the security community) or in the area of health: What is the role of cross-border transmission in the spread of HIV/AIDS? For example, are investments in HIV prevention in Africa or the Caribbean effective in reducing the spread of HIV/AIDS in donor countries, and more so than HIV prevention policies in donor countries? I find this a very questionable proposition, but this (or the earlier examples) would be critical for building a "public goods" argument. Thus, while HIV is a GPG, albeit one with a relatively uneven distribution of benefits. It is one reason why there is limited interest in the Global North and among donors in this topic. In renewing interest in applying this framework lies the most useful application of conceptualizing ending AIDS as a GPG. Below, I offer a critical perspective on taking this forward.

Implicitly, the two notions of global solidarity and shared responsibility are largely based on three – conceptually different, but related – considerations: health as a human right (Meier BM, Brugh K, Halima Y, 2012), HIV as a risk to national security (Poku, N. and Therkelsen, J., 2013) and a challenge to economic development (Haacker, 2001). Post-2015, I argue that all of the above-mentioned considerations apply to health issues over and above HIV/AIDS. International cooperation in health remains an important aspect of multilateralism. Conceptualising health not only as an end in and of itself, this section argues that it is an essential element of social sustainability, and therefore as a precondition for a global collective effort on climate change and sustainable development. This framing is, however, not devoid of challenges. A key critique of this conceptualisation is that it creates a situation of persistent mutual dependency between countries. Fortunately, this is already happening in climate change. The clearest contemporary example is the argument for lower per capita carbon emission rates in climate change negotiations: the idea is that it would cost less to not yet industrialized countries to embark on a green growth path than for already industrialized countries to dismantle their "dirty" industries. Thus, to manage globalisation, developing countries are asked to 'rescue' humanity from the vagaries of climate change. By extension, in the new health and development, to end the AIDS epidemic, national and international responsibilities in the long run need to be clarified.

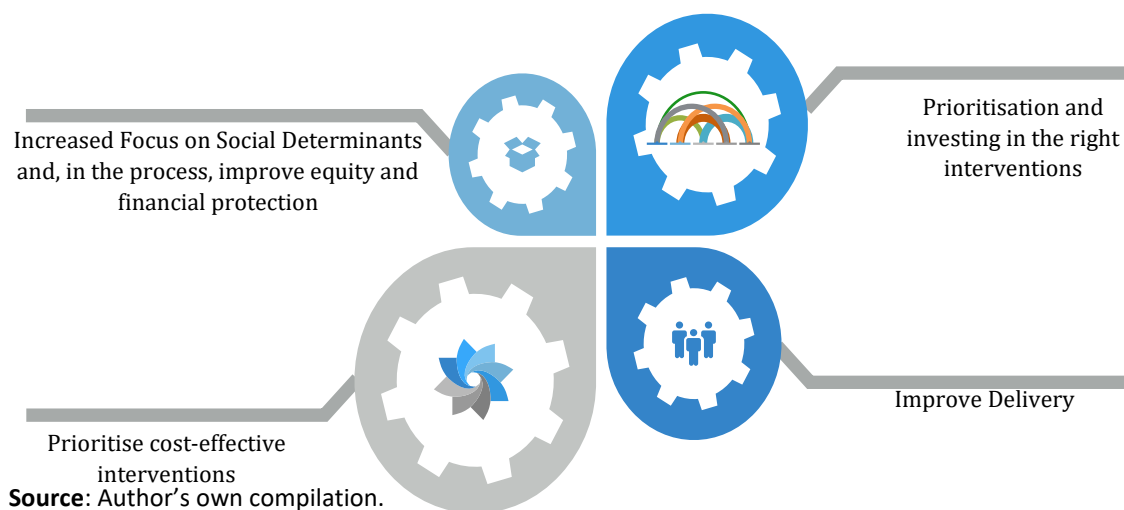
Figure 2: Analytical framework for fiscal space analysis for HIV and AIDS



In the short to medium term, at the national level, novel mechanisms of creating, expanding, optimising, and sustaining fiscal space for the national HIV/AIDS response will need to be urgently found if the “end of the AIDS epidemic” is to be a reality. The “fiscal space diamond” as conceptualised by Heller, S.P. (2006) enables analysis of the different ways in which a government can create (and/or expand) fiscal space. This conceptualisation facilitates answering policy questions on the macro-fiscal possibilities to expand fiscal space to achieve intended policy goals and in this case the end of the AIDS epidemic. Figure 2 shows how additional revenues for HIV and AIDS can be raised through domestic resource mobilisation, cutting on low priority expenditures to make room for high-impact expenditures. Deficit financing (i.e. borrowing either from domestic or from external sources), as well as government receipt of official development assistance (ODA), are other ways of expanding fiscal space.

As earlier shown, a governments’ potential ability to pay and resources needed to fast-track the AIDS response is at variance. Drawing from nudge theory, I posit that these countries need to and can be incentivized to spend more. However, donors must help to fill the gap. Also, tax avoidance, evasion, and other illicit financial flows are corporate and government malfeasance that is robbing economies and countries of needed resources in tax revenues. And, of course, and regrettably, some countries are spending inefficiently. Some of the shortfalls in resources can be ameliorated through increased efficiency, ART optimizations, the greater effectiveness of community-based programming, and more targeted response using the best mix of tools to enhance decision and delivery support (see Figure 3). Important to note though is that more resources will undoubtedly be needed, at least in the short run. Equally important, more and better spending now and over the next few years will produce enormous life, health, and cost savings in the future. Cognisant that in the creation (and/or expansion) of fiscal space to fund the end of the AIDS epidemic as a GPG, consideration for the political mechanisms involved is paramount as issues of feasibility and political buy-in act as enablers or hindrances in any attempt to alter the status quo (Van der Gaag et al., 2009). While this is necessary to set in motion the end of the AIDS epidemic, it is insufficient. The GPG concept, implicitly, extends the political economy analysis of public goods to the international level and, over a long-term horizon. Below, I extend this analysis to the global level, in the medium to long-term.

Figure 3: Options to further enhance fiscal sustainability through decision and delivery science



To translate policy concern into results, in terms of ‘best practice’, I posit that the Global Fund against HIV/AIDS, TB and Malaria (GFATM) is one such most promising new public finance and global health ‘instrument’ that offers design features for financing the end of the AIDS epidemic as a GPG. However, in light of its narrow mission, to realise the end of the AIDS epidemic, a broadening of its mandate - from three diseases to health – is a condition sine qua non. Additionally, as argued elsewhere (Ooms and Hammond, 2014), this will require that the Global Fund is funded through a mechanism of mandatory burden sharing,

including explicit clarification of its complementarity or additional to developing countries’ national responsibilities. As is clear, these are no easy challenges to manage. However, in envisioning a new international organization that would combine all these features, it is our view that it would likely look a lot like the present Global Fund.

The proposal for a central international pool of development assistance for health (DAH) – referred to as the Global Fund for Health in this section – has variously been proposed and analysed since 2006 (Ooms and Hammonds, 2014). Offering new insights to the financing of the provision of HIV services as a global public good, this section analyses and, both theoretically and empirically, extends this nascent proposal. Closely examining the global economy, the World Bank (2015) estimates US\$ 77 845 107 million as the 2014 Gross Domestic Product (GDP) of all countries. This translates into approximately an average GDP per person per year of about US\$ 11 000. If the global economy can afford to spend the equivalent of 3 percent on health — which is far less than what most countries are currently spending — then a health expenditure level of US\$ 300 per person per year would seem easily affordable and financially sustainable. Furthermore, as illustrated in see Table 2, since not all people would need the complete package of healthcare every year, health services costing up to US\$ 1 500 per patient per year may be both affordable and sustainable.

Table 2: Affordability and sustainability of health services from various perspectives

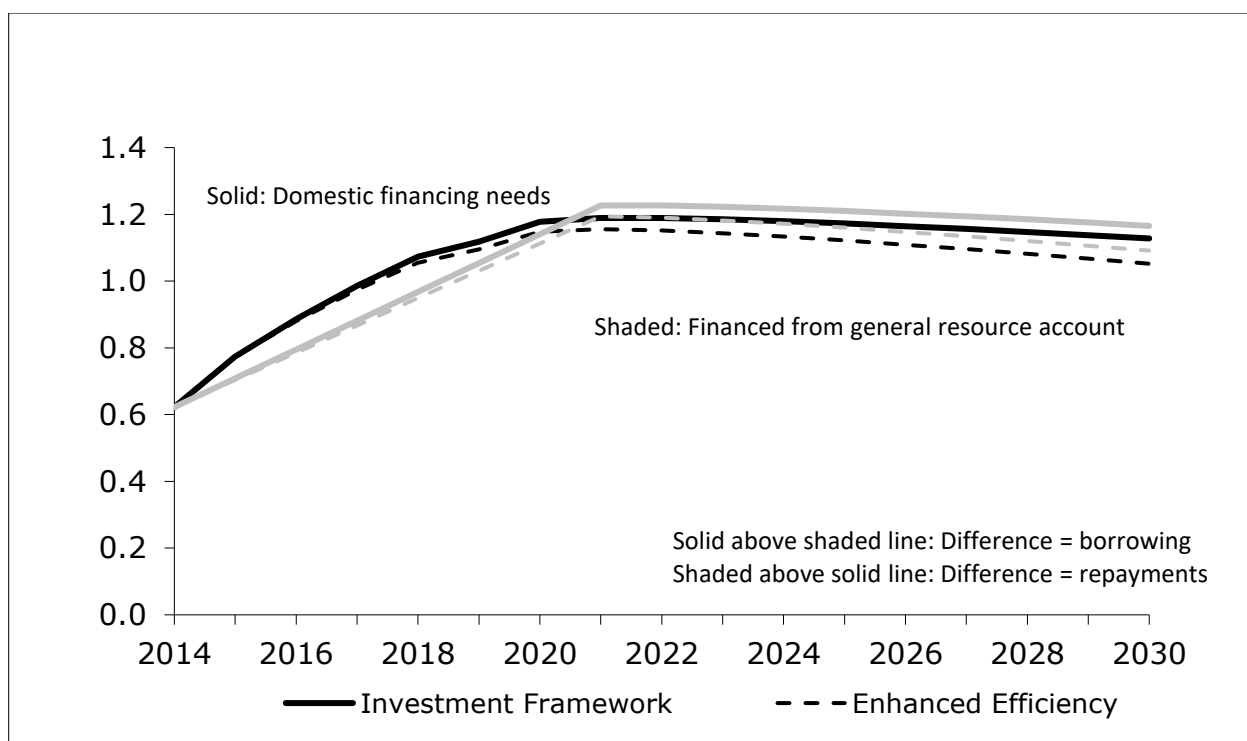
Perspective	Economic product per person per year	Cost of affordable health services per person per year without burden-sharing	Cost of affordable health services per patient per year with burden-sharing
Individual living in low-income country	US\$ 500	US\$ 20	–
Low-income country	US\$ 500	US\$ 20	US\$ 100
Global economy	US\$ 11 000	US\$ 300	US\$ 1 500

A recent Chatham House working paper (Ooms and Hammonds, 2014) provides a thorough discussion of some earlier literature not covered here and provides an extensive discussion - from a “political realism” perspective - the desirability of a Global Fund for Health. In a nutshell, “... from the perspective of partner countries, a Global Fund for Health is, on balance, more desirable than the option of keeping Development Assistance for Health (DAH) as it is. From the perspective of donor countries, the picture is more mixed and the desirability of preserving control over the DAH they provide may well override all other considerations. Donor countries have so far accepted ‘collective-choice arrangements’ if and only if they cannot avoid them – for example, when there are global public goods like infectious disease control requiring financing”.

The sustainability paradigm that traditionally imposes a national perspective on affordability and sustainability (Gottret, P., and Schieber, G., 2006) is insufficient. The history of the AIDS epidemic and response proves us right. In the 1990s, when AIDS activists demanded treatment for all PLHIV irrespective of ability to pay when HIV treatment per person per annum was more than US\$ 500, their demands were initially outrightly rejected on grounds of being fiscally unaffordable and unsustainable. The influential so-called Harvard Consensus Statement of April 2001 that called for a trust fund to meet the HIV treatment needs of poor countries and later became the blueprint for the Global Fund, was very explicit in its arguments that whereas AIDS treatment may be too expensive for some countries, from a global economy perspective, it was cheap and affordable. Additionally, the same can be said of the passage of the U.S. Global AIDS Act of 2003 and the eventual founding of PEPFAR. As self-evident as it may have sounded, as Oom (2008) notes, these developments in the early 2000s were a real revolutionary shift in how people and the world thought about health financing in a time of AIDS. This has implications for financing the end of the AIDS epidemic as a GPG.

Given that fast-tracking the required HIV prevention response will require a steep increase in HIV/AIDS-related spending during the decade of action, that is between 2020 and 2030, deficit financing may be one such policy lever that offers hope. However, its potential has not been extensively explored in both academic and policy research. Figure 4, using data from a country in the East and Southern African region, shows that the envisaged increase in resource needs is equivalent to about 0.6 percent of GDP or almost 2 percent of government revenues. From a public finance angle, in the short-term, financing this increase through additional revenues or spending cuts in other areas could be challenging in the short run. Moreover, as this illustrative country is a rapidly growing economy, spreading out the financing of the initial increase in the costs of the HIV/AIDS response under the two possible scaling-up scenarios (i.e. one that achieves the UNAIDS Investment Framework targets and another that maximises implementation efficiency) could avoid outright cuts in expenditures in other areas. Contrarily, the increase in HIV/AIDS spending could be financed out of the annual increase in domestic revenues. This way, financing some of the steep initial increases in the costs of the HIV/AIDS response through borrowing could make economic sense.

Figure 4: An example of domestic financing of the “end AIDS” target from current resources and borrowing, 2014 – 2030 (Percent of GDP)



Source: Author’s compilation.

In this illustration, the costs of the national HIV/AIDS response covered from current fiscal resources increases by only 0.09 percent of GDP annually, instead of an increase of 0.6 percent of GDP in 2014-2020. During the repayment period (from 2021 to 2030), however, the interest and amortization absorb 0.11 percent of GDP annually, so that the total current resources absorbed by the HIV/AIDS response then are higher than the current costs. Importantly, to address the long-term financing challenge, actualizing the Global Fund for Health will entail shared responsibility in the form of a “fair” contribution from virtually every country (as % of its GDP). Deficit financing could be one such lever for meeting the respective “fair share”. However, this is not without challenges. Globally, the management of public and publicly guaranteed (PPG) debt is one of the tasks that governments all over the world contend with daily.

In a globalised context within which the SDGs are being implemented, to finance the implementation of a fast-track agenda, accessing international finance – both private and public - is critical, the challenges of managing the same notwithstanding. As recently witnessed in Greece and other countries that have experienced fiscal distress, dominant among these challenges is the external shocks. Developing countries are overly exposed and vulnerable to these shocks and have a direct impact of undermining the ability to pay back these PPGs, and can potentially lead to costly sovereign debt defaults. Debt obligations are characterised by a strong pro-cyclical component. In other words, while debt obligations are easier to meet during times of economic growth when government revenues increase, they become relatively more onerous to service during recessions and economic slowdowns. Therefore, it is harder for governments to pursue countercyclical fiscal policies to smooth growth and development trajectories.

Indexing developing countries' external public and publicly guaranteed (PPG) debt with official creditors to their GDP performance has the potential to remedy the challenges of debt financing as currently practiced. There is a precedent with this approach. As UNDP (2015) notes, this way of proceeding can help countries not only improve external debt management but can contribute to minimising the risks of debt default. I argue that this, in turn, increases countries' resilience to external shocks. From the perspective of financing the end of the AIDS epidemic as a GPG, it plays two critical roles. First, in the short term, it could help expand fiscal space for financing the HIV response. Second, in the long-term, for heavily burdened countries, it has the potential to enable them sustainably and affordably meet their "fair" share of contribution to the Global Fund for Health when established. As proposed in this section, the GDP-linked debt needs to be specified for concessional debt, and non-concessional lending from official creditors to governments in developing countries. The idea behind this distinction is to allow for an additional degree of concessionality driven by GDP-linked debt dynamics. Details on the dynamics of operationalising this mechanism, including specifications adopted are detailed in UNDP (2015).

Bringing it all together, from a GPG perspective, I propose here a somewhat different notion of financing of the fast-tracking of HIV prevention, namely that embodied in the "global" – rather than a fiscal space-enhancing approach which is located in the "national". The former will certainly contribute to the latter and vice versa, but there will also be other aspects, such as the proposed Global Fund for Health, which are in their nature global (and thus a subject of global health diplomacy). It is this that I term as "the Weighted Composite Index of HIV Investment Priority". As implicitly elaborated in this section, an appreciation of key stakeholders, contextual issues, and decision-makers objectives informed the criteria and factors this Index should be cognizant of. It is a time-variant articulation and integrates the following factors: This idea, including the mechanics of its operationalization, is elaborated in detail in the latter part of this thesis.

6. Discussion

This paper has argued that there is an implicit international consensus that the global AIDS response is a mixture of global public goods and merit goods and requires a collective international response financing by appropriate domestic and donor resources. This, in turn, implies that there is a considerable acceptance of shared responsibility. However, what remains is to quantify the terms of that responsibility on the part of domestic and international investments. Whereas domestic expenditure on HIV can continue to increase as economies grow and countries reallocate in line with the ability to pay and disease burden, domestic financing remains limited by economic capacity, particularly in low-income countries. Also, some countries are already allocating as much as can reasonably be expected.

To manage fair and equitable globalisation, everyone gains from effective policies and programs that address the causes and consequences of the AIDS epidemic. Given that there are remaining unfunded needs well beyond the domestic ability to pay in many low and middle-income countries which continue to expose countries to fiscal risks arising from long-term fiscal liabilities of treatment, for example, this calls for continued and sustained innovation to enhance risk management and resilience. Though these are useful, it also calls for long term commitment of donor resources. Also, as Schwartländer B. et al. (2011) shows, spending more now is cost saving in the future. To help resolve the dilemmas of globalisation in the

new health and development agenda, risk-informed HIV financing that indexes official lending to GDP is one such promising innovation proposed, with mutual benefits to everyone - rich and poor countries alike – and thereby presenting a somewhat classic case of Pareto optimality.

In the new health and development agenda, the paper has also stressed there are encouraging signs that the remaining funding gaps can be met by future improvements in efficiency and effectiveness, although the short-term targets may not be met. If the 2020 and 2030 HIV prevention fast-track targets are to be met, it follows that there will need to be short-term increases in the level of international funding and risk-informed finance for HIV. These alternatives should be seen as an integral part of sustainable international economic and financial arrangements, characterised by stable and egalitarian global growth and based on policies built around the achievement of the SDGs. Owing to the “exceptionalism” of the AIDS response, that is, its reliance on open-ended international solidarity to complement domestic efforts, I conclude early successes of the global AIDS response can be sustained and expanded if it is extended to broader health issues of the poorest countries of the world.

As Birungi et al (2015) argue, in their briefing note to the global health community on the Lancet Commission on Health and Climate, “tackling climate change could become the greatest global health opportunity of the 21st century”. It is this key conclusion that makes us believe that broader global health diplomacy developments, as brought to the fore by the new health and development agenda, hold key to renewed impetus required to motivate ‘development partners’ (a term I prefer to use in this section as opposed to the traditional dichotomy of donor and partner countries, since some countries – such as India – both a Donor and a Recipient of Aid) to look for new solutions to old and new common concerns. Just as Ooms and Hammond (2014), our analysis is suggestive that the game-changing political motivation for supporting the nascent proposal for the establishment of a Global Fund for Health may come from global warming. At a minimum, as earlier mentioned, the necessity of capping greenhouse gas emissions from all countries may oblige donor countries to support at least the provision of subsistence rights in partner countries.

Finally, the new health and development agenda has ushered in many opportunities, particularly the prospects to fast track HIV prevention and end the AIDS epidemic. But behind this façade of the great promise are great threats to the sustainability of the AIDS response. The overall aim of this section has been to show how a GPG approach can practically fast-track HIV prevention in the new health and development agenda. Globally, everyone is seeking to end the AIDS epidemic. This quest has not only been echoed by the United Nations but also by ordinary folks. Ending the AIDS epidemic constitutes a GPG. While globalisation may be irreversible, the publicness and globalness of ending the AIDS epidemic are not. The current state of the epidemic and response is a consequence of past policy choices. With a shared vision, leadership, and innovation, the end of the global AIDS epidemic is possible in our generation. Ending the AIDS epidemic in the new agenda is both an art and a craft. This section has offered new tools to inform choices. However, ultimately these choices need to be advised by human rights, politics, and justice.

7. Conclusion

This paper theoretically conceptualizes the end of AIDS as a GPG. First, I revisit the definition of GPGs. Second, using this theoretical framework as a springboard, I apply it to the case of ending AIDS. Considering the recent conceptual reformulation of the economic theory of GPGs, I posit that ending AIDS embodies the properties of a GPG, but only in this sense. I conclude that this conceptualization and the attendant framing is useful to inform HIV/AIDS policies, particularly those related to sustainable financing for and delivery of HIV and other services that are central to ending AIDS.

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Appendix 6: Achieving a “Grand Convergence” in global health: a critical note on the potential contribution from sustainable HIV financing in Uganda.

Achieving a “Grand Convergence” in global health: a critical note on the potential contribution from sustainable HIV financing in Uganda

Introduction

In this paper, which I prefer to call a critical note, I empirically assess the contribution of HIV financing to achieving a “grand convergence” in global health in Uganda. The body of work in this section largely draws from Boyle et al. (2015) and is motivated by Jamison and colleagues (2013)’ work – in the context of the Lancet Commission on Investing in Health report, *Global Health 2035* - that elaborates a compelling investment case for a “grand convergence” in health outcomes globally. As used in this critical note, “grand convergence” refers to a “reduction in the burden of infections and RMNCH disorders in most high-mortality low-income and middle-income countries down to the rates presently seen in the best-performing middle-income countries (e.g, Chile, China, Costa Rica, and Cuba, conveniently labeled the “4C” countries)” (Jamison et al., 2013: 2-3). In this critical note, in line with the SDG timeline so as to connect the findings in this thesis to the broader policy discourses, I specifically estimate what the investment case for a “grand convergence” could achieve, and the attendant level of financial investment that would be required, by 2030.

I show that Uganda can significantly converge – in terms of key health outcomes – with those of wealthier countries by 2030 and could be achieved through financing strategic HIV investments, among other enhanced investments to not only scale-up innovative health technologies but also further strengthen resilient systems for health. This analysis is relevant for two main reasons. First, the notion of a “grand convergence” is an implicit unifying theme for health indicators in the SDGs. Second, the economic impacts of HIV/AIDS largely derive from its impacts on health. However, as the HIV epidemic has health impacts which differ from other health conditions in some important aspects⁴³, such as age most affected by disease specific cause of death, it is important to note that the above-mentioned health impact of HIV/AIDS do not simply represent a mere reversal of health gains achieved in the course of development. For this reason, and in light of the strong impact of HIV/AIDS on key health indicators in Uganda, this critical note specifically delineates the contribution of HIV to the grand convergence. Although the analysis suggests that the annual price tag to achieve convergence is large, with a “full-income” approach (see Appendix 7) we find that the benefits would be enormous, which makes the investment highly attractive.

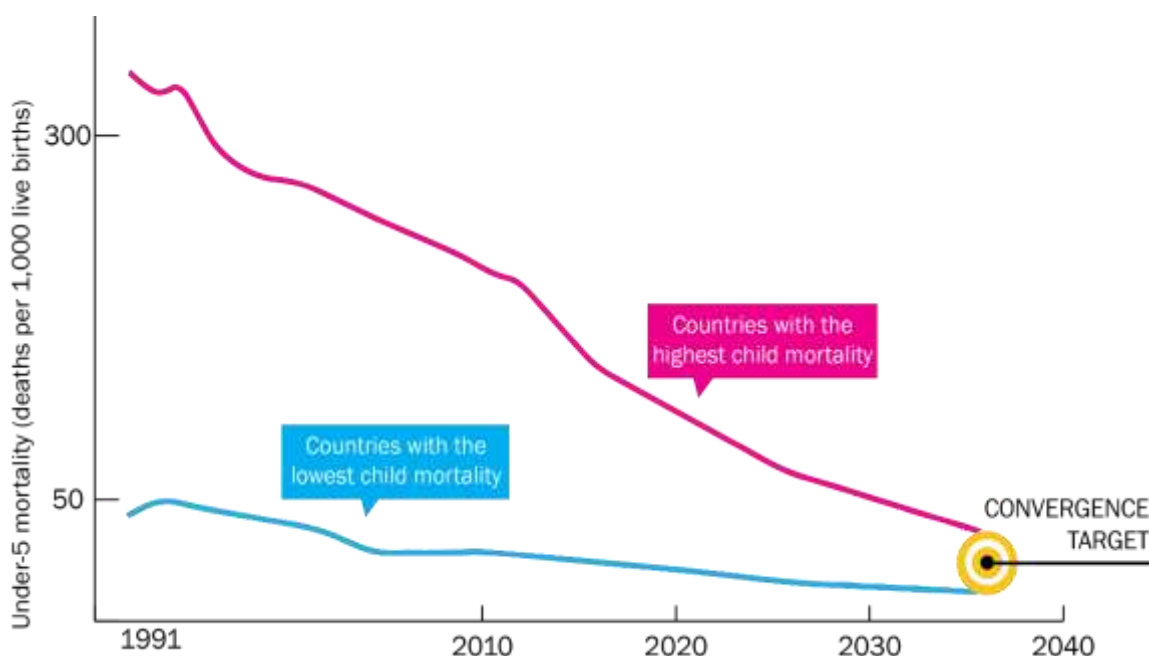
Below, I will proceed in 3 broad steps. First, using stylized facts, I provide some context to the discussion of the concept of the “grand convergence”. Second, the contribution of financing to HIV to the “grand convergence” discussion is presented and discussed. This is effectively done by presenting the relative contributions of HIV to the broad global health impacts from 2015 to 2030 (and 2035 to align with the CIH report). Finally, a concluding section concludes.

The context

First, Jamison and colleagues (2013) project that a significant global convergence could be realized in less than a generation (see Figure 1). Put differently, by 2035, infectious, maternal, and child deaths rates in LMICs, such as Uganda, could fall to levels seen today in the above-mentioned “4-C” countries. To realise this, an average incremental cost estimated at \$64B to \$83B per year in 2016–2025 and 2026–2035 respectively needs to be invested in scaling-up of proven efficacious health interventions, strength resilient and sustainable systems for health, and innovation.

⁴³ For example, one such difference is the fact that AIDS-related mortality largely occurs among young adults. The same is not true for many other health conditions as these primarily affect infants, young children and old people.

Figure 1: Cusp of a historical achievement: Nearly all countries could converge by 2035



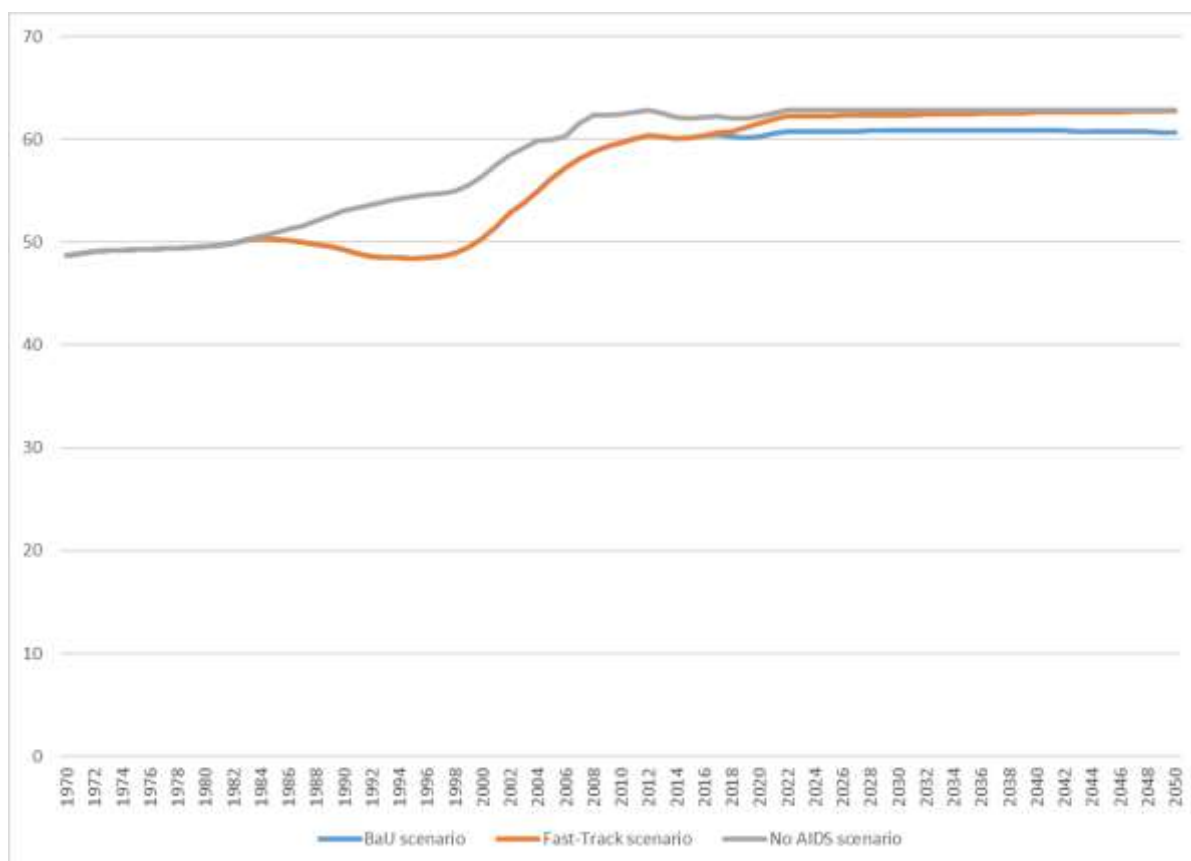
Source: Jamison et al. (2013)

Second, the impact of AIDS-related deaths is mirrored in corresponding declines in life expectancy. The UNPD (2018) estimates that by 1980 Uganda had attained a life expectancy of 48.5 years for males, and 51.7 years for females. By 1990, life expectancy had declined to 42.3 years (males) and 47.6 years (females). However, following the peak of the epidemic, life expectancy has rebounded since 1990 and, in 2000 reached the levels last observed in 1980. This, of course, does not mean that the expanded HIV/AIDS response and increased access to treatment had offset most of the adverse impacts of HIV/AIDS by that time. Instead, as Figure 2 shows, the impact of HIV/AIDS is still so negative in even in 2015 as to wipe out all gains in life expectancy from health gains in other areas achieved over 35 years. Specifically, it shows estimates of the actual course of life expectancy, as well as estimates of life expectancy in the absence of HIV/AIDS, and estimates of life expectancy in the absence of treatment (to help understand the contribution of the scaling-up to treatment to the recent increases in life expectancy).⁴⁴

HIV/AIDS caused a very large drop in life expectancy, from 50 years in 1980 to 42 years in 1991 – offsetting all health gains which had been achieved since the early 1960s (UNPD, 2015). This contrasts with stagnation in terms of health gains in other areas, so that the gap between actual and “no AIDS” life expectancy increased to 9.6 years. [Note: The modest decline in “no AIDS” life expectancy in the late 1990s is consistent with “no AIDS” estimates by the UN Population Division] Subsequently, life expectancy rebounded strongly, and the gap that can be attributed to HIV/AIDS has remained at about 4½ years since 2003. The most visible and direct impacts of the national HIV/AIDS response can be attributed to the scaling-up of treatment that has effectively improved survival prospects. However, the decline in HIV incidence since the late 1980s, which can partly be attributed to the national HIV/AIDS response, contributed to the gains since 1990 at a similar magnitude, yet more steadily.

⁴⁴ These counterfactual estimates were obtained modifying the 2015 estimates of the state of the epidemic in Uganda (UNAIDS, 2016), setting HIV incidence equal to zero throughout for the “no AIDS” scenario, and setting access to treatment equal to zero for the “no treatment” estimates. These scenarios are intended as diagnostic tools, not as meaningful policy scenarios.

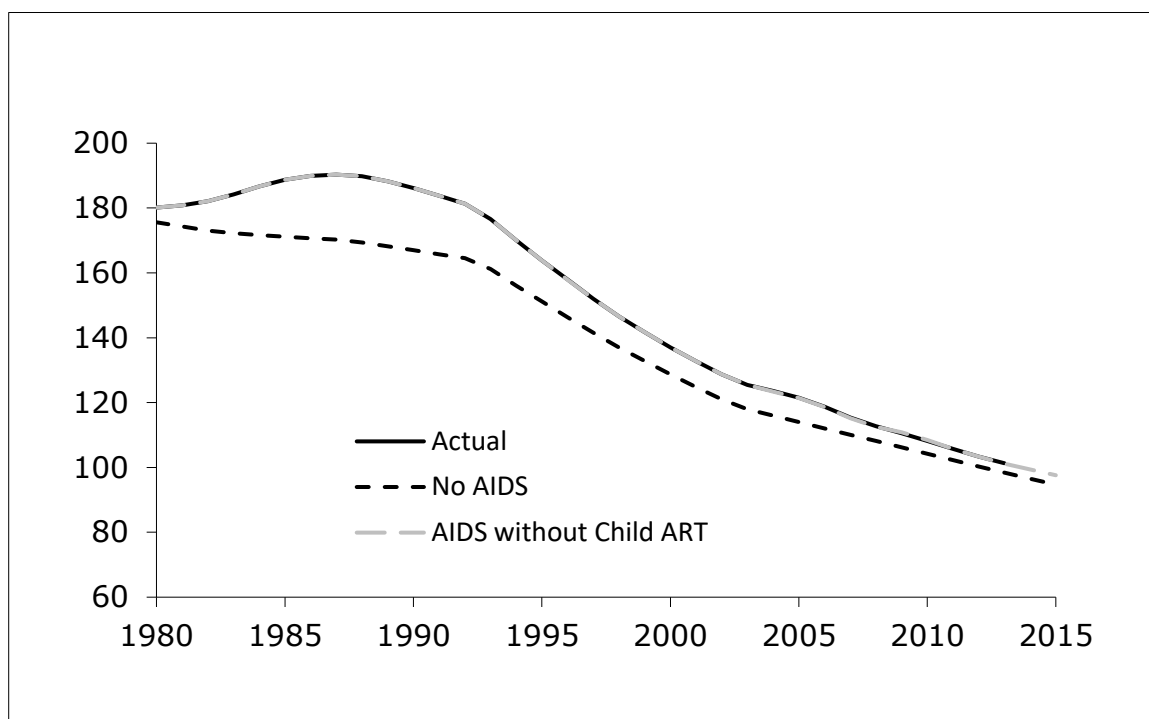
Figure 2: Life expectancy in Uganda, with and without HIV/AIDS, 1970 – 2050 (years)



Source: Author's calculations, based on UNAIDS (2018).

Third and relatedly, HIV/AIDS and the HIV/AIDS response have also been the most important factor behind the reversal in child mortality observed in the early 1990s (see Figure 66). As of 1987, about 190 out of 1,000 children in Uganda died before reaching age 5, and 20 out of these 190 deaths could be attributed to HIV/AIDS. Since then, maternal health and newborn care services have improved considerably, and – by extension - the impact of HIV has declined very strongly, accounting for only about 3 deaths per 1,000 live births as of 2015. There are three substantive reasons for this strong decline. First, HIV prevalence among pregnant women has declined steeply. Second, scaled-up prevention services have reduced the rate of MTCT by more than one-half. This has translated into reduced mother-to-child (HIV) transmission by 86% between 2009 and 2015 (UNAIDS, 2016). I contend that, together, these two factors have resulted in a decline in the number of new HIV infections among children from an estimated 4,600 in 1990 to about 1,600 in 2015. A third factor has become more relevant in recent years but is barely visible in Figure 3 as it follows the large decline in mother-to-child transmission – the scaling up of access to treatment has reduced mortality before age 5 among HIV-positive children by more than one-half.

Figure 3: Child mortality in Uganda, with and without HIV/AIDS, 1980 – 2015 (deaths per 1,000)



Source: Author's calculations, based on UNAIDS (2016).

Three important lessons can safely be drawn from this analysis of the impact of HIV/AIDS on national health outcomes. First, HIV/AIDS continues to be the single most important contributor to the national disease burden. Second, in light of Uganda's ambition to become a middle-income country, HIV/AIDS remains a significant challenge to the policy objective of catching up, in terms of health outcomes, with other middle-income countries such as Argentina, Brazil, Egypt, or Indonesia, with life expectancies ranging between 70 and 75 years. The impact of HIV/AIDS on life expectancy accounts for about one-third of the difference between Uganda and this country group. Finally, gains in reversing the impact of HIV/AIDS on life expectancy in the past were driven, in about equal parts, by the scaling-up of treatment and declining HIV incidence (partly a consequence of HIV prevention policies). To this end, with treatment coverage rates approaching 80 percent as of 2015, I posit that most of the progress in reversing the impacts of HIV/AIDS on life expectancy will come from improved HIV prevention outcomes.

Finally, in terms of economic and social consequences, as a point of departure, in discussing the macroeconomic effects of HIV/AIDS, I call for caution to be exercised. In the first place, whereas earlier modeling studies estimated large impacts on economic growth, efforts to empirically establish the same have largely been unsuccessful. See Table 1, which shows HIV impact on GDP per capita growth ranges from positive 1% to negative 1%. This may suggest that something could be wrong with the calibrated models. There has not been a large impact of HIV/AIDS on growth. Second, recent extensive syntheses of literature on the impacts of HIV/AIDS on affected households suggest that members of affected households recover economically after a couple of years. Haacker (2016), similarly, does not find a correlation between HIV/AIDS and subsequent change in poverty rates. To resolve the conflicts in the literature on whether HIV/AIDS is a good, bad or ugly thing for economic growth (and development), part of the solution to this puzzle could be that some households in the community (not affected by an AIDS death) gain at the expense of households affected by HIV/AIDS (e.g. employment opportunities, control of assets). Consequently, the impacts of HIV/AIDS on affected households do not fully translate into an aggregate effect.

Table 1: Summary of studies of the macroeconomic impact of HIV/AIDS in Africa

Study	Countries (period of economic data)	Period of most recently used HIV/AIDS data	Results (comparison with non-HIV/AIDS scenario)
Dixon et al (2001) ⁵	41 countries (1960-98)	Late '90s	Growth rates reduced by 2-4%; large variation across countries, in line with prevalence of HIV
World Bank (2001) ¹⁰	Swaziland	Early '90s	Average rate of growth of GDP in 1991-2015 will be 1.5% lower a year
World Bank (2001) ¹¹	Namibia	Early '90s	Average rate of growth of GDP in 1991-2015 will be 1.1% lower a year
World Bank (2000) ¹²	Lesotho	Late '80s	Average rate of growth of GDP in 1986-2015 will be 0.8% lower a year
Bonnel (2000) ¹³	About 50 countries (1990-7)	Mid-'90s	Rate of growth of GDP per capita reduced by 0.7% a year in the 1990s
Quattek et al (2000) ¹⁴	South Africa	Mid-'90s	Average rate of GDP growth over next 15 years will be 0.3-0.4% lower a year
BIDPA (2000) ¹⁵	Botswana	Late '90s	Average rate of growth of GDP in 2000-2010 reduced by 1.5% a year
Bloom et al (1995) ¹⁶	51 countries (1980-92)	Early '90s	Insignificant effect on income growth
Cuddington et al (1994) ¹⁷	Malawi	Early '90s	Average rate of growth of GDP in 1985-2010 reduced by up to 0.3%
Cuddington (1993) ^{18, 19}	Tanzania	Early '90s	Per capita GDP in 1985-2010 up to 10% smaller
Over (1992) ²⁰	30 sub-Saharan countries	Early '90s	Rate of growth of GDP per capita in 1990-2025 reduced by 0.15% (0.6% in 10 worst affected countries)

Source: Dixon, McDonald and Roberts (2002)

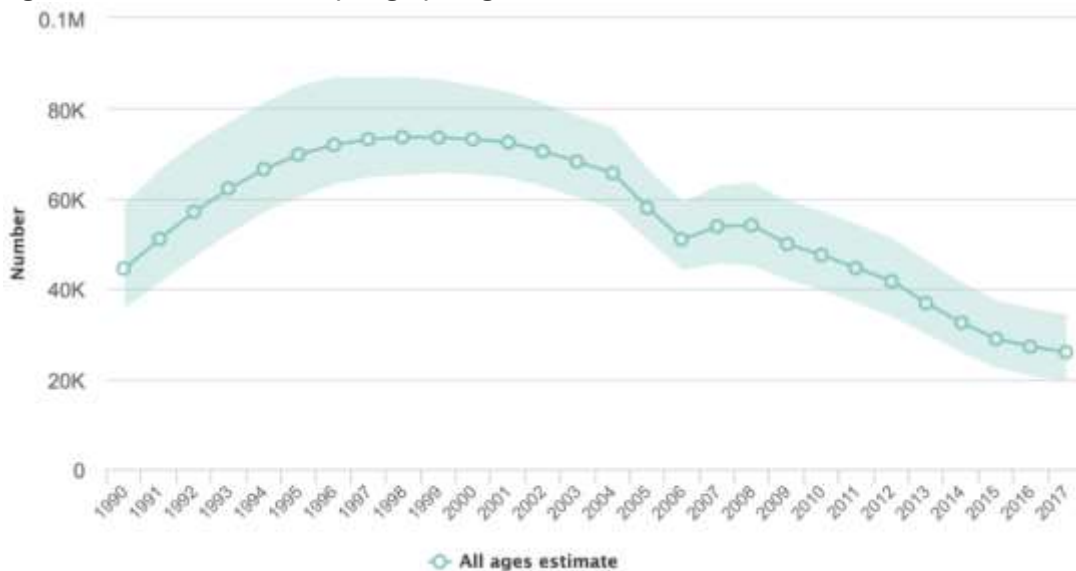
Another would be a theoretical analysis of how HIV might affect GDP per capita. From first principles, the growth of GDP per capita is the growth of GDP less the growth of the population (see Eq. (1)).

$$\frac{\dot{Y}}{P} = \dot{Y} - \dot{P} \dots\dots\dots (1)$$

This begs us to ask what has been happening to the projected growth of population in Uganda (see Eq. (2))

$$\dot{P} = \text{Fertility rate} - \text{Mortality rate} \dots\dots\dots (2)$$

Figure 4: AIDS-related deaths (all ages) in Uganda, 1990 - 2017



Source: UNAIDS (2018)

Two dynamics have been at play. First, before AIDS treatment, HIV infection reduced fertility (The ALPHA Network, 2017). Second, as Figure 4 shows, before 1999, HIV increased mortality. Consequently, since 2000, forward-looking population projections have been revised positively upwards to account for the incorporation of widespread AIDS treatment. Thus, to understand the channels of HIV spending since 2000,

there are more questions than answers. First, how much does HIV spending increase the GDP rate? Particularly, does HIV spending affect the rate of savings and capital investment (with foreign investment as a possible channel)? Second, by how much does HIV spending increase the population growth rate (say through integration with family planning)? Third, does HIV spending increase the productivity of the population as well as its size (say via reduced morbidity reducing caregiving by the healthy)? Finally, do a longer expected lifespan increases the incentive to invest in education (since life expectancy and schooling correlated as both own and parents' life-expectancy increase schooling (Hoque et al., 2018)?

On this latter issue, I argue that since HIV spending increases life expectancy by decades, it may be responsible for increased schooling. However, I must hasten to add that argument for HIV spending should not rest on impacts on GDP growth alone. Rather, there is a need for better evidence that HIV spending contributes more to GDP growth than to population growth. In other words, there is a need for evidence that HIV spending can slow population growth rather than increase it. Other possible but neglected channels for effects of HIV spending on GDP growth include the Keynesian multiplier effect (though this could be achieved by any other public expenditures), reduced risk of catastrophic health expenditures, higher returns to education, reduced poverty rates, and more equal income distribution (and whether this speeds growth) and long-run reduction in contingent fiscal liabilities (entitlements). I will return to some of these issues in this thesis. However, as this analysis shows, the best arguments for HIV funding may be based on benefits beyond GDP growth – such as can be captured by fast-tracking convergence (or full income methods in the preceding section).

Finally, as the CIH report's analysis was conducted independently of the SDG process and timeline, moreover at an aggregated global level, this section provides Uganda specific analysis. This is for two reasons. First, to connect with national policy discourses, country-specific estimates are needed rather than rely on interpolations from global estimates. Second, as the SDGs have a set target date of 2030 (and not 2035), I therefore estimate what the grand convergence might achieve – in health outcomes - by 2030 in Uganda. Also, I estimate the price tag. In other words, what is the level of investment required in the above-mentioned period.

Methods and data

This analysis builds on the analysis presented in Jamison et al (2013) to estimate the investment required for “grand convergence” in global health in Uganda. The methods are detailed elsewhere (Boyle et al., 2015; Jameson et al., 2013). For brevity, I do not present them here. However, the efficacious Reproductive, Maternal, Neonatal, and Child Health (RMNCH) interventions included in the current analysis are in Appendix I.

Results

As Table 2 shows, the “Enhanced Investment” scenario could avert a significant number of deaths for the investment period compared to the “Constant Coverage” scenario. I estimate that there would be more than 152,000 AIDS-deaths averted in Uganda between 2016 and 2030. For the period between 2016 and 2035, 185,000 AIDS-deaths would be averted. This represents 32% of all deaths averted. Additionally, because of the “grand convergence”, relative to the “Constant Coverage” scenario, AIDS deaths would decline by 94% while new HIV infections would decline by 87% by 2030 (from the 2016 baseline).

Table 2: Impact of the grand convergence investment case on Uganda

		Baseline 2011	Constant coverage scenario 2030	Constant coverage scenario 2035	Enhanced investment scenario 2030	Enhanced investment scenario 2035	Events averted by enhanced investments in 2030	Events averted by enhanced investments in 2035
Condition	Events	A	B	C	D	E	B-D	E-G
RMNCH	Births	1,552,556	2,934,725	3,461,743	1074278	1,230,575	1,860,447	2,231,168
	TFR	6.1	6.1	6.1	2.2	2.2		
	Maternal Deaths	4,809	9,091	10,723	1445	1,649	7,646	9,074
	Stillbirths	39,532	74,726	88,145	17640.357	20,165	57,085	67,980
	Neonatal deaths (<1 Mo)	40,135	75,918	89,555	8881	8,888	67,037	80,667
	Deaths (1-59 Mo)	108,606	209,318	246,615	31378	34,267	177,940	212,348
	Under 5 Deaths	148,741	285,236	336,170	40259	43,155	244,977	293,015
	Under 5 Mortality Rate	96	97	97	37.4754021	35	60	62
	Maternal Mortality Rate	310	310	310	134.52	134	175	176
Tuberculosis	New Cases	67,046	85,641	91,339	41805.2701	44,587	43,836	46,752
	Deaths (5 and up)	15,463	19,752	21,066	3994.42998	2,675	15,757	18,391
HIV/AIDS	New infections	137,161	285,784	338,561	36682.25	35,417	249,102	303,144
	Deaths	63,116	162,562	196,632	10488.9899	11,161	152,073	185,471
TB and HIV	Combined HIV and TB deaths	67,824	175,492	213,967	12500.7705	11,942	162,991	202,025
Total Deaths		260,906	544,544	649,005	71845.1275	76,911	472,699	572,094

Over a 20-year period between 2016 – 2035, the total incremental cost to achieve grand convergence through the enhanced investment case is US\$ 19,435,362,245. Specifically, for the years 2015, 2020, 2025, 2030, and 2035 the incremental costs of convergence would be US\$ 1,111,713,186, US\$ 1,106,208,681, US\$ 1,334,497,825, US\$ 1,545,681,279 and US\$ 1,921,733,143 respectively. This translates into cost per capita of US\$ 28.02, US\$ 24.58, US\$ 25.29, US\$ in 2015, 2020, 2025, 2030 and 2035 respectively. From a benefit-cost analysis perspective, excluding system costs, the cost per death averted drops by more than a half from US\$ 7,755.98 in 2015 to US\$ 3,269.9 in 2030. Finally, using 10-year totals, HIV accounts for 5% and 9% of total program costs for the period 2016 – 2025 and 2026 – 2035 respectively.

Table 3: Annual incremental costs of the grand convergence investment case in Uganda, 2015 – 2035 (in US\$)*

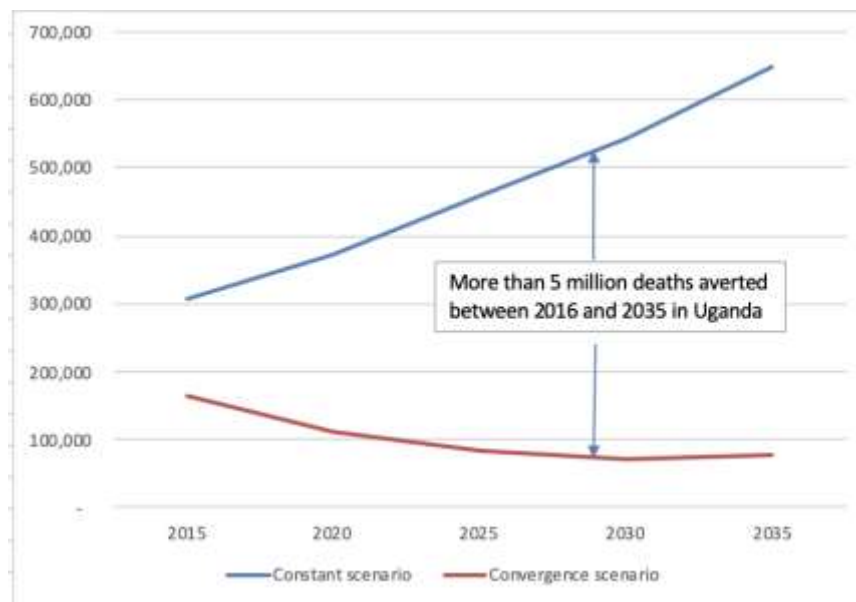
Cost	Category	2015	2020	2025	2030	2035
RMNCH	Family Planning	7,675,739	17,647,928	31,912,757	45,402,848	54,558,300
	Maternal and Newborn health	8,790,731	20,920,158	27,418,816	33,588,220	48,010,690
	Immunization	69,064,781	69,172,356	68,841,066	67,754,907	84,456,254
	Treatment of Childhood illness	14,499,337	21,530,504	18,888,535	11,327,146	13,383,210
HIV/AIDS, TB, and Malaria	Malaria Commodities	48,918,599	55,831,768	61,878,110	68,563,840	81,628,956
	Other Malaria Costs	55,656,896	62,470,089	66,526,897	72,577,164	89,164,078
	TB Treatment	38,942,619	27,379,105	28,050,249	28,748,048	33,651,956
	ART and PMTCT for HIV	69,067,653	126,806,834	202,224,974	283,058,775	396,200,208
	Other HIV Costs	56,151,742	116,305,946	170,533,091	239,633,697	336,674,478
Health Systems Costs		742,945,089	588,143,992	658,223,330	695,026,633	784,005,014
Total Program Costs		368,768,097	518,064,688	676,274,495	850,654,646	1,137,728,129
	Population	39,674,411	45,010,795	52,771,426	56,543,748	56,543,748
	Cost per capita (and average)	9	12	13	15	20
Total Overall Costs (incl HSS)		1,111,713,186	1,106,208,681	1,334,497,825	1,545,681,279	1,921,733,143
	Cost per capita (and average)	28	25	25	27	34

* Excludes the incremental cost of global R&D, estimated at US\$ 3 billion annually.

Discussion

The analysis in this critical note suggests that key health outcomes in Uganda can converge to a significant degree with those of wealthier countries (the so called “4Cs”) by 2030. As shown in Figure 5, financing effective HIV interventions and leveraging HIV funding, through integration among other policy levers, to fund RMNCH interventions has the potential to dramatically reduce the burden of disease in Uganda. Specifically, the enhanced investment scenario will reduce the under-5 mortality rate (U5MR) from 96 per 1000 live births to 37 per 1000 live births. While this improvement does not bring Uganda to OECD levels, it compares well to upper-middle-income countries – a category that Uganda aspires to belong to by 2030. This strategic investment would thus enable a “catch up”.

Figure 5: Deaths per year across scenarios in Uganda. 2016–2035.



As the grand convergence has an impact on the demographics of Uganda, it follows that it has potential to yield economic demographic dividends. Saving many young lives aside, the “Enhanced Investment” scenario to achieve a “grand convergence” calls for a rapid scale-up of family planning interventions in Uganda, one of the highest-fertility countries globally. By extension, this, in turn, substantially reduces the number of unintended pregnancies, causes the TFR to fall from the highs of 6.1 in 2015 to 2.2 in 2030. Despite an increase in an overall population largely from growing life expectancy, birth rates decline sharply. The projected total number of births in 2030 remains lower than the 2011 baseline levels. This yields a demographic dividend. Specifically, the above-mentioned demographic change has several potential benefits for Uganda. These, *inter alia*, include an overall reduction in total healthcare costs for mothers and young children. This reduces the burden on health systems. Additionally, this shift creates incentives for investments in education and women. Overall, this improves Uganda’s human capital.

Undoubtedly, achieving “grand convergence” will require a substantial increase in investments in health. The price tag for Uganda is an average annual incremental cost of ~US\$ 970 million. To put it in perspective, I propose evaluating the investment needed to achieve a “grand convergence” on a per-capita basis. I argue that this helps provide a seemingly more realistic perspective. The cost is affordable. First, in terms of incremental cost per capita, the “Enhanced Investment” scenario would cost about US\$ 28 – 34 more per person per year. However, based on estimates presented in Table 3, the estimated annual incremental cost per death averted averages around US\$ 4,700 for most of the analytical period. Importantly, most of the deaths averted from this investment accrues to children under 5. Consequently,

under 5 child survival prospects provide a larger number of life-years gained than from a death averted in the general population on average.

Finally, financing HIV through an integrated scale-up strategy – as envisaged under the convergence scenario - has synergistic effects, both within and across health interventions. First, strengthening RSSH creates platforms for service delivery, from the community to tertiary level. Second, there are interdependencies across categories of interventions. This, in turn, makes a broad scale-up strategy attractive. A case in point in the HIV-TB nexus. As Uganda has high rates of HIV and TB co-infection, strategies to scale-up early HIV treatment initiation among PLHIV reduces the prevalence of TB. For global health and HIV financing policy and practice, the findings suggest a need to employ a co-financing approach to sustainable HIV financing, as one policy lever to expand the HIV resource envelope by pooling budgets across sectors. More on this in § 6.5.

In conclusion, as a cautionary note, in interpreting these results, it is important to bear in mind some limitations. Below, I lay out four (4) of these. These particularly pertain to the purposes of this analysis as well as the data and analytic approach used in this critical noted. First, all modeling studies depend on the accuracy of the assumptions used and their translatability to new settings. The projections in this study assume that proven interventions (as laid out in Appendix I) work at a comparable level of efficacy in Uganda as in other settings (from which their corresponding efficacy data is drawn). Thus, to the extent that conditions in Uganda are different from those in other settings, I argue that the performance of these interventions may be different. In practice, there is likely to be considerable heterogeneity in the outcomes experienced in Uganda and other settings. However, owing to data limitations and those of the modeling tools used, the range of possible measures of uncertainty are not presented.

Second, the cost estimates used here are based on current or recent global health costs in Uganda. However, due to potential economies of scale and scope that may ensue in the future, I contend that over the next generation, the costs of procuring and delivering the above-mentioned interventions may well change in unpredictable ways. Consequently, to the extent that the models fail to capture adequately these cost elasticity and scale effects, this study may misestimate the true costs of “grand convergence”. Also, the estimates of costs in this note are based on present populations in need of services or at risk. It is expected that implementing health interventions in Appendix I will impact disease epidemiology. This will, in turn, narrow the target population. To this end, I conclude that the costs in future years as modeled may overstate the actual resource needs to achieve a “grand convergence” in Uganda.

Third, Uganda is a fragile state yet realizing “grand convergence” largely depends on political stability. This raises a legitimate challenge to the aspirations of convergence that depends on functional health systems. To mitigate this limitation, I have included a significant level of investment in health system strengthening in the model. Also, the costs of interventions over time are ramped up to reflect the challenge of expanding human resources for health (HRH) in complex operating settings. In light of these adaptations, I argue that to the extent that these strategic investments are insufficient to enable the needed scale-up, the results in this study may overstate the achievable reduction in burden of disease or understate the costs of “grand convergence” in Uganda. Additionally, this analysis of the impact does not explicitly account for any potential spillover benefit from these investments in improving care for chronic and NCDs. Globally, these are a growing source of losses in health-adjusted life years (HALYs). These externalities are even more relevant owing to the so-called “greying of AIDS”.

Finally, this analysis exclusively focuses on potential impact of health interventions. It does not account for changes exogenous to the health sector and their corresponding impacts on the Uganda’s trajectory towards “grand convergence” in global health. For example and of relevant to HIV financing, I do not explicitly account for positive impacts on health that may accrue from other investments that compete with HIV spending - in ROI terms - such as in education, agriculture, and housing. Conversely, the bi-directional impacts, for instance, since HIV spending increases life expectancy by decades, it may be

responsible for increased schooling, are not accounted for. Looking into the future, I contend that the balance of these factors will profoundly impact “grand convergence” in Uganda.

Conclusion

As in the CIH, this note finds that a “grand convergence” in global health may be within reach in Uganda. Uganda is on the cusp of a historic achievement and over the next generation, smart investments proposed in this critical note could drastically reduce mortality rates to levels comparable to those in the wealthier nations. This not only creates more equal opportunities for survival but significantly improves wellbeing for everyone everywhere. By embedding a “global convergence” narrative into HIV financing policy discourses, reforms, and action, I show that sustained global and local commitment to invest in health is needed. This has potential to usher in a healthier and more equitable phase in human health. To harness the ensuing the dividends, a holistic and integrated perspective needs to be adopted to strategic health investments. In Uganda, a “grand convergence” in global health will rely on a people-centered and rights-based rapid scaling-up of a full range of critical effective health interventions across all affected populations over their lifecycle and in all locations.

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Appendix I: List of RMNCH interventions included in the “grand convergence” analysis for Uganda

Category Package

RMNCH

Package 1: Family Planning

Modern family planning methods (pill, condom, injectable, IUD, implant, female sterilization, male sterilization, *lactational amenorrhea method*, vaginal barrier method, vaginal tablets, other contraceptives)

Package 2: Maternal and Newborn Health

Safe abortion

Post-abortion case management

Ectopic case management

Syphilis detection and treatment (pregnant women)

Multiple micronutrient supplementation

Balanced energy supplementation

Management of pre-eclampsia (magnesium sulphate)

Detection and management of diabetes in pregnancy

Detection and management of fetal growth restriction

Labour and delivery management

Active management of the 3rd stage of labor

Management of eclampsia (magnesium sulphate)

Neonatal resuscitation (institutional)

Kangaroo mother care

Clean practices and immediate essential newborn care (home)

Antenatal corticosteroids for preterm labor

Antibiotics for preterm premature rupture of the membranes (pPROM)

Induction of labour (beyond 41 weeks)

Neonatal infections/newborn sepsis - Full supportive care

Preventive postnatal care

Periconceptional folic acid supplementation

Calcium supplementation for prevention and treatment of pre-eclampsia and eclampsia

Package 3: Malaria

Malaria treatment (children)

Insecticide treated materials

Pregnant women sleeping under an ITN

Intermittent preventive treatment - IPT (pregnant women)

Treatment of malaria (pregnant women)

Package 4: HIV

Prevention of mother to child transmission (PMTCT)

ART (first-line treatment) for pregnant women

Cotrimoxazole for children

Pediatric ART

Package 5: Immunization

Tetanus toxoid (pregnant women)

Rotavirus vaccine

Measles vaccine

DPT vaccination

Hib vaccine

Polio vaccine

BCG vaccine

Pneumococcal vaccine

Meningitis vaccine

Package 6: Child Health

Oral rehydration therapy

Zinc (diarrhoea treatment)

Antibiotics for treatment of dysentery

Pneumonia treatment (children)

Vitamin A for measles treatment (children)

Breastfeeding counselling and support

Complementary feeding counselling and support

Management of severe malnutrition (children)

Management of moderate acute malnutrition

Vitamin A supplementation in infants and children 6-59 months

Why on earth should we continue to invest in the HIV response in Uganda?

Introduction

This brief commentary presents results of an empirical assessment of the economic returns of an ambitious strategy, the Fast-Track strategy that aims to markedly reduce new HIV infections, AIDS-related deaths, and HIV-related discrimination and, by extension, serve as a pathway to “end the AIDS epidemic by 2030” in Uganda. Over the past four decades, hundreds of billions of U.S. dollars have been invested in the global AIDS response, with impressive returns on investment. This notwithstanding, the prospects of ending AIDS remain uncertain. As I argue in Chapter 3, we must stop collectively fooling ourselves that the end of AIDS is in sight. I contend that owing to ecological factors, it is not possible to end AIDS without a functional cure and/or an efficacious vaccine.

Relatedly, the health financing landscape across low- and middle-income countries such as Uganda is changing. As countries develop economically, the role of public health spending is expanding, while the share of external funding in health expenditure declines. The drive towards universal health coverage (UHC) reinforces the need for additional domestic health spending. One implication of these developments is that the policy discourse on health spending frequently involves decisions on expanding the weight of health (and HIV) in government spending and reducing the shares of other sectors accordingly. It is important to recall that from the early days of the HIV response (see England (2008), for example), there have been growing questions on whether the global community should continue investing in HIV, with some claims that the HIV response has unjustifiably overly funded (Haacker, 2016). In this commentary, I argue that this criticism is unfounded. In fact, on the contrary, investing in the HIV response has borne impressive results, and investing now is financial saving in the future.

To empirically answer why on earth should we (continue to) finance ending the AIDS epidemic as a public health threat in Uganda, methodologically, the novel approach taken in this commentary has its foundation in the seminal work by Nordhaus (2002) who argued that the value of increased health (longevity) could be as important as the increased in economic growth. Building on this, Becker et al (2005) coined the term “full-income” to represent the way the growth rate in the “full” lifetime income values both the gains in material income and the gains in longevity. However, it was not until 2013 when the *Global Health 2035* Lancet Commission used the full income approach to state that chosen health interventions in LMICs could bring 9 to 20 Returns on Investment (RoI) – in full-income terms. In a nutshell, a “full income” approach incorporates the benefits of health improvements into national accounts, by adding the value of changes in life expectancy to the value of changes in the gross domestic product (GDP) to capture the effects of health improvements at the population level.

Taking a macroeconomic approach, I value mortality risk reductions within a full-income framework. Specifically, I estimate the economic benefits of ending AIDS in Uganda by 2030. Using a novel measurement tool, the “full-income” approach, I question – from an economic perspective – whether ending AIDS is a “good deal”? Globally, within the SDGs framework, there is consensus – implicit in SDG 3 - to end the AIDS epidemic as a public health threat by 2030. Additionally, in June 2016, the UN General Assembly adopted the Political Declaration to end AIDS which contains clear fast-track targets. Stover et al. (2016) have estimated that US\$ 11 billion is needed for Uganda to achieve these targets by 2030. While the price tag is known, the corresponding economic benefits of such an investment is unknown. It is this gap that this analysis aims to fill. Also, to the best of my knowledge, this study is the first academic study to apply the full-income approach to HIV in Uganda – from both a retrospective and prospective perspective.

The rest of this paper is structured as follows. First, I present the empirical methods employed and the data sources used. Thereafter, I present the key results. A discussion of the same follows before I conclude with policy implications and pointers to future work.

Empirical approach

In terms of methods and data, I estimated the incremental costs, benefits, and economic returns of the Fast-Track scenario in Uganda, compared to a counterfactual – the Business-as-Usual scenario - defined here as maintaining coverage of HIV-related services at 2015 levels. See Chapter 3 for details of the values of the above-mentioned analytic scenarios. Thereafter, the benefits are calculated using the “full-income” approach, which values both the changes in income and mortality and the productivity approach. For brevity, refer to Lamontagne et al. (2019) for the detailed empirical approach employed in this commentary. The unit costs as used here are drawn from Chapter 4.

It is well established in (fiscal) policy studies that opinions on government policies vary widely (Gaspar, Gupta and Mulas-Granados, 2018; Sunstein, 2018). Owing to an ongoing cost-benefit revolution in policymaking, Eq. (1), paying careful consideration of costs and benefits, gives a standard algebraic definition of the incremental benefit-cost ratio as a measure of the economic rate of return of the investment:

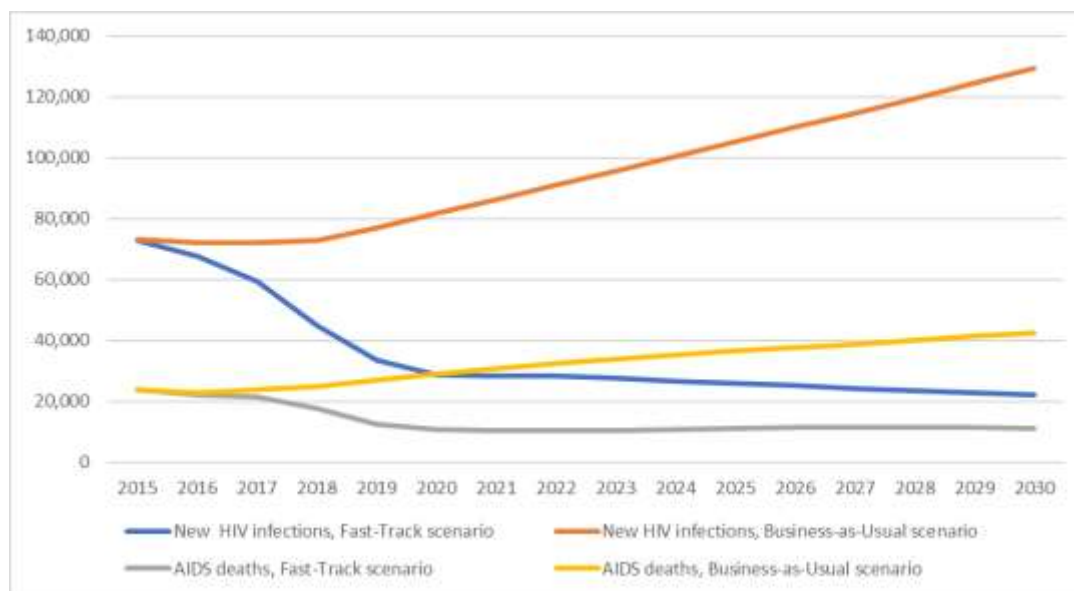
$$\text{Benefit- Cost Ratio} = \Delta B/\Delta C = (B^{\text{FT}} - B^{\text{BaU}})/(C^{\text{FT}} - C^{\text{BaU}}) \dots\dots\dots(1)$$

In Eq. (1) above, the subscripts FT and BaU denote the Fast-Track and Business-as-Usual scenarios. Also, all amounts are the present values of the future stream of dollar amounts over the 2015–2030 period, discounted to 2017 at a 3% discount rate, as traditionally used in the health economics literature (Haacker, Hallet and Atun, 2019).

Key results

In 2016, Uganda (alongside other countries) agreed on a Fast-Track strategy to "end the AIDS epidemic by 2030" by markedly reducing new HIV infections, AIDS-related deaths, and HIV-related stigma and discrimination (see Figure 1).

Figure 1: Key outcomes of Fast-Track and constant scenarios in Uganda



Source: Author’s analysis from UNAIDS (2018).

As earlier mentioned, in assessing the economic returns of the ambitious Fast-Track strategy in Uganda, I estimated the incremental costs, benefits, and economic returns of the Fast-Track scenario, compared to a counterfactual, the Business-as-Usual scenario, defined here as maintaining coverage of HIV-related services at 2015 levels. The benefits are calculated using the full-income approach, which values both the changes in income and in mortality, and the productivity approach. I find that the incremental costs of the Fast-Track scenario over the constant scenario for 2015-2030 represent US\$ 3 billion or US\$ 72.97 per capita. The full-income valuation of the incremental benefits of the decrease in mortality amounts to US\$ 450.85 per capita, representing 6.18 times the resources invested.

Discussion, conclusion, and policy implications

By way of discussion, it is important to note that the above results are consistent with other estimates of the return on investment of public health interventions. A systematic review of public health interventions in high-income countries – by Masters et al. (2017) - found the median benefit-cost ratio to be 8.3. Additionally, the return on investment found in this study falls within the ranges found by the only two studies (Lamontagne et al (2017) and Forsythe et al (2019)) – that to the best of my knowledge - that apply a full-income approach to the HIV response.

In conclusion, the economic and social value of the additional life-years saved by the Fast-Track approach exceeds its incremental costs, implying that this strategy for ending the AIDS epidemic is a sound economic investment. In other words, it is highly efficient, in comparison to other investments in global development. The full-income approach for health captures social benefits beyond gains in productivity and thus represents a more comprehensive metric that is suited to inform priority setting among competing global development interventions. Finally, on basis of impressive economic benefits as returns on investments, the HIV response in Uganda thus merits commensurate financial support.

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Appendix 8: Epidemic Transition Metrics⁴⁵

UNAIDS and partners have developed summary metrics to signal when the HIV epidemic has transitioned to a declining public health threat. A public health threat can be interpreted in different ways. In principle, the benchmarks are intended to identify when the contribution of HIV morbidity and mortality to the national burden of disease are declining, and discrimination for HIV infection is eliminated. Thus, tracking the metrics toward the benchmarks will allow countries to measure progress and encourage local accountability and target-driven programme management.

Below is a description of the four identified epidemic transition metrics.

1. HIV incidence rate / AIDS-related mortality rate

- Definition:** New HIV infections per 1,000 uninfected population and AIDS related deaths per 1,000 total population
- Benchmark:** not applicable
- Strengths:** This indicator is the existing SDG indicator. These indicators are straight-forward, commonly used metrics that can be compared to incidence and mortality from other diseases.
- Limitations:** This benchmark has already been achieved in many low-level epidemic countries making it less useful for accountability in all countries.
- Interpretation:** Incidence describes the risk of new infection while AIDS-related mortality describes the risk of the total population dying from an AIDS-related cause.

2. Percent reduction in new HIV infections and AIDS-related deaths

- Definition:** Percentage change in the number of new HIV infections and AIDS-related deaths since 2010
- Benchmark:** 90% by 2030
- Strengths:** Allows comparability between countries regardless of the magnitude of the epidemic
- Limitations:** Even with a considerable reduction in new infections or deaths a country with a high burden epidemic in 2010 will have to require considerable programmatic efforts to reduce the impact of the epidemic on the population.
- Interpretation:** This metric has an uncomplicated interpretation as the change that has occurred since 2010.

3. Incidence prevalence ratio (IPR)

- Definition:** The ratio of new HIV infections to the number of people living with HIV
- Benchmark:** 0.03
- Strengths:** Identifies a true epidemiological shift in the epidemic.
- Limitations:** This metric cannot be disaggregated by sex, age, or key population as the metric reflects an entire epidemic including transmission across population groups.
- Interpretation:** The average number of new HIV infections per each person living with HIV. When this ratio is maintained below 0.03 the epidemic will decline over time.

4. Incidence mortality ratio (IMR)

- Definition:** The ratio of new HIV infections to the total number of deaths among the HIV population
- Benchmark:** 1
- Strengths:** Identifies a point at which HIV related health care costs will diminish
- Limitations:** Requires to be interpreted together with a measure of low mortality among people living with HIV (otherwise $IMR < 1$ could be attained in the presence of high mortality)
- Interpretation:** When this value is less than one, the size of the population living with HIV decreases.

⁴⁵ For details, see Ghys et al. (2018).

Appendix 9: Python code for producing a cost-coverage curve

```
import pylab as pl
A = 1.0
B = 1e-5
x = pl.linspace(0,1e6)
y = 2*A/(1+pl.exp(-B*x))-A
pl.plot(x,y, label='A=%s, B=%s' % (A,B))

A = 0.8
B = 1e-5
y2 = 2*A/(1+pl.exp(-B*x))-A
pl.plot(x,y2, label='A=%s, B=%s' % (A,B))

A = 0.8
B = 2e-5
y3 = 2*A/(1+pl.exp(-B*x))-A
pl.plot(x,y3, label='A=%s, B=%s' % (A,B))

pl.xlim((0,1e6))
pl.ylim((0,1))
pl.xlabel('Spending ($)')
pl.ylabel('Coverage')

pl.legend()
```

Similar HIV Epidemics, Different HIV Spending: How countries with severe HIV epidemics are spending HIV funds on prevention, treatment and HIV response management

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Abstract

Background: Eastern and southern Africa (ESA) remains the region most affected by HIV globally. The region's most severe HIV epidemics have in common that heterosexual transmission accounts for the vast majority of new infections, that HIV also affects general population groups, and that the countries have large numbers of persons living with HIV. Comprehensive HIV responses are in place in all countries. Although HIV program spending patterns have been broadly analyzed previously, the expenditure by detailed expense category has not recently been systematically compared relative to epidemic size and economic conditions.

Methods: HIV spending data collected as part of Global AIDS Progress Reporting (GARPR) and National AIDS Spending Assessments (NASA) from 10 high burden countries in ESA was analyzed and compared in three clusters (prevention, diagnosis & treatment, cross-cutting support costs). Spending levels relative to number of people living with HIV (PLHIV), coverage of treatment and Gross Domestic Product were established and compared.

Results: Analyses revealed substantial variation in HIV spending in the 12 countries. Between 32–83% of HIV spending was on actual HIV service delivery including prevention, treatment and care, while 17–68% were spent on cross-cutting support costs such as management, health systems and other synergies. HIV prevention spending accounted for 6–21% of HIV spending and levels of spending on different prevention programs varied substantially. PMTCT was the only area within prevention that received more than 10% of prevention spending in all countries. Treatment & care absorbed 12–64% of total HIV spending. Treatment spending per person on ART varied from US\$141–946 per person/year.

Conclusions: There are substantial differences in HIV program expenditure across countries with severe HIV epidemics in ESA. Despite the region's progress in reducing new HIV infections and increasing treatment access, the extent of differences suggests that there may be substantial potential for further analyzing and improving allocative and implementation efficiency in specific countries.

Introduction

Eastern and southern Africa remains the region most affected by the HIV epidemic and is home to 19.0 million or 52 % of 36.7 million people living with HIV (PLHIV) globally, despite only having 2% of the world's population. [1] Despite differences in levels of HIV prevalence, the region's epidemics have in common that they are generalized – i.e. heterosexual transmission accounts for the vast majority of new infections [2], HIV also severely affects general population groups, and HIV remains the single largest source of deaths and disease burden in the region. [3] Expansive HIV responses -- covering prevention, diagnosis, treatment and support – are in place in all ESA countries. Progress has been made in several countries in reducing HIV infections and increasing treatment access, but substantial gaps in program coverage remain. [4] Although spending patterns have been broadly analyzed earlier [5], expenditure by detailed expense category has not recently been systematically compared between ESA countries or analyzed relative to epidemic size and economic conditions.

The paper establishes spending patterns on prevention, treatment and HIV response management, analyses similarities and variation among countries and thereby identifies areas of HIV spending, which could be further examined at the level of individual countries.

Methods

This analysis is based on HIV spending data collected as part of the UNAIDS Global AIDS Progress Reporting (GARPR) and National AIDS Spending Assessments (NASA) from 10 ESA countries that account for nearly 75% of the 19 million PLHIV in this region. [1] Expenditure data were collected at country level by national AIDS coordinating authorities from different implementers and funding organizations. The data is collected based on a standard template provided by UNAIDS, which classifies HIV spending into 8 main categories and 91 sub-categories. In order to ensure comparability, the analysis only includes the ten countries in ESA, for which at least one complete annual HIV spending dataset was available for the period of 2012 to 2014. Within that period, analyses were carried out for the most recent year with available data.

Descriptive analyses of HIV spending across the 10 countries were carried out for each of the main categories. Then the detailed 91 sub categories of HIV spending were divided in three clusters (prevention, diagnosis & treatment, management & support), in which detailed descriptive analyzes by intervention area were carried out. As UNAIDS changed its template for collecting financial data during the period for which we analysed data, data collected using the pre-2013 template were re-categorised to match the GARPR categories (in use after 2013). In addition, HIV expenditure was analyzed across the 10 countries by funding source. In order to assess HIV spending levels in relation to HIV epidemic size, the estimated number of PLHIV was obtained from UNAIDS Spectrum estimates for the respective year of expenditure. [1] Spending on treatment and care was analyzed in relation to the number of people on ART obtained from the AIDS-Info database. [6] Spending levels overall and by intervention area were also analyzed in relation to Gross Domestic Product (GDP) and GDP per capita (current international US\$) as estimated by the World Bank. [7] Table 1 summarizes key background variables for the years, for which HIV spending data was obtained.

Table 1. Background variables for 10 countries in eastern and southern Africa (2012-2014)

	HIV prevalence	Number of PLHIV	Number on ART	GDP per capita (current internat. US\$)	GDP per capita (PPP adjusted)
Swaziland, 2013	28.4	210,000	100,138	3,648	8,110
South Africa, 2014	19.0	6,800,000	3,050,420	6,472	13,083
Zimbabwe, 2013	15.0	1,300,000	665,199	906	1,743
Namibia, 2013	13.8	200,000	126,779	5,421	9,461
Zambia, 2012	13.3	1,100,000	480,925	1,725	3,552
Mozambique, 2014	10.7	1,500,000	646,312	623	1,136
Malawi, 2012	10.3	970,000	404,905	384	1,086
Kenya, 2013	6.0	1,500,000	656,369	1,261	2,844
Rwanda, 2012	3.1	190,000	116,031	667	1,511
Sudan South, 2012	2.6	170,000	4,540	944	1,819

Sources

(Note: all data refer to the year, for which HIV spending data was obtained as indicated in the left column)

UNAIDS 2016 estimates	UNAIDS 2016 estimates	UNAIDS AIDS Info Database	World Bank World Development Indicators	World Bank World Development Indicators
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Results

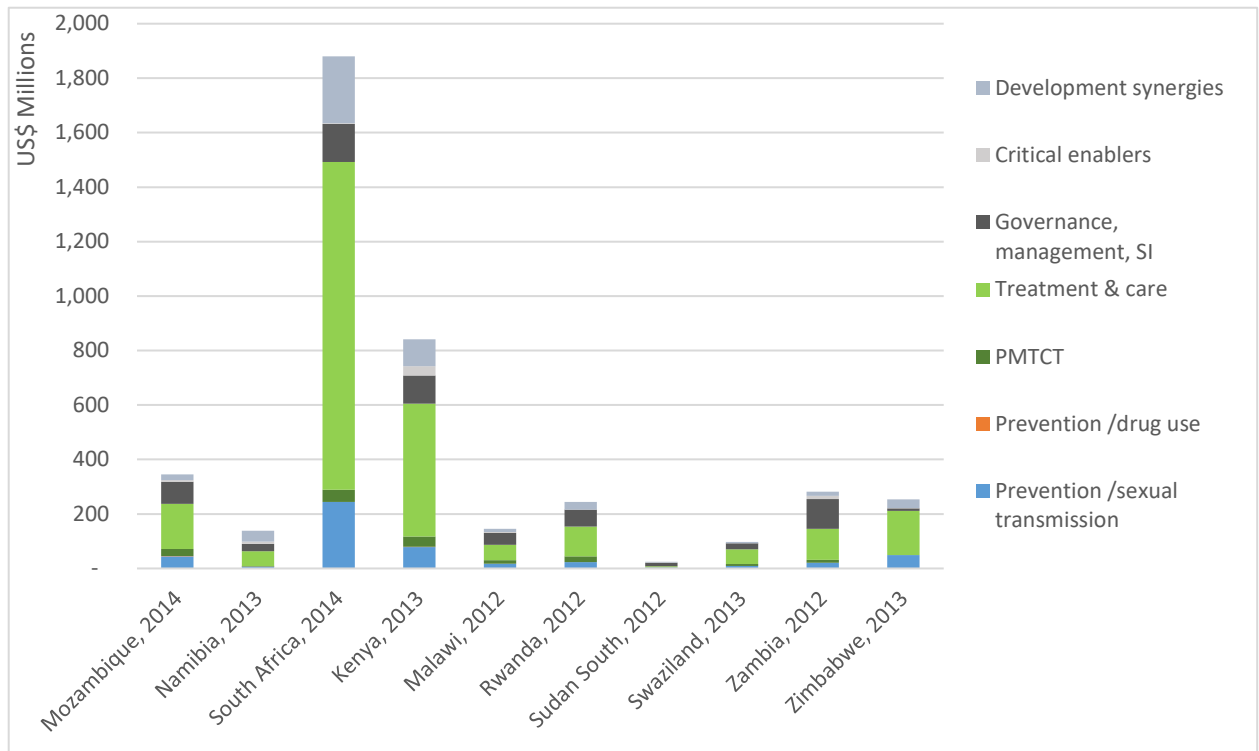
Results presented in this section are based on total HIV spending including domestic public, private and international funding.

Overall spending pattern: Large variation in HIV response expenditure on core services and cross-cutting management costs and between countries

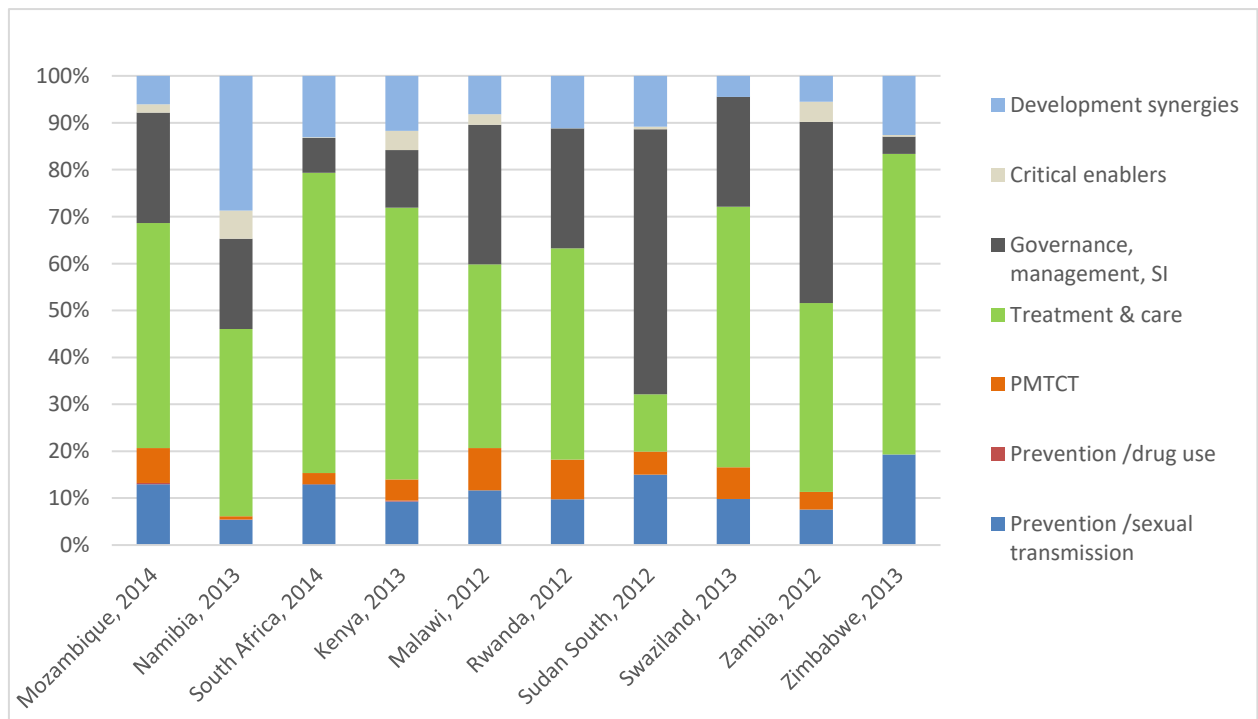
The analysis found large differences in the proportion of expenditure, which was incurred for core prevention, treatment and care services, which accounted for 32–83% of total HIV spending in the 10 countries. Correspondingly, large variations in cross-cutting management and support costs also exist (ranging from 17 to 68% (Figure 1b). South Africa and Kenya together accounted for 67% of HIV spending in the ten countries (Figure 1a). However, relative to epidemic size, HIV spending was highest in Rwanda (US\$ 1,282 per person living with HIV) and Namibia (US\$ 691), while it was below US\$ 200 in Malawi, South Sudan and Zimbabwe (Figure 1c).

HIV spending in percent of GDP was particularly high in the low-income countries of Malawi, Mozambique and Zimbabwe (1.9–2.4%), but lower in South Africa (0.5%) due to its larger GDP (Figure 1d). HIV spending in percent of GDP was also high in Swaziland (2.1%) in the context of exceptionally high HIV disease burden. However, despite relatively low adult HIV prevalence of 2.9% in Rwanda, HIV spending as percentage of GDP was highest in Rwanda (3.4%). Rwanda's HIV spending per person living with HIV was also highest across different sub-categories. South Sudan, despite low overall spending on HIV, spent the lowest proportion of HIV resources (32%) on core HIV prevention and treatment services (Figure 1b).

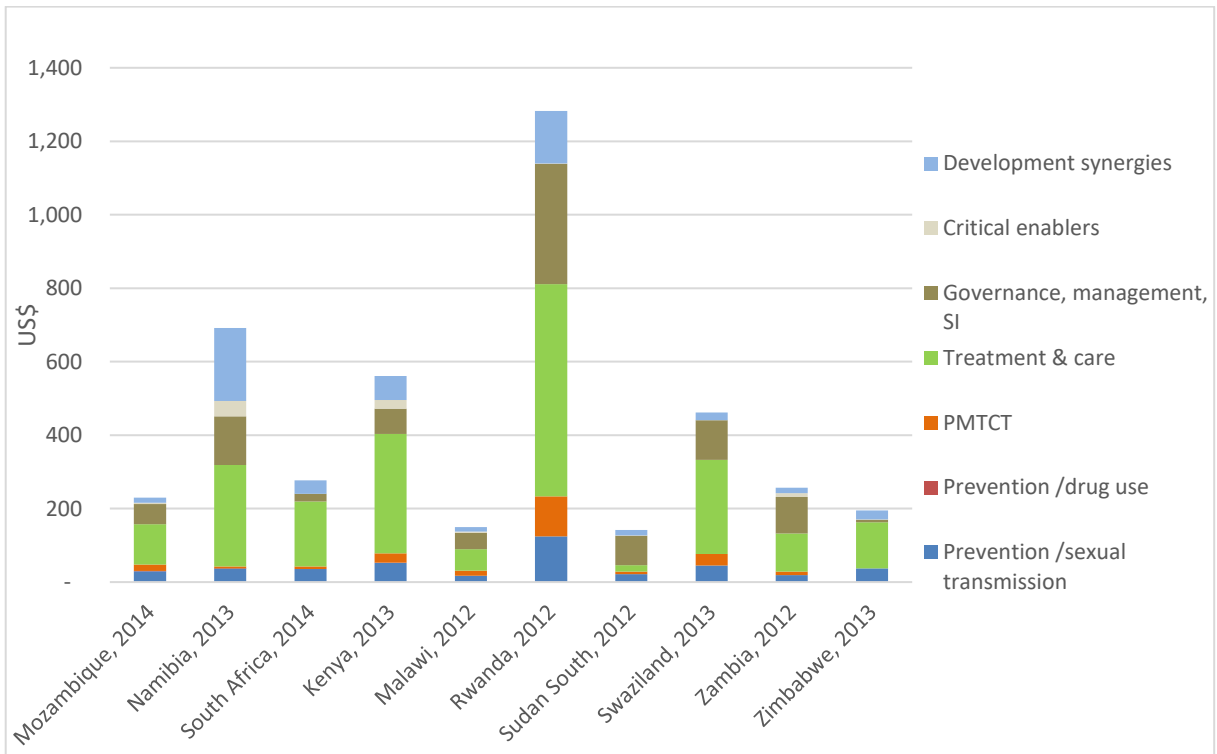
Figure 1. Total HIV spending in 10 countries in eastern and southern Africa by broad thematic area
a. In absolute numbers (US\$)



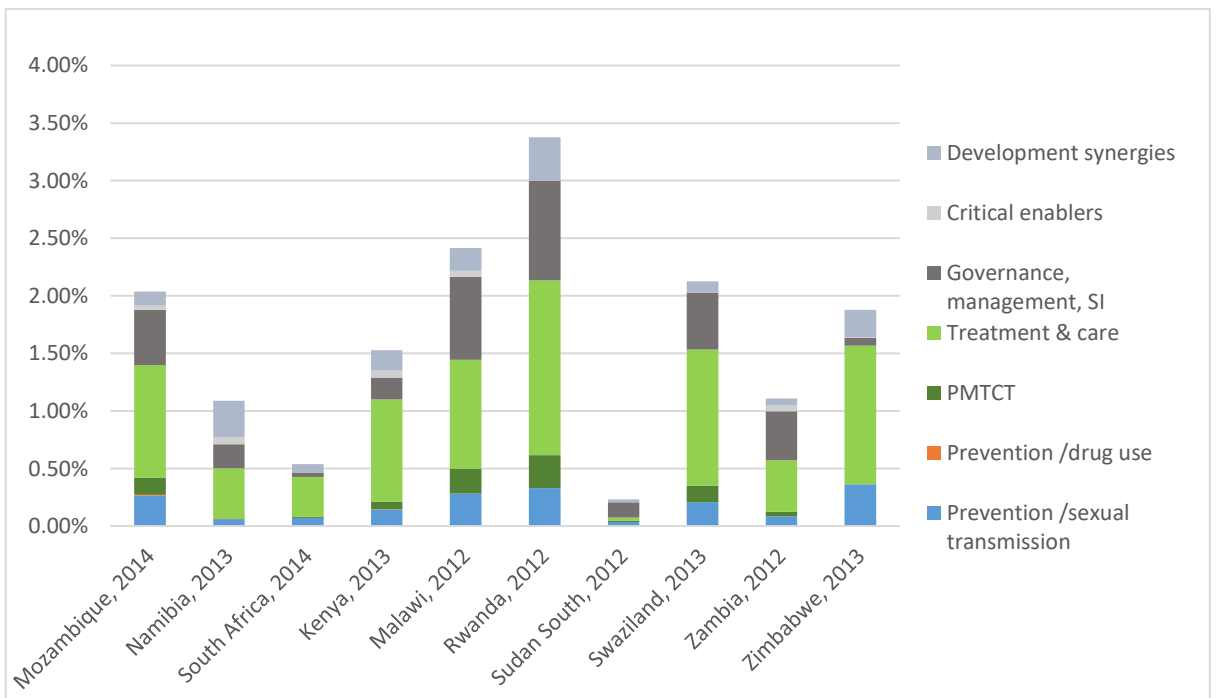
b. In % of total HIV spending



c. Per person living with HIV (in US\$)



d. Total HIV spending in % of GDP



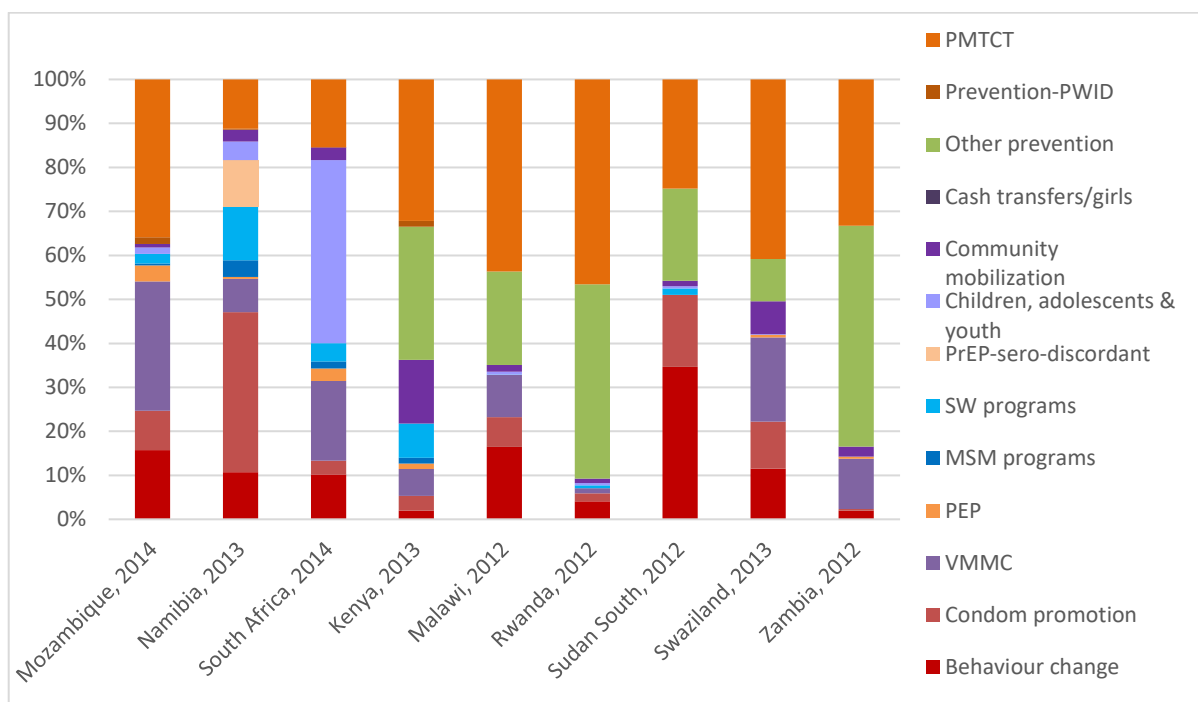
HIV prevention spending: Two decades into the response expenditure patterns suggest that 2012-14 there was little consensus how to spend prevention funds

HIV prevention spending in the analysis included non-HIV-treatment-based prevention of sexual transmission, prevention among people who use drugs and PMTCT. For this particular analysis, data were only available for 9 countries.

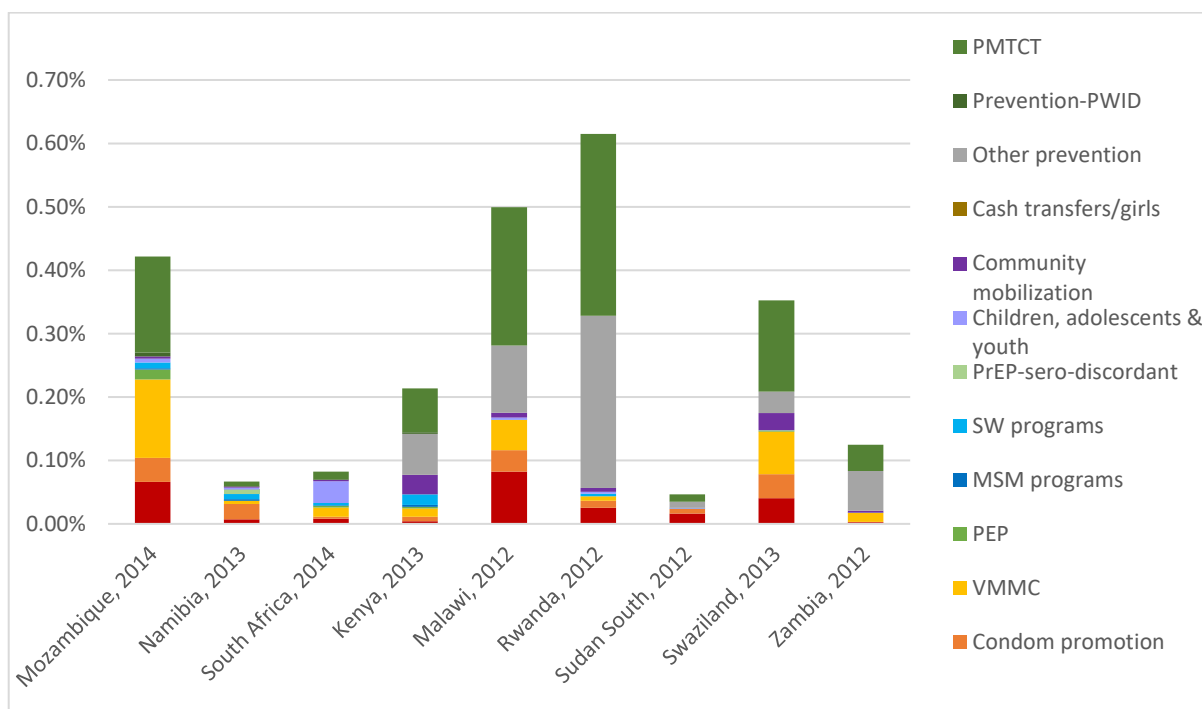
HIV prevention spending as defined above ranged from 6% of total HIV spending in Namibia to 21% in Mozambique and Malawi (Figure 1b). The thematic focus of HIV prevention spending varied very substantially between countries and was fragmented in many countries (Figure 2a). The only intervention area that received more than 10% of total HIV prevention spending in all 9 countries is PMTCT (but it still varied dramatically from 11–47% of total HIV prevention spending). For all other areas, variation in levels of spending was larger. Behavior change communication received 2–35% of prevention funds, condoms 0.4–36%, voluntary medical male circumcision (VMMC) 1–29% and programs for sex workers 0–12%. Four countries reported spending on programs for men who have sex with men ranging from 0.5–4% of total HIV prevention spending. Overall, core prevention services addressing the majority of new HIV infections, which are heterosexually transmitted including condoms, VMMC and programs for sex workers account for 4–56% of HIV prevention spending.

HIV prevention spending exceeds 0.4% of GDP in three low income countries (Malawi, Mozambique and Rwanda – Figure 2b), in which the majority of HIV spending is internationally financed. Due to relatively high GDP, HIV prevention spending in percent of GDP in South Africa and Namibia remained below 0.1% – more than 4 times lower.

Figure 2. HIV prevention spending in 10 countries in eastern and southern Africa
a. In % of total HIV prevention spending



b. In % of GDP



HIV Treatment: High investment into ART services in most countries, but great variation in spending on other care

Treatment and care including HIV testing services accounted for 12% to 64% of HIV spending in the 10 countries (Figure 1b) and in 7 out of 10 countries (except Namibia, South Sudan and Zambia) treatment & care spending was the single largest component of HIV spending. *Within* treatment and care budgets, adult ART accounted for 46% to 84% of all treatment & care spending (Figure 3a). There is considerable variation on what the remainder of treatment & care budgets are spent on. In Kenya, Rwanda and Swaziland, approximately 40% of treatment & care spending was absorbed by pre-ART and palliative care. Expenditure on HIV testing services varied greatly from less than 10% of treatment & care spending in Rwanda, South Africa and Swaziland to more than 30% in Namibia. In most countries – with the exception of South Sudan – more than 50% of PLHIV are diagnosed [6] and correspondingly yields of HIV testing have declined. Overall, similarly high levels of testing and diagnosis were achieved in countries with low and high HTS spending (Figure 3 d).

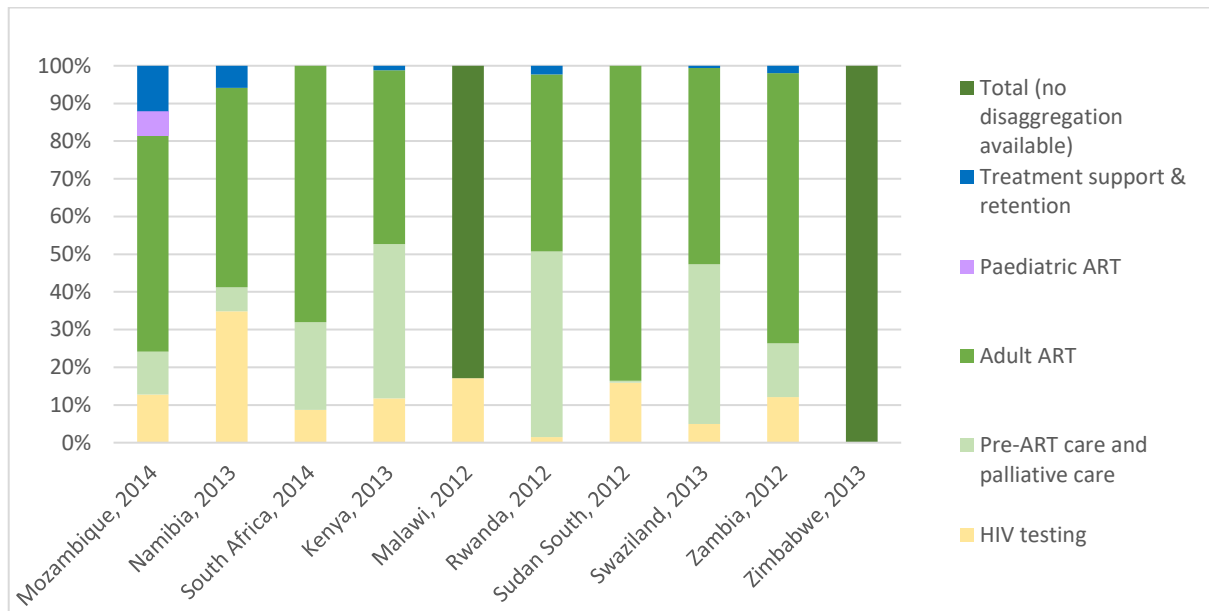
Treatment & care spending per person on ART varied substantially from US\$141 per year in Malawi to US\$946 per year in Rwanda (Figure 3b). Treatment spending was also below US\$300 in other low-income countries (Mozambique, Zambia and Zimbabwe). In South Africa, the country with the highest GDP per capita, treatment & care spending per person on ART was US\$395 and thereby substantially lower than in Kenya with US\$743.

The burden of treatment spending in % of GDP was not exclusively driven by HIV prevalence. Spending was proportionately highest in countries with lowest GDP, countries with high spending per person on ART and countries with high HIV prevalence (Figure 3c). Due to this combination of factors, HIV treatment spending is not necessarily highest in the countries with the highest levels of HIV prevalence.

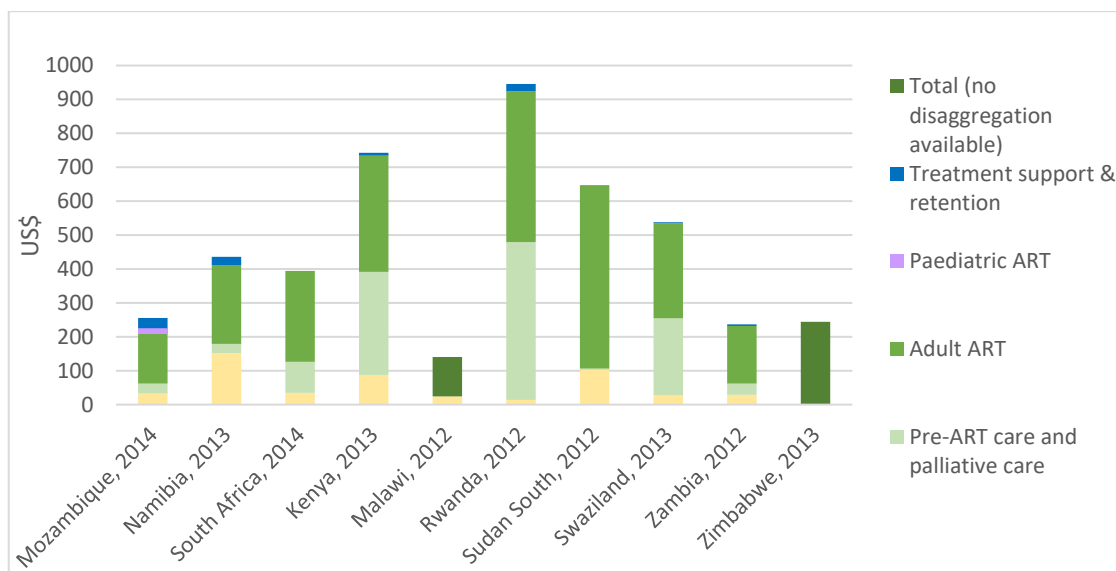
High investment in treatment in Rwanda led to high coverage, while limited investment in South Sudan implies very low coverage. Apart from South Sudan, countries with very different levels of investment

in diagnosis and treatment, have achieved ART coverage of 54-80% by 2015-16 (Figure 3 d). This suggests that countries with lower and higher levels of investment per person on ART have achieved fairly similar outcomes by 2015-16. Consistent comparable cascade data was not available for the years, for which expenditure analysis was done and hence, no systematic comparison of results in the cascade and annual spending was possible.

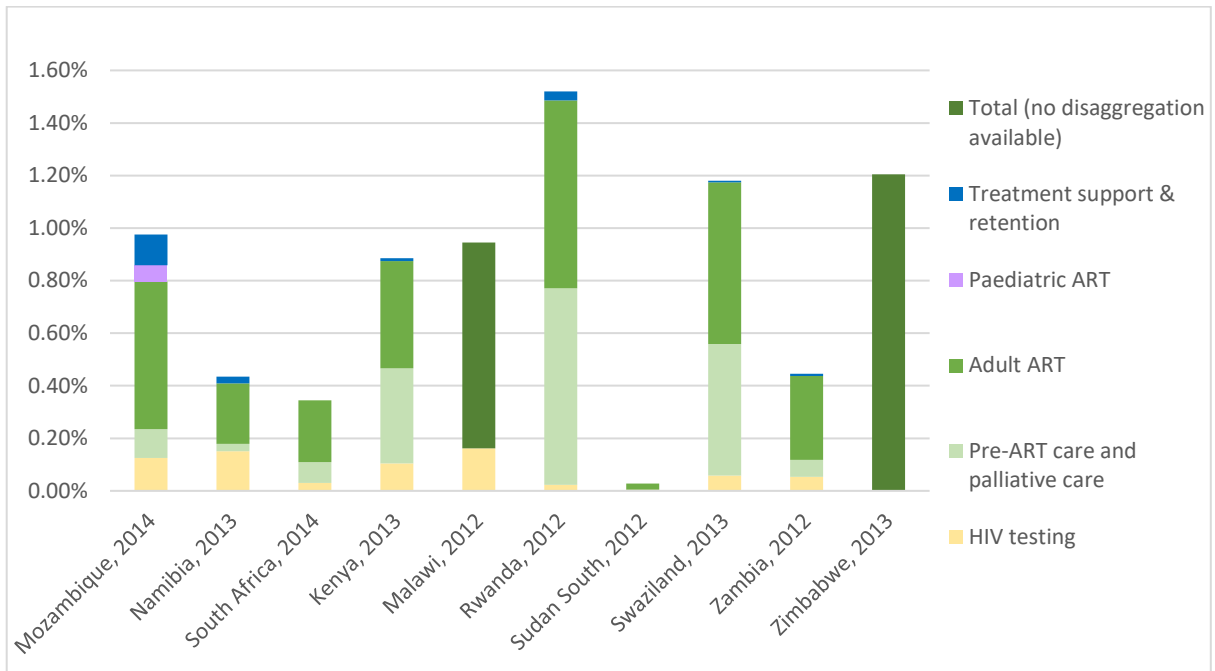
Figure 3. HIV treatment and care spending by sub-category in 10 countries
a. In % of total HIV treatment and care spending



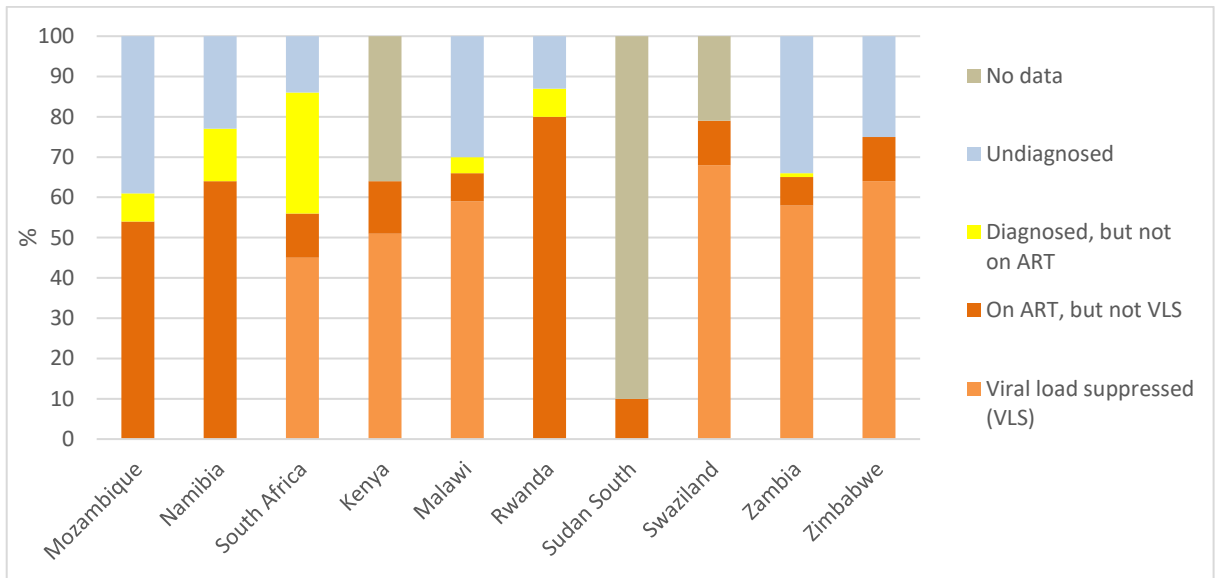
b. Per person on ART



c. In % of GDP



d. Progress towards 90-90-90 targets (2015-16)



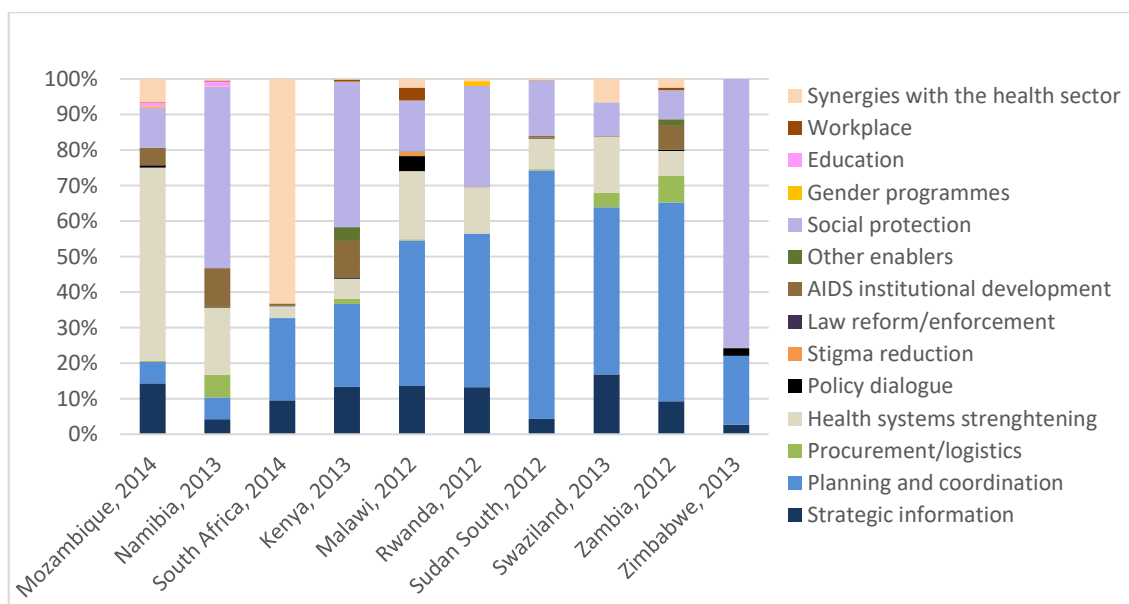
Source: Prepared by authors based on a summary table, which UNAIDS prepared using country reports and Spectrum estimates [8]

Cross-cutting management and support costs consumed a substantial portion of HIV spending and vary greatly in volume and what they were spent on

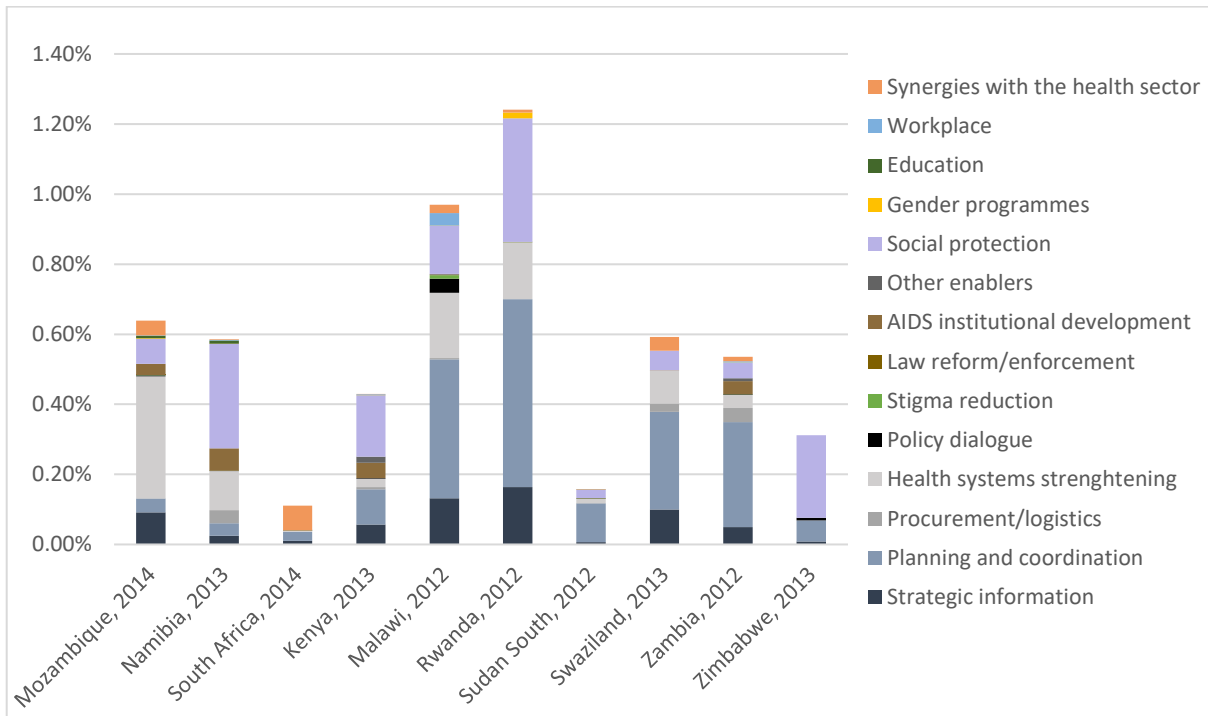
Cross-cutting support costs including management, health systems strengthening, social protection, gender, other development synergies and support costs ranged from 17% of HIV spending in Zimbabwe to 68% in South Sudan (Figure 1b), while also Malawi, Mozambique, Namibia, Swaziland and Zambia spent more than 30% of reported HIV expenditure on cross-cutting support costs (Figure 1b). The scope of spending on cross-cutting cost varies, but in half the countries (Malawi, Rwanda, South Sudan, Swaziland, Zambia,) planning and co-ordination dominates and accounts for more than 40% of cross-cutting support costs. In specific countries, other development priorities were reported as part of HIV spending including health systems strengthening (Mozambique), other synergies with the health sector (South Africa) and social protection (Namibia, Kenya and Zimbabwe). There is great variation in the level of cross-cutting costs per person living with, which tends to be highest where overall HIV spending per person living with HIV is high (Figure 1 c).

Relative to GDP, cross-cutting cost for management, enablers and synergies also varied greatly from less than 0.1% in South Africa to more than 1.2% in Rwanda and overall was relatively higher in low income countries (Figure 4b).

Figure 4. Cross-cutting supports costs in HIV responses in 10 countries in eastern and southern Africa
a. In % of total cross-cutting and support costs



b. In % of GDP

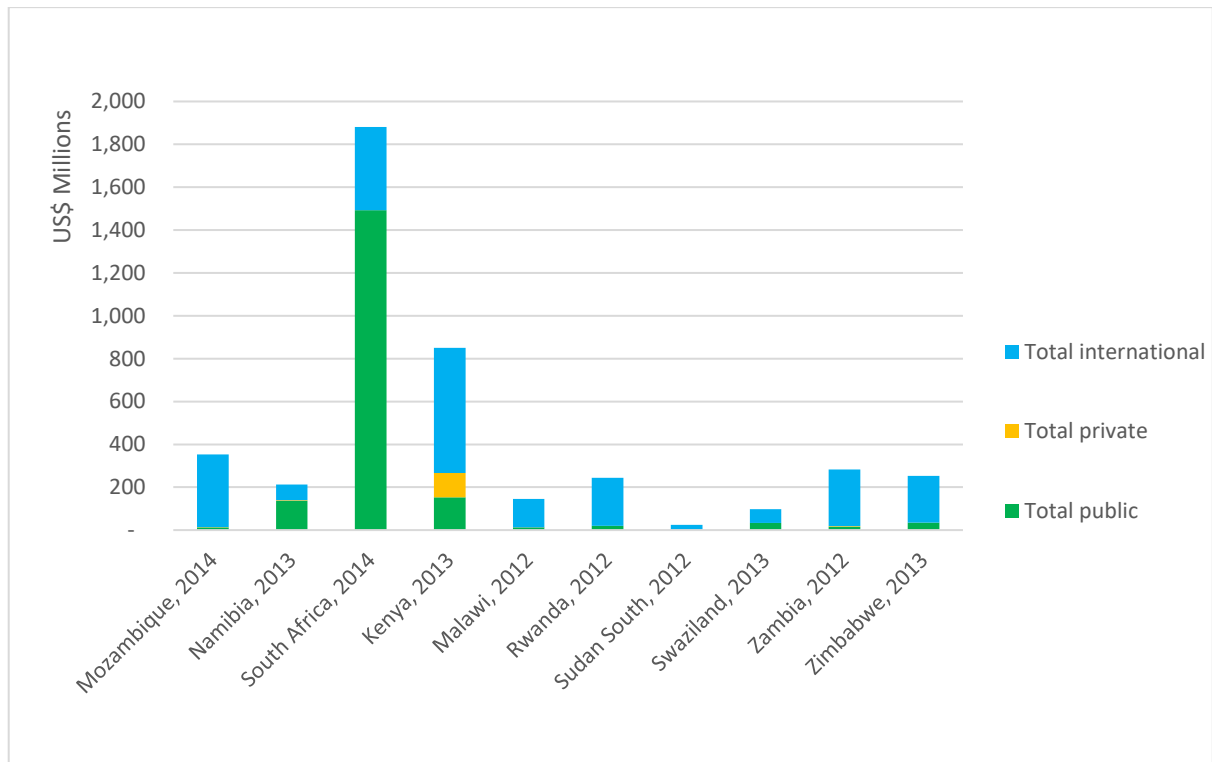


Financing sources: High dependence on international HIV spending

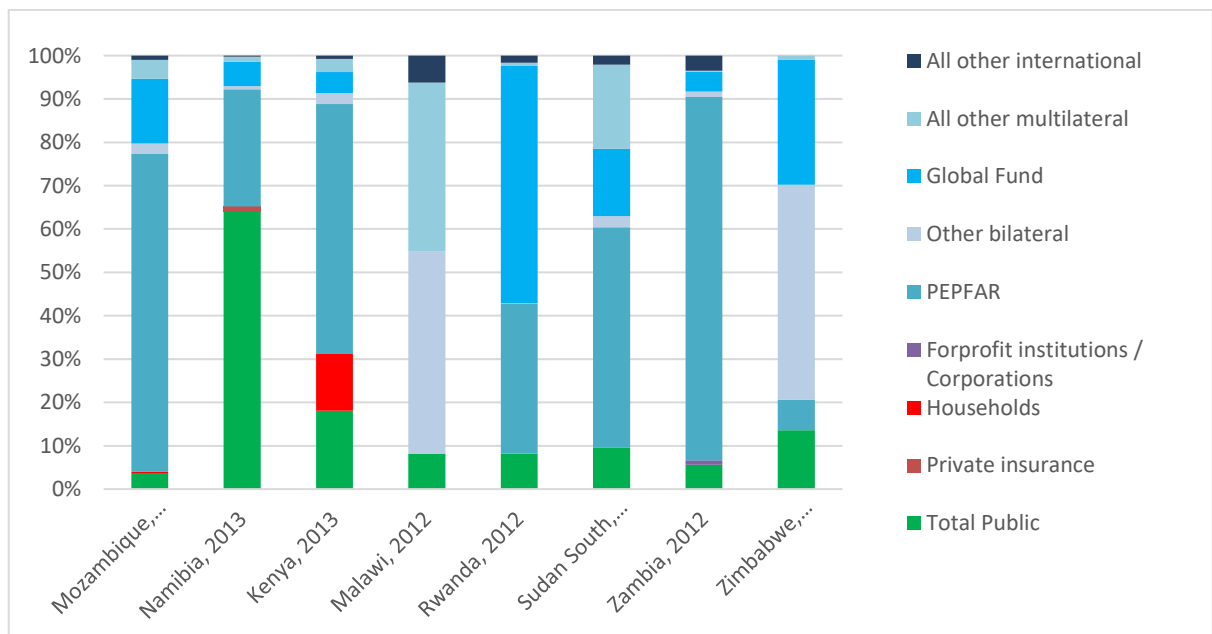
The volume of domestic HIV funding in South Africa exceeds domestic HIV funding in all other countries together (Figure 5a). Kenya receives the single largest external contribution to its HIV response in absolute numbers (Figure 5a). In half of the countries, international funding covered more than 90% of HIV spending, while only South Africa and Namibia funded the majority of the HIV response through domestic public financing (Figure 5b).

PEPFAR was the single largest external funder in a majority of countries except Rwanda where the Global Fund was the single largest funding source and Zimbabwe where other bilateral multi-donor support was the largest funding source. International contributions per person living with HIV are highest in countries with high total spending per person living with HIV (Figure 1c). This indicates that both high and low levels of spending per person living with HIV in specific countries are supported through international HIV spending.

Figure 5. HIV expenditure by financing source
a. In absolute numbers (US\$ millions)



b. By detailed source of funding (where available)



Note: For Malawi, Global Fund is included in other multilateral and PEPFAR in other bilateral.

Discussion

Levels and scope of investment into HIV responses varied greatly among countries. Despite similar epidemiological patterns between groups of countries in southern Africa (South Africa, Swaziland, Namibia as one group and Malawi, Mozambique, Zambia and Zimbabwe as another) and to a lesser extent eastern Africa (Kenya, Rwanda, South Sudan), each country reported a unique spending pattern for the year included in the analysis.

Table 2 summarizes key findings for each country and suggests potential areas of focus of future efficiency analysis in countries. In interpreting these findings is important to consider that HIV spending may have changed since the year covered by the analysis. Allocative efficiency studies in Malawi [9], Swaziland [10] and Zambia [11] as well as development of a prevention revolution road map in Kenya [12]—among other strategic planning exercises – have already systematically addressed the aspect of resource prioritization in specific countries in recent years as part of global analytical efforts to strengthen allocative efficiency. [13]

Table 2. Summary of findings and potential areas for further efficiency analysis in countries

	Key features of country HIV spending profile	Potential areas for further efficiency analysis at country-level
Kenya, 2013	Relatively high overall HIV investment, high treatment costs; within prevention relatively low spending on core sexual transmission programs	Implementation efficiency of prevention and treatment & care, in particular non-ART care costs (prevention road map developed in 2014)
Malawi, 2012	Low per capita HIV spending and lowest cost per person on ART but due to low GDP high spending in % of GDP; relatively high share of cross-cutting support cost	Implementation efficiency of non-ART care, review cross-cutting support costs (allocative efficiency reviewed in 2016)
Mozambique, 2014	Lowest contribution of domestic public spending; low treatment cost, but high spending in % of GDP; relatively high spending on cross-cutting support costs	Review allocations and implementation efficiency with a focus on cross-cutting support costs
Namibia, 2013	High investment per person living with HIV; large share of spending on cross-cutting support costs, low proportion for prevention, in particular VMMC	Review allocations and implementation efficiency with a focus on cross-cutting support costs and prevention
Rwanda, 2012	Highest investment per PLHIV and highest treatment cost per person, largely internationally funded, high cross-cutting support cost, prevention PMTCT focused	Review allocative and implementation efficiency across prevention, treatment & cross-cutting support
South Africa, 2014	Highest share of domestic investment, high focus on core HIV services, but despite high absolute investment, relatively low % of GDP spent on HIV, in particular prevention	Review implementation efficiency of selected sub-components of the response including coverage of prevention

Sudan South, 2012	Low HIV investment overall, lowest treatment allocation but very large share of spending allocated to cross-cutting support costs including planning and co-ordination,	Review allocative and implementation efficiency across the HIV response including a focus on cross-cutting support costs
Swaziland, 2013	Spending per PLHIV and treatment cost per person on ART above regional average; high non-ART care cost; prevention and cross-cutting cost within average	Review implementation efficiency of specific components of the response including treatment and cross-cutting supports costs
Zambia, 2012	Large proportion of HIV spending allocated to cross-cutting support costs; very high contribution of international financing;	Review implementation efficiency across different areas, in particular cross-cutting support cost (allocative efficiency reviewed in 2014)
Zimbabwe, 2013	High focus of HIV spending on core HIV treatment and prevention services, no data available for 2013 on detailed prevention spending;	Review implementation efficiency of selected sub-components of the response including coverage of prevention

Note: Spending profiles refer to the year under review and need to be reviewed in light of changes which were implemented since then.

Potential for refocusing prevention spending towards closing priority gaps

Heterogeneity in resource allocation was much larger in HIV prevention of sexual transmission compared to PMTCT, treatment and care. Core HIV prevention services for preventing sexual transmission only received a limited share of HIV prevention resources in several priority countries. For example in Namibia, VMMC only received 8% of prevention spending and 0.5% of total HIV spending, despite substantial coverage gaps and potential for impact [13]. In several countries investments into condom programming and programs for female sex workers were very low despite substantial coverage gaps [4]. Reasons for disparities between countries are likely to include limited consensus on priorities, delivery modalities and needed coverage levels for interventions, particularly those that are complex to measure such as condom programs, programs for female sex workers or behavior change programs. The very high level of more than 10-fold variation in the share of specific programs as of total prevention spending suggests that there may be potential for reallocation of prevention resources in several countries based on more detailed allocative efficiency analysis.

Besides drug costs, allocations to non-ARV components of care require review

Treatment costs per person on ART vary substantially across countries, which may partially be due to differences in drug costs [14]. After the 2012-14 period covered by this analysis ARV costs further declined [15], while treatment coverage increased [8] and future potentials for ARV price reductions through more efficacious regimens are being explored to reduce future drug resistance and costs for second line drugs [16]. Non-ARV components of treatment and care absorb substantial resources in many countries, but funds are used for different diagnostic and care interventions in different countries. In Malawi, treatment and care cost per person on ART increased from US\$141 to US\$242 in the 2016-7 national HIV response budget in a context of an expanding package of services including viral load monitoring. [9] The increase illustrates that the composition and cost of the package of treatment and care services beyond ARV costs will be a major contributor to the cost of HIV responses. The considerable differences in spending patterns between countries could be further analyzed at country level. Understanding service delivery modalities in countries with lower non-ART care costs may contribute to enhancing efficiency in countries with high spending on

these cost categories. In particular, implementation efficiency in relation to pre-ART care, palliative care, adherence support and the yield of HIV testing services could be further analyzed.

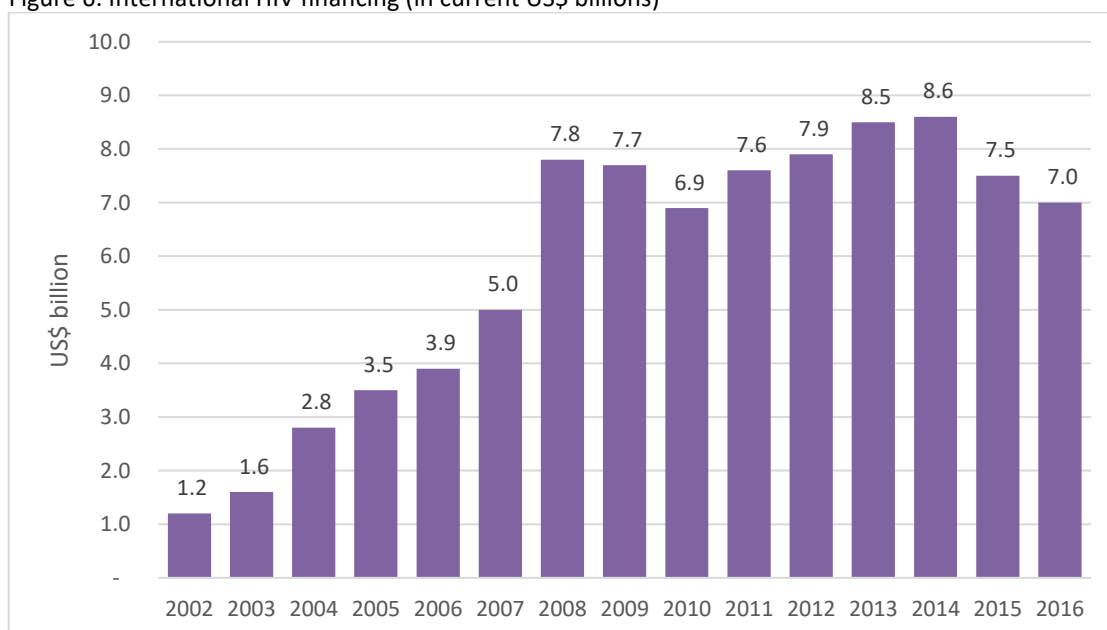
Cross-cutting and other costs: Rethinking which synergistic programs HIV responses are best placed to fund and manage

Differences in the scope of cross-cutting costs are more complex to interpret, because this area covers a wide range of expenses such as HIV response management, health systems strengthening, social protection and gender among others. The fact that different countries report different types of spending from HIV budget lines in this area suggests that no general statements are possible on what essential support costs across countries are and to what extent such development synergies need to be co-funded from HIV budgets. There may be genuine reasons for differences – such as HIV budgets making contributions to health systems strengthening in some countries based on specific gaps to be filled to deliver HIV services. In turn, spending patterns from countries also illustrate that many of these synergies do not necessarily need to be funded from HIV budgets, in particular in contexts where HIV budgets are limited and basic HIV services and demand generation are not fully funded. In terms of planning and management costs more specifically there are also great differences between countries, which suggest that the countries on the higher end of management and support costs could make savings in this area. In Malawi, a comparison of 2012 spending to the 2016-17 national HIV response budget showed a decrease in cross-cutting and other costs over time, while within the remaining cross-cutting costs further areas for potential implementation efficiency analysis included training, meeting, care and other support costs. [9]

Implications for enhancing efficiency: Potential for reallocations and alignment along the treatment cascade and for prevention outcomes

Our expenditure analysis for the period 2012-2014 has covered the peak years of international HIV funding, after which international support has begun to decline (Figure 6.) Global HIV targets envisage a substantial increase in coverage of prevention [4], diagnosis and treatment programs [8], which in a context of declining international financing will require increased domestic financing and enhanced efficiency.

Figure 6: International HIV financing (in current US\$ billions)



Source: Based on Kaiser Family Foundation and UNAIDS report [17]

Our analysis suggests that there may be considerable room for reallocations between sub-categories. The simplification of the reporting framework from 91 (before 2013) to 35 categories from 2014 onwards

already reflected streamlining of spending, but further alignment of investment to core outcomes along the treatment cascade and to other key prevention programs could be made at country level and globally. In 2015, the global ARV market in generic-accessible countries was estimated at US\$1.6 billion [15]. In 2016, combined international and domestic HIV spending in low and middle-income countries was estimated at US\$19.1 billion. This suggests that while ARVs are an essential and non-negotiable element of HIV spending, they do not account for the majority of HIV spending globally. This supports the hypothesis of a considerable potential for efficiency gains by conducting allocative and implementation efficiency analysis non-ARV care costs, prevention as well as management and other support costs.

Limitations

All data used in this analysis is based on country reporting, which -- despite detailed standardized guidance provided -- might not have been interpreted in the same way by all countries, particularly regarding what fits in different sub-categories of spending and potential incompleteness of reports -- a limitation, which has been observed elsewhere. [18] Nevertheless, it is unlikely that the large levels of variation in volume and thematic focus of spending could be fully explained by different interpretation of guidance and incomplete reporting. Another limitation is that estimated numbers of PLHIV and purchasing power adjustments, which were used in denominators of some analyses, have uncertainties and limitations in themselves [1], [19]. In addition, data from 3 different years (2012-14) may not be comparable exactly, because in some areas such as ART and PMTCT, global guidance and country-level coverage were changing over time in a dynamically emerging response. At the same time, our analysis suggests that despite the dynamic nature of ART and PMTCT responses over the 2012-14 period, spending on ART and PMTCT was relatively more consistent than spending on other areas. In other words, the global push for rapid change in these areas, may have contributed to more consistent investment across countries in the two areas. Finally, as changes may have occurred after the 2012-14 period in various countries, all patterns described in this paper should be seen as indicative and a representation of HIV spending at the time.

Conclusion

There are substantial differences in how countries in eastern and southern Africa spend HIV resources. Although partially explained by context, the extent of differences suggests that there is potential for further analyzing and improving allocative and implementation efficiency in several countries. Further analysis at country-level is required to determine specific areas for enhancing efficiencies, while scaling up national HIV responses towards a sustained efficient HIV response and expanding on the substantial gains made in several countries.

Author contributions and acknowledgements

In order to complement an HIV allocative efficiency study in Malawi [8], it was decided to conduct a comparative analysis of HIV expenditure in the eastern and southern Africa regions, on which this paper is based. CBe (conceptualization, analysis, writing of original draft), CBi (provision of data set, review and editing), MG (supervision, review and editing), NC (supervision, review and editing), NF (review and editing), DW (supervision, review and editing). We greatly acknowledge the work of all the staff of national AIDS coordinating bodies, other government institutions, UNAIDS, implementing agencies, funding partners and other experts who worked on collecting HIV spending data in the 10 countries in the context of NASA and GARPR exercises.

This paper reflects the work of individual authors and does not represent the views of their respective institutional affiliations.

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A mathematical modeling analysis to improve the allocative efficiency of the response to HIV/AIDS in Uganda

Abstract

Background: The global response to HIV/AIDS is at a crossroads. The global health financing landscape is changing as domestic and international funding for the AIDS response has stagnated and plateaued respectively and its prospects face an uncertain outlook. In Uganda, the quest to “end the AIDS epidemic as a public health threat by 2030” will be won or lost depending on how optimally HIV resources are used. This paper presents an allocative efficiency analysis to answer the following policy question: how can HIV funding be optimally allocated to the combination of HIV response interventions that will yield the highest impact in Uganda?

Materials and methods: This analysis is undertaken through an application of the mathematical modeling tool called Optimization and Analysis Tool (Optima) version 2.0. Optima 2.0 is a mathematical model of HIV transmission and disease progression, which uses an integrated analysis of epidemic, program and cost data to determine an optimal distribution of investments. I collated Uganda’s HIV epidemic and response data covering the period from January 1, 1990, to December 31, 2015, and spanning demographic, epidemiological, behavioural, programmatic, and expenditure dimensions. These data, in turn, were used to parameterise the above-mentioned population-based and flexible Optima HIV model to provide a formal method of optimisation and determines optimal allocations of HIV resources across numerous HIV programmes, target populations, and funding levels. Finally, novel in this paper is an embedded political economy analysis of the ensuing recommended policy and programmatic shifts.

Results: I find evidence of large potential gains in allocative efficiency. These are largest in reallocating funds from the general population to antiretroviral therapy (ART) and key populations programming, particularly focussing on female sex workers and men who have sex with men. Reallocating expenditure to priority geographic areas, more efficient community-oriented service delivery models, further task-shifting, and integration could help further improve the allocative efficiency of HIV spending in Uganda. Policy tools to realise these identified potential efficiency gains are identified.

Conclusions: Resources devoted to the HIV/AIDS response in Uganda are currently not being used as allocatively efficient as they could. This paper has identified areas where Uganda can increase the allocative efficiency of its HIV intervention programs. To move towards ending AIDS by 2030, I conclude that further reductions in national HIV incidence and AIDS-related deaths are possible through improved targeting of international and national HIV resources. However, allocative efficiency gains are constrained by “locked-in fiscal costs” (owing to the long period over which fiscal costs of the AIDS response evolve and the attendant implied moral and political commitments) as well as structural and behavioural barriers. Consequently, realizing these identified potential efficiency savings requires a painstaking focus on implementation processes and methods. Finally, insights from political economy and behavioural economics offer a better understanding of the dynamics underpinning power and resources (re) allocation and the attendant contestations as well as cognitive biases and heuristics with the potential to assure maximum impact of implementing the study recommendations and consequently leverage the same to expand fiscal space for the national HIV/AIDS response.

Key words: HIV, finance, resource, optimization, efficiency, Uganda.

Introduction

This paper, using mathematical modeling analysis, aims to contribute to optimize strategic investments for a sustainable and efficient HIV response in Uganda. Over the past 35 years since HIV was first recognized in Uganda, investments in the fight against HIV and AIDS have increased dramatically and are offering exceptional returns on investment (ROI) - in terms of the number of deaths averted and new HIV infections prevented for each Ugandan Shilling spent. Once heralded as a success story on the African continent for bringing down the HIV prevalence from the highs of 30% in the 1980s to as low as 6.4% in the 2000s, Uganda - buoyed by past successes and as part of the global community commitment - is working towards ending the AIDS epidemic as a public health threat by 2030. Corresponding ambitious targets have been set to inform the attainment of this goal and enshrined in her national HIV and AIDS strategic plans.

Despite the above-mentioned bold goals, there are ominous signs that the financing of the HIV response in Uganda is beginning to fracture as HIV resources are increasingly declining. Consequently, decision-makers and program implementers are increasingly faced with the challenge of reconciling growing demand for HIV services driven in part by the nature of HIV as “long-wave event”(Barnett et al, 2006)⁴⁶, the envisaged needed scale-up under the Fast-Track strategy, and the cost of inaction (such as historical under-investments in HIV prevention) among other factors on one hand, and a rapidly changing HIV financing architecture as resources available decline partly due to the 2008 global economic crisis, growing public debt and shifting global health priorities among other factors. To reconcile the above “irreconcilable” fiscal sustainability dynamics and thus mobilise adequate resources to move towards ending AIDS by 2030, there is an imperative to invest strategically in HIV programmes (Schwartländer et al., 2011).

In the current economic landscape, the achievement of greater efficiency from scarce resources should be a major policy lever for the long-term sustainability of the HIV response. This paper contributes to a better understanding of how to best achieve efficiency gains in HIV programmes in Uganda. This is the distinguishing added value of this paper. To the best of my knowledge, this present study represents the first Optima HIV application to Uganda⁴⁷. Specifically, I focus on one type of efficiency, allocative efficiency. As used here, to get the bang for a buck, it refers to whereby value for money is maximised by optimally allocating HIV funding across a mix of interventions in the right combination to yield the greatest health outcomes. The objective of this empirical modeling study was to estimate how to minimise the number of HIV infections by 2030 by focusing on the 4 Rs: the Right things (i.e. the most cost-effective combination of interventions), for the Right populations, in the Right places (i.e. locations) and in the Right way.

The rest of this paper is structured as follows. First, I present the methods employed. In the second section, the results are presented. Before a concluding section, I discuss the results. Specifically, in discussing the programmatic shifts recommended from the findings, I anchor them in the political realities and constraints as a point of departure to discuss pragmatic ways of balancing economics, science, and politics.

Data and methods

To estimate the optimal resource allocation across HIV programmes to maximize the impact of the funding available for the national HIV response through allocative efficiency, as well as planning for financial sustainability, I used the Optima HIV model, version 2.0. As the Optima HIV software tool itself is described in detail elsewhere (Kerr et al., 2015), for brevity, in what follows I describe how I approached key analytic

⁴⁶Barnett and colleagues (2006) define a long-wave event as one that “exceeds the span of a human generation in both gestation and impact, but it touches peoples’ lives intimately here and now. We are usually unaware of its starting point, and by the time we become aware of its presence and effects it takes a long time to slow down the process or to stop it. It demands visionary thinking to engage with its implications and long-term ramifications”

⁴⁷ The global Optima HIV allocative efficiency model presented by Kelly and colleagues (2018) utilised the Optima project file that I put together for this study. It presents results at an aggregated level for 44 countries.

steps in this study. To inform the model, I used demographic, epidemiological, and behavioural data by population group, along with expenditure and coverage levels of HIV programmes from January 1, 1990, to December 31, 2015. This was collated from various secondary sources. By fitting the model to data starting from 1990, I was able to efficiently replicate the historical epidemic trends in the model, thereby improving its forward-looking predictive capabilities. For details on data sources and parameter values used, see Optima matrix and project file accessible through the UCL Research Data Repository at <https://www.ucl.ac.uk/isd/services/research-it/research-data-repository>

I calibrated the epidemic model with UNAIDS' readily available HIV estimates and projections (UNAIDS, 2019) for HIV prevalence per population and age group, number of PLHIV, number of people receiving antiretroviral therapy (ART), the incidence of HIV infections, and AIDS-related mortality. The rationale for calibrating to UNAIDS data was due to three (3) main factors. First, the data is readily available at AIDSInfo (see <https://aidsinfo.unaids.org/>). Second, these estimates already consider locally provided estimates as well as population-based surveys. Lastly, to minimise the politics around global health data, they are regarded as legitimate as they are officially approved and endorsed by the Government of Uganda before publication. Selected calibrations are shown in Appendix I.

For cost functions, the latest reported time-unvaried unit costs for each HIV programme were applied, as obtained from Kwesiga (2016) as well as the recent national AIDS Spending Assessments (NASA (UAC, 2012)). These estimated costs are reported in current US\$. As used in this paper, the cost function parameters are the average cost (AC) of reaching an individual with the programme at the current level of operations, the estimated maximal attainable coverage of the programme, and the programme effect in terms of behavioural or clinical outcomes. Notably, I assumed that past expenditures for all services and components of the HIV response are a fair representation of the costs needed to implement these responses in the future. The cost-function parameter values could vary uniformly over ranges within 10% of best assumptions, based on 1,000 simulations.

In terms of the optimisation algorithm, I adopted an innovative adaptive stochastic descent (ASD) algorithm, as developed by Kerr et al. (2018), to calculate the optimal resource allocation against defined constrained objective functions. Here, Monte Carlo initialisations were used for the optimisations to minimise the possibility of finding a local optimum. As a default for optimisations in the model, they start ten times from the initial allocation and ten times from random allocations. It is this algorithm that I applied to estimate the optimal allocation of HIV resources across available HIV interventions to maximise health impact from 2016 to 2030, in comparison with last reported budget allocations. Programs were categorised as targeted or non-targeted, whereby targeted programmes include treatment and prevention programmes with a clear, potential effect on reducing HIV transmission, morbidity, or mortality. On the other hand, non-targeted programmes are those that might be essential in an HIV response but do not have a direct effect on health or cannot be attributed to population-specific outcomes. In line with global nomenclature proposed in the UNAIDS Strategic Investment Framework (Schwartländer et al., 2011), I refer to these as "enablers" elsewhere in this thesis. Consequently, as non-targeted HIV programme expenditures do not have a direct objectively verifiable effect on outcomes, I considered them to be fixed. In other words, they remain an integral part of the national HIV response but are excluded in the explicit optimisation. Relatedly, to account for political and moral commitments around HIV treatment, I subjected the optimisation to constraints such that funding to HIV treatment programmes (such as ART, opiate substitution therapy, and prevention of mother-to-child transmission) could not be decreased. This reflects ethical treatment approaches.

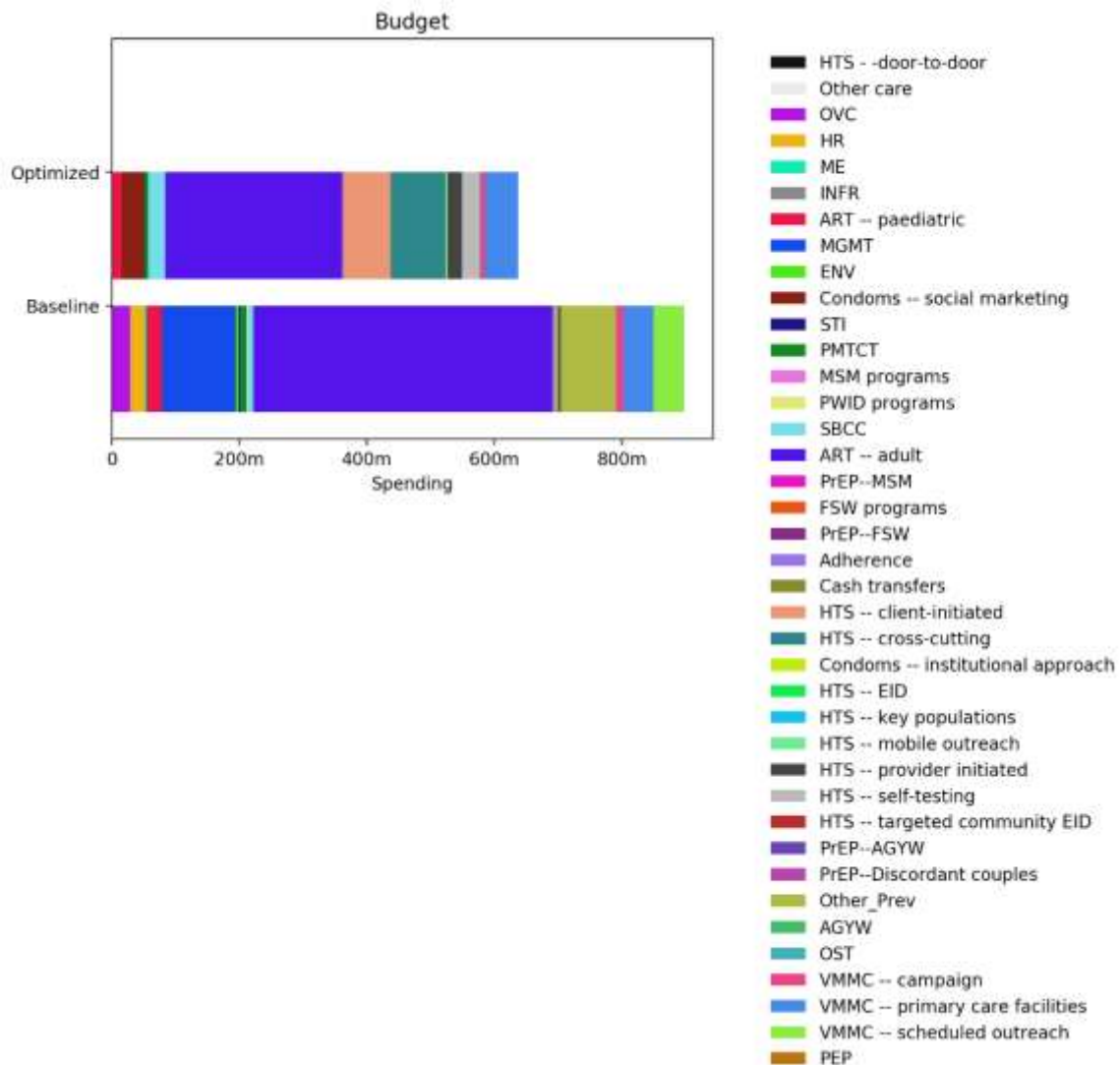
Finally, the optimisation analysis in this study is based on reallocation of last reported HIV funding amounts to redistribute funding between programmes. To ground the analysis in real-world realities, owing to the factors shaping the global health financing landscape as discussed earlier, I held international resources as constant. As a last analytic step, using different combinations of coverage for HIV programmes, the change in risk behaviour and morbidity and mortality outcomes were modeled. Based on these, new HIV infections and AIDS-related deaths were projected to 2030 under different funding amounts and

programmatic allocations across every possible combination of allocation. The two (2) analytic scenarios used are extensively described in Chapter 3 of this thesis. It is the modeled effect of these scenarios, with optimal resource allocation, that I used to estimate the cumulative new HIV infections and AIDS-related deaths by 2030. These are presented in the next section.

Results

To optimize annual HIV resource allocation to minimize new HIV infections and HIV-related deaths by 2030, Figure 1 illustrates the resulting recommendation to scale-up female sex worker (FSW) programs, voluntary medical male circumcision (VMMC) at primary care facilities, HIV testing services (HTS) using mobile outreach, evidence-based social and behaviour change communication (SBCC), provider-initiated HTS, client-initiated HTS, cross-cutting HTS, condoms programming using social marketing and HIV self-testing.

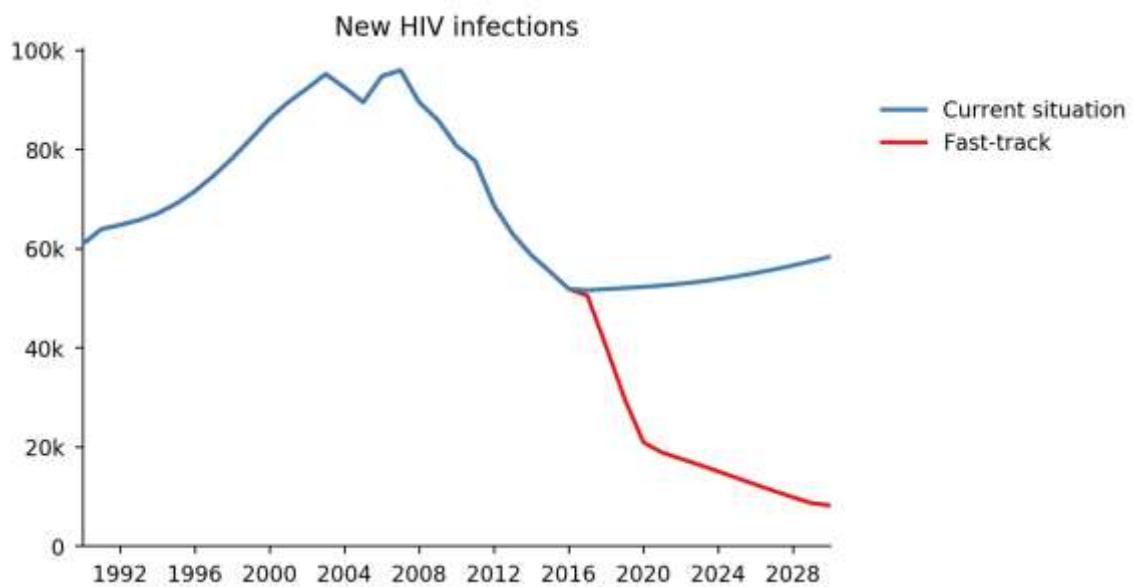
Figure 1: Latest reported and optimized annual 100% budget allocations to minimize infections and deaths by 2030 (in current USD).

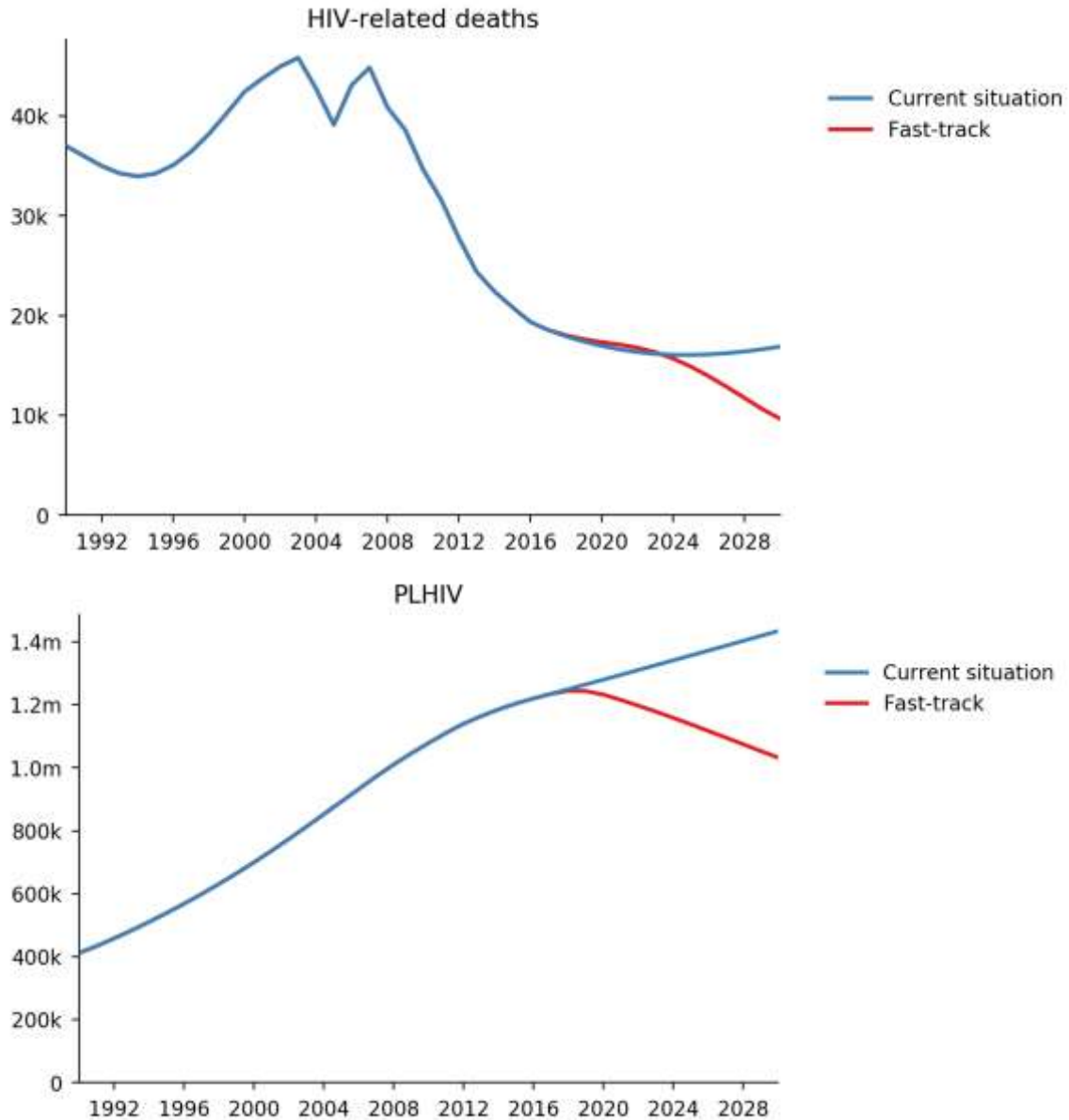


Conversely, an optimised allocation would see investments shifting away from less contextually cost-effective programmes targeted at the general population, such as sexually transmitted infections (STI) diagnosis and management, door-to-door HTS, and institutional approach to condoms programming. Finally, overall, there is a 28.98% potential saving from optimizing allocations.

Finally, in epidemiological terms, if the above recommendations are adopted and implemented, Uganda would move towards the Fast-Track targets. To this end, it is projected that 430,000 more new HIV infections (37% more) could be averted by 2030. It is important to note that, similar to my findings in Chapter 3, this will still be far below the targeted 90% decline by 2030 (relative to the 2010 baseline), let alone getting HIV incidence less than one in 10, 000 people per year a necessary benchmark for controlled HIV epidemic (Galvani et al., 2018).

Figure 2: Estimated trends in new HIV infections, HIV-related deaths and PLHIV with optimised resource allocation (2016 – 2030).

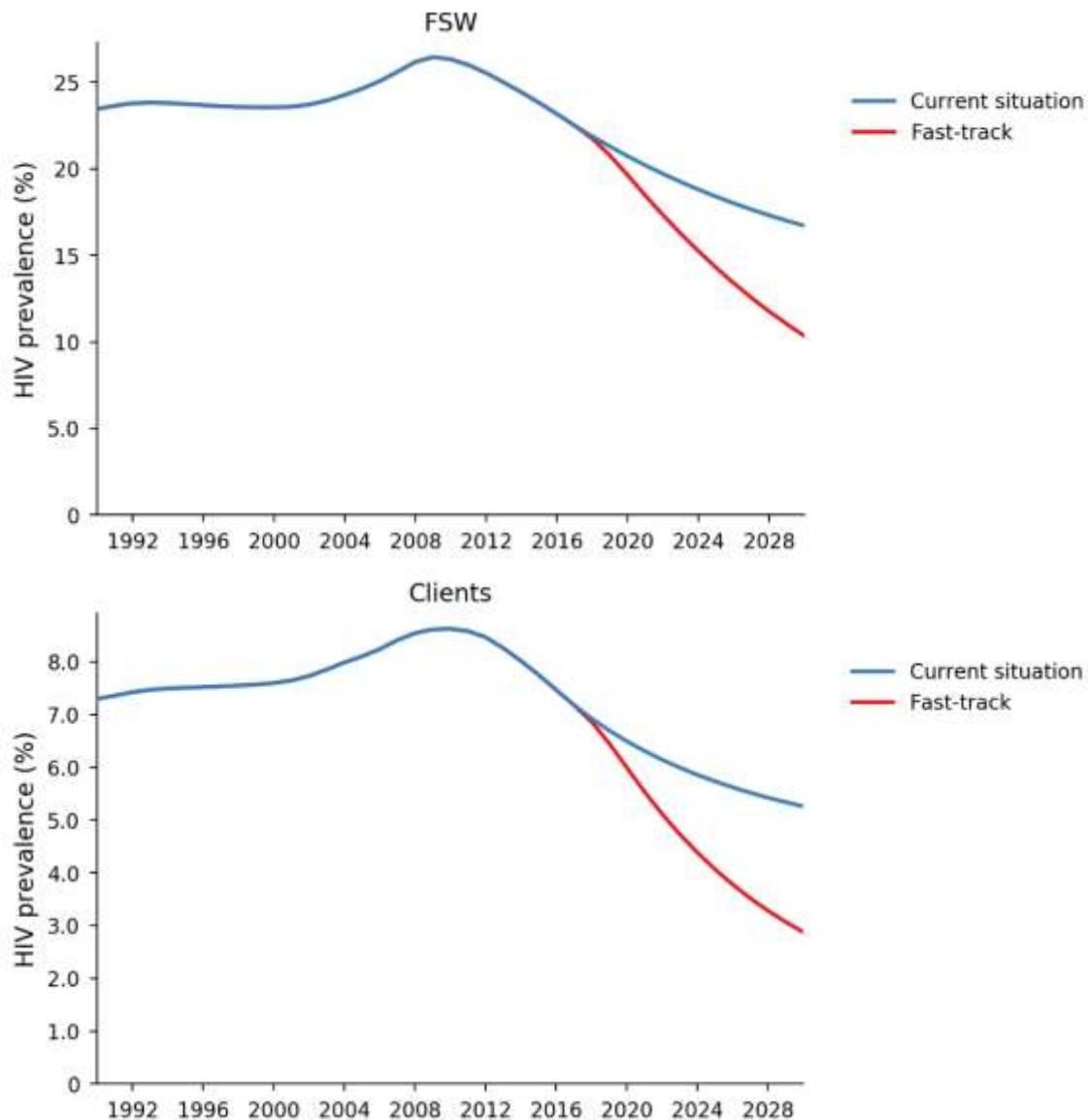




Discussion

An overarching message, and of relevance to Uganda and other resource-constrained settings, is one that draws from the central tenets of economics: limited HIV resources must be invested cost-effectively. In this paper, I show that by optimising HIV resources from 2016 to 2030, about 30% more new infections could be averted by 2030 compared with existing allocations. Based on this analysis, the most common priority towards achieving these reductions should be to scale-up ART and one or more efficacious HIV prevention and testing programmes targeting key populations. See Figure 3 for an illustration of the impact on HIV prevalence among FSWs and their clients. Albeit the relatively small sizes of key populations (in nominal terms), interventions targeting them have a potentially significant role to play in bending the epidemic curve. The notion of "force of infection" is central to this.

Figure 3: Estimated trends in HIV prevalence among FSWs and their clients with optimised resource allocation (2010 – 2030)



Although not included in the optimisation, more than a third (34%) of total HIV funds in Uganda are being spent on non-targeted programmes. As discussed extensively in Appendix 10 (of this thesis), this may be suggestive of an untapped opportunity to capitalise on reducing spending on non-targeted programmes and to optimally reinvest any savings in targeted programmes to further improve health outcomes. Relatedly, given the wide heterogeneities in HIV incidence within and between districts, I posit that there is an imperative to tailor the response to locations. As such, further reductions in incidence could be achieved if HIV resources were geospatially redistributed, with a priority shift in funds towards high HIV incidence districts. These represent settings where the greatest health outcome could be achieved.

Given HIV treatment is the most significant cost driver of the national HIV response in Uganda, it is safe to argue that response is currently heavily skewed towards HIV treatment, accepting the benefits for prevention. This study offers insights on what can be done to reduce infections and thus explicitly reduce the attendant long-term fiscal liabilities as a policy objective. This study reaffirms the ongoing gap in HIV resource needs devoted to HIV combination prevention. Looking to the future, more resources will be

needed to achieve HIV incidence targets by 2030. Even with Fast-Track coverage targets reached by 2030, this study reaffirms that Uganda will not achieve an epidemic transition, a key benchmark to end the AIDS epidemic as a public health threat by 2030 (Ghys et al., 2018).

To improve health outcomes in resource-constrained settings, such as Uganda, we need to focus on both 'what' and 'how'. This study empirically shows the alternative service delivery models that could yield maximum impact. Again, in implementing the shifts recommended by this study, particularly those requiring deprioritizing less efficient programs, it is important to recognize two (2) notable constraints. First is ignorance, that is the lack of knowing what works. Second is ineptitude. Here, knowledge exists but an individual or group of individuals fails to apply that knowledge correctly. These behoove us to figure out both the 'what' and the 'how' respectively. Thus, to mitigate against these political and behavioral constraints, whilst not unnecessarily presenting the novel ideas in Chapter 4 as a substitute for the much-needed necessary structural change, they offer pragmatic ways of balancing economics, science, and politics.

Finally, as with any modeling study, this suffers from several limitations. These have been discussed elsewhere (see Chapter 4 of this thesis and Kelly et al., 2019). As such, these findings are only modeling analysis projections. They have not been confirmed in practical settings. Neither have the results showing that optimal allocations are indeed more efficient in practice been validated, despite the study being calibrated to reflect country-endorsed and UNAIDS-endorsed epidemiological estimates. As discussed earlier, shifting resources – particularly deprioritising certain programs - based on evidence from resource optimisation studies such as this one is not always feasible – as there are losers and winners - given inherent political incentives among policymakers and implementers. The political economy considerations and behavioral economics-informed insights highlighted should be considered to move the country to a more optimal response if there is the will to make a greater impact.

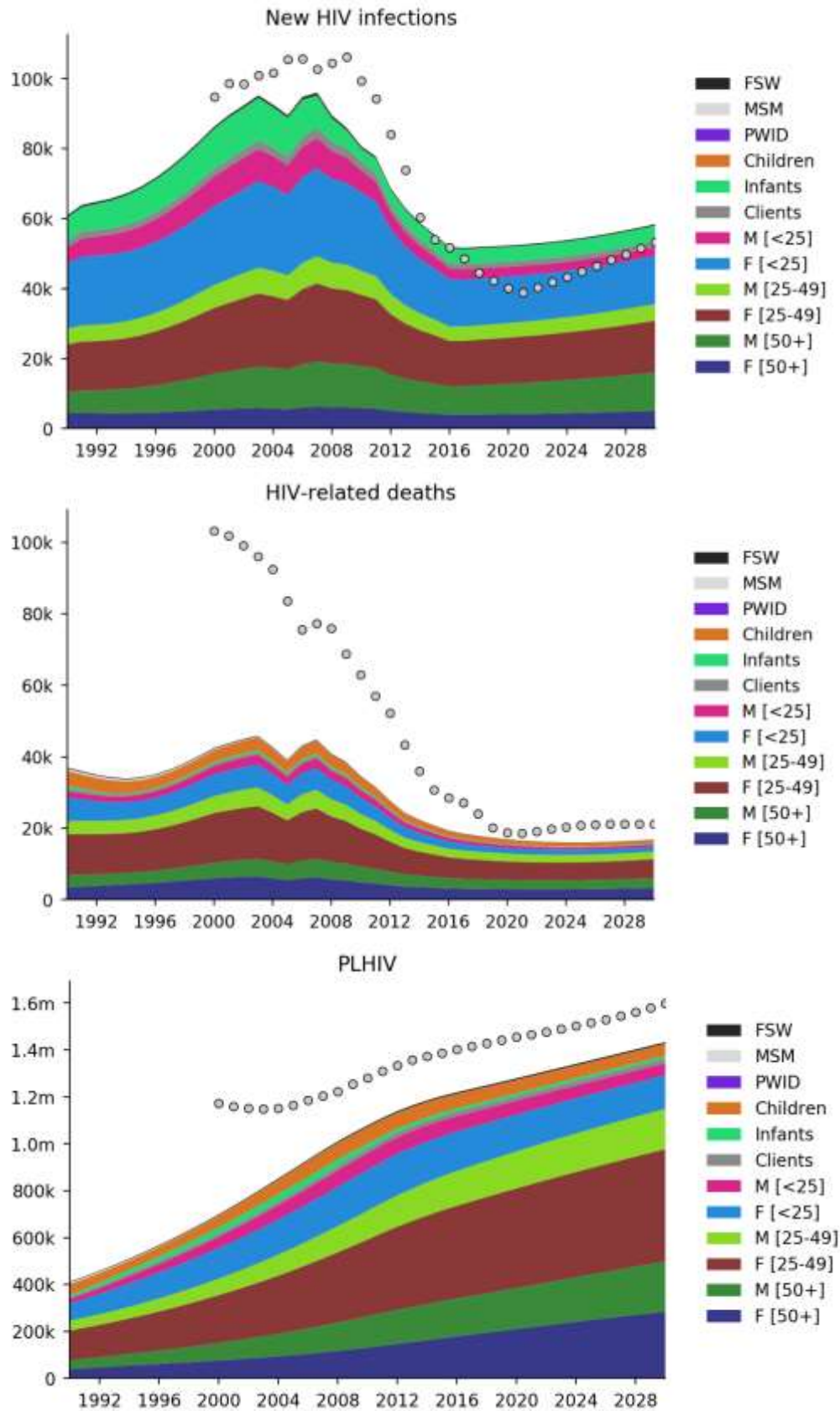
Conclusion

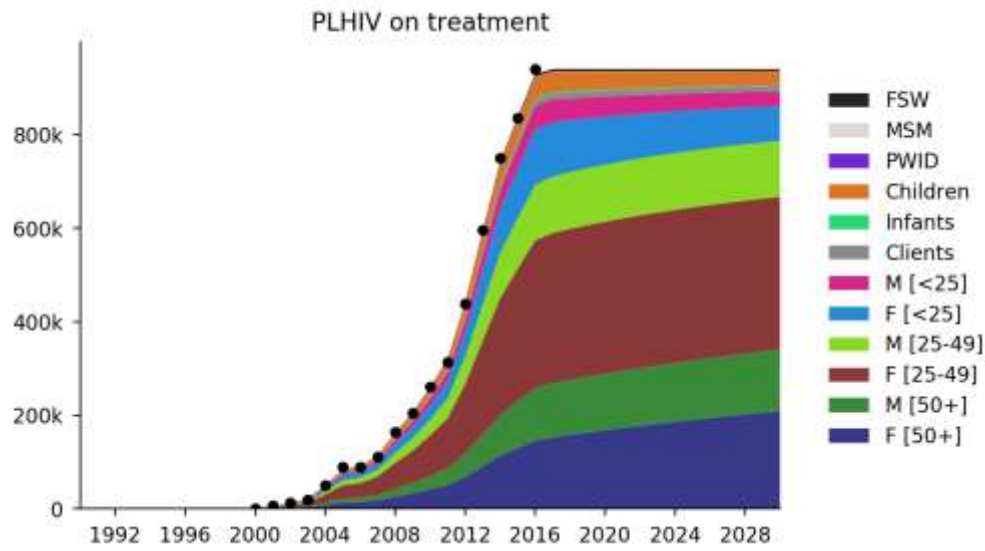
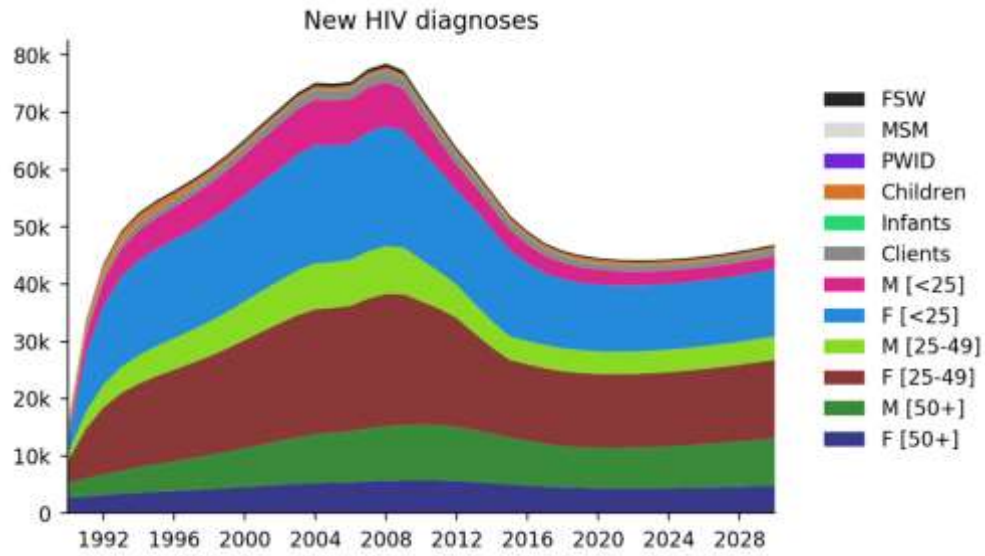
In this paper, I estimated where shifts in resource allocation could lead to improved effect with existing funding or a similar effect with less funding. Also, further reductions in HIV incidence are possible through improved targeting of HIV resources. To move from analysis to action, these findings have the potential to guide programme planners, policymakers, and donors in their decisions for improving population health outcomes. However, allocative efficiency will only improve the HIV response to a certain extent. A key policy implication is that – *inter alia* - innovations must also be realised to deliver HIV services at reduced costs by pragmatically revising policies to ensure resources are strategically invested in the most cost-effective HIV programmes that target populations and locations where they will have the strongest health effect. To this end, in addition to the efficiency gains identified for the HIV response in this paper, a range of efficiency gains could be explored across the health sector including (a) evidence-informed prioritization, both geographically (districts) and by intervention, (b) results-based approaches to financing while considering disease burden and (extended) cost-effectiveness, (c) active performance management of facilities and other implementers at national and sub-national-level, (d) optimized use of facility and outreach capacities, (e) enhanced accountability in the use of resources, and (f) optimized procurement while maximizing the use of generic products.

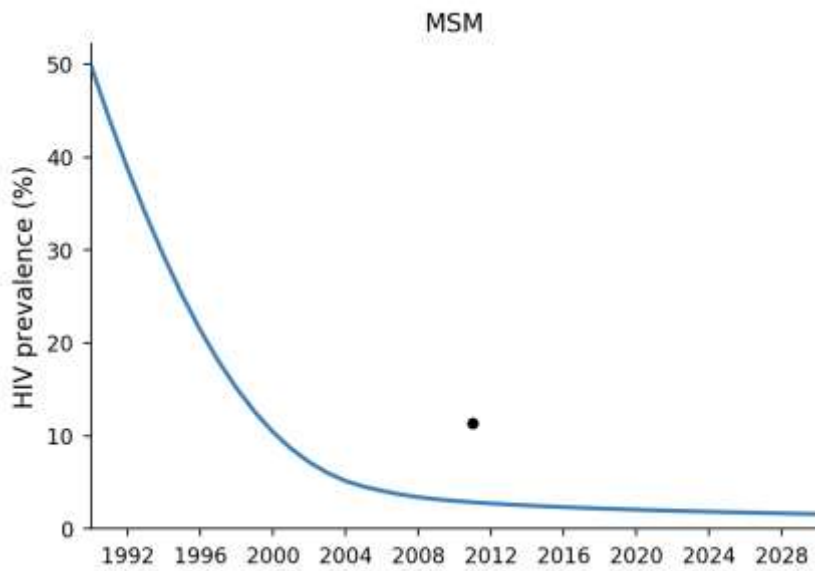
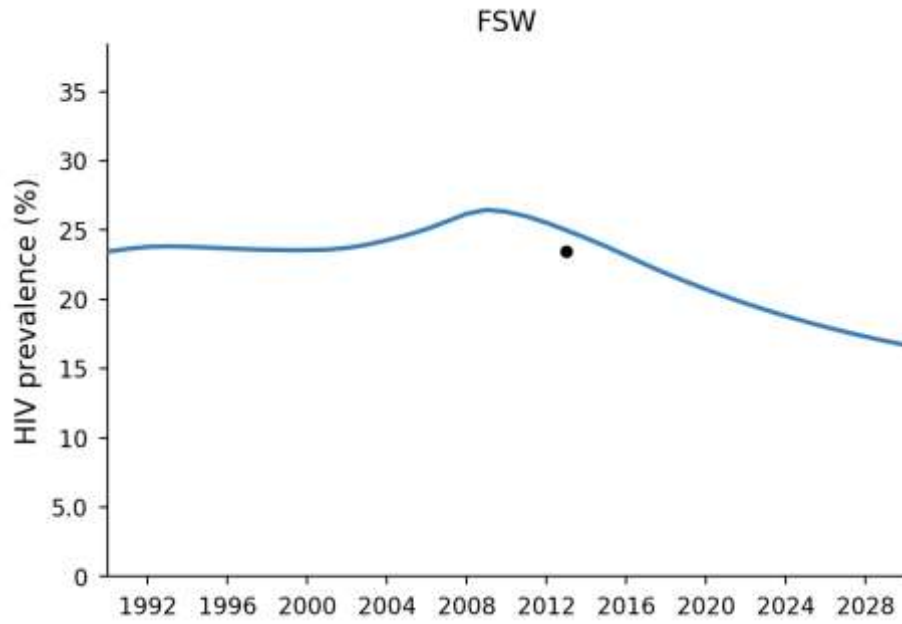
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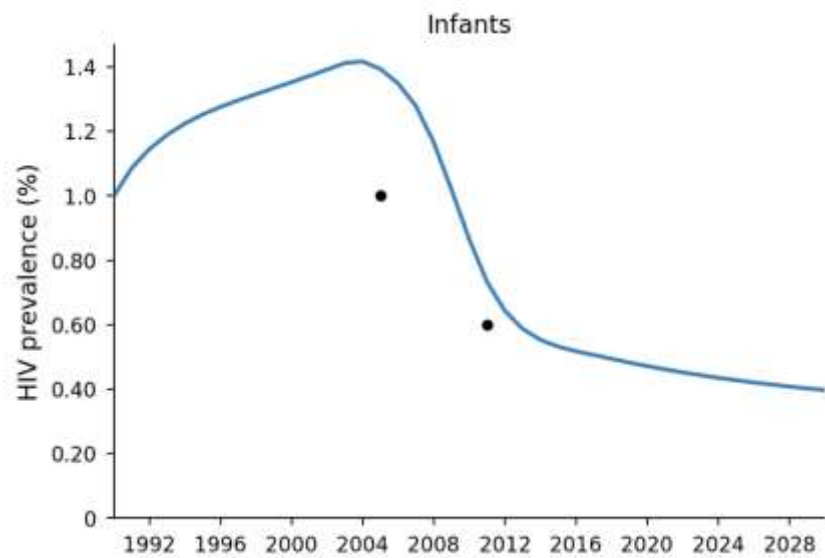
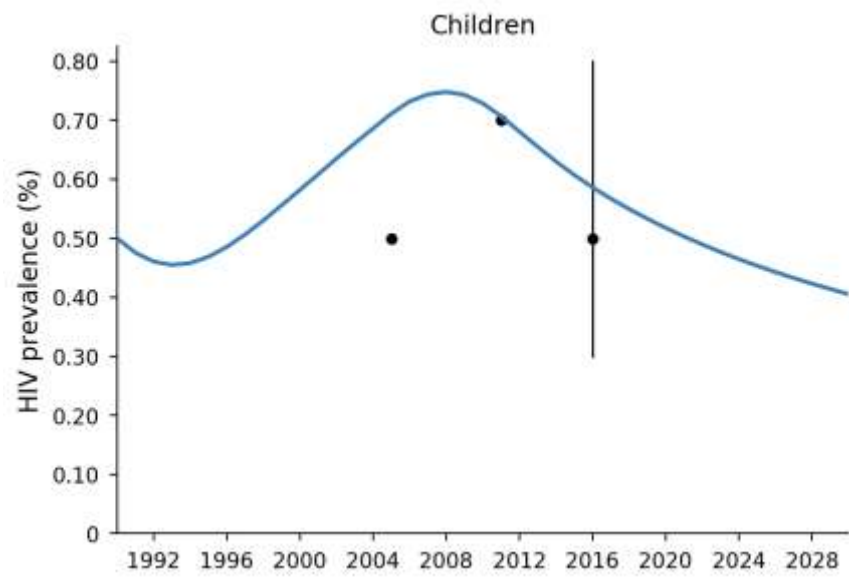
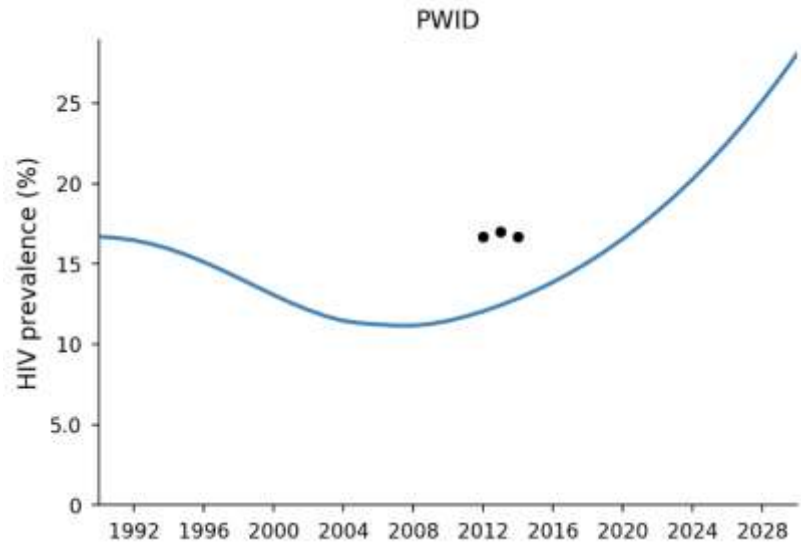
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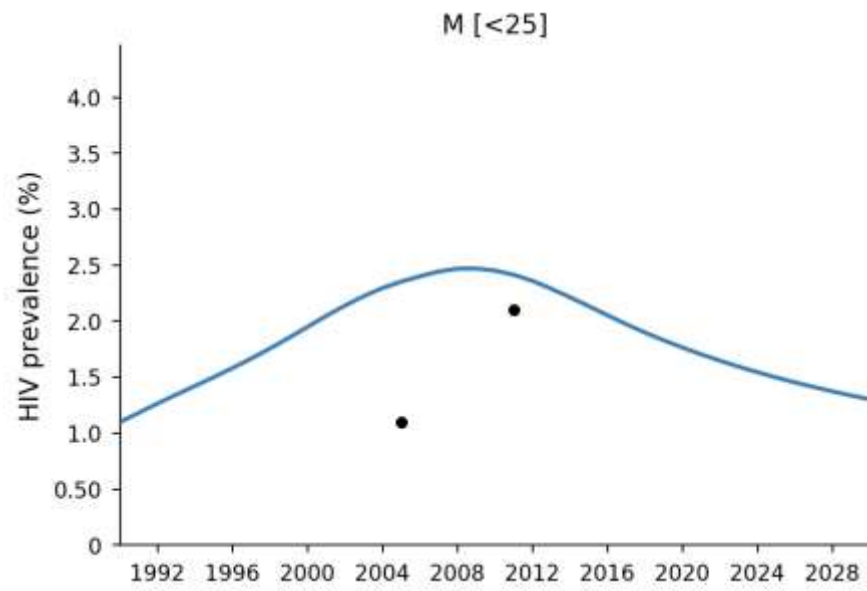
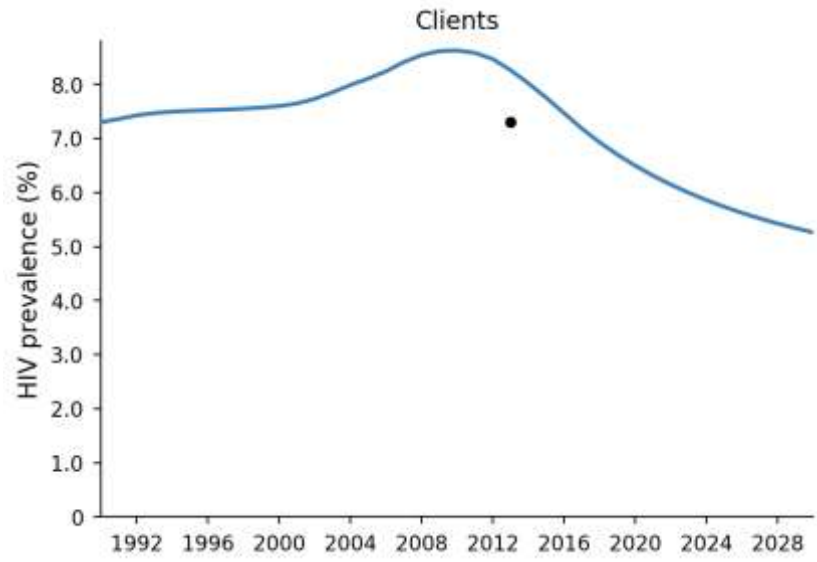
Appendix I: Selected model calibrations

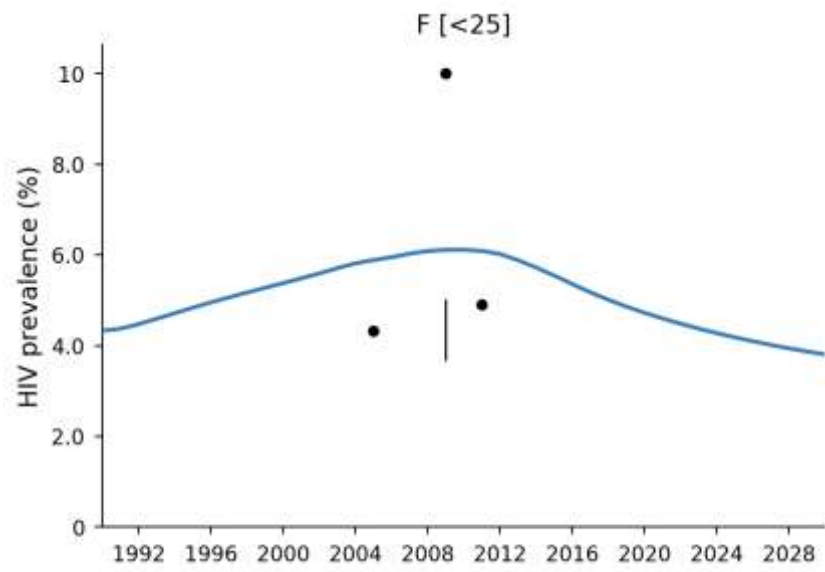
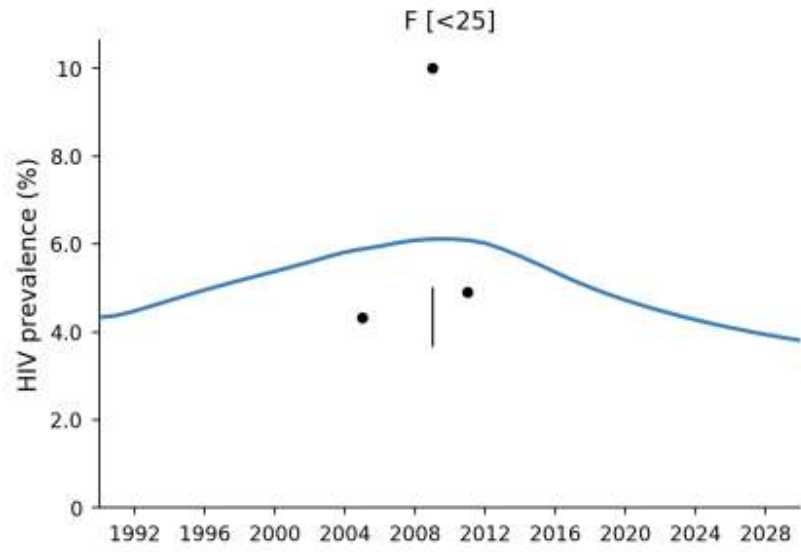


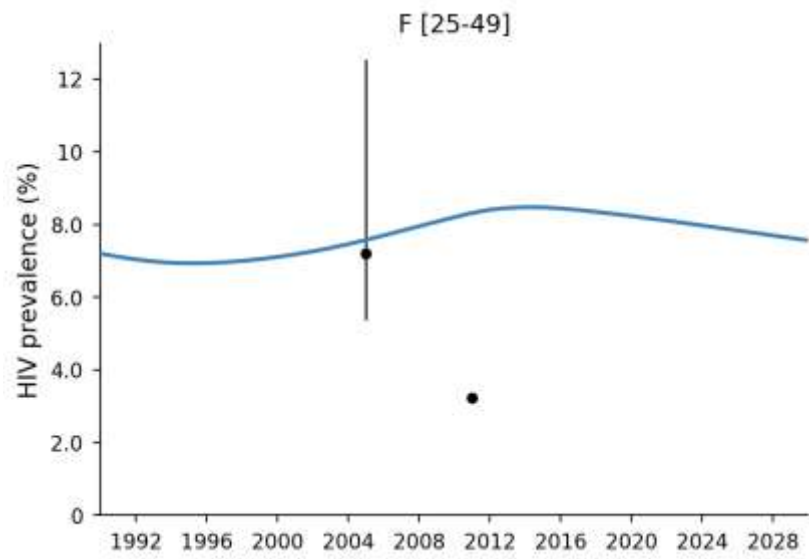
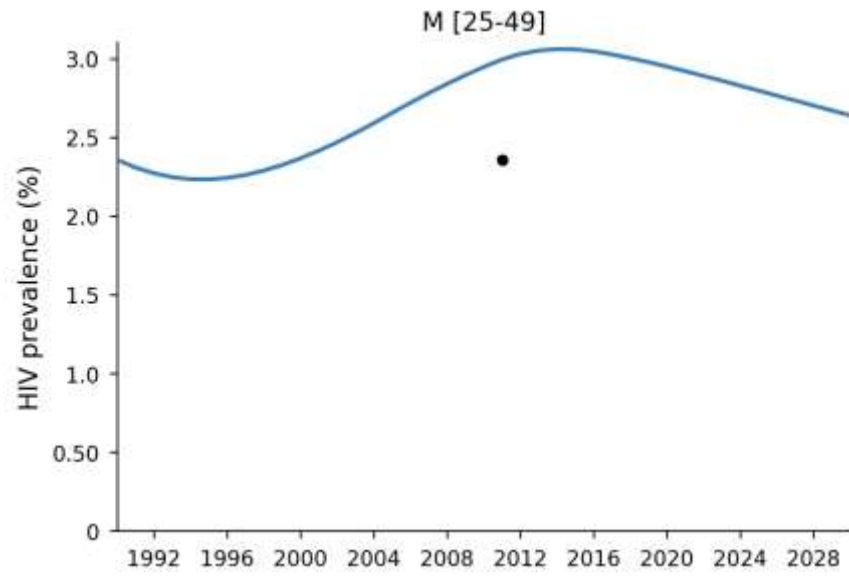


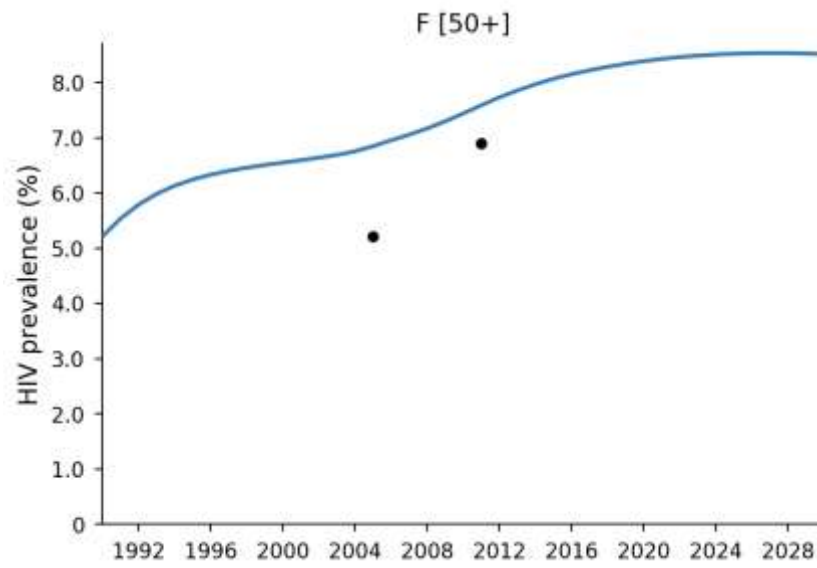
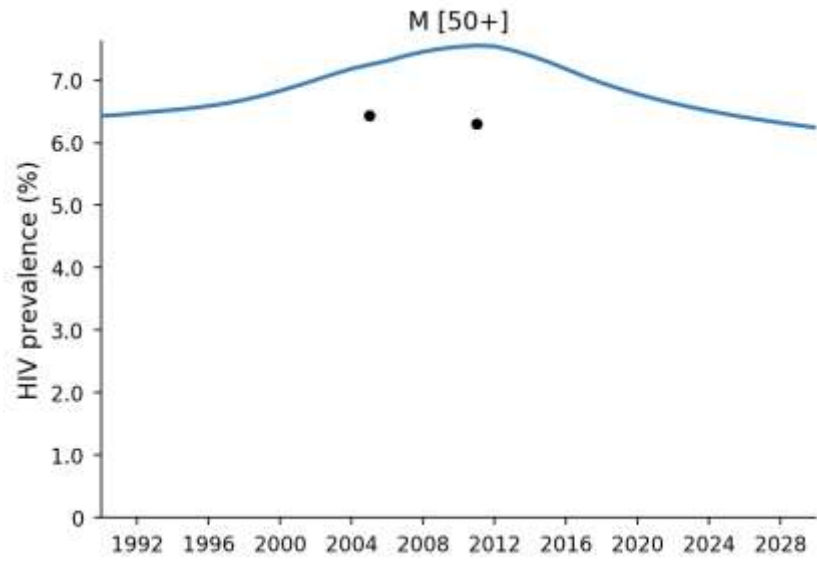












Appendix 12: Search string for HIV and AIDS

(HIV* OR AIDS* OR HIV Infections[MeSH] OR HIV[MeSH] OR hiv[tw] OR hiv-1*[tw] OR hiv-2*[tw] OR hiv1[tw] OR hiv2[tw] OR hiv infect*[tw] OR human immunodeficiency virus[tw] OR human immunodeficiency virus[tw] OR human immuno-deficiency virus[tw] OR human immune-deficiency virus[tw] OR ((human immun*) AND (deficiency virus[tw])) OR acquired immunodeficiency syndrome[tw] OR acquired immunodeficiency syndrome[tw] OR acquired immuno-deficiency syndrome[tw] OR acquired immune-deficiency syndrome[tw] OR ((acquired immun*) AND (deficiency syndrome[tw])) OR "Sexually Transmitted Diseases, Viral"[MeSH:NoExp])



Options for long-term sustainable financing of HIV/AIDS responses in Uganda

Page 1: Questionnaire

As mentioned in your email invitation, this questionnaire is meant to survey your subjective preferences on future HIV/AIDS financing in Uganda. Your input is highly valued and appreciated, and will only be used in anonymous form.

Page 2: Validation

1. Please copy-paste the validation code included in your invitation email.

Page 3: About you

Please provide some basic information about your affiliation

2. Please indicate your age group

- < 30 years
- 30 – 44 years
- 45 – 64 years
- > 65 years

3. Which category best describes your professional affiliation? * *Required*

3.a. If you selected Other, please specify:

Page 4: Questionnaire - Part I/II

Please indicate your agreement or disagreement with the statements below on the following scale, with 4 being neither agree nor disagree:

(Strongly agree) 1 2 3 4 5 6 7 (Strongly disagree)

Revenue generation

4. If the HIV/AIDS response were to raise additional resources to ensure its funding is sustainable over the medium to long term, to what extent do you agree or disagree that the following suggestions are good ways of raising these additional resources?

	1	2	3	4	5	6	7
Raise additional funding from ordinary tax revenues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from government borrowing (indexed to GDP)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from capitalising a national AIDS trust fund	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from a Debt2Health debt swap agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from a Buy-Down (a debt conversion instrument)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Raise additional funding from an increase in excise tax on tobacco, alcohol, sugar and sugar-sweetened beverages and ultra-processed foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from the National Health Insurance Scheme (NHIS)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from risk and credit guarantees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from social and development impact bonds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from diaspora bonds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from currency / financial transaction levy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from remittances levy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from mobile phone 'airtime' or telecommunications levy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Raise additional funding from investing oil revenues in a sovereign wealth fund and finance HIV services from interest gained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding from compulsory corporate social responsibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Raise additional funding by introducing an increase in income tax earmarked for HIV/AIDS services.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Page 5: Cost reduction

5. To what extent do you agree that the following suggestions are good ways of decreasing the cost of the national HIV/AIDS response?

	1	2	3	4	5	6	7
Eligibility for free antiretroviral treatment (including laboratory tests) should be means-tested, e.g. free for lowest income quantile or vulnerable groups but not free for everyone else	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p>Define a more restricted package of care that will be free at the point of use (subject to moderate co-payments) and exclude from the package services deemed be less essential including, among others, all third line HIV treatment.</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>Implement a co-financing approach by expanding the HIV resource envelope by pooling budgets across sectors</p>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Page 6: Program efficiency

6. To what extent do you agree or disagree that the following suggestions are good ways of improving the efficiency of implementing HIV/AIDS programs? *Optional*

	1	2	3	4	5	6	7
Privatising parts of HIV services enabling private sector competition and profits to take place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using performance-based and results-oriented approaches to financing HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using community-oriented service delivery models to provide HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<p>The publicly funded HIV programs should adopt more restrictive purchasing of new and expensive technologies and treatments, meaning that not all new treatments and technologies would be made available</p>	☐	☐	☐	☐	☐	☐	☐
<p>It should be possible to opt-out of the public sector HIV program and buy private health insurance instead. Private health insurance premiums would be tax exempt</p>	☐	☐	☐	☐	☐	☐	☐

It should be possible to top up publicly funded HIV program with private health insurance cover for expensive treatments and technologies that may not be covered by the statutory health care system	☐	☐	☐	☐	☐	☐	☐
---	---	---	---	---	---	---	---

Page 7: Effective interventions

7. To what extent do you agree that the following interventions are good ways of controlling HIV/AIDS program costs in the long term?

	1	2	3	4	5	6	7
48. Implement free and mandatory HIV testing services for people that are at particular risk of HIV infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HIV treatment should be free at the point of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Government should invest significantly to the cost of HIV prevention	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Positive living should be encouraged and rewarded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Key populations (i.e. sex workers, men who have sex with men, people who inject drugs) should contribute significantly more to the costs of their own HIV prevention, treatment and care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Education should be free as a preventive measure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public funds should subsidise HIV services for key populations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Page 8: Personal preferences

8. Please state your preferences in the following questions

	1	2	3	4	5	6	7
Publicly funded HIV services are better organised and delivered than privately funded HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be willing to pay more in income taxes to have publicly funded HIV services which are free at the point of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be willing to pay more in consumption taxes to have publicly funded HIV services which are free at the point of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I would prefer to pay out-of-pocket each time I need to purchase HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would prefer to buy private insurance that would carry my HIV prevention, treatment and care needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would prefer to have basic health insurance cover supplemented by private insurance for expensive products (i.e. technologies and treatments) that the publicly funded HIV programme cannot afford to cover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Political feasibility

9. Which options do you think are most realistic to implement in practice, i.e. the most politically feasible? Please tick 5 boxes corresponding to your 5 most preferred financing (1 for most preferred, 2 for second most preferred etc.)

	1	2	3	4	5
Finance HIV services from general tax revenues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Borrow (indexed to GDP) to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Capitalise a national AIDS trust fund to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negotiate and implement Debt2Health swap agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negotiate and implement a Buy-Down debt conversion instrument	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implement risk and credit guarantees to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finance HIV services through a national health insurance scheme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Invest oil revenues in a sovereign wealth fund and finance HIV services from interest gained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use social and development impact bonds to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Launch and use diaspora bond to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a pay-for-performance approach to pay for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a co-financing approach to pay for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase income tax of 1% earmarked for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on cigarettes as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on alcohol as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on sugar and sugary drinks as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on ultra-processed foods as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase general consumption tax (VAT) by 1%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combination of increased income tax and tax on cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination of increased income tax and tax on alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combination of increased income tax and increased corporate/business tax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from social protection to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from education to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from national security to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ugx 25,000 per annum per person living with HIV on ART	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Means-tested coverage of HIV treatment services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exclusion of less essential services, incl. orphan care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private parts of HIV services delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More restrictive purchasing of new and expensive technologies and treatments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Page 10: Your personal preferences

10. Given your own individual preferences, beliefs and values, which options would you prefer? Please tick 5 boxes corresponding to your 5 most preferred financing (1 for most preferred, 2 for second most preferred etc.)

Please don't select more than 1 answer(s) per row.

Please don't select more than 5 answer(s).

	1	2	3	4	5
Finance HIV services from general tax revenues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Borrow (indexed to GDP) to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Capitalise a national AIDS trust fund to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negotiate and implement Debt2Health swap agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Negotiate and implement a Buy-Down debt conversion instrument	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Implement risk and credit guarantees to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Finance HIV services through a national health insurance scheme	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Invest oil revenues in a sovereign wealth fund and finance HIV services from interest gained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use social and development impact bonds to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Launch and use diaspora bond to finance HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a pay-for-performance approach to pay for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a co-financing approach to pay for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase income tax of 1% earmarked for HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on cigarettes as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on sugar and sugary drinks as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on ultra-processed foods as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase tax on alcohol as needed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increase general consumption tax (VAT) by 1%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combination of increased income tax and tax on cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combination of increased income tax and tax on alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Combination of increased income tax and increased corporate/business tax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from social protection to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from education to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget reallocation from national security to HIV services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ugx 25,000 per annum per person living with HIV on ART	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Means-tested coverage of HIV treatment services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exclusion of less essential services, incl. orphan care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private parts of HIV services delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More restrictive purchasing of new and expensive technologies and treatments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Finally, if you would like to share any thoughts or comments on the future financing of HIV/AIDS response in Uganda, please feel free to include them below:

Page 11: Final page

Thank you for taking the time to complete this survey. I truly value the information you have provided.

Key for selection options

3 - Which category best describes your professional affiliation?

- Academia
 - Judiciary
 - Other
 - Think-and-Do Tank
 - Government Ministry, Department and Agency
 - Consultancy and advisory firm
 - Executive
 - Legislature
 - Non-governmental organisation
 - International bilateral and multilateral organisation
 - Person living with or affected by HIV
 - AIDS service organisation
 - Industry (e.g. pharmaceutical industry, private sector association etc)
-