The Contingencies of Global Health Science: The Making and Shaping of Transnational Biomedical Knowledge Production in Uganda

Thesis submitted in partial fulfilment of the requirements
for the Degree of Doctor of Philosophy

by

Joshua Parker Allen

St Antony's College

Word count: 81,000

Contents

Contents ii

Abstract v

Acknowledgements vi

Abbreviations and Acronyms x

Preface xiv

Introduction 1

Literature Review 7

Methodology 27

The Argument in Brief 41

Chapter Summaries 42

Positionality 44

Ethics 46

1. Why Did Uganda Become a Hotspot for Global Health Science? 47

Introduction 47

Part One: Colonial Science and Ugandan Political History 48

Part Two: Museveni, the WHO, HIV/AIDS, and the Return of Scientific Research 60

Part Three: The Growth and Establishment of International Health Research 76

Part Four: The Rise of 'Global Health Science' 81

2. "The Donors are Everything": Precarity and the Political Economy of Global Health Science 96

Introduction......96

Who Funds Global Health Science? – and to What End? 98

Macro: Funding Agencies......103

Meso: Research Institutes......109

Micro: Research Projects 115

Conclusion 123

3. Making Good Science: Knowledge Hierarchies and the Pursuit of the Universal 125

Introduction......125

Ideas about 'Good Science' in Multidisciplinary Research Teams......127

The SCART Trial: Making Piecemeal Scientific Facts and Compartmentalising Knowledge. 132

The PrEPCoVax Trial: The Value of Universal Knowledge and the Failure to Produce It......140

Compartmentalisation, Universality, and Knowledge Hierarchies in Global Health Science148

Conclusion 154

4. 'Stickiness' and the Aetiologies of Blind Spots in Ugandan Global Health Science ...157

Introduction......157

Blind Spots in Global Health Science Research in Uganda......159

Regional Blind Spots and the Emergence of 'Centres of Excellence'......160

Demographic and Clinical Blind Spots and the Rise of Experimental Global Health Science 166

How Global Health Science Remains Blind to its Blind Spots 176

Conclusion 184

5. Africanising Global Health Science: Co-Optation and the Drive for Scientific Sovereignty 187

Introduction 187

"Research is about foreign interests": Perceptions of Extraversion and the Northward Orientation of Global Health Science 189

Co-Opting Research: Topics, Locations, Services 195

Reflecting on Co-optation 220

Conclusion: Africanising Science and Scientific Sovereignty 222

Conclusion 227

Limitations 229

Contributions to Literature 231

Decolonising Global Health; or: So What, and Where Do We Go From Here? 233

Bibliography 235

Abstract

The multi-disciplinary field of global health science is a fundamental component of global health decision-making. Rigorous, systematic, and deliberate in its biomedical, scientific approach, global health science produces evidence regarding public health interventions and the spread and control of disease, and so on. It thus generates the scientific knowledge that informs and enables agenda-setting, policymaking, and resource allocations.

However, the practice of this scientific work is shaped by wider forces and relations. Science is a contingent form of understanding – far from being hermetically sealed from the world around it, science is shaped by its broader social, political, and economic context and relations. Global health science in this sense is no different – knowledge produced in this field is contingent and influenced by political-economic forces and funding dynamics, cultural and epistemic logics, and multi-scalar, transnational relations between people and institutions.

In this thesis, I investigate these dimensions of global health science as they play out in research in Uganda. My work is based upon a multi-sited and multi-scalar ethnography of two global health science research institutes in the country, which included twelve months of fieldwork and over seventy interviews, as well as three months of desk-based historical research for my MPhil in 2020.

Herein, I explain how and why global health science is contingent. I discuss, among other things, the ways in which global and local context, funding flows, knowledge hierarchies, grant-writing norms and incentives, and negotiations between scientists on topics, methods, and study locations shape scientific knowledge in the field. I argue that these contingencies reveal how and why global health science becomes disconnected from the pathogens, people, and places about which it strives to produce knowledge. That is, how the forces by which it is shaped alienate it from the needs of those it sets out to aid.

Acknowledgements

There are a great many people without whom this thesis would be significantly worse, and whom I thus owe profound thanks.

First of all, I would like to thank the Economic and Social Research Council (ESRC), St Antony's College, and the Oxford Department of International Development (ODID) for funding this project. Beyond sources of funding, St Antony's and ODID were also welcoming and greatly enriching homes to me for five years during my MPhil and DPhil – thank you to Gary Jones, Cat Bowley, and Dominique Attala, and the many others who made this possible.

Secondly, I would like to thank all my anonymous interlocutors for dealing with my irritating questions and allowing me access to their work and their lives around it, especially all the staff at MUSCo and CVHS where I conducted my ethnography. Without the open-hearted and generous access with which you provided me, this thesis would have been impossible.

I am also enormously grateful to all of my friends in Uganda – Piero Okot, Linda Bilula, Jackie Atingo, Jacky Aciro, Julian Hopwood, and all your respective kids – thank you for helping make the country a second home for me since my childhood. During my fieldwork, Tom Ogen, Clare Jagenda, Susan, Elysee Niyigena, Jean-Michel Kergoat, Beatrice Lushugurhi, Ting Saendi, and Julia Landstedt, all welcomed me into their respective worlds and provided me with a greatly supportive community. I am especially grateful to Joanna Remzi for giving me a place to live and for being there for me at a particularly difficult time in my life, and to Herbert Ssengendo – the greatest, kindest, and most patient Luganda teacher on the planet. I am in particular indebted and immensely grateful to Professor Janet Seeley and Dr Andrew Ssemata, both of whom were completely instrumental initially in getting this project off the ground, and ever since in their continued mentorship and support for my work.

In Oxford, there are also many people to thank. During my undergrad in Human Sciences, Naomi Freud and Professor Philip Kreager were immensely influential on how I think, and their

continued encouragement over the years has been hugely important. I also owe my thanks to Dr Tony Lemon, whose tutelage in African history and politics has proven foundational for me.

Progressing to my MPhil and DPhil, I was fortunate to stumble into a fantastic and challenging intellectual environment in ODID. First and foremost, my thanks go out to my primary supervisor Professor Simukai Chigudu, whose deep engagement with my work since I first discussed it with him more than six years ago has been absolutely instrumental. His line-by-line comments on various drafts of this thesis have improved and shaped it to no end and I am immensely grateful for the education and guidance he has offered me. My secondary supervisor Max Bolt has also provided thorough – and tough – engagement with and feedback on this thesis and along with Simukai has shaped the way I see and understand the world in profound and vital ways. Max has provided countless opportunities for me to teach students, present and get feedback on my work, read and contribute to the work of others, and participate in the strengthening of an academic community in ODID, and I am deeply appreciative of his efforts and help. Similarly, I would also like to thank Dr Myfanwy James for all her advice over the course of my DPhil and for her feedback on my work in the 'Ethnographies of Work' writing group organised by Max Bolt.

'Ethnographies of Work' proved to be an enormously important and influential part of my time in ODID. Three of the chapters of this thesis were submitted there and I am incredibly thankful to all those who offered such rigorous feedback on them and such deep reflection: Dr Amogh Dhar Sharma, Dr Leonie Hoffman, Julia Hampton, Leila Strelitz, Dr Sam McQuillen, Fede Cerruti, Dr Dani Renne, Alex Boothroyd, Maggie Neil, and Aparna Agarwal.

Outside of this group, others in ODID were also instrumental in various ways to the progression of this project, whether during the MPhil or DPhil. Professor Nandini Gooptu provided crucial criticism on two occasions in particular that was much needed and appreciated. Dr David Jackman was a fantastic teacher during my MPhil and helped to substantively shape my thinking about global politics. Professors Tom Scott-Smith and Sloan Mahone gave extremely constructive and thoughtful feedback for my Confirmation of Status. My seniors Dr Biruk Terrefe, Dr Vyoma Dhar Sharma, and Will Paja were all generous, kind, and critical at various important moments. Julia Hampton and Leila Strelitz have been essential companions academically and emotionally over the past five years and this thesis would truly not look the same without either of them.

My MPhil and DPhil were greatly enrichened by many other friends who have given me an enormous amount intellectually, socially, and emotionally. They have been a constant source of inspiration, growth, fun, and rejuvenation, and there is not a chance I would have completed this doctorate without them – or, at least, I certainly would not have enjoyed it so much. Thanks from the bottom of heart to Vibhuti Gour, Tanima, Luca Venga, Scott Singer, Julia Ellings, Nestor Maslej, Dexter Docherty, John Lindsay, Karo Becker, Pascal Mensah, Caroline Godard, Ziad Kiblawi, Eirik Kvindesland, Bridget Donovan, Hannah Stewart, Devika, Will Leben, Josi Lehnen, Clement Amponsah, Chiraz Hassoumi, Ellie Oppenheim, Nathan Geyer, Michael Delgado, Harry Manley, and Ollie Pilkington.

I also want to thank Aparna Agarwal, who has been a more generous, tolerant, and inspiring partner through the writing-up process than I could possibly have asked for. You have pushed and supported me in equal measure and set the bar very high for me as you begin to write-up your own DPhil.

Last but not least, I am incredibly grateful to my whole family, who were all ceaselessly understanding of me having “not quite yet” finished my PhD for months on end and who have all taken great care of me in different ways throughout this process. Thanks, in particular, to my sister Rachael with whom I first fell in love with Uganda and who has been a friend, confidant, and spirit-raiser since forever, and to my parents, without whom this thesis would have been completely impossible. Over the past three years, many people have asked me what it’s like to write a PhD with academic parents in the very same field. I have never really known how to answer the question, and perhaps unfairly have read into it a set of assumptions others might have about the potential for them to be overbearing and pedantic. Nothing could be further from the truth. In fact, getting my parents to discuss my thesis with me often required my outright demanding it. They resolutely (and probably conspiratorially) respected and encouraged my independence as a researcher and a scholar, only ever asking me questions and rarely providing my ones with answers. At the same time, they were endless sources of love, care, and encouragement. They have enabled me to grow and develop my own voice, but have always been there with infinite patience, warmth, and comfort. Words cannot express my appreciation and admiration for you both. This thesis is dedicated to you.

Abbreviations and Acronyms

ABC	Abstain, Be Faithful, or use a Condom
Africa MAP	World Bank Multi-country HIV/AIDS Programme in Africa
AIDS	Acquired immunodeficiency syndrome
AMR	Anti-microbial resistance
ANC	Antenatal care
ART	Antiretroviral therapy
ARVs	Antiretrovirals
AZT	Azidothymidine
BARDA	US Biomedical Advanced Research and Development Authority
BMGF	Bill and Melinda Gates Foundation
BMI	Body mass index
BMJ	British Medical Journal
CBO	Community-based organisation
CDC	US Centre for Disease Control and Prevention
CMA	Critical medical anthropology
COVID-19	Coronavirus disease
CUREC	Central University Research Ethics Committee
CVHS	Centre for Virology and Health Sciences
CWRU	Case Western Reserve University
DALYs	Disability adjusted life years
PrEPCoVax	PrEP and Combination Vaccines Trial
DfID	UK Department for International Development
DHS	Demographic Health Survey

DP	Democratic Party
DPhil	Doctor of Philosophy
DRC	Democratic Republic of Congo
EAMRC	East African Medical Research Council
EAVRI	East African Virus Research Institute
EBM	Evidence-based medicine
FIC	Fogarty International Centre
GAVI	Global Alliance for Vaccines and Immunization
HAART	Highly active antiretroviral therapy
HIV	Human immunodeficiency syndrome
HTI	Human Trypanosomiasis Institute
ICU	Intensive care unit
IDI	Infectious Disease Institute
IHD	International Health Division
IHME	Institute for Health Metrics and Evaluation
INGO	International non-governmental organisations
JCRC	Joint Clinical Research Collaboration
KY	Kabaka Yekka
LGBTQIA+	Lesbian, gay, bisexual, transgender, queer, intersex, and asexual+
M&E	Monitoring and evaluation
MCMNH	Centre of Excellence for Maternal Newborn and Child Health
MDGs	Millennium Development Goals
MensIES	Menstrual Health Intervention and Evaluation in Secondary Schools
MPhil	Master of Philosophy
MRC	Medical Research Council

mRNA	Messenger Ribonucleic Acid
MSM	Men who have sex with men
MTCT	Mother-to-child transmission
MU-JHU	Makerere University-Johns Hopkins University Research Collaboration
MUSCo	Mbarara-US Collaboration for Global Health
MUST	Mbarara University of Science and Technology
NACP	National AIDS Control Programme
NCDs	Non-communicable diseases
NCI	National Cancer Institute
NGO	Non-governmental organisation
NGS	Next generation sequencing
NIH	National Institutes of Health
NIHR	UK National Institute for Health Research
NRA	National Resistance Army
NRM	National Resistance Movement
ODA	Official Development Assistance
PEPFAR	US President's Emergency Plan for AIDS Relief
PhD	Doctor of Philosophy
PHIND	Public Health International Development
PI	Principal investigator
PLWH	People living with HIV
PrEP	Pre-exposure prophylaxis
R&D	Research and development
RA	Research assistant
RCT	Randomised-controlled trial

RHSP	Rakai Health Sciences Programme
SCART	Short-Cycle Antiretroviral Therapy
SHINe	Survey on HIV Networks
STD	Sexually transmitted disease
STS	Science and technology studies
TB	Tuberculosis
TMC	Trial Monitoring Committee
UAC	Ugandan AIDS Commission
UBOS	Uganda Bureau of Statistics
UCSF	University of California San Francisco
UK	United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNAIDS	Joint United Nations Programme on AIDS
UNC	Uganda National Congress
UNDP	United Nations Development Programme
UPC	Uganda People's Congress
US	United States of America
USAID	United States Agency for International Development
UVRI	Uganda Virus Research Institute
WHO	World Health Organization
WHO/GPA	WHO Global Programmes on AIDS
WHO/SPA	WHO Special Programme on AIDS
WTO	World Trade Organisation
YFRI	Yellow Fever Research Institute

Preface

Dr Mukisa and I are sitting in a medical supply store, the only refuge for my audio recorder from the endless bleeping and chatter of the adjacent ICU. Crammed in a corner around a small table encircled by shelving units, sparsely populated with various generic drugs, we begin our interview. We are in Mbarara Regional Referral Hospital, the largest in western Uganda. The hospital is surrounded on almost all sides by the city's public university, the Mbarara University of Science and Technology (MUST), and is just a minute's walk up a steep road flanked with motorbikes and chapatti vendors from the rented offices of the research institute I had been studying. Our conversation is frequently interrupted by nurses, trainee doctors, and pharmacists running in and out to grab medicines and blood pressure monitors, and to obtain snippets of valuable advice from the experienced Dr Mukisa.

"I'm tired," he says, after one such interruption, "I'm ready to retire." Dr Mukisa has been working at the hospital and at MUST's medical school for decades. He has witnessed the effect of the dramatic proliferation of research projects that Mbarara has experienced since the mid-2000s, when a US university professor first established a partnership with the hospital's fledging HIV clinic. This collaboration blossomed, bringing in departments from the university and the hospital, as well as researchers from other elite US academic and medical institutions. Riding the tidal wave of funding for 'global health' that swelled over the late-2000s and 2010s, the partnership adopted the name 'MUSCo' (Mbarara-US Collaboration for Global Health Research), which now holds dozens of grants from private philanthropists, the US government's National Institutes of Health (NIH), and the Wellcome Trust, among others, to conduct scientific research on Mbarara's people.

But despite these flows of finance, Dr Mukisa is sanguine about what all this has actually meant for the hospital, and the care it has been able to offer the communities it serves. "Our thinking in the beginning was the target should have been research that is going to be practical, and which solves our local problems and helps us move from one state to the other. And that is what we had in the beginning. But down the road, we started seeing that research is becoming more and more like it's the funder who says it would like things to go in this other direction, and yet we feel we have our own local problems which need to be listened to and which we could probably find solutions for." I ask him to elaborate on what things are like now in the research world. He shakes his head and scratches the plywood table, boxes of antibiotics stacked precariously against the wall at one end. "Today, I really think that it is a cartel. There is a team of people, a group which knows how to get grants. How come particular people will always win particular grants? I mean you could think this is a syndicate that you don't understand... Let them prove to us that grant 'X' has led to a change like this. You, man..." He pauses and sighs, "You will spend a whole year trying to do this [during your research] and you will fail... Ask yourself: this university has grants that are worth millions of dollars. What can you see on the ground? Can you see that translate on the ground?... My patients here – I have one nurse who is running seven patients. Why can't somebody be very, very tough and come out and ask is it practical to do ICU in this kind of set up? Study that! And give the evidence! And let it go out there!" He bangs the table with his fist in a display of abject frustration, and gestures towards the row of beds, IV drips, and patients on the other side of the storeroom door. "This here is criminal. Show me that every time you have three patients and then you add on a fourth patient, and you leave that one nurse, you have this kind of mortality. Can it be something that is going to influence the lawmakers to say come on guys, let's put more nurses in these units? Nobody wants to do that. They will always look for their simple ways of doing things... They [the funders] have their interests".

*

A couple of weeks later, I have a very different conversation with Dr Douglas Williams, a senior official in the NIH. Our interview is conducted over Zoom, as he wanders around Bethesda, a suburb of Washington D.C., his microphone occasionally picking up the chirping birds and laughing children of a park near his house. Dr Williams has worked in global health for decades, having held roles in various US government agencies over his career working in infectious disease control and surveillance in multiple “resource-limited settings”. He tells me of his longstanding commitment to global health equity, to improving the health of poor people the world over, and, at the heart of this, his mission to “decolonise global health”. Where Dr Mukisa was tired, frustrated, and pessimistic about the impact and value of global health, and global health research in particular, Dr Williams is energised, excited, and optimistic, bordering on braggadocious in his enthusiasm and zeal for the “capacity building” work to which he has dedicated most of his career. He speaks proudly not only of the effectiveness of global health at making the world a better place – he cites vaccination programmes and mass HIV/AIDS treatment campaigns as examples – but also of the great strides that have been made in advancing equity in the scientific research that informs this programmatic work. He illustrates this by telling me of the work he has done to ensure more researchers from the Global South are credited as authors on journal articles, are able to conduct and write “good science”, and can win independent research grant funding, as well as the improvements he has helped make to laboratory capacity across sub-Saharan Africa to enable more basic science research on the continent. Moreover, he talks about how the foci of global health science research has been shifted following demands from African colleagues: “African researchers have played a really important part in… the recent focus on NCD [non-communicable disease] research, for instance… We’ve come a long way!” he quips, his enthusiastic smile audible through the tinny speaker of my laptop, “And there’s lots more still to do!”

*

Mukisa and Williams sit at opposite ends of global health science. Mukisa is a doctor, working in Mbarara hospital day in, day out, and in the past has combined such work with research, much of which was funded by Williams' institution, the NIH. Williams meanwhile operates at a completely different scale – based in the US, but flying around the world (including to Uganda, where we first met) to strategise, network, and capacity-build. Williams plays a major role in conversations regarding the global health research agenda, contributing to decisions around funding priorities. Some of this funding reaches Mbarara – the NIH is the world's largest funder of global health science and has funded dozens of projects in the city since the early-2000s. From their different positions in the field of global health science, Mukisa and Williams thus offer very different perspectives on the flows of money from the Global North to the Global South that enable scientific projects to happen.

These two conversations, much like many others I had throughout my fieldwork, illustrate in their stark differences the central puzzle and argument of this thesis. Both Mukisa and Williams are, in a certain sense, 'right'. As I show in what follows, Mukisa's argument that research has lost its way in Uganda and is not, as it once was, so tied to local or national issues, is widely espoused by Ugandan researchers and clinicians, and holds up to empirical analysis. Yet at the same time, what Williams frames as the 'progress' of efforts to 'decolonise' the field is not misleading. African scientists are more represented than ever as authors on articles and as co- or sole principal investigators (PIs) on research projects, laboratory capacity is stronger by the year, and there has been a steady, though not transformative, diversification of the diseases of study – gone are the days of almost exclusive focus on HIV/AIDS, malaria, and tuberculosis. Paradigms like 'community engagement' are more and more common, even if used in somewhat tokenistic fashion. And yet despite these changes, analyses like those of Dr Mukisa persist, seemingly irrespective of how much progress is made in making global health research more equitable.

What to make of this? How do well-intentioned scientists and officials like Williams simultaneously do work they think is important in ways that they think of as ‘right’, while those like Mukisa take such a radically different view? This is the central puzzle of this thesis. To be clear, such differences neither exist in a Williams/Mukisa binary, nor are they reducible simply to positionality and geography – as we shall see throughout this thesis, the inner workings of global health science are more complex than this. Yet nevertheless, in global health science, the views of those at the top of the system tend to be rather different from those at the bottom. In this thesis I explain this divergence by showing how and why it is that, despite good intentions, the practice global health science ends up being shaped by influential forces larger than itself, leading it to become disconnected from people like Mukisa and places like Mbarara hospital. I thus show how and why global health science gets blown off course from its moral and political mission, with vital consequences for what ends up getting known.

Introduction

This thesis examines the production of knowledge in 'global health science': an interdisciplinary field of research and practice defined both by its epistemic commitments to scientific rigour, and its political and moral commitments to controlling disease internationally and improving health outcomes amongst the global poor. Global health science has emerged over the course of the past three decades as a fundamental and constitutive part of global health, where it informs policymaking through the production of data and the testing of interventions relating to health issues mostly in the Global South. It is in the light of this rigorous production of scientific knowledge that evidence-based global health policymaking typically takes place: as so many of my interviewees noted, good science is the backbone of good practice in global health. While the relationship between research and policy is not deterministic (Parkhurst, 2017; Biruk, 2018), global health science is nonetheless the primary epistemological field of global health, one in which the relationship between evidence and efficacy is borne out (Adams, 2016d), and in which knowledge about what works is produced.

The centrality of science to global health is in some ways what distinguishes global health itself from its antecedent forms. During most of the colonial era, science to a degree informed medical practice that took place among Christian evangelical missions, while relatively small-scale scientific research was conducted typically to protect colonial officers and to sustain extractive economies by ensuring colonial subjects could continue to work. Tropical medicine then emerged as a formal discipline, institutionalizing scientific research on diseases prevalent in the Global South, such as malaria and yellow fever, with a focus on controlling these diseases to enable colonial economic productivity. Following the independence of most of the colonised world in the mid-20th century, international health emerged over the 1970s as a paradigm in which science became a tool for development and state-building, emphasising the transfer of biomedical knowledge and technologies to strengthen health systems and build primary care in these new states (Weisz and Tousignant, 2019). The rise in the use of the term 'global health' in the 1990s reflected a shift away from a state-centred model of international public health and towards one of transnational global governance, with policies and pharmaceuticals developed by Northern actors. Funding was then deployed to support the strategic interests and technocratic expertise of donors and investors, and science came to sit at the heart of processes of global health governance, which bore an emphasis on evidence-based, transnational scientific research that could support policymaking on a global scale (Geissler, 2018). This is marked by the global proliferation of biomedical scientific research projects (Crane, 2013; Geissler, 2015), clinical trials (Petryna, 2009), global health university departments (Crane, 2010b), the abundance of global health policymakers with advanced scientific and/or medical training, and a salient discourse of 'following the science' that permeates every aspect of global health decision-making.

Yet, as we know from science and technology studies (STS) scholars, science itself is a contingent form of knowledge production. Held up as transcendent, objective, and unassailable, science is nevertheless shaped by certain epistemic logics, cultural practices, histories, and political-economies (Latour and Woolgar, 1979; Latour, 1987, 1988). Thus, like others who have studied the role and production of scientific evidence in global health, in this thesis I too understand science as a contingent means of producing knowledge that is inextricable from its social, political, and economic context, with distinctive cultural and epistemic logics that shape it (Adams, 2010; Crane, 2013; Biruk, 2018, 2021).

As I demonstrate, these contingencies give rise to limits and blind spots in the making of science in global health, which, like any other paradigm, is not panoptic in its vision and comprehension of the world and aspects of life within it. Given the ever-rising tide of evidence-based and expert-led policymaking in global health, critical interrogation of these limits is important in elucidating the implications of the ways in which scientific evidence is constructed, rationalised, and performed for what ends up being known in global health fora.

Based upon an institutional ethnography of two biomedical, scientific research institutes in Uganda, I discuss across five empirical chapters the epistemological and the political-economic contours of these issues through an analysis of how global health science is practiced, from its funding to its dissemination to and uptake by policymakers and institutions of global health governance. I ask: *How is knowledge produced in global health science in Uganda, and with what implications?* Building on literature in the field of critical global health, I thus examine how data are collected, what interventions are tested and why, and which methodologies are deployed, analysing how these decisions about what and how to research are ultimately taken and with what justification. From this, I consider what counts as global health science; what falls into its purview and what does not.

Uganda represents a useful and relevant case for exploring the politics of global health science for several reasons, which I discuss in greater depth in chapter one. Firstly, Uganda has a long history of hosting transnational, biomedical, scientific research funded largely by institutions in the Global North. This is today in evidence by the productive and abundant research institutes present in the country, many of which have contributed to major scientific studies of international acclaim and relevance, and two of which were sites for my ethnography. Secondly and relatedly, Uganda is commonly referred to by development practitioners and commentators as a 'donor darling' (Green, 2008; Fisher, 2012, 2014; Taylor and Harper, 2014; Reid, 2017). It has been a significant beneficiary of international development since current president Yoweri Museveni took the helm in 1986, after which he sought rapprochement with the Global North following twenty years of political instability and opened-up the country to global governance institutions. Thus, unlike in some other sub-Saharan African countries with strong traditions of scientific, medical research, such as South Africa, Uganda's research agenda has been dictated to a significant extent by donor states, multilaterals, and other global health and development institutions, rather than the national government. This openness to such actors has meant that these global actors have had greater influence and scope to conduct their activities on their own terms than perhaps is the case in some other states. Consequently, while this means that their influence may be overstated locally in relative terms in my ethnography as compared with other states, it does mean the window Uganda provides onto the structures which these actors constitute and uphold is a relatively clear one. Given that these actors operate in largely similar ways across the continent if not the Global South in general, the centrality of Uganda to global health science both historically and in the present thus makes it an interesting, important, and revealing location in which to critically interrogate the field in general.

What is global health science? The field lacks a formal and widely accepted definition (Garcia-Basteiro and Abimbola, 2021). Consequently, it is difficult to impose a definition, as the boundaries of what does and does not constitute global health science are not clearly demarcated. Indeed, many of my interlocutors referred simply to 'global health' in general when discussing both practice and scientific research in global health, or conceptualised the latter in vague terms as existing within the wider field of global health. Nevertheless, for the purposes of this thesis, I broadly conceive of the field as the systematic, scientific study of topics relevant to global health entailing the production of qualitative and/or quantitative data through observation and often, but not always, experimentation, which enable the testing of hypotheses and/or theories. I make an important distinction here between global health science and global health data production more generally: the latter only becomes the former when the data are analysed and used systematically to test theories and hypotheses, often through comparison with other data; when this does not take place, such as in disease surveillance, I do not consider it global health science.

What is meant by 'global health' in the context of global health science, though? Global health more broadly also does not hold an accepted, unified definition given the wide variety of different actors and diverse forms of action that claim or are claimed to participate in it. Existing definitions from more mainstream global health researchers and practitioners are typically normatively driven and highlight transnational efforts to reduce health inequalities globally through improving health outcomes. Yet these definitions in some form or other make an argument for what global health *should* be, or what some people *claim* it to be, rather than what it *is* in practice (Abdalla *et al.*, 2020). For instance, a commonly cited definition is that of Jeffrey Koplan and colleagues (2009, p. 1995):

> Global health is an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasises transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences and promotes inter-disciplinary collaboration; and is a synthesis of population-based prevention with individual-level clinical care.

As Nicholas King and Alissa Koski (2020) note however, in definitions like these it is not clear what distinguishes global health from public health – the science and art of improving and protecting the health of populations through organised and institutionalised action, including the control and prevention of disease (Winslow, 1920). Does the term 'global health' then apply to all public health efforts everywhere? Clearly such definitions are too broad and tell us little about what global health actually is (Abimbola, 2018; Garcia-Basteiro and Abimbola, 2021). Definitions of global health from the social sciences and humanities are thus more helpful, I would argue, in cutting through the normative visions of what global health might be and instead thinking about what it is in practice based on empirical observation and analysis. The sociologist-cum-anthropologist Andrew Lakoff (2010) offers a particularly useful view of the field, conceiving of global health not as a fixed entity, but as two overlapping and dynamic sociotechnical regimes of action: global health security and humanitarian biomedicine. The former refers to efforts to securitise the spread of pathogens – generally but not exclusively from the Global South to the

Global North – and thus to anticipate and control them. The latter refers to efforts to tackle diseases that mostly affect poor countries, with a focus on alleviating suffering through technical and financial support. As Lakoff (2010, p. 60) notes:

> Each regime is 'global' in the sense that it strives to transcend certain limitations posed by the national governance of public health. Within each regime actors work to craft a space of the global that will be a site of knowledge and intervention. However, the type of ethical relationship implied by a project of global health depends upon the regime in which the question is posed: the connection between health advocates and the afflicted (or potentially afflicted) can be one of either moral obligation to the other or protection against risk to the self. Global health is, in this sense, a contested ethical, political, and technical zone whose contours are still under construction.

Lakoff's conceptualisation of the two regimes of global health is not intended to be exhaustive. Indeed, Susan Erikson (2015, 2019) might point out that the significant and growing involvement of the private sector in global health provides an additional dimension to Lakoff's model, concerned fundamentally with profit rather than the anticipation and control of disease or the alleviation of suffering. Instead, Lakoff and other scholars in the field of critical global health conceive of global health as something "still under construction" and thus still being discovered, even as its form continues to shift. In many respects, the task of critical global health scholars is to shine a light on the ”obscure object” of global health, "making intelligible what often remains obscured, reformulating problems to allow alternative solutions, resisting individualistic and technical models to highlight the social mechanisms and political issues of [what is claimed to be global health]" (Fassin, 2012, p. 115). It is these aims to which this thesis aspires, in the context of global health science.

The remainder of this introductory chapter proceeds as follows. I begin with a review of the literature relevant to this thesis. First, I outline the field of critical global health and explain how it has been articulated and understood by scholars. Second, I argue that a salient preoccupation of this field has been inequalities. Third, I situate an interest in scientific knowledge and its production as central to understandings of inequalities in global health and proceed by discussing various bodies of literature relevant to this. Following my literature review, I move on to my methodology, which I begin by outlining the overarching methodological approach of this thesis, before describing my research methods in more detail. I then summarise the primary arguments of this thesis, summarise the five empirical chapters, and end with a discussion of my positionality and how this has shaped the work herein.

Literature Review

Critical Global Health

This thesis is situated within the interdisciplinary field of critical global health. To my knowledge, first mention of the term 'critical global health' was made in the introduction of the 2013 book *When People Come First*, a collection edited by the medical anthropologists João Biehl and Adriana Petryna (Biehl and Petryna, 2013a). However, critical studies of global/international health governance and policymaking and their implications for diverse groups of people around the globe long predate this. In this sense, the more recent advancement of critical global health as a field is an effort to categorise and bring together wide-ranging literature from several disciplines that have been engaging in shared or similar conversations since the 1980s. These have most significantly included (medical) anthropology, history, politics, international relations, and sociology (McInnes and Lee, 2012; Adams, 2016d; Harris and White, 2019; Bhattacharya, Medcalf and Ahmed, 2020; Graboyes, Gallagher and Tappan, 2022). More recently, scholars in human geography and STS have also made important contributions (Herrick and Reubi, 2017;

Montgomery *et al.*, 2017). In many respects then, critical global health parallels development studies in its integration of approaches from across multiple disciplines and its empirical focus – albeit to varying extents – on efforts to improve human livelihoods mainly in the Global South, and how these are experienced, implemented, and planned, with medicine and public health replacing economy and economics (Rieder, 2016).

In perhaps a similar vein to development studies, what exactly constitutes critical global health is hard to pin down. Indeed, in the various efforts to delineate the field, from Biehl and Petryna's in 2013, to others more recently, no formal definitions have been put forward (Biehl and Petryna, 2013a; Adams, 2016d; Adams and Biehl, 2016; Herrick and Reubi, 2017; Ingram, 2018). Instead, various foci of the field are evoked. Biehl and Petryna (2013a, p. 14) advocate for work which advances "methodological and analytical frameworks that focus on people and the dynamism of social fields", and which explores "on-the-ground involvements that address the successes and failures of health efforts, the politics of control and non-intervention, the effects of heterogeneity, the primacy of the personal and the role of the interpersonal, and, finally, human inventiveness in the face of impossible choices and even untreated pain". Biehl and Petryna thus argue for a critical global health that works to "liberate human potentials and futures, wherever they are thwarted" through opening "new avenues of thought" and challenging dominant, bioscientific paradigms that too often assert monopolies on truth and hierarchies on evidence (Biehl and Petryna, 2013a, pp. 5, 8, 12). Vincanne Adams (2016d) meanwhile offers a narrower invocation of the field, highlighting the importance of ethnographic, anthropological attention to the relationship between evidence and efficacy in global health – how the former is produced, and how the latter is claimed or effaced. Similarly, Thomas Cousins and colleagues (2021, p. 1) have described the field as having "attended closely to the configurations of knowledge and power that have defined global health as a political enterprise, scrutinising the forms of evidence, efficacy and accountability that are at work in its programmes and tracing the uneven delivery of its promises." With a slightly broader scope, the international relations scholar João Nunes (2023, p. 10) argues that critical global health should entail an approach that:

> … aims to be analytical (investigating and reflecting social tensions, the multiplicity of experiences, the justifications and claims of social actors, oppression, and unrealized potential); critical (identifying contradictions between what social arrangements ostensibly proclaim and what they actually produce); and political (oriented towards emancipation and the reparation of historical injustices).

Ted Schrecker (2022, p. 139), a political scientist, states that studies in critical global health involve at least five key elements:

> First, they involve some degree of commitment to health equity. Second, they situate health inequalities with regard to underlying [political, economic, and] social arrangements or institutions. Third, history matters. Fourth, the potentially pernicious impact of medicalisation and the dominance of medical frames of reference must be acknowledged. Fifth, production of scientific knowledge must be recognized as a social process whose material and institutional contexts matter.

These characterisations of the field of critical global health vary greatly, and I do not attempt to add to these – those that I have mentioned are illustrative enough of the field for my purposes here. That said, something that cuts across them all, and indeed something that constitutes an enduring focus of critical global health in general, is inequality. Specifically, how and why health inequalities are produced, maintained, and experienced, and how and why efforts conducted with the ostensible aim of improving them are devised, rationalised, and implemented, and with what implications for people's lives.

A Focus on Infections and Inequalities

Owing to the numerous disciplines that have contributed to critical global health, there are many ways of tracing the field's longstanding critical engagement with inequalities. Particularly important however is the interdisciplinary field of the political economy of health, which arose in the 1970s in the US amidst growing engagement with Marxist theory in the social sciences and humanities – and Immanual Wallerstein's world systems theory in particular. The political economy of health thus emerged as "a theoretical framework used to study health inequalities," which argued that "health disparities are determined by social structure and institutions that create, enforce, and perpetuate poverty and privilege... with particular emphasis on the detrimental health effects created by capitalist relations of production and sustained by specific political-economic arrangements" (Morgan, 2005, p. 401). As Lynn Morgan (2005, p. 402) has noted, this framework was enormously influential in a wide range of disciplines, including anthropology, human geography, public health, environmental science, epidemiology, political science, economics, and sociology. As it gained currency in each of these in the 1970s and 1980s however, it fragmented somewhat, as each of these disciplines sought to interpret it and integrate it into their approaches in their own ways. Nevertheless, the political economy of health inequalities remained a subject of interest within these disciplines (Witeska-Młynarczyk, 2015).

This thesis, in its methodological and analytical approach, is informed more by medical anthropology than the other constituent disciplines in critical global health, and it is through this discipline that I shall primarily trace the continuities of this engagement, not least because the developments in this discipline have been particularly influential to others in critical global health.

A focus on inequality in medical anthropology arose due in large part to the emergence of Critical Medical Anthropology (CMA), a subfield of the discipline that emerged in the 1970s and 1980s inspired by the political economy of health framework (Morsy, 1979). Among other things, CMA criticised medical anthropology at the time for being culturally relativist and insufficiently engaged with the ways in which health inequalities and their related suffering were caused by political, economic, and historical processes, such as capitalism, colonialism, state policies, and global governance (Baer, Singer and Susser, 2003). CMA also critiqued biomedicine, arguing that it was reductive in its hegemonic treatment of illness as purely biological and thus obscured how social, political, and economic factors shaped health outcomes in ways that enabled suffering and health inequalities to persist (Nguyen and Peschard, 2003). Scholars like Hans Baer, Merrill Singer, and Paul Farmer were particularly important in advancing these arguments. Paul Farmer (Farmer, 1996, 1999, 2003, 2004), for instance, across various publications in the 1990s and 2000s, demonstrated the importance of paying attention to the structural factors that give rise to health inequalities – something he conceptualised as structural violence. In *Infections and Inequalities* (1999), Farmer situated Haiti's HIV/AIDS epidemic in a wider historical and political-economic context. He described how the country's experience of French colonialism, capitalistic structural adjustment policies, and the neocolonial influence of the US government, created the conditions for HIV/AIDS to spread in Haiti by decimating and neglecting its public infrastructure. In so doing, he argued that reducing health inequalities requires tackling the "upstream" causes of disease – poverty, racism, the legacies of colonialism, extractivist and capitalistic economic arrangements, and so on. He thus criticised older approaches in medical anthropology for in some sense naturalising the diseases suffered by people in the Global South by neglecting how these wider historical and political-economic processes created particular material conditions that enabled diseases to spread and shaped how they were experienced. Farmer argued that disease should not be treated solely as a form of social experience, but also as a historically produced condition that is deeply political and economic.

Over the course of the 1990s and 2000s, many of the criticisms from CMA became absorbed by mainstream medical anthropology, and the sub-field to an extent lost its distinctive identity as an insurgent, radical force within the wider discipline. Today, rare is the medical anthropological study that altogether neglects history and political economy. Nevertheless, CMA laid the foundations for sustained, critical anthropological engagement with global health, as the paradigm rose to prominence over the 2000s and 2010s, and in particular for critical engagement with the inequalities and the efforts to manage or mitigate them that came to define global health as a field of action. This is evident in the efforts of critical global health anthropologists to "challenge orthodoxies", maintain "a healthy scepticism of established hierarchies of knowledge-making", and "attend to people's struggles for survival and a future, and also to the larger discourses, structures, and economies that shape life chances— that is, to the ways in which politics matter" (Biehl and Petryna, 2013a, pp. 11, 12, 18–19). Furthermore, the engagement of CMA scholars with history, political economy, and other disciplines has also proven influential in shaping the interdisciplinarity of critical global health anthropology, something reflected in the various volumes edited by anthropologists in the field that bring together work from multiple disciplines from epidemiology to history (e.g. Biehl and Petryna, 2013b; Farmer *et al.*, 2013; Geissler, 2015). CMA scholars were also influential outside of anthropology in shaping work on health inequality in the other disciplines that have been brought together in critical global health. Paul Farmer in particular, in no small part due to his additional occupations as a physician, activist, and NGO-director, was a highly persuasive advocate for the central ideas of CMA and an equity-based approach to global health, garnering influence in public health and medical sciences in addition to social science fields concerned with health inequalities.

Knowledge and Inequalities in Critical Global Health

How then have critical global health scholars approached the study of health inequalities? One of the most important ways that this interest in inequalities in critical global health has been born out is through the study of knowledge, its production, and the ways it informs action in global health. This focus itself has a long and expansive intellectual history, and one that was greatly influenced by the work of Michel Foucault (Witeska-Młynarczyk, 2015). From the 1980s onwards, Foucault's (1978, 1991) analyses of biopower (a definitional facet of the liberal nation state articulated through the management of populations through technologies and discourses), and the related concept of governmentality (the techniques, practices, and logics of political governance) were greatly influential across the social sciences (Nguyen and Peschard, 2003; Ingram, 2018). His wider preoccupation with the relationship between power and knowledge – especially scientific and medical knowledge (Foucault, 1976, 1980) – has proven fertile ground for critical global health scholars, who have sought to elucidate how the production of such knowledge has shaped techniques, practices, logics, and systems of governance in global and public health (Nguyen, 2009; Brown and Kelly, 2014; Biruk, 2018; Ingram, 2018; Webber and Prouse, 2018).

This, in turn, is central to the critical study of inequalities in global health. How health inequalities are defined, how efforts ostensibly concerned with their mitigation are devised, funded, and decided upon; how they are enacted and rationalised; how they misapprehend the contexts in which they intervene; how they accomplish unexpected and sometimes undesirable ends: each of these involve an understanding of the working and making of knowledge. In other words, all decisions in global health are made in the light of some evidence or other – what this evidence actually is, what it constitutes, what it claims to be, what is claimed to be better evidence than others, which inequalities it reveals and which it conceals, and how – all of this is vital to grasp in order to make sense of the phenomena that constitute global health in action. This is reflected in Biehl and Petryna's interests in challenging knowledge hierarchies and exposing the limitations of dominant bioscientific paradigms; in Adams' (2016d) and Cousins and colleagues' (2021) attention to evidence and efficacy; in Nunes' (2023) focus in the justifications of actors and the contradictions between what is proclaimed and what is produced; and in Schreckter's (2022) emphasis on the contingency of biomedical knowledge and the potentially damaging dominance of its frames of reference.

Datafication

A particularly important focus for scholars in critical global health with regard to knowledge and its relationship to power and inequality has been the 'datafication' of global health: the rise in the use of and belief in the power of numbers, indicators, metrics, and statistics – and the scientific analysis thereof – to identify and solve problems efficiently and effectively and measure outcomes (Adams, 2016b). There are many different, but interconnected, strands of this literature.

Some scholars have discussed datafication in the context of the rise of "audit culture" in global health and international development (Merry, 2011). The term emerges from work by Marilyn Strathern (2000) and Michael Power (1997), and refers to the proliferation of practices of accountability and rituals of audit through bureaucratic systems of measurement, monitoring, and evaluation involving standardisation. Strathern and Power describe these audit regimes as often implemented to foment order, control, and compliance with top-down systems of governance. Efforts to expand regimes of audit have accelerated over the 2000s and 2010s in global health, owing in large part to the desire on the part of donors to know that the projects they fund are operating cost-effectively are delivering what they said they would. This boom in audit, monitoring, and evaluation in global health has led to the production of vast amounts of data to demonstrate the fidelity and efficacy of programming and the accountability of practitioners (Gimbel *et al.*, 2018; Reubi, 2018b).

Audit culture has also been connected to the Foucauldian concepts of governmentality and biopower, both of which necessitate the production of data in that they require populations to be 'understood' to be governed. Populations must be measured, managed, and demarcated

(Biruk, 2019). Important indicators necessary for legitimating and rationalising techniques of governance must be calculated, including through the production of institutionalised norms (Merry, 2011). Prediction, the management of risk, the legitimation of authority through expertise, and the creation of order through counting, comparing, and standardising are all essential within this framing of politics. Scholars like Richard Rottenburg have thus argued that audit culture represents an important means through which power can operate and become globalised. "Through these interventions," he writes, "the sovereign responsibility for public health is underhandedly shifted to a peculiar bricolage of non-state and non-national organizations operating on a global level above national accountability" as well as to state institutions in the Global North (Rottenburg, 2009, p. 425). Vincanne Adams (2016c) has likewise argued that the datafication of global health is in part concerned with enabling global governance by a diffuse collection of private, philanthropic, state, and multilateral actors. This enables people and their health to be countable and visible to these institutions, denoted economic value (such as through disability adjusted life years, DALYs), and managed through policies, interventions, and pharmaceuticals (see also Davis, Kingsbury and Merry, 2012). She thus argues, in Tolkienian fashion, that the pursuit of "one metric to rule them all" – a measure that demonstrates which policies work best – is a fundamental component of the pursuit of these actors providing "health for all," amidst the wider context of global governance and subversion of national sovereignty (Adams, 2016c, p. 24). In the absence of such a metric, epidemiology has come to fill an important role as a discipline that can name, differentiate, map, and group populations and particular characteristics thereof, measuring a host of variables and informing decision-making for policymakers (Nguyen, 2010, pp. 114, 133). As Reubi (2018b) has argued, epidemiology has itself become a kind of audit process, one that performs scientifically rigorous monitoring and evaluation, assesses cost-effectiveness and adherence to protocol, defines and models risk, maps and delineates populations, and counts people and their health outcomes.

Another thread of the datafication literature is that surrounding global health security. Global health security refers to efforts to pre-empt, rapidly respond to, and control epidemics through securitisation. In practice, as many scholars have demonstrated, global health security is a regime of action through which actors in the Global North can use architectures of disease surveillance and discourses of biosecurity to prevent the spread of deadly epidemics from the Global South (King, 2002; Ingram, 2005; Lakoff, 2010; Benton, 2017). As with the production of metrics and indicators, systems of global governance are held as central to this capacity. The production of surveillance data, funded by and fed into these systems in theory enables the tracking of emerging infectious diseases through laboratory-based surveillance of samples, rapid diagnostics, and established reporting pathways, preventing pathogenic threats from reaching Northern populations (Lorway and Khan, 2014; Erikson, 2019). The growth of laboratories and the ease of access to samples to these ends has also enabled more complex and advanced scientific research. As various scholars have noted, datafication in this way has also produced new sources of value, enabling investment and transnational scientific research on new topics and subjects that have presented great opportunities for scientists and firms in the Global North (King, 2002; Petryna, 2009; Benezra, 2016).

The rise of evidence-based medicine (EBM) as a paradigm of knowledge production has also been tied to datafication (Adams, 2013). In public and global health, evidence is understood as data that has been contextualised – that is, data that has been collected, which is then compared standards, reference values, or norms, and often used to test a hypothesis (Dammann, 2019). Evidence becomes knowledge once it has been verified through repetition of experiments and hypothesis testing and a general consensus has been built between scientists on the basis of discussion and reasoning (Dammann, 2019; see also Latour 1987). EBM emerged as a paradigm in the Global North in the 1990s, and is often defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett *et al.*, 1996, p. 71). While medicine had always been ‘evidence based’ in one way or another, EBM emerged as a novel paradigm because it formalised an explicit hierarchy of evidence that cast experimental and statistical methods as the most ‘valid’, and insights from clinical experience, observational studies, and ‘anecdotal data’ as the least (Tenny and Varacallo, 2022). As Maya Goldenberg (2012, pp. 15–16) has argued, EBM introduced “an important *shift* in biomedical thinking and practice” (original emphasis), a shift in:

> ...what counts as valid evidence and what qualifies as the most rigorous methods of empirical research... This commitment to highly controlled data and methods of statistical analysis that were previously used only for population-based research (such as public health) represents not only methodological change, but also a novel regard of the reliability of various forms of medical knowledge.

As the historian of science Theodore Porter (1992, p. 633) wrote of the shifting role of science in governance in the 20th century, “quantification appears as a strategy for overcoming distance and distrust. This pertains also to the natural sciences where measurement and statistics have been crucial in transforming local experimental skills into public knowledge.” While EBM emerged in the Global North, with the rise of global health in the 2000s it was integrated into systems of global health governance and decision-making, informing clinical guidelines and health policymaking. This took the form of a significant growth in transnational biomedical and scientific research taking place in the Global South over the 2000s and 2010s, and the proliferation of randomised controlled trials (RCTs) as the gold standard of evidence-making (Wahlberg and McGoey, 2007; Adams, Craig and Samen, 2016; Jensen, 2019). Its role has thus been critiqued for locating legitimate decision-making power in health governance in a diffuse array of institutions in the Global North (Adams, 2005, 2013, 2016a; Jensen, 2019). I address EMB in global health science in greater depth in the final empirical chapter of this thesis.

Finally, datafication in global health has been critiqued for what it misses out, enabling inequalities to persist either because important data are not being collected, or because the quantitative emphasis of datafication means that qualitative factors relating to health inequalities are not captured or possible to capture. This means that the data available to decision-makers is not sufficiently representative of the reality it tries to depict. This builds on a longstanding literature theorising the nature of quantification itself, and the qualitative aspects of life that are not or cannot be described numerically (Kleinman, 1995). Scholars have noted that quantification can "“erode” and “silence” other “social realities”" (Law and Urry, 2004, pp. 395–97; Blouin, 2020, p. 321; cited in Reubi, 2020, p. 441), with the aim of rendering the people, places, and pathogens ‘legible’ (in the sense of Scott, 1998; Biruk, 2012), and “comparable and countable” (Adams, 2016b, p. 7) to systems of global health governance. This work makes various important observations about what gets left out or subsumed in the making of numbers, the result of which shapes not only the ‘quality’ of the data in question, but further the contributions that such data makes to development and global health discourses, and the action that they might subsequently motivate. Claire Wendland (2016a) and Adrienne Strong (2020) for instance, in their work on maternal mortality in Malawi and Tanzania respectively, both demonstrate how such data flattens out not only deeply traumatic events, such as the death of family members, but also information vital to a more holistic and context-specific understanding of maternal mortality. They show how the collection of this data necessarily ignores important information in the interests of performing bureaucratic audit tasks in line with government and WHO guidance. Reduced to data points, which end up being not only distortive of the social and economic realities of care, suffering, and treatment, but also unreliable in their own right, maternal mortality thus becomes poorly understood in centres of decision-making. Strong and Wendland thus argue for more decentralised, less bureaucratised, and more locally attuned data collection to make the suffering and loss associated with maternal mortality more visible to policymakers, and thus easier to address. However, they also argue that some aspects of the social worlds they analysed through their ethnographies cannot be captured by quantitative data. Similar such points are made by Sara Davis (2020), who shows with respect to HIV/AIDS treatment how particular groups who are not counted and who are not sufficiently visible to global governance institutions are thus misunderstood and not targeted with policies, leading to the persistence of negative health outcomes. On the other hand, being counted and visible in particular contexts can also enable repression by state authorities (Davis, 2020).

Relatedly, these processes of quantification can also allow for the integration and imposition of particular assumptions or normative visions of the world that diverge from those of the people they describe. David Reubi (2018a, 2020) for instance has examined the involvement of epidemiological research and reasoning in informing and evaluating anti-smoking policies in sub-Saharan Africa. He notes that data is collected, variables determined, research funded and commissioned, and conclusions drawn all predicated on a set of implicit assumptions regarding modernisation and its relationship to the epidemiological transition, in which the disease burden of countries shifts with economic development from being dominated by infectious diseases to non-communicable diseases. The uptake of practices like smoking is a significant aspect of this, even though smoking rates have been and remain low in much of sub-Saharan Africa. In a similar vein, Mahajan (2008) has shown how epidemiological HIV/AIDS epidemic modelling in India, which compared data from India with models from elsewhere, worked to construct a discourse about the epidemic amongst policymakers and global health actors that was at odds with local experiences of it.

Collectively, this body of work has thus made important contributions to understanding the ways in which the use and reliance upon quantitative means of rendering the world and people legible to global health governance institutions can both lead to problems in the localisation of programming and to the centralisation of expertise and thus decision-making authority and legitimacy far away from the locations in question. Both of these have major implications for understanding health inequalities and efforts to reduce them. It has also shown how these architectures of data production, surveillance, and accountability form part of global health governmentality, with data flowing from the South to centres of decision-making in the Global North.

My project builds upon this large body of literature in a few ways. Firstly, if quantification misses out important things, but global health scientists work in teams including people who are in the field every day and well aware of the important stuff getting missed, why does this persist? How and why are decisions made to continue to produce knowledge in particular ways even while colleagues raise doubts about its usefulness and representativeness? Secondly, this literature takes a strongly Foucauldian view of datafication, arguing it to be bound up with governmentality and biopower through its emphasis on producing knowledge about populations for their management through technologies, and through the disciplinary and accountability-driven audit cultures they enact. Such a conceptualisation is helpful in highlighting how even apparently benign and possibly well-intentioned initiatives like producing data about people suffering from health inequalities to inform better policymaking decisions can end up serving the interests of Northern actors. Yet we understand little from this about the people involved in the multi-scalar system that produces scientific knowledge. Many of these people are convinced that the work they do makes the world a better place, and with good reason: global health can point to countless successes, from radically improving HIV/AIDS treatment and prevention, to slashing malaria mortality rates. How then do we make sense of the creative work of scientists – both Northern and Southern – in navigating this system of knowledge production? How do the political forces discussed above shape their work? How much room do they have to pursue alternative agendas?

The Political Economy of Global Health Science

Having discussed the ways in which scholars in critical global health have interrogated the role of data and their scientific usage for global governance, I here turn to literature on the political economy of global health science. By this, I refer to the ways in which scientific research gets funded and is thus made possible, and how it is shaped by these flows of funding. In critical global health, much of this work draws inspiration from work in STS and the history of science. For example, Bruno Latour (1988) showed how Louis Pasteur did important work in building political support for his work, enabling it to be funded and thus to be widely taken up as important and useful. In a different vein, Steve Sturdy (1992) showed how the integration of science into medical practice in Sheffield in the late-19th and early-20th centuries was driven more by the pursuit of administrative efficiency than because doing so improved the quality of diagnostics and treatment outcomes. Thus, what scientific knowledge was taken up, commissioned, and funded in support of this process was profoundly shaped by this wider managerial goal of administrative efficiency. Scholarship such as this has established scientific knowledge as being contingent upon political-economic forces and contexts, which more recent scholars have sought to explore in the context of global health.

Some of this work has focused on the increasing role of the private sector in shaping global health science. Susan Erikson (2016) has shown how investors and firms have sought to generate and collate data that enables them to justify investments in the Global South to shareholders with high returns on investment. Erikson demonstrates that data is shaped by these financial goals. In a similar vein, Adriana Petryna (2005, 2009) has documented the globalisation of clinical trials, as private companies seek out human subjects for enrolment in experimental research testing the efficacy of pharmaceutical products. As she illustrates, knowledge production to these ends is profoundly shaped by the projected profitability of the products being tested, while experiments are increasingly taking place in the Global South due to the much lower costs associated with doing so compared with the North.

These market logics (competition; cost-effectiveness; value generation) do not apply solely to the private sector. Johanna Crane (2013) has demonstrated how, as more funding was made available for scientific research on global health issues – and in particular on HIV/AIDS – universities across the Global North scrambled to establish partnerships with research institutions and clinics in the Global South to access and produce data to conduct scientific research. Due to a host of factors, there was substantial funding targeted at immunological and virological research, as well as clinical epidemiology, creating knowledge at the molecular level, with scientific research thus shaped by these political-economic incentives (Crane, 2011b). Marissa Mika (2015, 2021), in her work on the Uganda Cancer Institute, has illustrated how public, private, and philanthropic funding enabled and constrained the clinical and research work of clinicians over the course of decades since 1950. This funding waxed and waned over this period depending to a large extent on the political and economic context both nationally in Uganda and globally, as I discuss in much greater detail in chapter one. Noémi Tousignant (2018) makes a similar observations with respect to toxicologists in Senegal, though she focuses more on the ways these funding uncertainties are lived by these scientists, highlighting the dynamic temporality of scientific work amidst an uncertain and fluctuating funding landscape.

This body of work has been informative for my project. Part of my interest is in shedding light on the ways in which political-economic factors shape what knowledge is made in global health science. I am explicitly interested not in how these factors shaped knowledge solely in the projects in which I conducted my ethnography at that given moment, but rather in situating such observations in a wider analysis of the wider global health science funding system, interrogating how knowledge production in global health is influenced by political-economic structures. What kinds of decisions do scientists take in terms of how they approach the work they do in the light of these structural dynamics, such as incentives and disincentives, cultural norms, and material bottom-lines.

Collaboration and Extractivism in Global Health Science

Another important body of literature upon which I build in this thesis is that surrounding the ways in which power inequalities between the transnational epistemic communities of scientific researchers shape the work that they do. Chiefly, this has been investigated through analyses of global health 'collaborations' or 'partnerships' – formalised agreements between researchers to work together on a given project – which have often been argued to be extractive, benefitting Northern researchers and the global governance institutions that fund them more than their Southern colleagues or research participants. For instance, scholars have shown how valuable data and samples taken from African research subjects are then beneficiated in Northern public and private institutions for purposes of national defence, profit, and 'global governance', or produced in service of Northern priorities, thereby exacerbating North-South inequalities (Riedemann, 1993; Lachenal, 2015; Geissler and Tousignant, 2016; Wendland, 2016b; Boum II, 2018; Fouad, 2018; Gimbel *et al.*, 2018; Kenworthy, Thomas and Crane, 2018; Crane *et al.*, 2019). In this work, extractivism has also been tied to unethical forms of research, in which, for instance, African participants have been subjects of experimental pharmaceutical interventions for pathogens that are not present in their locations (Crane, 2011b). Scholars have argued that these unequal power relations between Northern scientists and their Southern colleagues are upheld by the ways in which research in funded, planned, and directed – given that most funding flows from Northern institutions, Southern researchers are often obligated to work with foreigners in order to access the resources necessary to conduct scientific research (Crane, 2010b; Biruk, 2018; Fouad, 2018). It is important to note however that such accounts offer nuanced depictions of the relations between Southern and Northern researchers that go beyond simplistic and Manichean analyses of power. While the material reality often is that funding from Northern donors limits the scope for Southern scientists to substantively shape the research agenda, the work of Southern scientists has been shown to be significant nevertheless in practically enabling research to take place and in shaping the practice of scientific research in the process (Crane, 2010a, 2013; Moyi Okwaro and Geissler, 2015; Boum II *et al.*, 2018).

In this body of literature, the work of Johanna Crane has been particularly significant, and provided much of the initial inspiration for this thesis. Her book *Scrambling for Africa* (2013) describes the rise of transnational 'global health science' on HIV/AIDS in a Ugandan clinical setting and in US universities over the 2000s, and analyses the ways in which material inequalities between Northern and Southern researchers shaped the ostensibly 'collaborative' research that was being conducted, giving rise to "frictions" that were at once scientifically productive and rife with extractivist logics and inequalities. The concept of friction deployed here is one drawn from Anna Tsing (2005), who conceptualises it as the productive yet often messy and uneven encounters that occur when different cultures, ideologies, and systems come into contact through globalisation.

While based on empirical material from the mid-2000s that is now somewhat dated (the specific practices analysed by Crane have changed greatly), Crane's book raised important questions about who global health science ultimately serves, who benefits from it, and how unequal power relations between the Global North and South shape contingent scientific knowledge. Crane's book interrogates the ways in which biomedical knowledge about HIV/AIDS emerges from a postcolonial political context beset by inequalities. She argues that these inequalities both constrain and enable global health science – limiting the equity of partnerships between Northern and Southern researchers, but enabling the production of biomedical knowledge on HIV/AIDS that would be impossible in the Global North due to the uniqueness of the scientific opportunities presented in Africa. A central tension in Crane's writing is her seeming ambivalence about the normative value of global health science: she is evidently inspired by science and technology scholars who tend to take a morally and politically agnostic approach to their analysis of the field. Such a perspective, when combined with a postcolonial political critique of the power relations that the shape the production of such knowledge, could lead to an argument that is in some sense 'anti-science', which Crane absolutely is not: she readily acknowledges the transformative impact on people's lives of the introduction of antiretrovirals for people living with HIV in Uganda, for instance. The result of this is a set of conclusions to her work that offer important insights into how inequalities shape knowledge production in global health science and how Northern scientists flocked to the South to avail the scientific opportunities it offered, but little in the way of a more structural or holistic analysis of the field of global health science and its potential role in efforts to alleviate ill health – something only possible to do by taking the field seriously and analysing how it targets and values some forms of evidence over others. This project thus differs from Crane's work – and the work of similar such scholars who remain ambivalent or agnostic about the political and moral mission of global health – in that it begins from a point of generalised support for the normative aims and ambitions of the field (to reduce health inequities and improve health outcomes) and for the role of biomedical science in enabling these. A world with global health and global health science is better than a world without it. This is, in my view, an important point to establish from the outset: while in this thesis I resolutely retain and develop the critical approaches of the critical global health literature, I am also interested in advancing an understanding of how structures shape action in ways that ultimately undermine the efforts of those practicing global health science from an initial disposition of sympathy for the normative aims of many of the actors involved.

Before turning to my methodology, there is another body of literature that I want to briefly discuss – the 'decolonising global health' literature. This is a body of work found in mainstream global and public health journals such as *The Lancet*, *The British Medical Journal* (BMJ), and their various subsidiaries like *BMJ Global Health*. In these journals, short articles or comment pieces are frequently published by global health researchers, activists, and practitioners from a diverse array of national and disciplinary backgrounds discussing contentious issues relevant to the field. This large and rich body of work has raised concerns with various aspects of 'decolonising' the field, ranging from what 'decolonising' global health actually means or should entail (e.g. Abimbola and Pai, 2020; Lawrence and Hirsch, 2020; Khan *et al.*, 2021; Abimbola, 2024), to equity in research collaborations (e.g. Boum *et al.*, 2018; Faure *et al.*, 2021), to the politics of authorship on journal articles (e.g. Abimbola, 2019), to the 'dos and don'ts' of capacity building (e.g. Masekela *et al.*, 2022; Raees *et al.*, 2023). Such literature is generally based upon the lived experiences of the researchers themselves and is typically highly normative, often written in an 'op-ed' style, and aimed at effecting specific changes in global health practice and research. However, it is rarely theoretical and notably almost never cites any of the work in critical global health that has hitherto been mentioned.

While such literature is also relatively infrequently acknowledged in critical global health, it has been highly informative for this project – it is widely read amongst my interlocutors, who would sometimes discuss it in interviews, or reference examples of such work that they or their colleagues had written. It also served as an effective and fruitful means of learning about the experiences and perspectives of a wide range of different researchers, thus informing my interview questions, ethnographic planning, and my empirical analysis. It also enabled me to get at least a rough sense of the extent to which my observations in the context of Uganda were representative of the wider international context of global health science. Furthermore, some of this work offered analysis and empirical insight that was instrumental in the development of my own thinking throughout this project. As a consequence, while this literature is generally not theoretical and therefore is not one to which I will directly contribute in this thesis, it is one to which I hope to contribute in separate writing informed by this work at a later date. I also draw on some aspects of it throughout this thesis as a means of contextualising the claims of my interlocutors. Furthermore, discussions around 'decolonising' global health science are ones that I return to in the conclusion.

Methodology

Approach

In order to understand how global health science is made in practice, we must understand the decisions that are taken in its production, the social relations that enable it, and the ways in which political-economic, cultural, and epistemic factors shape what it comes to be. Such an approach is informed by the work of sociologists and anthropologists of science, and Bruno Latour in particular. In his seminal book *Science in Action*, Latour (1987) argues that ethnographers should study "science-in-the-making" as a way of understanding the work that goes into the making of science. "Uncertainty, people at work, decisions, competition, controversies": these are what one must investigate to better understand the profoundly social processes that lead to the construction of scientific facts (Latour, 1987, p. 4). Ethnographic exploration of these relations, practices, and processes necessitates going to a place. For Latour, this was a Nobel prize winning physics laboratory in the US state of California. For me, this was two research institutes in

Uganda. In other work discussed above, Latour (1988) also argues for situating scientific practice in a wider political-economic context. This thesis investigates the effects of this context as it was made manifest in the institutes I studied. However, there are various aspects of global health science, compared with, say, physics, that mean that this thesis is not a straightforwardly Latourian undertaking.

First and foremost is the fact that global health science is not physics, or indeed any other singular scientific discipline. As was made clear in my earlier definition of the term, and as I illustrate in chapter one, global health science emerged over the late-1990s and 2000s as a multi- or interdisciplinary field involving numerous disciplines. These include: virology, molecular biology, epidemiology, statistics, health economics, social policy, qualitative health research, medicine, bioethics, nutritional science, biology, health systems, genetics, and others. The much-cited adage of Arthur Kleinman (2010, p. 1518) that global health "is more a bunch of problems than a discipline" is indicative of this disciplinary diversity. Indeed, individual global health research projects will almost always involve scientists from different disciplines working together, sometimes directly and other times in parallel pursuing different work streams, such as quantitative and qualitative data collection and analysis, or epidemiology and laboratory science. This work is sometimes published together and other times separately. Moreover, even on the same project amongst researchers of the same discipline, there are different roles to fill. With few exceptions, as I discuss late in the thesis, Ugandan researchers are tasked with shepherding prospective projects through ethical review processes, recruiting local staff, gaining access to participants and study sites, and generally managing the implementation of the project. Their Northern researchers meanwhile win the grant funding, do the bulk of the journal article writing and conference presenting, and tend also to lead on the scientific research design of the project. Thus, researchers of the same disciplinary training can have very different tasks and expertise depending on their role in the project and projects past, which is often dictated by which country they come from, as well as seniority. However, as we shall see, these are generalisations – ones that remain broadly true, yet ones that, if taken too seriously, conceal important nuances.

Can we then study 'global health science' as a singular epistemology? This thesis shows we cannot – the field is too splintered. Concepts like "epistemic communities" (Haas, 1992) and "epistemic cultures" (Knorr Cetina, 1999) can be useful here up to a point in evoking the differences between groups of scientists. Haas (1992, p. 3) describes epistemic communities as networks of professionals with recognized expertise and competence in a particular domain, who share: (1) a set of normative and principled beliefs; (2) shared causal beliefs about how certain phenomena function; (3) notions of validity and appropriate methods for producing knowledge; and (4) a shared policy enterprise or commitment to solving specific issues. Haas is an international relations scholar, and this concept is focused on the more macro-level role of scientists in contributing to global governance and policymaking, something to which global health scientists certainly aspire. His point about normative beliefs is also helpful: global health science brings together normative beliefs in both the value of expanding scientific knowledge for its own sake, but also in using such knowledge to save lives as soon as possible. Knorr Cetina meanwhile is an STS scholar, so her concept of epistemic cultures is more concerned with the more micro-level differences between scientific disciplines like physics and biology and how they differ in terms of epistemic commitments, sociality, scale, materiality, and so on. From a distance, both of these concepts appear useful in conceptualising the implications of the many different disciplines and forms of expertise that come together in global health projects. Yet the closer one gets to the lived professional experiences of researchers, the more difficult it is to find any kind of boundary between distinct 'communities' or 'cultures' – as I show over the course of this thesis, such thinking only takes us so far and tends to underrate the material, non-epistemic forces that shape the work of knowledge production. In any case, thinking in such terms is not the primary interest of this thesis – I am not trying to think about how these scientists differ, but rather what they do or do not accomplish with their labour and why and how the knowledge they make is shaped by structural forces.

The challenges that epistemic and experiential diversity bring to studying the production of knowledge are not new, however. The historian-anthropologist Ann Stoler has conducted work on knowledge production in the context of systems of European colonial governance, in which colonial officials scattered across the world had to produce and send knowledge about colonial territories back to the centres of empire in Europe. In this context, Stoler argues that epistemology should be understood "not as a fixed architecture of knowledge production, but as achieved labour and worldly practice… as what people do, as a navigational strategy" in the making of knowledge (Stoler, 2008, pp. 350–351). This enables a reckoning with the diverse epistemic formations in different sites of empire across the world and does away with any assumption of congruity to the epistemic practices of her subjects. In studying the epistemological, cultural, and political-economic contours of global health science then, my research draws its approach from scholarship that has understood knowledge production in terms of what people do to make knowledge: by looking at what people do to make it, we can understand what people consider it to be, what sits within its bounds, and what does not. By situating such an analysis in a political-economic context, we can also see how the work of producing scientific knowledge in global health is shaped by funding flows.

Yet doing this ethnographically presents challenges in the context of global health science. Global health science is fundamentally transnational – studies are funded by institutions of many countries, but generally ones located in the Global North, and are then conducted largely in the Global South by teams of people usually hailing from at least two different countries (and often more). Understanding global health science ethnographically as a transnational field of knowledge production thus entails multi-sited and multi-scalar research (Marcus, 1995). While going to a singular place is helpful in seeing how global health science lands in a given context, it gives but a glimpse of the field as a heterogeneous whole. If we are to deepen critical understanding of this field, we need to do more than this. As James Pfeiffer and Mark Nichter (2008, p. 413) argue, ethnographers "need to become more sophisticated when 'studying up' and carrying out multisite ethnographies of multiple stakeholders in health systems, donor communities, and emerging global health networks."

Johanna Crane (2013), in her ethnography of a global health science research institute in Uganda, discussed above, dealt with this issue by combining her place-specific, ethnographic observations with wider analyses of the field of global health science informed by sociology and history. Thus, her work offers a rich history of the "turn towards Africa" in health science research and its interconnection with developments in the HIV/AIDS epidemic, but it does not consider the navigational strategies and the more quotidian work of producing knowledge called for by Latour and Stoler. Cal Biruk (2018) meanwhile takes a different approach in their ethnography of demographic research projects in Malawi. Biruk in many respects does the opposite to Crane – focusing less on the wider sociology and history of demography and much more on the mundane realities of collecting data in the field. Biruk lays out their work as following the "social lives of numbers", showing how the social meanings of the numbers shift as they pass through scales from the fieldworkers and enumerators, to the data collators and managers, to the researchers in Northern academic institutions who compile them into evidence and statistics. We thus learn a great deal about what goes into making demographic data, but relatively little about demography itself as a wider field beyond its epistemic commitments to clean data.

How then can we study global health science, taking into account its multi-scalar, multi-sited, transnational geography and the ways in brings together different forms of expertise and epistemic practices, whilst still retaining the depth of analysis that comes from seeing it land in a given place? Such an endeavour is made more and less complex by the rise of digital technologies – when Crane and Biruk were collecting their empirical material in the 2000s, the projects in which they conducted their research were managed over the occasional Skype call and more substantively by email and site visits. This limited the extent to which the Northern scientists involved in their projects could feature as substantive interlocutors – in Crane's case, a single individual provides the bulk of this material. Today however, Zoom and Microsoft Teams have revolutionised transnational scientific research – meetings can take place daily, and Northern scientists have more day-to-day communication with their Southern colleagues than was possible fifteen to twenty years ago. This opens up the possibility of these individuals serving as central interlocutors and the online meetings as critical sites of observation – both important for this project – but it also adds additional layers of complexity to relations between researchers and the communications that are possible to observe. Moreover, where both Biruk and Crane critique the unequal North-South power relations in the funding, design, analysis, and dissemination of scientific work, these too are changing, with more Southern scientists than ever taking leading or equal roles in these tasks. However, these activities are often coordinated via email, tracked changes in Microsoft Word, WhatsApp, and in video calls – all of which are fiendishly difficult spaces for the ethnographer to observe.

This brings me to the methodological approach of para-ethnography. Para-ethnography refers to an alliance of sorts between ethnographers and their interlocutors in the process of knowledge production: "a somewhat veiled, maybe even hesitant, overture to partnership or collaboration with our counterparts found in the field" (Holmes and Marcus, 2005, p. 251). It emerges from the idea that certain groups engage in forms of interpretation and analysis that resemble ethnographic approaches in their reflexivity and critical thinking, and that these analyses can be taken seriously and form part of the ethnographer's own analysis. The approach is most commonly associated with the work of George Marcus and Douglas Holmes, who developed the term in relation to their work on central bankers, many of whom offer complex and deep analyses of their own work and industry that are of great use to the ethnographer

(Holmes and Marcus, 2006). Marcus and Douglas (2005, p. 237) thus argue that para-ethnography provides "a somewhat subversive, yet controlled, access to fugitive social facts in a key contemporary system of technocratic expertise, which conceives and produces the idea of the global as daily practice." Such a claim, made in relation to central banking, carries clear resonance with the study of global health science. Para-ethnography enables a greater depth and breadth of ethnographic analysis of technical and expert spaces[1]. By engaging critically and reflexively with the theorisations and analyses of interlocutors, ethnographers can observe in mundane practice aspects that might otherwise go missed. By tapping into the technical and expert knowledge offered by interlocutors and engaging – even debating – with them about the wider significance of their analysis of this knowledge, ethnographers can develop a richer and wider analysis of this knowledge, its production, and its social significance. Moreover, benefiting from the self-reflective experience of expert interlocutors also enables broader spatial and temporal horizons that exceed the limited scope of fieldwork. Particularly important for my project, para-ethnography also allows the ethnographer indirect access to the hard to observe and difficult (or forbidden) to access communication between scientists or other experts: emails, private meetings, WhatsApp messages, documents, unsuccessful grant applications, and so on. Engaging in dynamic, critical, analytic conversations with interlocutors about these aspects of their professional life enables a richer sense of the professional worlds they inhabit and the work they do.

These methods were highly useful in my project. In the remainder of this section, I describe the details of my own research, beginning with the three months of desk-based research I conducted during the COVID-19 pandemic for my MPhil (2019-2021), before proceeding to a

---

[1] Para-ethnography has not solely been deployed for studying experts, however. Sherine Hamdy (2008), for example, has used para-ethnography in the context of her work on kidney disease in a hospital in Cairo. She observes that her interlocutors – many of whom were slowly and painfully dying from renal failure – offered complex and rich theorisations of their own suffering, situating it in relation to long histories of state failure and political mismanagement.

lengthier discussion of my ethnographic doctoral research, which lasted for one year in 2022. It is in this latter section that I return to a discussion of para-ethnography.

MPhil Research

The research for my MPhil was conducted just a few months into the COVID-19 pandemic, which prevented me from conducting fieldwork in Uganda. Instead, I had to conduct research from my desk in the UK. This meant my plans to conduct ethnography in Uganda were scrapped and I had to alter my research design to fit the new global circumstances of national lockdowns and travel bans. I thus made the decision to focus on the political history of HIV/AIDS research in Uganda and the ways this history has shaped medical research today, work that I could do from my desk in the UK. I was especially interested in the relationship between scientific research and the aims and strategies of political and global health actors, in particular the Ugandan and US governments, as well as the WHO, the World Bank, and other international organisations. In hindsight, my interests in these themes could not have been insulated from the politics of the concurrent COVID-19 pandemic going on around me.

My interests in these themes led me to draw on the work of scholars who have conducted political and historical research both on HIV/AIDS and on the efforts of the Museveni administration to build legitimacy and credibility nationally and internationally. In pursuit of the latter, I followed Fisher (2012, p. 406, see also 2013, 2014), who analysed documents from "Western policy makers, news agencies, consultancy firms, and think tanks" to assess messaging strategies from government actors. In pursuit of the former, I followed Justin Parkhurst (2001, 2002, 2008, 2011, 2012, 2017), whose critical secondary analyses of epidemiological publications and grey literatures on HIV/AIDS in Uganda inspired my initial approach. Parkhurst examines epidemiological evidence from a critical standpoint, shedding light upon the political contexts in which HIV/AIDS control in Uganda was taking place and the ways in which this evidence was used and shaped by actors like the Ugandan and US governments and international organisations.

I built on these methods by focusing on the ways in which events and history are explained and described in scientific literatures and documents and how differing explanations or ideas of these events reflect competing attempts to justify ideological positions, which also constitute efforts to consolidate legitimacy. Thus, following Philo (2007, p. 178), I sought not only to look at the "descriptions which [are] offered of the world in a specific text, but to look at the social" – as well as, in my case, the political – "relations which [underpin] the generation of these descriptions". Furthermore, in my analyses of biomedical publications and grey literatures, I endeavoured to 'read against the grain'. Such a practice is commonplace among historians and social scientists conducting archival analyses (e.g. Stoler, 2002), but I deployed the method on the output of research institutes, and particularly on publications in peer-reviewed biomedical and public health journals. In practice, such a method involves a critical examination of the gaps and silences of these papers; of the present and the absent (Blouin, 2020). Moreover, it involves a critical historical assessment of how such publications were produced, from the initial funding application, through the ethics and research design processes, the collection of data, and the eventual analysis and dissemination of findings.

This endeavour was informed by my interviews, of which I conducted fifteen. All were conducted online on either Microsoft Teams, Skype, or Zoom. I received ethical approval to conduct these interviews from Oxford University's Central University Research Ethics Committee (CUREC). My interviewees were primarily medical and public health researchers based in Uganda, the UK, the United States, and South Africa who had worked, or currently work, on HIV/AIDS in Uganda. Specifically, these researchers were a combination of epidemiologists, clinical researchers, statisticians, and social scientists employed by or with experience of working with major health research institutes. I also interviewed Ugandan research assistants and junior researchers working with such institutes. Finally, I interviewed two individuals employed by the Ugandan government involved in the HIV/AIDS control response.

Access to such a wide range of individuals was in many respects facilitated by the global pandemic. Those researchers that had not been drawn away from their ‘normal’ topics of choice to study COVID-19 were easily accessible virtually. I was consequently able to interview individuals in Mbarara, Entebbe, Kampala, Johannesburg, Seattle, Baltimore, Massachusetts, Oxford, London, and Oslo without difficulty. Given the diverse array of individuals with whom I spoke, the content of the interviews varied greatly, and my questions were tailored to the particular interviewee. The interviews each lasted an hour, and I followed the University of Oxford’s guidance regarding data storage, confidentiality, and informed consent, which was obtained verbally.

DPhil Research

Where my MPhil project enabled me to deepen my knowledge of the history and politics of scientific research on HIV/AIDS in Uganda, my DPhil research enabled me to investigate the practice of global health science in the present. I pursued these aims by conducting a total of nine months of in-person ethnographic research in Uganda in 2022, followed by a further three months of participant observation in online meetings and in-person interviews while based in the UK. My research was multi-scalar and multi-sited, and comprised institutional ethnography on two institutions, which I here pseudonymise as CVHS (the Centre for Virology and Health Sciences) and MUSCo (the Mbarara-US Collaboration for Global Health Research), as well as three research projects hosted and implemented by these transnationally managed institutes.

CVHS is a collaboration between several elite British and Ugandan biomedical and health research institutions located on the top of Nsamizi hill in the city of Entebbe, overlooking Lake Victoria, just south of and contiguous with the Ugandan capital of Kampala. As detailed in chapter one, biomedical research has taken place in some form or other in Entebbe since the beginning of the 20th century, and CVHS' own history is a long one, with many of the oldest researchers at the Centre having worked there for more than thirty years. The institute is run by a multidisciplinary group of researchers from the UK and Uganda, with disciplinary backgrounds spanning virology, epidemiology, and anthropology. My access to CVHS was enabled through my connection with Professor Margaret Oppenheim, a British social scientist whom I had interviewed during my MPhil research, and whom was immediately and enthusiastically supportive of my request to conduct half of my ethnography within the institute in which she had worked for many years.

Within CVHS, I was embedded within two research projects: MensIES (Menstrual Health Intervention and Evaluation in Secondary Schools) and PrEPCoVax (PrEP and Combination Vaccines Trial). MensIES was a RCT testing the effect of a 'package' of interventions aimed at improving menstrual health and attitudes towards it on self-reported mental health and educational outcomes of secondary school pupils. PrEPCoVax meanwhile was a trial of two different experimental HIV vaccine regimens, alongside a control group, with an additional study of a new form of Pre-Exposure Prophylaxis (PrEP) taking place in parallel. The trial took place across three African countries including Uganda and was coordinated from the CVHS headquarters in Entebbe – the first time that a multi-country vaccine trial was directed from entirely within Africa.

MUSCo is a collaboration between several US universities and Mbarara University and is located in the small southwestern Ugandan city of the same name. It was founded during the first stages of the global health research funding boom in the early-2000s by a US American researcher who commenced a research partnership with a Mbararan physician-researcher whom he met at a seminar on HIV/AIDS in Kampala. Unlike CVHS, whose leadership is a mixture of Ugandan and British scientists, almost all of whom formally hold posts in the UK university within which the centre technically sits, MUSCo is completely independent of its US partners other than through the specific grants being run and administered through it at any one time. Its leadership is entirely Ugandan, with the institution sitting awkwardly at the fringes of Mbarara University's administrative infrastructure, which means for instance that it is generally committed to paying staff in accordance with the standard, low pay scales of Ugandan public institutions. Other differences between the institutions are that, where CVHS relies both on core, endowed funding and grants, MUSCo relies entirely on grant funding and philanthropic donations to survive, and its Ugandan and US American components are held together only through the social ties of the researchers in each country, the current grants they hold, and underlying memoranda of understanding between the institutions.

Within MUSCo, I was based within the SHINe study, the institute's longest running project which had been in operation for more than ten years due to the creative work of the US American PIs in consistently winning grant after grant to keep the project going. While it has had many different foci over the years, SHINe has largely been focused on conducting research on social networks and seeing how these determine people's health-seeking behaviours. This is discussed further in chapter two.

My interlocutors were drawn primarily from those working in these three projects, but also from outside them in the two institutes I studied. I also interviewed some people who had no formal connection to the institutes at all, and instead worked with other research institutes in Uganda. My interlocutors spanned a wide range of different academic disciplines, professional roles and experiences, nationalities, levels of personal familiarity with Uganda, political views, and so on. Some of these people I developed strong relationships with and met many times, others I spoke to only once. Some I only ever met online, others I shared a physical office with for months.

The ethnographic research that I conducted across these two institutes and three projects took place across different locations in Uganda as well as online in the regular Microsoft Teams, Zoom, and Skype calls that these projects hosted several times weekly to coordinate the implementation of research activities between those in Uganda and those elsewhere. I also conducted more than one hundred hours of one-on-one, key-informant interviews both in-person and virtually with seventy scientists, fieldworkers, data managers, finance officers, trial managers, research assistants, and people working for funding institutions[2]. I thus attempted, following Crane (2013) and Biruk (2018), to capture the perspectives of the people making scientific knowledge from those interacting with participants, filling out surveys, and implementing projects, to those cleaning the data, analysing findings, writing journal articles, giving conference presentations, and designing future projects, to the officials in funding institutions, and others. Throughout, I reflected on the professional lives of my interlocutors and thought about how they contributed to the making of global health science through their action and work; how they paid attention to some information more than others or conceived of some evidence as more valuable than others; how disciplinary hierarchies played out. Capturing such perspectives and actions amongst a geographically disparate set of interlocutors necessitated a multi-scalar approach. I had to move between different spaces: clinics, offices, and laboratories in Uganda and the UK, field sites like schools, villages, and trading centres in Uganda, virtual meeting rooms bringing researchers together from across the globe to manage, plan, and complete projects, and international conferences at which findings were presented. I was not tied

---

[2] These individuals were loosely split between Ugandans living and working in Uganda, almost all of whom I interviewed in person rather than virtually, and Northern researchers, whom I interviewed either in-person in Uganda, in-person in the UK, or remotely in the US, Spain, Canada, or South Africa.

to a specific locality, but rather moved between a set of places tied together by transnational relationships between researchers conducting and administrating science. I thus followed Biruk (2018) and other contemporary anthropologists who have sought to construct transnational 'fields' of study for ethnography that span both virtual and physical and North and South in so far as such spaces are connected by shared endeavours and collective action.

Para-ethnography thus served as a helpful means of approaching the study of these multi-scalar and multi-sited expert networks, full of difficult-to-observe nooks and crannies like emails, WhatsApp messages, private calls and conversations, confidential documents, and so on. Many of my interlocutors offered complex and deep reflections on their experiences working in global health science, offering me access to their perspectives on events and processes that surpassed the spatial and temporal boundaries of my ethnography. A few were even anthropologists working in 'social science' teams in these institutes, and thus were able to provide fascinating analyses of their experiences over many years. In my many interviews and conversations with my interlocutors, lots of whom I spoke to several times, I would challenge and interrogate their accounts, thinking against the grain of their narratives in real time and putting the perspectives of other interlocutors to them to respond to. Where possible, I would also triangulate accounts of events, seeking out multiple perspectives from people present for moments I missed. Para-ethnography thus offered a way of navigating between scales. For example, I gained access to the perspectives of research assistants about their principal investigators (PIs), and PIs about their research assistants – both in specific meetings I observed, and over the course of a decade or more. The insights and analysis provided by all parties in question were more than just narrative data, but rather were born out of sustained critical reflection on the part of all involved with friends, colleagues, workshop facilitators, and individually. Such points relate also to the connections I observed and studied between PIs and those that directed the institutes or departments in which they were based, or those working for the funding agencies that issued research grants to them. Given the disparate nature of these networks, it was not always possible to speak to the exact official in the exact department that made a confidential decision behind closed doors to fund a particular research project to which I had access – para-ethnography thus enabled me to acquire a diversity of thoughtful, reflective, and often critically-engaged perspectives based upon years of experience at different scales and sites of global health science and assemble aggregate points of view in each from those whom I could access. Para-ethnography enabled me to move "between thick and thin" (Holmes and Marcus, 2006, p. 35) in my work. 'Thin' data (that operating at a higher level of abstraction, or a coarser level of granularity), served "as the material, so to speak, out of which [I could] create contexts and preconditions for 'thick' description" – where I had glimpses of activities, I could leverage the expertise and experience of my interlocutors to bridge micro and macro scales of analysis.

As a consequence of this method of reaching into the in-between spaces and times that are difficult to observe ethnographically, the balance in the empirical material presented in this thesis between thick description and the narratives of my interlocutors is slanted towards the latter – perhaps more so than some ethnographies. I provide many direct quotes from my interlocutors, both as a means of elevating their voices in my work – for I believe they have much of worth to say themselves – and as a means of taking my analysis further.

The Argument in Brief

In this thesis, I critically interrogate the practice of global health science and the knowledge it produces. In conceptualising science as a contingent form of understanding rather than a transcendent one, I illustrate how knowledge production in global health science is shaped by cultural and epistemic logics and a political-economic context. I argue that this leads to global health science being shaped by influences that do not necessarily align with the needs or interests of the people it is ostensibly intended to benefit. I thus elucidate the structural factors that lead to this disconnection in the foci and methods of scientific research from the needs of the Ugandan public as they are articulated by Ugandan researchers. Whilst such disconnection is neither total nor consistent – a great amount of important and informative scientific knowledge is certainly produced in the country – I show in this thesis how and why the needs of Ugandan people are systematically downplayed and de-prioritised due to a combination of political-economic and cultural and epistemic dynamics.

In other words, this thesis is concerned with showing how power actually works in contemporary global health science – not through explicit domination and subordination, but through banal and bureaucratic practices, well intentioned epistemic frameworks, and flows of funding. Amidst wider critiques of global health for its challenges in adapting to local and national social, political, and economic contexts, I conclude that wrangling with the cultural, epistemic, and political-economic forces shaping knowledge production is essential in better localising global health practice and correcting the misalignment between global and public health.

Chapter Summaries

This thesis makes this argument across five empirical chapters. Chapter one traces the history of biomedical, scientific research in Uganda, and explains why the country became a hotspot for global health science. In so doing, it traces how knowledge production in global health science changed over time in relation to shifting national and global political, social, and economic contexts. In particular this chapter highlights the deeply contingent nature of the transition in global health science research from being largely descriptive in the 1980s – for instance involving the production of prevalence rates and the identification of disease risk-factors, primarily in relation to HIV/AIDS – in the 1980s, 1990s, and early-2000s, to being more experiment- and intervention-based since then.

Chapter two investigates the ways in which funding instabilities in global health shape what scientific knowledge is made in the field and uses the concept of 'precarity' to conceptualise both the material instabilities of these funding flows and the reactions they engender on the part of scientists. It begins with a description of who the primary funders are of global health science, before articulating a multi-scalar analysis of the way this precarity is experienced at three levels: funding institutions, research institutes, and individual research projects. It argues that the short-term, grant-funded nature of transnational scientific research financing necessarily relegates questions of relevance to public health and development policy beneath the prevailing priority of maintaining funding, which substantially shapes what knowledge gets made. Scientists and researchers thus decide what to produce data on amidst what they perceive to be constraints from the system of global health funding and priority-setting. A version of this chapter is currently in press in the journal *Medicine Anthropology Theory* (Parker Allen, 2025).

Chapter three analyses disciplinary and knowledge hierarchies in global health science and the epistemic commitments that underpin them. It begins with a description of the ways in which diverse groups of scientists from different disciplines come together in research projects to produce knowledge. It then explores how knowledge hierarchies play out in these multidisciplinary spaces through discussion of two clinical trials. I then argue that what structures these hierarchies are claims to the universality of the knowledge produced by different disciplines: when scientists can state that their work remains true and valid on a great scale, their work is given more value. I argue that because global health science has taken up this principle, that global health science is perceived to be most valuable when it makes claims on truth that are not locally specific, but rather universal, it is therefore less attuned to the local context that is important to public health policymaking.

Chapter four looks at blind spots in global health science. Through an analysis of the aetiologies of these blind spots, I show that global health research is made much easier to propose and fund when there is already good data from which to illustrate the need for research or to test a given intervention. Consequently, there is a strong incentive to do research on people, places, and conditions to which attention has already been paid, while deviating from these established areas is quite difficult. I conceptualise this as 'stickiness', and argue that this plays an important role in the shaping of scientific research – and practice based upon it – in Uganda.

Chapter five analyses the experiences of Ugandan scientists in scientific research partnerships in global health, and details how many such scientists try to co-opt research projects and grant funding, which they see ultimately not to be in their interests, to make the most of them – delivering improved patient care or trying to collect data and test interventions on neglected people, places, or health issues. In the process, it argues that the collective action of these Ugandan scientists is not insignificant, and that it results in the development of healthcare institutions and their associated infrastructures of knowledge production, resulting in the production of data that speaks to national issues and enables demands to be made on the state and on global governance institutions.

Positionality

Uganda is a country in which I have spent significant time, having lived in the country for several years in total since I was a child during the regular work trips made there by my parents, whom I accompanied. Prior to my project, I was therefore familiar with many aspects of the social and political contexts in which my research was to take place, making access to the research institutes of study easier, and enabling me to more easily and quickly understand the contexts in which scientific research was taking place. Generally, I found that this experience enabled me to form bonds with my Ugandan interlocutors relatively easily, and there were but a small handful of occurrences where I felt that I was being associated with the senior researchers – Northern or Ugandan - that were the bosses of those participating in my study, therefore prompting caution. This was in evidence by the ready and abundant critiques of many of these Northern researchers and the structures in which they operated that were offered to me by my Ugandan interlocutors with little prompting or probing. I also learnt to speak Luganda (albeit only to a basic level of understanding), which while only spoken in one of my two field sites was nevertheless an effective way to build rapport and trust with my interlocutors and office mates – if only to enable them to laugh at me. Nevertheless, there were some interlocutors who were politely wary of my presence and who responded to my questions briefly and placidly.

In truth, the aspect of my positionality that presented the most significant hurdle to my research was not my racial identity or nationality, but rather my academic discipline. While this did not present a great challenge amongst the more junior research staff tasked with implementing the projects in which I conducted my ethnography, it presented an enormous challenge in my efforts to gain access to these projects in the first place and in recruiting certain senior, experienced scientists – Ugandan, British, or US American – as interviewees. Amongst those who were most suspicious of my work were virologists, epidemiologists, molecular biologists, and very senior managers and administrators. Whilst the scepticism about the potential for an anthropologist amongst their ranks to cause havoc and trouble was not universally felt amongst researchers of these disciplines, a number of important gatekeepers carried strong concerns about my research – some of these dynamics are explored further in chapter two. Such occurrences were rare, but occurred at several important stages throughout the project, requiring careful handling and reassurances of ethical conduct.

Ethics

My DPhil project received ethical clearance from Oxford's CUREC, the Ugandan Virus Research Institute, and the Ugandan National Council of Science and Technology. It then went through further ethical review from the university managing CVHS, as well as through two other elite British universities involved in the PrEPCoVax project, and went through further informal review by MUSCo. As a part of this, I had to take online courses in Good Clinical Practice and biomedical research ethics. During my research, I obtained consent iteratively, and my interlocutors were able to opt-out of my observational research, and withdraw their consent during and after interviews.

Throughout this thesis, I have pseudonymised my interlocutors to protect their identities as best as possible, often also pseudonymising the organisations they worked for. I also offered my interlocutors the option of having total anonymity if they requested it, in which I would not include any information about them in the thesis whatsoever other than that for which I received explicit consent. I have also pseudonymised the institutes and projects in which I conducted my ethnography, as doing so was a condition of access. I have taken steps to minimise identifiability as much as possible while retaining information that is important to my description and analysis. I also agreed to send some of my interlocutors a copy of this thesis before it was submitted to confirm I had followed all the ethical procedures in my write-up which had been agreed upon.

Chapter One

Why Did Uganda Become a Hotspot for Global Health Science?

Introduction

In this chapter, I explore why Uganda became a hotspot for global health science research and how the scientific knowledge produced there has been shaped by a multitude of global and local factors. This chapter examines several interconnected historical trajectories that help explain why Uganda became one of the largest recipients of global health funding from the 1980s onwards.

Firstly, I situate the rise of biomedical, scientific research in Uganda in a longer historical context and discuss its importance in colonial scientific research. Here, I note the importance of the founding of a set of scientific and medical institutions in providing the physical infrastructure, such as offices, labs, and supply chains, and human resources, such as physicians and scientists, that enabled Uganda to become and remain a site of important scientific research over much of the twentieth century. While changes were wrought on these institutions over the 1960s, 1970s, and early-1980s by the politically and economically tumultuous regimes of Presidents Milton Obote and Idi Amin, I show throughout this chapter that these institutions have remained the foundations of much of the scientific work to take place in Uganda over the past century.

Next, I discuss the emergence of HIV/AIDS in Uganda and the efforts to tackle it by President Museveni, whose rapprochement with the West after coming to power in 1986 and whose efforts to revitalise Uganda's image coincided with political and economic changes in geopolitics, international health, and development. In particular, I address why HIV/AIDS became such important issue to the West in this period, demanding action. As a result of this, Uganda became an important site of international health interventions throughout the 1990s and beyond, with biomedical research playing a progressively more important role in these interventions over the decade.

Lastly, I trace the proliferation of health research over the course of the 2000s and 2010s, describing the rise of experimental global health science amidst a rapidly changing and widening global health landscape, noting in particular the central role of RCTs and pharmaceuticals in the research for and practice of global health.

Overall, I argue that Uganda became a hotspot for global health science because of a plethora of interconnected political, economic, cultural, and epidemiological processes, and show how these processes have shaped the production of biomedical knowledge in the country over the course of its history.

Part One: Colonial Science and Ugandan Political History

Colonial Science

Part of the reason Uganda became a hotspot for biomedical research lies in its British colonial history. The territory itself was established in 1898 as a British protectorate in an expansion of the preceding Buganda protectorate, established in 1894. The Buganda protectorate, located in what is now Uganda's 'central' region[3], was so called because it represented the incorporation of the Buganda Kingdom into the British empire. This process was negotiated slowly over the two decades prior to 1894, and one which was enabled by the British exploiting political divisions both within Buganda society and between the Buganda and other neighbouring and rival groups[4] (Reid, 2017). The pre-existing and complex Buganda administrative system was also appealing to British colonial officials, and it was ripe for exploitation through their policy of indirect rule. Consequently, Buganda became central to the British colonial project in what became Uganda: the region became the administrative, economic, and political heart of the protectorate, and later, the nation. This is reflected in the age and distribution of the country's churches, clinics, universities, and research sites, the first of which tended to be founded in the Buganda region either in the years preceding or in the years following its colonisation (Iliffe, 1998; Pringle, 2016). Of these, churches and clinics came first from the 1870s onwards, as the introduction and spread of biomedicine and Christianity was an important aspect of the efforts by the British to establish political power in Uganda, as in many other locations. Following the formalisation of Uganda as a British protectorate at the turn of the century, research institutes followed in the wake of medical and religious institutions. Indeed, as Helen Tilley (2016, p. 746) argues, the expansion of biomedical services in Africa during the colonial period "tended to go hand-in-glove with launching research programs", with the intention of producing scientific knowledge important to "human health or economic development". In this, Uganda was no exception. Consequently, Uganda began to see biomedical research taking place in the years following its establishment as a British protectorate in 1898. Early research projects investigated a wide range of different

---

[3] This nomenclature is slightly misleading however – the central region encompasses much of Uganda's southern border with Lake Victoria.

[4] It should be noted that this was not a smooth process – the conversions of Ugandans to Christianity took decades and was beset and enabled by political division between the Buganda kingdom and other groups (Reid, 2017).

medical conditions affecting colonial administrators and missionaries as well as local populations.

A defining part of colonial scientific health research was on *trypanosomiasis*: a parasitic disease carried by the tsetse fly vector, otherwise known as 'sleeping sickness'. It became a major source of alarm and attention across colonial Africa due to its high mortality rates amongst local populations and colonial officials, and concerns about its potential to disrupt economic activity. So great was this concern that the disease prompted the first efforts at international biomedical coordination, as the various European colonial powers sought to collectively control its spread (Tilley, 2011). Uganda in particular had several severe epidemics of the disease, and the attention these garnered resulted in the British colonial government sending a series of scientific missions to the country beginning in 1902 (Headrick, 2014). This, in turn, led to the founding of the Human Trypanosomiasis Institute (HTI) in Entebbe on the shores of Lake Victoria in the Buganda region (Cummiskey, 2017). Entebbe was an appropriate choice for the Institute's location because it was already an important administrative centre for the British colonial office, and it was located in a place where epidemics of the disease were rife: the parasite and its vector were particularly prevalent on the Lake Victoria coastline and in its surrounding forests (Tilley, 2011). The Institute conducted major research on the disease, which was afflicting thousands across the subcontinent as colonially-mandated changes in land use resulted in ecological changes favourable to the tsetse fly and brought human populations into closer contact with them (Tilley, 2011, 2016). Research on the disease and its underlying parasite was presented at many international conferences in the early decades of the 20th century. This research was met with great interest, and, in conducting it, scientists were also able to generate both concern and scientific curiosity. As Cummisky has argued, such work was amongst the first that led "to the development of a widespread perception of Uganda [amongst European scientists, doctors, and colonial officials] as both a place riddled with exotic viruses and a place where researching those viruses was possible". Sleeping sickness research thus laid the institutional groundwork for, and ignited the political and scientific interest that enabled, Uganda's gradual establishment as a hotspot of scientific research.

However, the initial focus of scientific research in Uganda on trypanosomiasis gave way to yellow fever over the 1920s, eventually leading to the HTI being renamed the Yellow Fever Research Institute (YFRI) in 1936 (Cummiskey, 2017). This transition in interest was due to various factors, including improvements in the environmental control of trypanosomiasis and developments in pharmaceutical treatment, as well as the fact that while disruptive, the disease primarily afflicted African populations. Yellow fever, on the other hand, had proven lethal and catastrophic, particularly to European colonial administrators, traders, and missionaries in West Africa. Moreover, the virus, transmitted by a mosquito vector, had broken out in various South American ports, causing high mortality and negatively impacting trade and commerce. The League of Nations thus made controlling the disease a priority. This was particularly important for Britain given fears that the disease, transmitted by the *aedes aegypti* mosquito, might spread to South Asia, where that species of mosquito was abundant but where there had been no yellow fever epidemics. Given that the disease was endemic in West Africa, but was rarely seen on the East African coast, Uganda was thus viewed by officials and scientists as being something of a natural barrier preventing the virus from spreading further eastwards to the coast and from there on to the Indian subcontinent (Cummiskey, 2017). The creation of the YFRI in Entebbe on the site of the former HTI, funded by the British colonial administration but initially more significantly by the Rockefeller Foundation's International Health Division (IHD), reflected these concerns. It was also an early indication of the responsiveness of scientific research to the incentives and demands of international funders.

In addition to housing research, the topics of which besides yellow fever also included a variety of other viruses and insect vectors, the YFRI also became a hub for vaccine distribution in sub-Saharan Africa, particularly of vaccines for yellow fever in the years before and during the

Second World War (Cummiskey, 2017; Kaleebu, 2020). This further consolidated the Institute's position as a vital node in international health networks. Eventually however, progress in developing knowledge and fighting yellow fever led to a decline in funds for research on the virus, a trend compounded by the gradual retreat of the Rockefeller Foundation from international health programming and research as it pivoted its strategic priorities towards US and Latin American health science capacity building. The Foundation withdrew from the running of the YFRI in 1950, though it continued to provide some funding, and the Institute was taken over by the East African Medical Research Council (EAMRC). It was renamed the East African Virus Research Institute (EAVRI), a name change illustrative of its wider research mandate (Cummiskey, 2017).

In this period, Makerere University, situated just north of the EAVRI in Kamapala, adopted an increasingly important role in research activities. Makerere had been founded by the colonial administration in 1922, initially starting life as a technical training college teaching medicine, amongst other vocational courses. It was granted full university status in 1949 and gradually became a hub for research biomedical and otherwise, alongside its teaching hospital, Mulago (Lowe Morna, 1989; Mills, 2006; Pringle, 2015). From the 1920s onwards, Makerere University researchers and clinicians became progressively more involved in the EAVRI and its antecedents, developing a longstanding institutional partnership that persists to the present. This partnership became especially productive in the 1950s when Makerere University scientists worked alongside colleagues from EAVRI to, for instance, make notable advances in the field of cancer virology, demonstrating the association between Burkitt's Lymphoma (named after a British surgeon working at Mulago) and underlying infection with Epstein-Barr virus (Cummiskey, 2017; Mika, 2021).

This colonial history of biomedical science in Uganda is important to foreground. As Tilley (2011) argues, colonial Africa became a "living laboratory" for the colonial powers – a site of experimentation and knowledge production that was ultimately concerned with the advancement of European interests, ideals, and ambitions, but one that was cross-cut and profoundly shaped by its dynamic engagement with African environments and people. In Uganda, where British colonial administrative authority was concentrated in Buganda and built around core institutions like the YFRI and HTI, the training and involvement of researchers and clinicians was a central aspect of this. Such institutions, while run by British appointees of the colonial office, also played important roles in the training and growth of a cadre of Ugandan researchers. As Julia Cummisky (2017) illustrates in her history of the HTI and its successors, the fact that such institutions in Uganda have typically persisted into the present is a testament to the instrumental involvement of Ugandans in their work since their inception. Such continuities of institutions, the development and practice of expertise, and of commitments to scientific knowledge production are thus important to highlight.

So too is the integration of such institutes in global scientific and governance networks. Even in their earliest colonial iterations, institutes like the HTI were highly responsive to the priorities of the institutions that funded them – in this case the British colonial administration and the Rockefeller Foundation in particular – due to the need to maintain financing to continue their work. As Tilley's and Cummisky's accounts both reveal, the economic pressures on those doing scientific research meant that scientists had to justify the continued value of their work to those institutions providing funding. Throughout this chapter, and indeed the thesis, it will become evident that such a structural dynamic within the funding and practice of science in Africa has persisted to the present day.

Independent Uganda in Context

After the Second World War, owing both to shifting attitudes towards colonialism in Britain and to sustained pressure and campaigning by Ugandans, changes began to take shape in the governance of the Ugandan protectorate. In 1958, Uganda was eventually granted internal self-governance through a legislative council, and then the right to have its own full, national elections in 1961. This led to the country's declaration of full independence from Britain in 1962. While this transition is often discussed as being relatively peaceful compared to other African counties, the protracted process of colonial liberation was fraught, divided, and violent, as Richard Reid (2017) has discussed. As Mahmood Mamdani (1983, p. 6) notes succinctly, "The revolt against colonialism was first and foremost a struggle for unity amongst the colonised." This was due to profound and longstanding divisions between different groups within Uganda.

These divisions had been exploited by the British as a means of establishing the Ugandan protectorate in the first place. This included divisions between kingdoms or 'tribes', as they were then called by the British, such as the conflict between Buganda and Bunyoro in which the British intervened to support the former in a move that enabled the establishment of indirect rule (Mutibwa, 1992). But it also included divisions between different groups within larger socio-political units: in Buganda, the British exploited divisions between different Buganda chiefs who were more or less favourable to the British and to a centralisation of political authority under the Kabaka (Ingham, 1958). After the founding of the protectorate, the British also furthered divisions within the Buganda between Protestant and Catholics, the latter of whom had been converted by the French in the years before the protectorate was established (Twaddle, 1988).

Meanwhile, the centrality of the Buganda economically, infrastructurally, and politically in the British protectorate bred further resentment between groups. A particularly divisive aspect of this was the application by the British of Buganda administrative structures to the rest of the country, with Buganda civil servants often placed in leadership positions over people from other ethnic groups. This model of administration also involved governance through chiefs –

something that was especially fraught in Northern Uganda, where acephalous political structures were more common, and centralised political authority in individuals often anathema to existing forms of public authority (Ingham, 1958). Chiefs and administrators tended to be Protestant and British-aligned, something that caused tension amongst a population that by the 1950s was largely Catholic. As Mamdani (1983, p. 9) has noted, during the protectorate years, Protestantism was essentially a state religion, with Protestants favoured over Catholics for Chieftaincies, and Catholics over Muslims. Even within Buganda these tensions were apparent, with a minority of the population antagonistic to the centralisation of political authority under the *Kabaka* (King) and what they perceived to be the persecution of Catholics by Protestant-aligned Ganda elites (Reid, 2017).

Further divisions sown and exacerbated during the colonial period included those between the primarily Nilotic and Luo peoples of the North and the largely Bantu peoples of the South. The British colonial administration governed these two regions differently. The North was often used as a supply of labour – particularly for police and military positions given the colonial notion that Northerners were inherently more 'warlike' – while the South was used for agriculture, often involving the large-scale displacement of people to make room for large farms (Mamdani, 1983). Such a divergence in treatment created complex inequalities – Northerners tended to hold military positions, but economic wealth was concentrated in the South (Dinwiddy, 1983; Mamdani, 1983). A further complication was the arrival of large numbers of South Asians to Uganda at the encouragement of the British. These South Asians were barred from owning land and instead incentivised to engage in business activity, which the British accurately anticipated would connect enterprise in Uganda to longstanding South Asian-run businesses on the East African coast, to the benefit of British commerce (Mamdani, 1983).

In the years surrounding independence, these divisions were manifest. The Democratic Party (DP) was founded in 1954 by Catholic Baganda who did not support Buganda separatism and who felt unrepresented by the *Kabaka*. The Uganda National Congress (UNC), founded two years earlier, was meanwhile a nationalist party formed by a group of activists from across Uganda who rejected the domination of Buganda in Ugandan society. Both of these parties engaged with protectorate politics alongside representatives of the *Kabaka* of Buganda, Muteesa II, despite their differences, and thus all three groups were instrumental in the negotiations leading to limited internal self-rule in 1958, followed by the first, full national elections in 1961. Just prior to these elections, in 1960, one of the key founding members of the UNC, Milton Obote a Lango from the North, split from the party to create his own, the Ugandan People's Congress (UPC). This split was itself illustrative of the divisions in Uganda at the time: Obote differed from his UNC colleagues in his stronger anti-colonial politics and rejection of British involvement in Uganda, his clearly articulated vision for a secular party and state that diverged from that of the more Protestant UNC elites, and his steadfast commitment to a singular nation that united ethnic groups from outside Buganda. In the 1961 elections, boycotted by Baganda separatists, the UPC and DP dominated, with the latter winning by a slim margin and forming a government. After a transition to independence was voted upon by this government and agreed with Britain, fresh elections were held in 1962 with the full participation of Buganda, which had resigned itself to a union, but sought political autonomy that would enable the *Kabaka* to retain and wield substantive power. This participation largely took place through the *Kabaka Yekka* (KY, 'The King Alone') party, founded in 1961. Capitalising on this, Obote's UPC created an alliance with the KY, agreeing to grant Buganda autonomy within a unified nation. This strategic political move catapulted Obote to the leadership of a coalition government in 1962 as the first Prime Minister of an independent Uganda, with *Kabaka* Muteesa II acting as the ceremonial President.

However, the alliance did not last long. In office, Obote pursued centralisation of power and in practice sought to curtail Buganda autonomy. Alongside his appointee to Commander of the army, Idi Amin, Obote also sought to illicitly support a rebellion in the neighbouring

Democratic Republic of Congo (DRC), purchasing arms from his ally President Julius Nyerere of Tanzania and exchanging them with the Congolese rebels for money, gold, and ivory. Obote's political rivals both within the UPC and KY caught wind of this scheme and alleged that some of these Congolese funds were being stolen by Amin and Obote, with these allegations being used to justify efforts to unseat Obote in the interests of reaffirming Buganda autonomy. These efforts failed, and instead Obote alleged that the *Kabaka* had attempted to instigate a coup against his government, eventually leading to the 1966 Mengo Crisis in which Obote commanded Ugandan soldiers led by Idi Amin to storm the *Kabaka*'s palace, killing hundreds, with the *Kabaka* himself narrowly escaping into exile. Elections, which the constitution mandated should be held every five years, were thus cancelled in 1967 by Obote owing to this political instability, while the political status of kingdoms was abolished, and Uganda declared a Republic with Obote as President. Collectively, these acts marked a sharp turn, albeit one heavily foreshadowed, towards authoritarianism and widespread political violence, as Baganda resisted these changes (Leopold, 2020). Under Obote, corruption was perceived to increase dramatically, something that also coincided with a 'socialist' effort to redistribute resources and bring businesses into state ownership, and a growing view that he was favouring Acholi and Lango people from the North in his various appointments and that they collectively were benefitting from this state-led redistribution (Mutibwa, 1992).

Idi Amin, from the small Kakwa group in Uganda's Northwest, seized on the growing resentment and divisions of the increasingly despotic Obote regime. In 1971, while the president was attending a Commonwealth meeting in Singapore, Idi Amin instigated a successful and largely unopposed coup, installing himself as President, leaving Obote to take refuge with his ally Nyerere in Tanzania. But Amin did not substantively diverge from the path down which Obote had already led Uganda – the plundering of state institutions, the violent repression of political challengers, and the seizing of economic assets in the name of redistribution, all continued unchecked. Ugandan Asians, many of whom held productive businesses in the country, were summarily expelled by Amin in 1972, with their assets seized by various state actors. By the mid-1970s, the optimism surrounding Uganda at independence in the early-1960s had evaporated. The productive, export-driven economy was shattered, government coffers were drained, and widespread political violence had taken hold, particularly against the Acholi and Lango populations seen to have benefitted from the Obote years and amongst whom loyalty to the deposed president was assumed.

But the violent despotism of Idi Amin proved highly unstable, with several coup attempts, mutinies, and insurgencies led against him throughout the mid-1970s. In 1978, amidst the chaos of these years, a rapidly declining economy, and a declining support base, Amin decided to invade Tanzania. The exact reasons for this remain unclear: the decision may have been taken in a misguided effort to forge unity within Uganda against an external 'threat', an effort to distract from internal issues through a war, a way to root out defectors Amin believed to be hiding in Tanzania, and/or an attempt to project regional power (Leopold, 2020). Whatever the reason, the decision to invade backfired. In 1979, Nyerere responded quickly and with great force, counterattacking with both the Tanzanian army and allied Ugandan rebel groups and deposing Amin within months. In 1980, the transitional government set up by Nyerere ran elections, with the UPC – still led by Milton Obote – winning amidst allegations of vote rigging. The start of Obote's second tenure as President – often referred to by Ugandans as 'Obote 2' – almost immediately prompted a guerilla war. The 'Bush War', as it became known, lasted five years and led to hundreds of thousands of civilian deaths, with some estimates as high as 300,000 (Reid, 2017).

During this war, the opposition to Obote was somewhat divided, but over its course its constituent forces gradually rallied around Yoweri Kaguta Museveni and his National Resistance Army (NRA) – a young commander from the far West of Uganda belonging to the Bayankole ethnic group. Eventually, Obote was overthrown in a coup led by his own army leaders, as he struggled to contain divisions between the Lango and Acholi members of his own army. Tito Okello, an Acholi, thus claimed the Presidency for a few months, but ultimately could not defeat the insurgent NRA, which took power under Museveni in 1986 and ushered in a new era in Ugandan politics. Museveni immediately changed the Ugandan political system, abolishing political parties under his “no-party democracy” and reforming the NRA into the National Resistance Movement (NRM) which supported his candidacy for President in the successive elections that followed the end of the Bush War. Museveni pursued an ambitious plan for rebuilding the country built around political and economic stability, rapprochement with the West after Idi Amin and Obote’s isolationism, and rejuvenating Uganda’s international image.

Health Science in Independent Uganda

Throughout these twenty years of violence and instability, Uganda’s biomedical research institutions proved remarkably resilient. While “Makerere [shrivelled] into a skeleton of its former self” (Lowe Morna, 1989, p. 49), and foreign academics, many of whom led biomedical research locally, largely fled the country, some research at the university and its teaching hospital Mulago remained operational, and the EAVRI meanwhile remained operational. Partly as a consequence of the exodus of foreign researchers and physicians, the Obote and Amin years were also marked by an ‘Africanization’ agenda at Makerere, Mulago Hospital, and EAVRI, in which Ugandan clinicians and researchers increasingly occupied leading jobs the institutions (Cummiskey, 2017; Mika, 2021). This agenda also eventually involved the renaming of EAVRI as the Ugandan Virus Research Institute (UVRI) in 1979, a name it continues to bear today (Kaleebu, 2020). While these changes accompanied and perhaps contributed to significantly declining funding flows, as the ties between European researchers in Uganda and their funders back home could no longer be exploited, scientific research in Uganda did not stop altogether in spite of all the chaos that surrounded it. Certainly, the country's research institutions found it significantly more challenging in many ways to keep staff, attract international collaboration, and stay financially afloat, but researchers were able, for instance, to run a cohort study to better understand the link between Burkitt's Lymphoma and Epstein-Barr virus for most of the 1970s, with the project only coming to an end in 1979 (Cummiskey, 2017). Indeed, in cancer research in particular, the two decades of insecurity remained relatively productive, as Marissa Mika (2021) highlights in her history of the Ugandan National Cancer Institute in Mulago Hospital, with the institute's director skilfully navigating tumultuous political waters. UVRI was meanwhile largely ignored by soldiers who were otherwise raiding and stealing from government institutions – something which has been speculatively attributed to fears amongst these soldiers about the dangerous and mysterious viruses stored in the institute's laboratories (Kinsman, 2008, p. 91). Whatever the reason, the continuity and resilience of this institution, as well as Makerere and Mulago, is important to note in explaining how and why transnational, biomedical research was able to return to Uganda in the 1980s and then proliferate in the 1990s and 2000s.

Part Two: Museveni, the WHO, HIV/AIDS, and the Return of Scientific Research

This section contextualises and explains the return of transnational, biomedical research in Uganda at the end of the 1980s and 1990s. It shows how Uganda's severe and early HIV/AIDS epidemic, the strategies and 'openness' of its political leadership, changes in the structure of international health, and a related turn in the Global North towards addressing the African AIDS epidemic coincided, creating the conditions for Uganda to become a hotspot for global health science. This involved building upon Uganda's existing biomedical institutions – both of research and clinical care – and the people trained within them.

Museveni Opens Up Uganda

Upon his inauguration, Museveni faced a country scarred by twenty years of conflict. The optimism of the early 1960s was gone, government coffers were empty, and Uganda's global reputation was tarnished by the anti-colonial rhetoric, corruption, and isolationism of Obote and Idi Amin. The economy was in tatters, infrastructure and public services were decimated, and there was no plan for development. In these circumstances, Museveni recognized that repression without absolute power would breed cycles of violence and instability, jeopardising his own power in the long-term. Building on his success as a guerilla leader, Museveni united the Bantu South, creating a strong political coalition. Then, understanding the changing global geopolitical landscape as the Soviet Union declined, he took steps to align with the West (Hansen and Twaddle, 1991). He sought to minimise violence, espouse human rights discourse, build allegiances, and symbolically decentralise power, creating democratically elected 'resistance councils' as local government bodies, initially used during his war against Obote and Okello. He also made it a central policy of his regime to appeal to governments in the Global North and to multilateral organisations for aid and support, opening up Uganda to donor funding and international development policies as a means of rejuvenating the country's economy and shoring up both his international and domestic legitimacy in the process. These efforts included some somewhat symbolic gestures, such as the appointment of the British judge Peter Allen, a vociferous defender of judicial independence under Obote, as Uganda's Chief Justice (Associated Press, 1985), but included more substantive measures too. Particularly important for his efforts to seek rapprochement with the West was a series of 'liberalising' economic reforms, beginning in the 1980s and continuing into the 1990s, that diverged from the Marxist ideology Museveni had previously espoused (The New Humanitarian, 2006). These included the privatisation of government parastatals and an embrace of structural adjustment (Brett, 2008). The economic reforms in particular allowed Museveni to position Uganda as an investment- and market-friendly state that acceded to prevailing economic orthodoxy, and has since been variously referred to as a "success story" (Belshaw, Lawrence and Hubbard, 1999) and "show case" (Dijkstra and Van Donge, 2001) by market-friendly economists[5].

But the challenges posed to Museveni's Uganda in 1986 did not stop here. Almost immediately, Museveni faced one of the defining challenges of his presidency - an epidemic of a disease known locally as '*slim*', or '*silimu*' in Luganda.

Uganda's HIV/AIDS Epidemic

Slim was characterised by severe wasting, opportunistic infections, chronic diarrhoea, fever, and swollen lymph nodes, and often associated too with the dark, cancerous lesions of Kaposi's sarcoma. The first cases of this strange and seemingly untreatable disease were described by clinicians during the Bush War in the early-1980s, primarily in southwestern Uganda near the border with Tanzania. Gradually, documented cases of the disease mounted. As Cummisky (2017) describes through oral histories recounted by several of the doctors working in the region at the time, the looming threat of the developing epidemic was terrifying – it was unclear how it spread, but entire families would be killed by it in the space of a couple of years. Concern mounted amongst clinicians in the region and a small number of doctors began to speculate that *slim* was in fact AIDS – a disease they had only read about in newspapers and journals that was associated

---

[5] These claims have been nuanced by political economists (e.g. Brett, 2008)

primarily with homosexual men in the Global North (Kinsman, 2010). For this reason, the alarm sounded by these doctors, who tended to be at the beginnings of their medical careers, was not immediately heard (Kuhanen, 2010b). Many more senior doctors and public health officials dismissed the concerns as absurd (Cummiskey, 2017). In any case, Uganda was embroiled in conflict and the government had little to no capacity to respond to an epidemic of any sort, much less one for a disease that doctors did not even agree existed. However, a group of Ugandan clinicians persisted in their insistence that *slim* was AIDS. Led by David Serwadda and Nelson Sewankambo, two junior doctors working on the frontline of the epidemic, and assisted by some funding and technical expertise from a British physician-researcher who had worked at Mulago since the 1960s, this group conducted laboratory tests to prove that *slim* was indeed AIDS (Cummiskey, 2017). This data was published in an article in *The Lancet* in 1985 (Serwadda *et al.*, 1985).

Despite this evidence, there was no agreement amongst Ugandan doctors or public health officials in the mid-1980s as to the extent of the spread of AIDS – the necessary data collection and analysis was almost impossible given the wider political context (Kinsman, 2010). Nevertheless, concern continued to mount as cases of *slim* increased. Thus, while Museveni was at the very start of his presidency also sceptical about *slim* and its relationship to AIDS, he was quick to change his mind. Having sent a garrison of soldiers to Cuba for military training, Museveni was reportedly shocked when these troops were tested for HIV upon arrival and many of them found to be positive. The public and international embarrassment of these soldiers being sent home by the Cuban government has thus been attributed as an important aspect of Museveni's sudden shift in position with regards to AIDS (Iliffe, 2006, p. 67; Kinsman, 2010, p. 60), though it is important not to downplay the internal pressure to take the epidemic seriously that he faced from doctors like Sewankambo and Serwadda. It is also likely that Museveni sensed opportunity in the crisis - embracing the concerns about AIDS in Uganda, the president began to take action, reaching out to the Global North and multilateral organisations for support, just as he did with regard to Uganda's economic development. As I discuss later in this chapter, these efforts were and have remained remarkably successful at bringing in and retaining donor funding.

That Uganda's HIV/AIDS epidemic was so severe is important to take into account in an explanation of why the country became a hotspot for global health science. As John Iliffe (2006) has argued, African countries tended to suffer worst from AIDS simply because they were afflicted first. Scientific evidence has pointed categorically to HIV/AIDS having originated in central Africa, most likely in the DRC, before spreading eastwards into the Ugandan, Rwandan, and Tanzanian borderlands in the 1970s (Pepin, 2011). With the southwestern region of Uganda embroiled in conflict throughout this period and an associated destruction of its medical infrastructure, the disease spread and established itself in sexual networks without the awareness of international or government authorities (Iliffe, 2006). As Robert Thornton (2008) has further explained, the constant movement of soldiers across the Tanzanian-Ugandan border, and the high prevalence of sexual assault, may have contributed to the virus' spread. So too did the cross-border smuggling trade, known in Uganda as *magendo*, which proliferated in particular during the economic deterioration of the Amin years, as the formally South Asian-owned businesses were taken over by local elites (referred to as *mafuta mingi*, or 'fat ones') who did not have the same access to trade routes as their predecessors (Kuhanen, 2010a, 2010b). This trade took place primarily along the shores of Lake Victoria between Kampala and Tanzania, with many of the villages along the way establishing popular brothels that may too have contributed to the transmission of HIV. Also important was the large-scale urbanisation prompted by the wars of this period, as people sought safety in urban centres, abandoned unprofitable land, and sought prosperity in trading towns (Kuhanen, 2015). Given that, as various authors have noted elsewhere across Uganda (Branch, 2013; Kuhanen, 2015; Porter, 2017), much of the social regulation of youth sexuality occurred within the household or compound by parents and elders, the effects of such regulation were diminished by urban migration of Ugandan youth who often moved without their parents.

Uganda's HIV/AIDS epidemic thus became, in the words of a senior official in the Museveni government, Dr Sam Okware, "a bomb waiting to explode" (Kuhanen, 2015, p. 276), owing both to the earliness of its epidemic relative to other countries and the political and economic context in which the virus spread.

Museveni and the WHO Take Action on 'African AIDS'

Shortly after the return of his soldiers from Cuba, Museveni began to act on Uganda's HIV/AIDS epidemic, reaching out to the WHO for support – in 1986, as today, the world's most important institution for technical public health advice (Kuhanen, 2015). Museveni's request for support coincided with an institutional gear shift in the institution: prior to 1986, the WHO had rejected calls from African states for financial and technical assistance for HIV/AIDS epidemics, but in 1986 it responded favourably to Museveni's request. There are various reasons for this.

Previously, the WHO's programming had been centred around primary care and maternal and child health following the 1978 Alma Ata Declaration – an international agreement with the aim of achieving "Health for All". While the declaration generated great optimism, its lack of clear objectives, and – most importantly – a lack of funding for public healthcare in the Global South, led to a relatively limited translation of its objectives into national and international policymaking (Cueto, 2004). Structural adjustment policies in the 1980s and 1990s then further limited government expenditure on public services, undermining the aims of the declaration. While the shortcomings of Alma Ata were complex, the WHO's relative ineffectiveness at making meaningful progress towards primary care led to widespread criticism of the organisation, which was further compounded by concerns about corruption and poor management, thus diminishing its influence (Brown, Cueto and Fee, 2006). Furthermore, its aspiration to universal healthcare more broadly chafed uncomfortably against anti-socialist politics in the US at the peak of the Cold War. As a consequence, Western funders – particularly the US – increasingly allocated 'extrabudgetary funding' to the WHO: funding outside of the control of its central decision-making body, the World Health Assembly, which was made up of delegates from member states and which voted democratically on the use of the 'regular budget' drawn from routine contributions from members (Brown, Cueto and Fee, 2006). This extrabudgetary funding could then be used by its donors according to their own priorities. Given the wider geopolitical Cold War context, a lack of faith in Southern governments to actually deliver primary care, increasing faith in the market logics and processes to deliver expand healthcare provision, and other reasons, Western donors tended to tie this expenditure to specific health issues in what have been termed 'disease specific' or 'vertical' interventions (Packard, 2016). These donors were motivated to better influence the WHO to expand and open up markets – including pharmaceutical markets – in the Global South, and to practice public health diplomacy and increase soft power. Moreover, there were growing concerns in Reagan administration in the US in particular that epidemics could destabilise African states, potentially threatening US interests and/or leading to the spread of socialism (Epstein, 2007). Given that, by 1987, the WHO's extrabudgetary funding exceeded its regular budget, Western donors were thus able to wrest control over at least half of the WHO's programming (Brown, Cueto and Fee, 2006), which eventually was important in the organisation's change of approach regarding HIV/AIDS.

There were various reasons why Western states were concerned about HIV/AIDS in particular. Firstly, the epidemic was touted as the most likely to lead to the African security breakdowns feared by the Reagan administration, but also offered an opportunity to expand US soft power in Africa in the wider Cold War context through public health diplomacy (Epstein, 2007). Secondly, there was growing pressure on Western donors and the WHO to do something about the ever-worsening accounts of people in Africa dying of AIDS like diseases from some African states, the media, activist groups, NGOs, and other multilateral organisations (Iliffe, 2006). In the West, these were tied to that region's own scarring experience with the disease (Patton, 1990). Thirdly, there were growing fears globally about the spectre of 'African AIDS', as it came to be known, over the 1980s. As Paula Treichler (1999) and Cindy Patton (1990) have discussed, the AIDS epidemic in the West was associated with subpopulations: homosexuals and trans-women, intravenous drug users, and those infected in clinical settings from contaminated blood. However, AIDS in Africa was understood not to be confined to these risk groups, and epidemics on the continent appeared to be affecting largely heterosexual populations. Western governments were thus concerned that 'African AIDS' might spread to their countries and create more generalised epidemics everywhere, with catastrophic consequences. These motivations for the turn towards Africa and African AIDS in development institutions, multilaterals, and Northern government aid departments were also met with scientific hypotheses that African AIDS may be biologically different, evident perhaps in its different clinical presentations – Kaposi's sarcoma, for instance, was far less common in AIDS cases in the West (Crane, 2013). Given how little was known about HIV/AIDS in the 1980s, Africa began to emerge as a scientific frontier where higher caseloads and the possibility of multiple generalised epidemics could facilitate important research that might inform efforts to control it in both the Global South and North (Crane, 2013).

While these changes were taking shape, many African heads of state with potentially large and growing HIV/AIDS epidemics in their respective countries in the 1980s were either reluctant to address the disease, sceptical of it and the sensationalism surrounding it in Western media, or in outright denial of its existence in Africa to a significant degree whatsoever. As Iliffe (2006, p. 67) notes, "Zimbabwe's doctors were initially instructed not to mention AIDS on death certificates. Senior figures like Houphouët-Boigny in Côte d'Ivoire, Hastings Banda in Malawi, and Moi in Kenya ignored the subject entirely or denounced the Western press for 'a new form of hate campaign'." In the DRC, Mobuto issued a press moratorium on the subject for four years after HIV/AIDS was announced in the country. In South Africa, then still under apartheid, Nelson Mandela's early efforts to discuss the disease were met with disapproval from his supporters, and he subsequently remained quiet about it, fearing political reprisals. In fact, Senegal was the only country besides Uganda to openly address HIV/AIDS as a public health crisis in the mid-1980s, with President Abdou Diouf, like Museveni, acting on the advice of a well-trained local cadre of medical experts in seeking technical and financial support to manage the epidemic from multilaterals and Northern governments. However, it is also important to note here that the early scepticism around AIDS, while undeniably damaging in terms of the public health responses of these countries, was also embedded in a wider political context and historical context in which there was well-reasoned mistrust of Northern scientific and development institutions in the aftermath of colonialism (e.g. Fassin, 2008). Nevertheless, irrespective of the relative merits or rationale for addressing HIV/AIDS epidemics, the point remains that Uganda's efforts to do so were early, direct, open, and thus relatively unique. Given the abovementioned changes regarding HIV/AIDS globally, Uganda was therefore well positioned to receive attention from the multilateral organisations, NGOs, and Northern governmental institutions that had begun to turn their attention towards African AIDS.

It was in this wider context that Museveni's request for help from the WHO was heard. In February 1987, just a few months after his request, the WHO founded its Special Programme on AIDS (WHO/SPA, later the Global Programme – WHO/GPA). The WHO/SPA was almost immediately successful in raising funding. Its first director, a 39-year-old American named Jonathan Mann, who had been lobbying for resources to address AIDS in Africa for a number of years, increased the programme's budget from less than US$1 million in 1987 to over US$100 million by 1991 (Iliffe, 2006, pp. 68–69). One of the first recipients of funding from WHO/SPA was Uganda through its new National AIDS Control Programme (NACP), established in 1986 under WHO advice just before the SPA was formally founded. This NACP was the first of its kind anywhere in the world, and it marked a turning point in AIDS governance, something for which Uganda was duly rewarded – by 1989 the country was receiving US$18 million in funding from the WHO and bilateral aid, while "other countries in the region were receiving between $1 million to $4 million" (Slutkin *et al.*, 2006, p. 358). HIV/AIDS thus became a means for Museveni to revitalise Uganda's national image, bring in foreign investment, rekindle the country's relationships with international actors and, in so doing, consolidate his own legitimacy and authority as president.

However, Museveni's shift in approach to HIV was made difficult by a lack of data – designing effective public health policy was challenging, given that so little was known about the disease and its epidemiology. Indeed, at the time of the NACP's creation, only around 900 cases of HIV had been diagnosed and formally reported due to limitations in testing capacity (Slutkin *et al.*, 2006, p. 352). Moreover, by accident or design, much of the early documentation of HIV/AIDS cases in Uganda from the late-1970s and early 1980s was lost in the relocation and rebuilding of government offices, clinics, and ministries (Kuhanen, 2008). Nevertheless, it was clear that HIV/AIDS had spread at least across the South-West and central regions of Uganda (Kuhanen, 2010b, 2015).

The Renaissance of Transnational Biomedical Research

The dearth of data and the apparent spread of the epidemic presented both a challenge and an opportunity for Museveni's government looking to address HIV/AIDS nationally and rebuild its reputation internationally, as it did for Ugandan and international health scientists, and international health policymakers seeking more knowledge about the disease.

One of the steps Museveni took, under advice from Ugandan doctors and Ministry of Health officials was to bring back transnational biomedical research to the country. While, as noted above, such research had not stopped during the insecurity of the 1970s and early-1980s, funding for and foreign involvement in it had greatly diminished. In 1986 then, Museveni invited Professor Frederick Robbins, a Nobel Laureate and public health researcher from Case Western Reserve University (CWRU) in the US to work with researchers at Makerere University to set up a research project on HIV/AIDS, with the initiative winning funding from the US National Institutes of Health (NIH) in 1988. What became known as the Uganda-CWRU collaboration subsequently began extensive work, particularly on tuberculosis (TB) and HIV coinfection.

Then in 1987, with presidential backing, UVRI initiated a partnership with researchers at Columbia University to set up a cohort study in Rakai district to study HIV/AIDS in the local population. This involved tracking the health of a sample of individuals in the district over time as a way of monitoring their HIV/AIDS related health outcomes and risk factors. As Cummisky (2017) has illustrated in detail, this study was initiated by Nelson Sewankambo and David Serwadda – the two Ugandan clinician-researchers who published the 1985 paper confirming *slim* and AIDS were the same. Following this, they sought funding to run a cohort study in Rakai to conduct more research on the disease, and were eventually connected to Maria Wawer, a researcher at Columbia University in the US, with this university supplying the first funds to run the cohort study. Initially, the group had planned to house the project in Makerere, but UVRI was instead proposed by the government owing to its reputation in securely handling and storing pathogenic material. Thus the 'Rakai Project' was born as a collaboration between Makerere University, UVRI, and Columbia University by the end of 1987 with emphatic government support.

The following year, Museveni's government invited the UK Medical Research Council (MRC) to assist the newly founded NACP in their AIDS control work through research, with the work to be headquartered at the UVRI campus in Entebbe. Given the over-representation of urban data at the time, they were asked to focus on Uganda's rural population. The MRC accepted the invitation and found funding for the project from the British Overseas Development Administration (ODA), with the resulting MRC/ODA/UVRI collaboration founded in 1988 (Kaleebu *et al.*, 2015). Longitudinal, cohort-based research commenced the following year in a rural parish a few hours' drive from Entebbe, near the town of Masaka, before subsequently expanding to other sites across central and southwestern Uganda (Kaleebu *et al.*, 2015). Also in 1988, a different group of researchers from CWRU set up another project with researchers at Makerere and doctors at Mulago Hospital specialising in perinatal HIV and mother-to-child transmission (MTCT)[6].

On these events, Kinsman (2010, p. 82) has suggested that, for Museveni, this openness to research may have been less about the science and the research itself, and more that "the organisations' presence gave him credibility… Museveni reportedly had other interests in addition to the science in mind". This notwithstanding, the invitations to, and support of, these research partnerships by the new Ugandan government was indubitably vital to their arrival and success. However, important too were the interpersonal and institutional relationships between scientists and clinicians in Uganda and in the Global North, the historical reputation of UVRI and Makerere as hubs for biomedical research, the fact that Ugandan scientists had started the work already, and that there already existed a well-trained cadre of researchers and traditions in the country.

In addition to these reasons, the country – and its serious and worsening HIV/AIDS epidemic – also presented immense scientific opportunities for researchers from the Global North to learn more about a virus and disease that were little understood at the time. As noted

---

[6] The US researchers on this project eventually moved from CWRU to Johns Hopkins University, and in 1966 it was renamed the Makerere University-Johns Hopkins Research Collaboration (MUJHU).

in the previous section, Uganda presented a scientific frontier for the study of HIV/AIDS because of the opportunity to study a larger HIV/AIDS epidemic than was present in the West, and because of a growing interest in 'African AIDS' (Crane, 2013). Particularly interesting in these early years from a scientific perspective was the study of mother to child transmission and paediatric HIV, both of which were difficult to study in Northern contexts in which negligible numbers of children and pregnant women were seropositive (Crane, 2013). Likewise, the co-presentation of TB and HIV was more easily understood and studied in African contexts where TB was more common.

Given how little was known about the disease, early work was thus entirely 'descriptive' – concerned with identifying and monitoring prevalence and incidence rates, improving understandings of drivers of risk, transmissibility, differences in clinical presentation, stigma, and so on. None of the research was concerned with systematically evaluating control efforts, nor explicitly with devising interventions or solutions to the epidemic, but rather with understanding it better (Packard and Epstein, 1991; Kinsman, 2010, p. 81). Such research was epitomised by the two longitudinal cohort studies run respectively by the MRC/ODA/UVRI collaboration and the Rakai Project, allowing them to trace the changes in the rates of prevalence and incidence within a given population over time. These studies were the first of their kind on the continent, representing yet another element of the virtuous cycle Museveni worked to trigger – the studies were products of Uganda's rejuvenated international reputation and perpetuated this reputation further by their very presence.

Yet the scientific opportunity presented by Uganda also represented a risk to funders. Given the uniqueness of the research taking place, and scepticism on the part of funders that high-quality scientific research was even possible in a country with such significant resource and infrastructure constraints, there was no guarantee of results. As a consequence, early HIV/AIDS research in Uganda had to provide results and advance scientific knowledge on the disease to aid in its control. To this point, Kinsman quotes one of his interviewees, a foreign scientist working in Uganda at this early stage, who explained: “We were very insular… and focused on publication to prove that the research was productive.” (Kinsman, 2008, p. 92). The initial success of the research – such as the two major cohort studies – was thus pathbreaking, creating a model for other projects elsewhere and a platform within Uganda to conduct further research (Cummiskey, 2017).

The World Bank and the Multi-Sectoral Approach

With this flurry of activity in Uganda the WHO/GPA, in their partnership with the NACP, treated “Uganda as a special case, a kind of showcase for the WHO/GPA’s work in Africa, where they had free reign to try everything to stop the epidemic” (Kuhanen, 2015, p. 276). From 1986, Uganda thus became a country of central importance to international health organisations as a site demonstrating the WHO’s efficacy in intervening and reversing the course of an epidemic. Attaining such an image for the WHO was crucial at a moment when its credibility and influence was waning, as noted above. However, within just two years, the WHO’s co-creation of the NACP came under intense criticism for its “inactivity, incapability, and… lack of credibility”, as well as corruption and political unaccountability (Kuhanen, 2015, p. 277). Alongside this public criticism of the early attempts at HIV control and governance, skyrocketing HIV rates were publicised with ever greater attention and concern in both global media and academic journals. In 1988 for instance, data from the antenatal care clinic in Mulago Hospital reported that 25% of expectant mothers from that year had tested positive for HIV (Kinsman, 2010, p. 71).

With Uganda increasingly at the forefront of efforts to control African AIDS, and with the WHO seemingly failing, other organisations stepped up their involvement. USAID and UNDP both increased their funding for AIDS control in Uganda, joined by the World Bank (Kuhanen, 2015). The latter had become an increasingly dominant international actor over the 1980s with its leadership of structural adjustment policies and a growing budget from contributions from the US and its allies. Its elevated role and financial capacity were due in large part to its promotion of a globalist, capitalist, and free market political economy amidst the wider Cold War context. It had also begun to demonstrate an interest in addressing health due to mounting evidence linking it to economic growth and productivity. With the WHO's influence waning over the course of the 1980s, the World Bank was quick to step into the space it left. As Brown, Cueto, and Fee (2006, p. 68) note of this transition:

> WHO officials were unable or unwilling to respond to the new international political economy structured around neoliberal approaches to economics, trade, and politics. The Bank maintained that existing health systems were often wasteful, inefficient, and ineffective, and it argued in favour of greater reliance on private-sector health care provision and the reduction of public involvement in health services delivery. Controversies surrounded the World Bank's policies and practices, but there was no doubt that, by the early 1990s, it had become a dominant force in international health. The Bank's greatest 'comparative advantage' lay in its ability to mobilize large financial resources. By 1990, the Bank's loans for health surpassed WHO's total budget…

Despite this dominance however, the World Bank acknowledged that the WHO had technical expertise in public health, medical practice, pharmaceutical regulation, and so on, rendering the organisation an indispensable partner in its efforts to reshape international health, albeit one that needed reforming and redirection. As a consequence, the World Bank suggested governance reforms to the NACP model, but did so as part of a wider effort to coordinate the response to the epidemic amongst government partners in the Global South, as well as the WHO, USAID, UNDP, and others international development and health institutions.

The main initial output of the reform was the 'multi-sectoral' approach to HIV control, announced at a major international conference in August-September of 1990. This approach ‘decentralised’ Uganda’s response to the virus and became a model for future and ongoing HIV control efforts in the Global South (Kuhanen, 2015). It involved radio hosts, clinicians, religious groups, NGOs, community-based organisations, local figures of public authority and regional healthcare providers in the design and implementation of HIV prevention and control initiatives, and spread work across government ministries (Allen and Heald, 2004). It also meant establishing a national AIDS Commission in 1992 – the Ugandan AIDS Commission (UAC) – headed by the president. The approach itself consisted of leveraging this expansive, nationwide network to convey a multitude of HIV/AIDS-related messaging, ranging from encouraging abstinence or reducing the number of sexual partners, to promoting the use of condoms, as well as more fundamental information about the disease and its transmission (Parkhurst and Lush, 2004; Thornton, 2008).

However, while the stamp of legitimacy of multilaterals and development donors was given to the multi-sectoral approach, the more practical aspects of what it constituted were for the most part already the policy of the Ugandan government, with the NACP having initiated this broad-based approach in the late-1980s. What the World Bank and others brought in these early stages, then, was international legitimacy, significant flows of funding, and technical and managerial advice at the national level. This was partly a product of the recognition that, at the turn of the 1990s, so little was known about the disease – either about the virus in general or about its epidemiology within Uganda specifically – that international policymakers were largely “working on a hunch” about what might work to control it. Thus, the demand for scientific evidence began to grow slowly, supported by the financial might of the big Northern donors who had much to gain and lose on the fate of Uganda’s HIV/AIDS epidemic.

Part Three: The Growth and Establishment of International Health Research

By the start of the 1990s, research at the MRC/ODA/UVRI, MU-JHU, Uganda-CWRU, and Rakai Project collaborations was well under way, with much of their work presented at international conferences and some of it published in international journals within the first couple of years of the decade (Seeley *et al.*, 1991; Wawer *et al.*, 1991). In 1991, another important research institute was set up at the explicit direction of President Museveni, the Joint Clinical Research Centre (JCRC). The JCRC was established as an autonomous non-profit entity in a joint venture by the Ministries of Health and Defence alongside Makerere University, with the latter providing the scientists, and the ministries providing policy expertise and operational and infrastructural support respectively (Mugyenyi, 2008). The government also fitted the new institute out with East Africa's first flow cytometer machine, allowing researchers to conduct CD4 counts, an important means of measuring the progression of HIV. The JCRC was expected to use this foundational governmental investment to fundraise internationally and grow to bring in further collaborations (Mugyenyi, 2008). It thus represents a good example of the sorts of administrative reforms and projects that the Museveni administration undertook to facilitate flows of donor funding into the country.

Nevertheless, the capacity for research institutes to manifestly contribute to HIV/AIDS control efforts in Uganda at this time was limited: there was no evidence basis for many of the different policies being implemented as part of the multi-sectoral approach, and little still was known about the virus and the epidemiology of the epidemic in Uganda (Kinsman, 2010). As a consequence, much of the research taking place in the late-1980s and early-1990s was descriptive and interested in producing basic epidemiological data such as on risk-factors (e.g. Serwadda *et al.*, 1992) and incidence and prevalence rates (e.g. Wawer *et al.*, 1994), which collectively enabled tentative and coarse evaluations of AIDS control measures with little purchase on policymaking. Funding for biomedical research at this time was also still relatively limited, although it began to increase incrementally over the first half of the 1990s (Cummiskey, 2017).

However, in the mid-1990s, things changed rapidly. In 1993, Ministry of Health data was published showing Uganda to have the highest HIV incidence rate in the world and a continuously expanding epidemic – with 400,000 people in Uganda already dead from AIDS, this was a terrifying finding (Kuhanen, 2015, p. 281). Just a year later in June 1994 though, further data was released from four, urban antenatal care sites (testing pregnant women) indicating what appeared to be declines in HIV prevalence taking place over the course of 1993 (Kuhanen, 2015). The reaction both internationally and nationally was one of astonishment. The government ordered audits of the data and of the procedures taking place at the data collection sites, eventually concluding in March 1995 that the data were accurate, with further data from 1994 from a wider variety of sites confirming this trend (STD/AIDS Control Programme, 1995). In this period, funding for scientific research began to increase significantly, as did the attention garnered by its outputs, as donors and policymakers sought out explanations for what seemed to have worked in Uganda (Kinsman, 2010; Cummiskey, 2017).

These Ministry of Health data were followed up with studies from the various research institutes later in the year, with the MRC/ODA/UVRI unit showing a possible decline in HIV prevalence in their rural population cohort, although the authors were more confident in suggesting that the epidemic had stabilised rather than declined (Mulder *et al.*, 1995). Data from other institutes followed at the International Conference on AIDS and STDs in Kampala in December 1995, where five independent studies, each primarily drawing on urban samples, documented apparent declines in HIV prevalence (Konde-Lule, 1995). Collectively, this news was momentous – it was the first indication of sustained declines in HIV prevalence in a country with a generalised epidemic, attracting global media attention and praise from leaders of foreign governments and international health organisations (The New York Times, 1996; The Economist, 1999; Parkhurst, 2001a). President Museveni opened the conference, attended by some 4,000 health specialists from across the world, highlighting the central position that Uganda had come to hold in the development of HIV/AIDS control measures and research internationally (Boahene, 1996). Following the conference, two further studies made similar claims of declines from geographically limited ANC and general population data (Asiimwe-Okiror *et al.*, 1997; Wawer *et al.*, 1997). Thus, claims of a Ugandan success story began to be made after years of significant investment and expenditure from international health organisations, although the researchers who had collected and analysed the data urged caution in their published work about immediately attributing the causes of the declining prevalence to successful AIDS control policies, noting that there may be other causes, such as mortality, driving the observed decline. Nevertheless, the papers expressed optimism that at least some aspects of AIDS control efforts seemed to be working.

At a moment in history in which HIV/AIDS was still a death sentence for most people – certainly those in Africa – and a widespread source of acute panic and concern, the reports from Uganda of a possible prevalence decline were celebrated. For the World Bank, WHO, USAID, UNAIDS, and other international donors, this was an indication to the world that doing things 'their way' led to results. For Museveni and his government meanwhile, the reports were evidence of their success at reshaping the governance of Uganda, and served as a means of attracting more attention, investment, and aid money to the country. For the doctors and researchers on the front line of Uganda's epidemic, it provided important hope and encouragement that their work was not in vain, although AIDS mortality remained high.

Following the announcement of possible declines in prevalence, biomedical researchers began to interrogate the reasons for the observed declines in prevalence – did they reflect actual declines in incidence, or were other explanations driving the declines? If there were declines or plateaus in incidence, what might be causing these changes? (Serwadda *et al.*, 1995; Asiimwe-Okiror *et al.*, 1997; Konde-Lule, Tumwesigye and Lubanga, 1997; Mungherera *et al.*, 1997).

This represented an important addition to the foci of biomedical research, though not a totalising one. There was great interest on the part of all those involved in the Ugandan HIV/AIDS response to work out whether incidence was in fact also declining and if so, what was driving it. Research endeavoured to address these questions, but this did not mean that researchers pivoted away from other issues. Nevertheless, the eyes of the world were on Uganda – donors, international health actors, and the Ugandan government all needed data to back up their respective claims to success, and researchers to some extent provided this, though more widely cited initially were data from the government's antenatal care clinics across the country. As a consequence, before incidence rate data could be produced verifying claims of success, Uganda was already being presented, by donors, multilaterals, NGOs, and Museveni himself, as a success story, with delegations from other states visiting Uganda to learn from the country's approach to tackling HIV/AIDS, including South Africa, Malawi, Tanzania, India, Bangladesh, Rwanda, and Botswana (Parkhurst, 2001b). Uganda also featured prominently in much of the grey literature published by international organisations at the time, cited as an example of 'best practice' with a model that other countries should emulate (e.g. World Bank, 1997, 2001; Schwartländer and Sittitrai, 1998; UNAIDS, 1998b, 1998a; USAID, 1999; World Bank and UNAIDS, 2001; see also, Kuhanen, 2008, 2015). Declines in incidence were eventually confirmed in a MRC/UVRI[7] study based on ten-years of cohort data from the institute's rural field station, and the results were announced at a conference in Johannesburg in 2000 and later published in *The Lancet*

---

[7] The collaboration had again renamed itself in 1998 after ODA was renamed the Department for International Aid and Development (DfID) and administratively withdrew from the partnership, although DfID has continued to financially support it.

(Mbulaiteye *et al.*, 2002), though the representativeness of these findings have been challenged (Parkhurst, 2002).

However, while there was much interest in categorically defining 'what worked' in Uganda's successful HIV/AIDS strategy (Parkhurst, 2008), the biomedical research institutes in the country did not publish categorical diagnoses for specific policies that had the greatest impact, partly because the volume and breadth of HIV control activities made it impossible to isolate and assess a single intervention away from others. Certainly, for instance, higher and growing rates of knowledge about the disease and its prevention, greater uptake of counselling, higher rates of condom use, delayed sexual debut, reductions in numbers of sexual partners, and persistently high rates of mortality, which both reduced the prevalence rates but also created and consolidated a sense of fear about the disease, as almost everyone knew someone affected (Mugyenyi, 2008, p. 158; Thornton, 2008). But none of these factors alone explained the declines in incidence and prevalence. As a consequence of this, the causes of these declines became politicised, as donors, international organisations, and President Museveni's government were all able to use the multi-sectoral approach as a 'black box' – its breadth and multidimensionality allowing, for instance, Museveni to make claims to socially conservative US American audiences that the success of the approach hinged on abstinence and partner faithfulness programmes. Various international organisations meanwhile came to conceptualise the Ugandan model as one that endorsed an 'A, B, C' (Abstain, Be Faithful, or Condomise) approach to HIV/AIDS control, even though such terminology was not used in Uganda until 2003 and such a conceptualisation of the efficacies of HIV/AIDS communication strategies greatly flattens their social and political reach and complexity. The multi-sectoral approach thus legitimised and lent credibility to the continued action of the Ugandan government and international health actors through its breadth and lack of specificity (Parkhurst, 2008, 2012, 2017; Thornton, 2008; Kinsman, 2010).

Nevertheless, the attention garnered by Uganda's HIV/AIDS prevalence declines and the apparent success of the multi-sectoral approach led to increased funding for scientific research in the search for answers regarding what specifically worked. As Cummisky (2017) and Kinsman (2010) have documented, this period in the mid- to late-1990s thus enabled research institutes to build up their research capacity, training more research assistants and administrative staff, purchasing more laboratory and diagnostics equipment, and expanding physical infrastructure, like office space. This placed these institutes in prime position to benefit from the explosion in financial resources for what became known as global health science in the early-2000s.

Part Four: The Rise of 'Global Health Science'

Explaining the Rise

By the early-2000s, funding for global health was beginning to increase dramatically. The Global Fund for HIV/AIDS, TB, and Malaria was established in 2002 and proved highly successful at fundraising: by the end of 2002 it had supported projects tackling HIV/AIDS, malaria, and TB to the tune of US$567mn; by 2004, this figure had reached US$3.1bn. These figures continued to grow, with the cumulative total disbursed by the fund reaching US$135bn by 2013 (Packard, 2016, p. 294). UNAIDS meanwhile saw its budget grow from US$300mn in 1996 up to US$4.7bn by 2003 (Biehl, 2007, p. 1102). The World Bank dedicated US$1bn to its disease-specific 'Multi-Country AIDS Programme in Africa' in 2000 (Packard, 2016, p. 287). Similar increases were observed in funding for global health initiatives by other UN agencies, foreign aid departments, philanthropic organisations, and pharmaceutical companies (Clinton and Sridhar, 2017). While the majority of this expenditure was for implementing programmes, funding for research increased in lockstep with these increments. These significant increases in funding can largely be attributed to the US government and other US nongovernmental actors like the Bill and Melinda Gates Foundation and pharmaceutical companies.

The increased involvement of the US in international health in the 1990s, which gave rise to the increased spending in the late-1990s and early-2000s has many causes. Firstly, the health security paradigm continued to gain ground. As noted earlier in this chapter, some of the earliest spending on African AIDS under the Reagan administration took place because of fears the generalised and heterosexual epidemic would spread to the US, and because of the potentially politically destabilising effect African AIDS epidemics might have on the continent and thus on US interests. This led to the view that US American economic and biosecurity interests should be protected through targeted spending on epidemics and epidemic response in the Global South. These perspectives persisted and were not restricted to AIDS – also important was the somewhat vague but nevertheless concerning spectre of 'emerging infectious diseases' – although AIDS was a powerful driving force for this health security paradigm in the 1980s and 1990s[8] (King, 2002; Ingram, 2005; Lakoff, 2010). The US Centres for Disease Control and Prevention (CDC) published reports on these issues over the 1990s with growing frequency and urgency, as did the NIH – the largest funder of scientific research globally – and a number of other agencies within the US government, as well as the WHO. Dozens of major medical journals also released special issues on these topics in the middle and latter half of the decade (King, 2002). Such activity was followed in 2000 first by President Clinton's administration's formal designation of HIV/AIDS as a threat to US national security, and second by Resolution 1308 of the UN Security Council stating that HIV/AIDS was a threat to international peace and security. Both of these declarations were

---

[8] As previously noted, these often racist imaginaries of Africa as a progenitor of dangerous and destructive disease has a long history (Vaughan, 1991).

significant at marshalling and justifying significant expenditure on health issues in the Global South, including for scientific research.

Also important was the end of the Cold War and the pivoting of Western foreign affairs priorities away from being directly concerned with countering Soviet influence and towards supporting development, democratisation, and political stability in developing countries. This was motivated both by a desire to expand and support Western interests in the Global South – such as enabling access to natural resource wealth and more globalised supply chains and consumer markets – but also altruism and humanitarian imperative (Lakoff, 2010).

Nevertheless, funding stemming from the latter was often tied explicitly to political and economic reforms: structural adjustment still prevailed, while the World Bank's 'good governance' agenda to combat Southern corruption and increase financial accountability also emerged. With structural adjustment also lobbying for the privatisation and roll back of public services which the IMF and World Bank argued were fiscally unsustainable, development organisations and bilateral aid donors filled the gaps. Expenditure to this end was often organised around particular funding drives or missions, such as the Millennium Development Goals (MDGs), put forward by the UN in 2000, though work on many of its components had already begun in the preceding years. Targeting specific development outcomes, many of which related to health, the MDGs agenda was effective at raising funding. So too was the Global Fund, established in 2002 to specifically tackle HIV/AIDS, malaria, and TB. Furthermore, the 1990s saw the increasing involvement of the private sector as Southern markets opened up and provided opportunities for multinational companies. Such firms became involved in international health through the proliferation of public-private partnerships such as the Global Alliance for Vaccines and Immunisations (GAVI), founded in 1999, which tended to promote techno-scientific and disease-specific solutions to health issues (Packard, 2016). In parallel, philanthropic organisations, and the Bill and Melinda Gates Foundation (BMGF) in particular, became prominent financiers of international health initiatives: the BMGF spent US$1.7bn between 1998 and 2000 (Lakoff, 2010, p. 65).

As Andrew Lakoff (2010) has argued, the global and transnational geographies of these efforts in the post-Cold War era came to be understood as ‘global health’, as contrasted with the multilateralism and internationalism of the post-Second World War era in which a more limited model of public health centred national governance (hence, ‘international health’). With limited faith in the West in the ability for Southern governments to deliver development goals without direction, external funding, and accountability mechanisms, and amidst concerns about the possibility of these countries to foment insecurity and become sources of disease, the global governance of health thus emerged. Central to this practice was figuring out what solutions could be devised and implemented to address priorities, leading to increases in scientific research funding.

Enter PEPFAR

The early-2000s marked the arrival of US President George W. Bush’s President’s Emergency Plan for AIDS Relief (PEPFAR). This was initiated in 2003 alongside a pledge by the President to spend US$15bn on AIDS relief in Africa and the Caribbean over a five-year period, of which US$9bn was directed at creating new national programmes in recipient countries. In 2007, Bush refunded PEPFAR with a further US$48bn over the following five years (Packard, 2016, p. 299). The creation of this funding mechanism was one that aimed to address both the health security concerns related to HIV/AIDS raised by the preceding Clinton administration, as well as to enhance US soft power in Africa, and – in testament to Bush’s evangelical Christian faith – to enact what he called his “work of mercy” on the African continent.

Uganda was the first country to receive a PEPFAR disbursement, owing firstly to its successful response in combatting its HIV/AIDS epidemic in the decade prior and its favourable political environment. The central pillar of PEPFAR was its aim to provide HIV-positive people in Africa with highly active antiretroviral therapy (HAART, now generally referred to as ART). ART had been developed in the mid-1990s and was highly effective at preventing the progression of HIV to AIDS. However, while they were made progressively more effective and more available to patients in the Global North[9], their cost at US$10,000-15,000 per patient per year was far too high for most Southern governments (Packard, 2016, p. 289). In Uganda, ART was almost completely inaccessible other than to very small numbers of people who were either so wealthy as to be able to afford the medications, or otherwise enrolled in an NGO-run scheme, or a research project: the JCRC in Kampala for instance gave out ART as part of studies in the late-1990s and early-2000s, enabling small numbers of individuals to gain access to the drugs, but such projects were rare. An additional complication here was that while pharmaceutical companies in India and Brazil had reverse-engineered ART to produce generic equivalents at 70 per cent lower prices, other countries were prohibited from importing them under international patent law. This meant that these drugs were kept from many people dying of AIDS because of the need to protect the financial interests of pharmaceutical companies in the Global North (Farmer, 2003).

However, pressure from activists across the world and the leaders of various Southern governments eventually led to the US and WTO changing their positions and allowing the importation and production of these generic drugs, with the cost per patient per year then decreasing dramatically from US$10,000-15,000 in 1997, to US$300 in 2002, and US$87 by 2007 (Messac and Prabhu, 2013, p. 126). The declining cost made the argument not to fund the distribution of ART in the Global South more difficult, while the pressure from activists and the

---

[9] A small number of Southern countries also gained access to them, most notably Brazil (Biehl, 2007).

growing attention of global health actors and foreign governments was also effective in prompting action from donors. Also important were continued advances in the efficacy and choice of HIV treatment options, with the development of various new drugs, such as tenofovir disoproxil fumarate (known by the brand name Viread), from the early-2000s which could be taken just once a day, rather than multiple times, reduced the likelihood of the development of drug resistance, and had fewer side-effects.

Eventually, these factors contributed to the growth of a wealth of programmes that began rolling out widespread, free ART across much of sub-Saharan Africa by the mid-2000s, enabled by the vast increases in funding outlined above, and by PEPFAR in particular. The WHO and UNAIDS thus launched the '3 by 5' scheme, aimed at enrolling 3 million new people on ART by 2005. While this ambitious aim failed, accomplishing less than half this number, it was illustrative of a turning of the tide in global HIV/AIDS policy and was indicative of the rapid growth in attention and resources that were directed in particular towards the disease in Africa. In Uganda, funding from PEPFAR and UNAIDS and loans from the World Bank, enabled the Ministry of Health in 2004 to announce a scheme providing free ART to those patients most in need, as well as their ambition and plan to provide universal coverage of ART in the coming years (Wendo, 2004). While such an ambition had in practice little to do with the WHO and UNAIDS' '3 by 5' initiative, the government nevertheless pitched the project as being in line with this goal – in a fashion typical of the Museveni government's savoir faire in courting and retaining donors.

The Implications for Research

As Johanna Crane documents in *Scrambling for Africa* (2013), the dramatic increases in funding for global health, spearheaded by, but not confined to, HIV/AIDS, were matched by a proliferation of research institutes and projects in Uganda. The JCRC, MRC/UVRI partnership, Rakai Project, MU-JHU, Uganda-CWRU collaboration, and others continued their work and grew their research portfolios, but over the 2000s and 2010s were joined by an abundance of other transnational research institutes. One of particular importance was the Infectious Diseases Institute (IDI), founded in 2002 as a public-private partnership between Makerere University, Mulago Hospital, the Ugandan Ministry of Health, and the pharmaceutical company Pfizer, and run by a group of physician-scientists from Uganda and the US (Ronald *et al.*, 2011; Nakanjako *et al.*, 2022).

This substantial increase in research activity was due – certainly – to significant increases in funding for research. This was partly because donors wanted to know what projects to fund, but it was also because of the country's existing, well-established research ecosystem, well-trained cadre of physician-scientists, administrators, and research assistants, and the scientific opportunities present in the country. In the mid-2000s, just as ART was beginning to be rolled out in Uganda, researchers from the Global North began to arrive in greater and greater numbers. Of particular interest was the study of the effects of ART amongst a 'treatment naïve' population with low levels of drug resistance. As a consequence of having been starved of treatment for AIDS, Ugandans presented a virological blank slate, as the local strains of HIV had not adapted to ART. This meant that, amongst other things, researchers would be able to study the effects of ART on the evolution of HIV in the body, something that was not possible in the US because treatment was initiated before such studies could take place. As Crane argues in her discussion of these events, such scientific interest was illustrative of the "molecularization of medicine" (2013, p. 94) and of "global HIV science" (2013, p. 105), in which the focus of doctors and scientists gradually shifted from the clinical presentations of patients, to the underlying pathologies at the molecular level.

The increase in funding for HIV/AIDS control in Uganda and, particularly, the provision of ART led to a turn in biomedical, scientific research at the dawn of the country's "treatment era" (Crane, 2007). From the mid-2000s, research on HIV/AIDS became increasingly focused on ART, with studies targeting patients on the drugs, as well as the efficacy and cost effectiveness of different forms of treatment rollout (Kaleebu *et al.*, 2015). Also important was research into ART 'adherence' (e.g. Oyugi *et al.*, 2004) – the extent to which HIV patients stuck to their treatment regimen – and the effects of varying levels of adherence on drug resistance, other HIV/AIDS-related diseases and infections, and so on. Such a development in the foci of research matched the changes in the ways the HIV epidemic was being tackled: the introduction of ART revolutionised treatment and prevention and needed to be understood both at the 'socio-behavioural' and molecular levels. An additional aspect of this turn was the proliferation of trials concerning pharmaceutical interventions: prior to the mid-2000s, large scale pharmaceutical interventions for HIV/AIDS were not possible, and the only way to fight the epidemic was through understanding it deeply and raising awareness effectively about how to prevent disease transmission. With the breakthroughs in ART access in the mid-2000s, research on the virology and molecular biology of the disease and its treatment was more possible, aided by the increasing availability of and funding for laboratory equipment. As a consequence, the avenues of research opened up in these fields, with virologists and molecular biologists, who had previously had a more limited role to play in the HIV/AIDS response in Uganda, now better able to conduct research that might be useful in fighting the epidemic.

More broadly however, global health had undergone a foundational shift. The scientific development of effective ART, the reduction in their cost, and the increases in funding for their purchase had enabled the conditions for widespread access to ART across the Global South, resulting in the aversion of hundreds of thousands of AIDS deaths. Consequently, ART was understood by many almost as a 'magic bullet': pharmaceutical interventions offered solutions that were highly effective, and, in a way, simple and direct to administer as treatment. Such a conceptualisation aligns with what Joao Biehl (2007, 2021) has termed the "pharmaceuticalization" of global health, in which a focus on the development and provision of pharmaceuticals as a means of 'solving' health crises came to the fore of the field. This pharmaceuticalization extended beyond HIV/AIDS and has become evident in every major sector of global health, including TB, malaria, filoviral diseases, neglected tropical diseases, and so on (Wailoo *et al.*, 2010; Allen and Parker, 2016; Craddock, 2017; Kelly, 2018; Lezaun, 2018; Castro and Fleischer, 2020). In many respects, the subsequent rise of Pre-Exposure Prophylaxis (PrEP) typifies this change in global health: with the confirmation in the mid-2000s that antiretrovirals could be taken by HIV-negative people to prevent infection and the subsequent development of PrEP specifically for this purpose, organisations like PEPFAR quickly adopted PrEP as a central component of their HIV control strategies, emphasising the provision of these pharmaceuticals in their programming, alongside ART for HIV-positive people. HIV research in Uganda responded to these changes, with a wealth of research taking place on the acceptability, uptake, molecular biology, immunology, and adherence to PrEP, amongst other similar topics.

Yet it was not just a preoccupation with pharmaceuticals that drove biomedical research in the 2000s and 2010s. There was also an increasing focus on non-pharmaceutical 'interventions'. In Uganda, a useful illustration of this additional focus was research on male circumcision. Not being circumcised had long been known to be a risk-factor for HIV-infection, with the Rakai Project noting this in a 1992 article, for instance (Serwadda *et al.*, 1992), as well as in other articles in the 1990s and 2000s (e.g. Kelly *et al.*, 1999). This eventually led to an RCT being conducted by the Rakai Project in the mid-2000s to evaluate the effectiveness of circumcision in reducing HIV incidence. In common with a similar study that had taken place in South Africa, and at a similar time to a parallel trial conducted in Kenya, the Rakai trial was stopped early because the evidence for the protective efficacy of circumcision was so strong as to be unfair on the control group who had not been circumcised and were therefore at elevated risk of HIV-infection (Gray *et al.*, 2007). The fallout of these trials was that circumcision was recommended as a safe and effective means of HIV prevention by the WHO, with PEPFAR then spending US$16mn in 2007 and US$26mn in 2008 on the procedure across several African countries, with this figure continuing to grow thereafter (Packard, 2016, p. 307). In 2013, PEPFAR estimated that 4.7mn men would be circumcised by their funded partner organisations across southern and eastern Africa (Packard, 2016, p. 307). As Packard notes, while those approving, funding, and implementing male circumcision programmes made clear in official documents that circumcision was not intended to be a substitute for initiatives aiming to reduce HIV transmission through education, behavioural change, and social support, in practice it was promoted as a central tool in the HIV control toolbox and sometimes, like PrEP, as a 'magic bullet'. Indeed, the US American scientists Maria Wawer and Ron Gray, who had co-led the Rakai Project's trial along with Ugandan colleagues, were so proud of their discovery that they hung a large photo of a Ugandan man's foreskin in the common area they shared between their two offices in John's Hopkins University, according to a publication in the university's magazine at the time (Willyard, 2007).

Research on ART, PreP, male circumcisions, and other issues like them thus came to pervade the field of global health science over the 2000s and 2010s, with research increasingly focused on biomedical solutions, primarily pharmaceutical, to global health challenges. This was accompanied by research around these solutions regarding uptake, adherence, outcomes, and so on. Entangled with these changes was the rise in the RCT as a means of generating valid, objective knowledge in global health. During the time of my fieldwork in 2022 for instance, in both of the research institutes in which I conducted my ethnography, there were numerous RCTs running on issues as diverse as menstrual health, paediatric ART adherence, and postpartum sepsis. Their usage as a means of producing evidence about interventions that work in global health began in the early-2000s. As Packard (2016, pp. 307–308) explains:

> The growing use of RCTs was fuelled by a rapidly expanding academic-research enterprise funded by multilateral organizations, bilateral donors, and the manufacturers of pharmaceuticals and biomedical devices. In the United

> States, governmental funding awarded through USAID, the Centers for Disease Control and Prevention, the Department of Defense, and the National Institutes of Health, together with support from philanthropic organizations, including the Gates Foundation, funded a growing army of global-health researchers conducting RCTs of various biomedical technologies in the Global South. NGOs dedicated to running RCTs collaborated with development organizations to test planned interventions. One of the largest such organizations, Innovations for Poverty Action, boasted on their website that they conducted "randomized evaluations because they provide the highest quality and most reliable answers to what works and what does not."[10]

As Vincanne Adams (2013) notes, RCTs were so widely lauded because of their prominence in 'evidence based medicine' (EBM). EBM rose to the fore of Western medical practice and public health governance from the 1990s, before spreading into global health. Often defined in public health and medicine as the "conscientious and judicious use of current best evidence in the healthcare of individuals and populations" (Sackett *et al.*, 1996), EBM is, at its core, an effort "to create a stronger 'scientific' foundation for clinical work by focusing on new kinds and meanings of evidence." (Adams, 2013, p. 55). As an approach to healthcare, EBM was not 'new' per se – medical practice has always been in some sense 'evidence based' (Goldenberg, 2012). Whatever novelty the paradigm brought instead lay in its codification, formalisation, and standardisation of differences between kinds of evidence, rendered in an explicit hierarchy, in which knowledge produced through experimental methods and validated statistically and comparatively was ranked more highly than qualitative research. Thus, RCTs and other kinds of experimental research – as well as systematic reviews thereof – became, as Adams (2013, p. 55) puts it, the "gold standard". While the prominence of RCTs as the optimal means of generating valid knowledge should not be overstated – they are not understood in global health governance as flawless and totally superior to other methods – they have become the most important tool in the global health

---

[10] Innovations for Poverty Action, "About," www.poverty-action.org/about/

toolbox for figuring out which solutions work for particular problems. As a consequence, conducting RCTs is a mark of significant scientific prowess, and scientists conducting potentially impactful and successful RCTs on global health priorities often expect, and generally receive, prestige and attention for their work. RCTs and studies like them have thus become aspirational for scientists to conduct just as they have become desirable for funders to fund, given their powerful claims on truth and potential for impact on policymaking. However, RCTs are typically very costly to run, with budgets – particularly of those involving the testing of pharmaceutical products – extending into the millions or tens of millions of US dollars (Bothwell *et al.*, 2016, p. 2178). Consequently, much biomedical research in Uganda goes on in preparation to conduct an RCT down the line if competitive funding is secured, with studies testing, for instance, whether particularly mobile study participants could be retained in the study and not lost to follow-up, whether participants will comply with drug regimens, or how cohorts might be constructed that are representative of a wider population. Other such preliminary studies might test the feasibility of the prospective RCT by implementing the intervention in question, or parts of it, in smaller areas and/or in smaller sample populations, or involve analyses of whether the prospective intervention would be ethical, cost-effective, or culturally or behaviourally acceptable. Baseline data collection may take place that could be used in a grant application for funding to demonstrate the need for or likely viability of an expensive RCT. This flurry of research activity was evident in the research institutes in which I conducted my ethnography – the orientation of researchers towards the kinds of knowledge production that produces the most valid and scientifically rigorous evidence precipitated enormous amounts of biomedical research which it was difficult to directly connect to addressing an urgent public health issue in Uganda. Another implication of the rise of EBM and RCTs in global health was that, in their privileging of variables for measurement and calculation that are quantifiable and comparable, they privileged, as Packard (2016, p. 311) notes, “those things that can be counted, such as the numbers of pills taken, vaccines administered, and nutritional supplements provided", with research on these issues thus more valid and desirable (see also Adams, 2013).

Another important change in global health research in the 2000s and 2010s was the increase in multi-country studies and studies that compared and/or combined data from multiple countries. In the 1990s, studies that tested interventions implemented simultaneously in Uganda and other countries were rare to non-existent, but these took place more and more frequently over the late-2000s and 2010s and are now more commonplace (e.g. Kaida *et al.*, 2008). Likewise, studies comparing data produced in different locations across Africa are also more common, partly because the availability of such data has increased (e.g. Morris and Ferguson, 2006; Morris, Morris and Ferguson, 2009). Such a shift in the scale of global health research – certainly that taking place in Uganda – is important. Where in the 1990s, research in Uganda was focused quite specifically on epidemics, particularly HIV/AIDS, in the country itself and efforts there to control them, and was therefore necessarily connected with national political institutions, the globalisation of biomedical research gradually led to a shift in focus, in which the production, ideally via experimental methods, of solutions to global health problems across many different 'resource-limited' settings became optimal as a means of influencing global standards, best practices, and governance. This is evident even in the practices of the Northern researchers working in some of the research institutes in Uganda – in the 1990s, it was not uncommon for Northern researchers working with the Rakai Project or the MRC/UVRI unit to be living in Uganda full-time, or at least to be making regular trips to the country. Partly as a consequence of advances in video-conferencing technology and partly as a consequence of the globalisation of health research however, this is now vanishingly rare, with Northern investigators now seldom travelling to Uganda for more than a few days at a time. Moreover, whereas now older researchers like Ron Gray and Maria Wawer, mentioned above, from the Rakai Project, worked more or less entirely on Uganda, it is now commonplace for Northern global health researchers to be involved in research projects across numerous countries at the same time. Such practice is illustrative of other changes besides the globalisation of health research, but nevertheless indicates how this globalisation has shaped the practices and expertise of scientists and is reflective of the shift in the scale of research and the gaze of researchers from being more focused on national contexts to being more global in scope. Another aspect of the globalisation of biomedical research is the increasing prominence of research funded by the pharmaceutical industry in Uganda, as part of a wider shift in the globalisation of clinical trials discussed by Adriana Petryna (2009). With the rising capacity to conduct more and more complex pharmaceutical trials in Uganda over the 2000s and 2010s, owing to the increasing and improving capacity of local institutions, concentration of expertise, and availability of scientific infrastructure like laboratory equipment, more trials were conducted in the country, such as for novel varieties of PrEP and ART for HIV/AIDS and TB treatments. During my fieldwork, pharmaceutical funding was an important part of the patchwork of funding available for scientific research and was present in a number of the trials taking place at the research institutes in which I was based.

A final change taking place over the 2000s and 2010s that had an effect on biomedical research in Uganda was the rise in what Vincanne Adams (2013, p. 76) has called "audit culture" in evidence based global health. Adams' usage of the term recalls Marilyn Strathern's (2000) anthology of that name examining the growing significance of generally bureaucratic practices that strive for accountability. As Adams (2013, p. 76) writes, Strathern "explains the historical transition toward more evidence-based forms of accountability as an outcome of new infrastructures of "audit culture" tied to late twentieth-century neoliberal reforms", in particular the growing focus on cost-effectiveness. Such aims, argues Adams, are also evident in the research funded by these organisations and other global health donors, with the rise of monitoring and evaluation (M&E) research a case-in-point: such research evaluates the efficacy of programming or of specific projects according to changes in given, comparable features – often quantitative variables, though not necessarily. Research of this form is now commonplace in Uganda. Another aspect of the rise in audit culture is the effect it has on the use of research methods. Given funders seek clear, accountable forms of evidence that are easily comparable to one another and demonstrably and reliably connect a treatment or intervention to an associated outcome, RCTs themselves become a 'more accountable' form of knowledge to funders than less precisely structured interventions might.

Thus, the boom in funding for global health, the privileging of experimental research methods, the rise of EBM, and the pharmaceuticalisation of global health, the increasing emphasis on accountability, and the globalisation of biomedical research in the Global South have come together to shape the focus of scientific research in Uganda over the course of the 2000s and 2010s. The result of these related, entangled changes was, I have shown, to shift the foci of global health research in Uganda away from issues surrounding national programming and towards issues regarding global health governance more broadly. As I will demonstrate in the following chapters, such a shift has significant implications for what research takes place and thus what knowledge is produced, and this carries great importance for global health practice.

Chapter Two

"The Donors are Everything": Precarity and the Political Economy of Global Health Science

Introduction

In this chapter, I discuss how the precarious political economy of funding shapes what is known in global health science. This field, in common with development practice more broadly, is profoundly shaped by turbulence in the amount and foci of funding available for it. Such funding is usually in the form of short-term, soft-funded grants, which are applied for and obtained from funding agencies to finance research lasting a few months to a few years, and which have implications for how, what, and where knowledge is made. This chapter sheds light upon the precarity of obtaining and maintaining this funding for scientific research and the ways in which the management and mitigation of this precarity by scientists and administrators end up shaping the knowledge they help to produce in profound and important ways.

I elucidate this through the lens of precarity, which I conceptualise as a state of uncertainty, anxiety, fragility, and instability experienced by individuals and institutions as a consequence of fluctuating, changeable, or volatile flows of the resources necessary for action. Understood thus, precarity is not confined to global health science – indeed, in "The Aid Chain", Wallace et al. (2006) illustrate how fragile and changeable financial relationships between development funders and NGOs shape the work that these NGOs do. Focusing on knowledge production in global health science then, this chapter examines the ways in which the precarity of flows of economic resources (in this case funding) shapes action (in this case knowledge production). Through a multi-scalar analysis of the political economy of the organisation, planning, and conduct of global health science research, I thus conceptualise efforts by scientists and administrators to obtain and maintain funding as efforts to manage and mitigate the precarities to which they and their institutions are exposed. In such terms, precarity is both an affective and material paradigm for understanding the political economy of global health science: it captures both the fragile and unstable economic uncertainties involved in obtaining funding for research, and the related anxieties, stress, and awkwardness that these uncertainties engender – with ensuing implications for decision-making on the part of scientists. Consequently, precarity shapes the knowledge produced in global health science in profound and important ways. Thus, I argue that the precarious system of transnational scientific research funding relegates questions of relevance to public health and national development policy beneath the prevailing priority of maintaining funding from Northern donors. The banal and technical landscape of academic science funding therefore plays an active and important part in the maintenance of North-South inequalities in the production of scientific knowledge for global health, despite intentions to the contrary on the part of many Northern scientists.

The chapter addresses this by tracing the implications of the precarity of global health funding at the macro, meso, and micro levels respectively: from the funders and those involved in negotiating continued global health funding as a whole, to the management of research institutes, and finally to the principal investigators (PIs) of individual projects.

In the case of the first of these, I describe the perspectives of those that work for and with funders themselves, and the precarities they experience in maintaining the existence of funds for them to distribute for important global health research. I illustrate that these people are deeply concerned that this funding may disappear or be significantly diminished. This has implications for the kinds of research they fund and their justifications for doing so. Next, I turn to the meso-level of funding precarity – the funding of research institutes. Building on my own difficulties in obtaining the access necessary to conduct the fieldwork for this project, I show how those in charge of managing research institutes are very concerned about maintaining good relationships with donors, and in continuing the 'fundability' of their institute's research in the long run. This again has consequences for the kinds of scientific knowledge produced by the institutes. Lastly, at the micro-level, I discuss the ways in which funding precarities within individual projects that are experienced by individual or small teams of scientists shape the nature of the research they conduct, as PIs endeavour to daisy-chain grants together so as to build their careers, pay their own and their colleagues' salaries, maintain their research infrastructure, and continue their data production activities. From these three levels of analysis, I conclude that financial precarity is a critical component of scientific knowledge production in global health: soft funding from grants pervades the field, with important implications for the scientific knowledge produced therefrom.

Who Funds Global Health Science? – and to What End?

Before explaining the ways in which precarity shapes the production of scientific knowledge in global health, I will first address where this funding comes from.

Funding for scientific research in global health is not centralised, and working out exactly which institutions fund what number of global health research projects and to what extent is not an easy undertaking. While there have been efforts to identify how global health as a whole is funded (McCoy, Chand and Sridhar, 2009; Clinton and Sridhar, 2017; IHME, 2021), there have been, to my knowledge, no efforts within the past decade to identify the exact proportion of these funds that are directed for research.

Nonetheless, some data do exist that give at least an indication of the global health science funding landscape. The health research and policy organisation 'Policy Cures Research', for instance, collects and collates data annually on research and development (R&D) expenditure in global health. These data describe expenditure on "research and development of new health technologies for global health issues such as neglected diseases, emerging infectious diseases, and sexual & reproductive health issues" in "middle- and lower-income countries" (Policy Cures Research, 2023). Policy Cures Research's most up-to-date data report that global health R&D spending increased from US$3.7 billion in 2014 up to US$6 billion in 2019, before almost doubling over the course of the COVID-19 pandemic to US$11.3 billion in 2020. The majority (>60%) of this funding has come from public institutions every year listed in their dataset, which at the time of writing runs from 2007-2022. Of these, the US government's NIH is by far the largest funder of global health R&D internationally, contributing US$3.75 billion of the US$9.82 billion spent in 2022. The aggregate investment of the pharmaceutical industry in global health R&D is the next largest in Policy Cures Research's database, contributing a total of US$1.9 billion, while the BMGF is by far the largest philanthropic funder, spending US$820 million in 2022.

Policy Cures Research's data also helpfully illustrates the spread of funding for disease-specific R&D. Excluding Coronaviral diseases (including COVID-19, which led R&D funding from 2020 until 2022), HIV/AIDS had commanded the largest proportion of R&D investment since 2007, followed sequentially by TB, Malaria, and Filoviral diseases, such as Ebola. In 2019, HIV/AIDS accounted for 27% of total funding, TB 13%, Malaria 11%, and Filoviral diseases 9%, while other diseases, including some research targeting multiple diseases at once, round out the remaining 41%. Since 2007, the majority of this funding has gone toward either vaccine or drug development, with basic[11] scientific work (on which vaccine and drug development are based) also accounting for a significant proportion.

---

[11] Basic science, also known as pure research, refers to science concerned with answering fundamental questions to better understand phenomena, natural or otherwise.

What these data do not capture however, is expenditure on kinds of global health science research other than health technology R&D. These might include: health systems and operations research – studies on the structure of and practices in health systems, including the programmatic delivery of interventions not directly related to the generation of new technology, such as drugs that have already been developed and which are not new; implementation science research – studies looking at how best to carry out particular pharmaceutical or behavioural interventions; monitoring and evaluation research; disease surveillance research; and social scientific or behavioural research that is not directly concerned with producing and testing new pharmaceutical and medical products (Policy Cures Research, 2023).

These are important exclusions from the dataset. Indeed, many of the projects at the two research institutes in which I conducted my ethnography would not be included in the above figures. Likely understated in Policy Cures Research's numbers is the expenditure of multilaterals, who are much more likely to invest in, for example, monitoring and evaluation research testing the efficacy of a particular set of interventions, or clinical research not directly concerned with the development of new health technologies, rather than in the development of new pharmaceutical products. Conversely, funding coming from the pharmaceutical industry is likely overstated in the Policy Cures Research data in proportional terms, as this industry invests little – if anything – in forms of research that are not specifically about the development of new health technologies. Furthermore, the dataset underestimates research spending overall, as almost every institution listed in the database with the exception of the pharmaceutical industry also dedicate varying amounts of funding for research on topics without a direct connection to R&D for new technologies.

Nonetheless, the Policy Cures Research data is useful in giving a rough sketch of the funding landscape in global health science and, importantly, in emphasising the significance of publicly funded institutions in global health science funding, and particularly the US NIH, the largest single spender on global health R&D. In 2022, the US Biomedical Advanced Research and Development Authority (US BARDA) was the second largest funder of global health R&D, but spent less than 29% of what the NIH did in the sector in the same year. This serves to demonstrate the prominence of the NIH in global health science. This is important because, as the NIH states on its website, it is an institution that "provides leadership and direction to programs designed to improve the health of the Nation [the US] by conducting and supporting research."[12] Thus, the largest player in global health science – a field concerned at least in part with the improvement of (some aspects of) public health in the Global South – is an institution primarily tasked with advancing scientific knowledge nominally to the benefit of the US taxpayer, rather than to fund the production of knowledge that is useful for development and public policy practitioners in African countries. While some NIH officials with whom I spoke vocalised their desire to use NIH funding to advance development goals, they acknowledged that this is not the main responsibility of the NIH, a point highlighted by the fact that the Fogarty International Centre (FIC) – the only NIH body explicitly responsible for global health research – represents just 0.2% of the NIH's total budget at about US$84.2 million in the period 2019-2023 (NIH, 2023). The remainder of the NIH's enormous budget has to be defended to the US Congress on the basis of its relevance to advancing scientific knowledge in the national interest, and therefore the funding it distributes must at least ostensibly be in the furtherance of these interests.

The predominance of the NIH and its scientific bent are also illustrative of a wider feature of the global health science funding landscape: the lack of purchase of development issues in this field. While global health science is not made up by the NIH alone, much of the funding available for knowledge production in global health is explicitly tied to advancing a particular, normative understanding of scientific knowledge first and foremost. Funding also targets 'global health

---

[12] https://www.nih.gov/about-nih/what-we-do/mission-goals [Accessed 02/-2/2024]

security' issues, such as disease surveillance and research into 'emerging infectious diseases' – work that has been critiqued extensively in the critical global health literature for being concerned primarily with protecting Northern populations, rather than those in the South (Ingram, 2005; Lakoff, 2010; Benton, 2017). Behind the NIH, the aggregate spending of the global pharmaceutical industry outpaces any other single funder, including the BMGF, in the Policy Cures Research dataset and accounts for a substantial proportion of research funding, with such research characterised as 'global health' despite its primary motivation being one of profit: to produce new health technologies and generate return on investment for shareholders. A sizeable proportion of global health science funding is thus dedicated to advancing scientific knowledge in Northern national interests and/or producing profitable technologies.

Another important dimension of global health science research funding is that it is generally given out as short-term grants, typically lasting between three and five years, with few grants lasting beyond six years. Such grants are an aspect of global health science funding that can cause great precarity for individual researchers and research projects, as there is a constant sense of insecurity around where the next round of funding will come from to continue to employ staff, provide care for patients, or produce important data. However, I should note that there are also many reasons why short-term research grants have become predominant in global health science. They enable funders: to more quickly divert money to new issues in the face of new evidence or events; to give money to institutions with less capacity to administer complex, large, long-term grants; to more quickly demonstrate the value of the research they are paying for to the government (or other entity) which provides money to the funder; to hedge against the risks associated with longer-term research, in case the data being generated are not useful or poor quality; and perhaps also to exert more control over the direction of knowledge production, as longer-term grants might necessarily be more flexible in terms of what knowledge they end up producing, while disbursing shorter-term grants can enable funders to better direct knowledge production along particular strategic lines according to established priorities. Yet while some of these rationales are clearly quite sensible, the environment of precarity engendered by these short-term grants has important ramifications for the production of scientific knowledge in global health.

Macro: Funding Agencies

It was late afternoon on the third day of Africa's largest HIV/AIDS conference. Professor Ed Davis and I sat sandwiched between deck chairs and a seesaw, just outside the main conference hall of Kampala's Speke Resort: a sprawling, luxurious hotel on the glaucous shores of Lake Victoria. He and I were exhausted. We had started our day at dawn for a 'capacity-building'[13] workshop that he had run, which was followed by nine hours of presentations on HIV/AIDS research. Davis is one of the conference organisers: an experienced professor in microbiology and molecular genetics at a top US university and an experienced NIH grantee. He was in high demand during the short tea breaks throughout the day, but I managed to pull him away for an hour before dinner for an interview. It was not until we met, though, that he enquired in greater detail about my research. Yet I had scarcely said more than a sentence on my interest in the politics of global health science before he interrupted. My research was important, he told me, because global health is all about politics, and politics is all about money. He elaborated: "Global health has to have a politically friendly environment behind [it], because [if] you have 8 years of somebody like Donald Trump [as President, then] there is no global health." What he told me next resonated strongly with what I would come to hear regularly throughout my fieldwork: that global health funding for both science and practice is fundamentally precarious due to the potential for

---

[13] I use this term as my interlocutors do and will not use scare quotes around it henceforth.

government funding of global health to change. While other sources of funding exist for global health, such as in the philanthropic and private sectors, national governments – and particularly that of the US – provide the majority of the cash the field needs to survive. “Remember,” Davis told me, holding up a single finger,

> Global health is nothing else but a big foundation at a governmental level… [If] the government changes, you may not have money tomorrow because all the global health institutes are running on grants. If somebody decided that, politically speaking, investing in the health of Africa or other [resource-] limited countries doesn’t mean crap to the US and it’s more important to go for people that are living with Alzheimer’s [in the Global North], that pot of money within 24 hours will be shifted… And it’s a big reality check… You cut the money to the UN, you cut the money to any organisation because America comes first [and] most of the [global health] programmes are going down the drain, and so the [question of] sustainability of some of these programmes is clear and [now] yes, we have [US President Joe] Biden. [But] I don’t know if Biden is gonna survive another 4 years after his term, and if somebody like Trump comes back, it’s gonna be tough shit for all of us… without government support we are doomed to failure.

Davis’s allusion to Trump’s ‘America First’ agenda is one that I heard articulated during many of the interviews I conducted in 2020 for my Master’s fieldwork, prior to Biden’s election as President. At that time, all of my US American interviewees expressed their profound concern for the future prospects for global health under then-President Trump. While this was expressed less frequently in conversations and interviews I had with such people during the Biden administration, anxieties regarding a potential Donald Trump comeback were nonetheless still pervasive. For Davis and others, the political instability of global health funding flows represents an existential concern for policymakers and scientists and makes life extremely difficult for those in these jobs, who must endlessly persuade those in power to continue to dedicate substantial resources to efforts to improve the health of people in the Global South.

To this point, Davis gave me a remarkable example from what happened during the Trump administration. Antony Fauci, then coming to the end of what would be a 40-year stint as the head of the NIH, attracted global attention for his handling of the COVID-19 pandemic in the US and his robust responses to Trump's myth-mongering about, for example, the potential for ingesting bleach to be an appropriate medical treatment for the disease, amongst other such outlandish claims. Davis told me, amidst impassioned gesticulation and with some pride, about what was going on behind the scenes during this period, and how Fauci managed to protect the NIH's budget:

> What saved us was that Fauci convinced Trump to put this policy that he was going to end the HIV pandemic in the US by 2030, and because he is a fucking idiot, he believed that. Because there is no damn way that you're going to end the [HIV] pandemic in the racist climate that he was creating – I mean, the only way to end the pandemic would have been to kill all the people infected with HIV, you know, cremate them – I'm serious you know, I'm not kidding, I really think that he didn't realise – Fauci is very polite, he said: 'Blah blah blah, come my way and I'll show you [all the] good you can do - establish this policy and give us the money because [then] our policy will end the pandemic by 2030', and [Trump] said, 'That's a great goal!' That saved our asses, because Fauci was able to play the psychology of this piece of shit in our favour… [So,] we are definitely worried about funding. And never more than now we appreciate as I said the work that people like Fauci [have done]. But who is our next Fauci?

This story Davis told me, in which the fate of the NIH was seemingly balanced on a knife-edge, speaks to the sense of precarity felt amongst my interlocutors regarding the continued flows of funding for global health science, something also reflected in Davis' emotive choice of words and fervid body language. Whether it is true or not, Davis's narrative illustrates how the maintenance of global health science funding in the US is talked about by these scientists as something almost arbitrary, something that could be stripped away from them the moment that the political winds change, and something that requires delicate work for its preservation on the part of global health actors, like Fauci leading Trump up the garden path. Such precarity is important to foreground here: whether Trump or any other leader, if people working in global health cannot convince those that fund them that their work is necessary and in the national interest, they fear that the flows of funding will disappear or dramatically reduce, and thus unravel the decades of progress, capacity-building, and trust they have built with Southern governments, scientists, and research participants. As Davis explained:

> The reality is that global health is a very complex intertwining of politics and desire by the scientific community to do good for the people, and how you can make them work [together] is very complicated. For us, in my opinion, you can do a lot of good… as long as the political effort is there.

For Davis, this deeply held "desire" to "do good" animates his experience of and shapes his anxious reactions to the precarities to which he is exposed.

What can be made from this discussion and what are the implications of these precarities for knowledge production? Firstly, funders often support knowledge production on topics around which there is already agreement that effort should be made to address a particular health issue. For many funders explicitly concerned with advancing global health, this means sticking to an existing consensus around global health priorities. Once something is agreed upon as a priority, particularly by the US government and to a lesser extent the governments of other countries in the Global North, funding can be marshalled around it. Examples of this include HIV/AIDS research in Africa, which boomed alongside Malaria and TB following the creation of MDGs in the 1990s and the founding of the Global Fund in 2002, and was then bolstered by George Bush's commitment to spend US$15 billion[14] on treating and controlling HIV/AIDS in the Global South

---

[14] A figure which has since climbed to US$110 billion as of April 2023 (https://www.kff.org/global-health-policy/fact-sheet/the-u-s-presidents-emergency-plan-for-aids-relief-pepfar/)

through his PEPFAR programme, launched in 2003. Another example is the West African Ebola crisis, which led to increased funding for global health security and filoviral and zoonotic disease research, then boosted again by the COVID-19 pandemic. People working in agencies that distribute the funding for research tend, or are obligated, to support these priorities, rather than going out on a limb and deciding that other health conditions (around which an international consensus to address them has not yet been built) should be a focus. Global health science research thus tends to go hand in glove with funding for global health practice, rather than in accordance with national public health priorities in the Global South (Viergever, 2013). Alternatively, global health science research can pursue the answers to scientific questions of relevance to the Global North, as there is a strong sense among those working for funders that the scientific research they fund should stick to the remits of their institution. This applies to much of the work the NIH funds, for instance. As Dr Douglas Williams, a senior NIH official, told me in one interview, the NIH is "a science agency and not a development agency": its remit is to provide funding for research into important scientific questions pertinent to the US public first and foremost. As Williams put it: "[The NIH has] certain priorities, and so if you can say here's something that's the number one killer of Americans, that's gonna get more attention than something that really isn't an issue in the US – I think that shouldn't be very surprising." Consequently, the research the NIH funds in the Global South from its constituent institutes other that the FIC (the only NIH body explicitly tasked with global health research) should address "important basic science" questions, or issues that are important to US taxpayers, such as testing new drugs that might also be useful in US patients, or work around global health security. Regardless, whether pertaining to advancing scientific knowledge relevant to Northern populations or producing knowledge around global health priorities, funders of global health science research are strongly incentivised and, in some cases, institutionally obliged to support and extend existing priorities through the knowledge production they fund, rather than supporting research into other issues.

A second implication of funding precarities for knowledge production is the need for funders to demonstrate to the institutions that fund them that the work they support is effective and impactful. As noted above, this is an important, but not the only, reason for the proliferation of 'impact-driven', short-term scientific research. This kind of research targets global health priority areas and endeavours to generate quick results, conclusions with wide generalisability, and scalable solutions, rather than slower, more iterative work built out of descriptive epidemiological research and localised sociological and behavioural research. Such research enables funders to better describe the effects of the work they support, and thereby hedge against political instabilities in global health funding flows: "The era of grants", as one Ugandan clinician put it to me, has substantial implications for knowledge production. Parallels here can be drawn with the "projectification" of global health described by Meinert, Whyte, and colleagues, in which short-term, time-limited, soft-funded financing of healthcare provision in Uganda by international donors privileges some forms of care and service provision over others (Whyte *et al.*, 2013; Meinert and Whyte, 2014).

Macro-level funding precarities are thus important in shaping the kinds of global health science research that gets funded. These precarities limit the scope of knowledge production to this end, with funders often sticking to priorities from which it is difficult to deviate. Shorter-term research only compounds this issue, as it is by necessity narrow and specific in its focus, addressing particular questions and rarely possessing the breadth of scope to understand the implication of studying one health issue rather than an under-researched other.

Meso: Research Institutes

The week before Christmas 2021, I presented my PhD project proposal to an elite biomedical scientific research institute. The institute was a collaboration between several Ugandan institutions and a top US university. After months of emails with the scientists at the Ugandan end, my request to conduct part of my ethnography within their institution had finally been – in principle – approved. All that was left was to outline the details of my project to the US Americans on the management team in a fifteen-minute Zoom presentation. Unfortunately for me, I was COVID-ridden, in quarantine from my parents and sister in the small attic room of my family home in London, but rescheduling was out of the question: I needed their approval to begin my ethnography in the new year as soon as possible. Pleasantries and introductions were brief after I joined the call with the management team. With their cameras off and mics muted, there appeared to be little interest in or enthusiasm for my project. An eerie, heavy silence persisted throughout my presentation, as I spoke to a series of vacant black squares, each labelled with the names of prestigious scientists whose work I had been reading since I was an undergraduate. As I finished the presentation, the most senior among them spoke, a US American professor who had co-founded the research collaboration many years previously. "What do you mean when you say you're interested in the politics of funding? Are you interested in the donors?" Her question was thick with cautious apprehension. I attempted to explain what I meant by this; that I was interested in the ways that the donor-funding landscape shapes the knowledge that gets made in research institutes like this one, and that my research would be using their institute as a window into the world of funding, but the conversation was already over. The professor was clearly worried about the possibility for my research to harm the relationships with donors that the collaboration had built over more than thirty years. Her voice seemed agitated as she responded, expressing concern that what I would write could seriously jeopardise the financial sustainability of their work. Two weeks after the call, I received a terse email informing me that my research would be too much of a burden on their time and that my request to research their institute had been denied.

Eight months later, something similar happened. It was a Friday in mid-August, and I had just returned to my desk at CVHS (one of the two institutes in which I conducted my ethnography) from a late lunch with some of the research assistants when I received an email from Professor Margaret Oppenheim, a senior social scientist at the institute who had been a great help in setting up my research. She told me to come to her office with Dominic Magezi, a colleague and mentee of hers that had been tasked with supervising me during my time at the institute. When we arrived, Oppenheim explained to me that my recent efforts to recruit interviewees from amongst the senior scientists at CVHS had caused quite a stir in the most recent management meeting at the institute. Professor Jane Richardson, a British virologist with whom Oppenheim and others had had various disagreements over the years, had received an email from me explaining my research and inviting her for an interview, and had panicked. Richardson hadn't been told that my project was happening, and she had voiced her profound misgivings in the meeting that my research might cause trouble and hurt CVHS' relationships with donors: having an independent researcher within the institution investigating the politics of research was a recipe for disaster, in her mind. My work could risk the reputation of CVHS, and potentially endanger the financial sustainability of the institute if my research suggested that the donors or CVHS were doing things wrong. Fortunately, Oppenheim and others on the committee supportive of my work had soothed the situation somewhat, but Oppenheim advised me to lay low for a couple of weeks and wait for everything to settle down.

These two experiences were but two glimpses of a much wider phenomenon in global health science: the sensitivity grantees have with respect to the precarious sources of their funding, something felt particularly strongly by those managing complex research institutes with multiple, long-term funders, each with their own interests and expectations. As one US American epidemiologist put it to me: “The donors are everything.” Anything that might compromise the integrity of the relationships between scientists and their funders generates discomfort and angst, and scientists are protective of these lucrative but potentially unstable relationships, relying on them to continue to conduct research, hang on to good staff, and continue to ‘capacity-build’ African research partners. The fears scientists have with regard to institutional partnerships with funders borders on the existential, and effectuates action with implications for knowledge production, as scientist-leaders try to mitigate the precarity of their relationships with donors. This is particularly important given that those involved with the management of research institutes feel a duty of responsibility to their junior colleagues to create and sustain research infrastructure through which they can conduct research.

One of the most important ways in which research institute management attempt to deal with what they see to be fragile relationships with donors is to enhance the institute’s ability to win grants: the more grants that can be won, the more that valuable research can be done, but also the more resilient the institution is to changes in funding availability if a particular funder changes what they’re looking for, stops giving out money, or if investigators do not win grants that they hoped they would. Moreover, given the competitive nature of winning grants, having an intelligently organised research institute, optimised to fit the scientific research funding landscape, helps to augment the institute’s financial sustainability in the long run. In what follows, I present an example, reconstructed as an ethnographic vignette from my field notes, of the kinds of strategic decisions that scientists in management roles take to do this – to boost the institute’s scientific competitiveness amidst an environment of financial precarity – and the effects these have on the knowledge-producing architecture beneath them.

*

July 2022, CVHS, Entebbe

I am packing up my bag for the day when Dominic [Magezi] walks into the office we share with some CVHS RAs [research assistants]. The white, flimsy door slams abruptly behind him, as it always does; Lake Victoria's breezes flow unceasingly into the office from the open windows opposite the door. The room is bright with the glare of the afternoon sun, reflecting off white tables, white walls, white floors, and the timeworn laptop screens of the RAs transcribing interviews. Most of them turn around in their swivel chairs, one shielding their eyes from the sun, to look at the source of the sudden noise. Dominic greets them all, and headsets are removed, and audio files paused as the greetings are returned. They are all, apparently, aware that Dominic had come from a meeting with some of the senior scientists in charge of running the research unit, where they had been discussing some organisational changes that were to be made, but this is only made clear to me from his explanation to another colleague that seems just as curious as I am at the uncommon intrigue amongst the other inhabitants of the office at Dominic's arrival. Dominic begins to report back what he had heard. "There will be a reorganisation of the unit into three priority groups", he says, leaning slightly against the desk closest to the door: "Vaccines, viruses, and non-communicable diseases". There is an air of bemusement and perplexity in the room. "What does it mean?", one of the younger RAs says. Dominic explains that the reorganisation is about funding – it's about making the institute more competitive and effective, although he seems unconvinced himself, even as he explains it. He advises the rest of the group: "If you want to survive here, you have to go with the change." There is a moment of silence in the office as the news sinks in, before Dominic begins to reassure them: "You can still try to do research in what you find interesting, but you need to find a way to put it in one of the priorities". There are murmurs of assent amongst the RAs, and Dominic walks back to his chair and sits down.

*

This vignette reveals some of the uneasiness felt about the organisational changes being made at CVHS. As I later discovered, this was not an uncontroversial decision, and there was a sense amongst some of the senior scientists in the institute that the focus on viruses and vaccines, both of which would foreground laboratory science work, was indicative of a broader shift at the institute away from more descriptive, implementation-related, epidemiological work, and away from the interests of the 'communities'[15] with which the institute has worked for over thirty years. Indeed, such was the strength of the internal resistance to this change, that some marginal concessions were quietly made to earmark at least a little funding for other kinds of research projects. Nevertheless, the reorganisation as a whole would be going ahead, as some of the scientists involved in the management of the institute were confident that laboratory and basic science work, particularly that involving vaccines, would be the surest bet financially going forward, and would give the institute the greatest potential for maintaining funding.

The particulars of the above case are also important to unpack. The meeting from which Dominic came involved many of the most senior scientists involved with CVHS, including Professor Jane Richardson, who would later take such issue with my own research. The relationships between those on the committee were, and still are, fraught, with scientists divided along disciplinary lines around the direction that the institute should take. Professor Oppenheim and others advocate for more "engaged" research and more 'social science', based on what they

---

[15] I use this term as my interlocutors do and will not use scare quotes around it henceforth.

see to be the big issues in the Ugandan context, while their virologist and molecular biologist colleagues are more supportive of the laboratory-based work that is better valued in their discipline. But the argument they made, both in the meeting Dominic came from and many others, is that the money is in vaccines and laboratory science work, and this is a difficult point with which to contend for Oppenheim and others. At the end of the day, when it comes to the direction research institutes should pursue in their quest for knowledge, money leads the way.

These kinds of proactive steps by senior scientists to try to optimise their institutes and projects to an ever-changing and precarious funding landscape are important ones – albeit controversial, divisive, and occasionally alienating. They also have clear implications for knowledge production: the effort to reorganise the institute around the perception of what will get the most funding in the future illustrates the responsiveness of researchers in global health science to the priorities of donors. This latter point is especially important. Research institutes are highly sensitive to changes in the funding landscape. The anxieties of senior scientists regarding the precarities of this funding give rise to this sensitivity and responsiveness, and it is therefore these international donors to which the scientists adapt their work first and foremost, not the demands of the Ugandan state, nor of the Ugandan communities with which they work. This is not to say that governmental and community perspectives are altogether disregarded – far from it – but rather that there is a prioritisation process in which funding takes precedence over government and community engagement. Furthermore, the kinds of expertise and experience that are built amongst the more junior Ugandan research staff involved in this research is also reflective of these international priorities, with those in the office described above evidently concerned that their skills in interviewing and transcribing would not mesh well with the 'harder' scientific work involved in laboratory-based and vaccine research. Thus, the economic precarities of the funding landscape cut across hierarchies and geographies, affecting all those reliant on the continued flows of money.

Micro: Research Projects

What about individual projects? How is precarity felt by principal investigators (PIs) in charge of running scientific research projects? As is the case at the higher levels of funders and research institutes, funding for projects is also precarious. Grants are competitive, and it is no easy task for PIs to endlessly find money with which to support their research activities. As is the case for much of academia globally, research grants are an important means for researchers to remain employed. This is felt most acutely by many of my US-based interlocutors, some of whom rely entirely on research grants to retain their university jobs. This is true even for some senior scientists – for example, one head of department at a top US university whom I interviewed has to fundraise more than 70% of their salary. By comparison, the situation is generally slightly less precarious for senior British PIs, many of whom have permanent jobs involving teaching, and who are less dependent upon grant funding for job security. The experiences of Ugandan investigators meanwhile are varied – some have university or clinical posts that diminish the necessity for them to have grant funding, but those holding posts in research institutes are invariably much more dependent on grant funding to maintain their employment. Nevertheless, for all of my interlocutors, grant funding is also important in building prestige in their fields and institutions, as well as a crucial component of 'having an impact' in global health, as high-quality research is a potent source of legitimacy for scientists hoping to improve the lives of people living in 'resource-limited' settings. Irrespective of the nature of their employment however, the precarity of global health science funding cuts across geography, discipline, rank, and experience: researchers across the board experience precarity with respect to their ability to, for instance, continue to employ junior staff, provide opportunities for Master's and PhD students to do research, and maintain their provision of various benefits for study participants, such as drugs and treatment that might be difficult for participants to otherwise obtain.

Clearly then, PIs have a lot to lose if they do not continue to win grants, and continuing to win them is a source of stress, as well as a great burden on their time. As a consequence, most research projects tend to be more responsive to the research priorities of global health funders – much as research institutes and funders themselves are to the institutions above them from which they draw their own funding – than to what could be identified as important where the research is taking place. Getting funded is just too important not to prioritise.

Project PIs attempt to mitigate the precarity that comes with global health science by conducting 'fundable'[16] research (i.e. topics and methods that are more likely to get funded). What is understood within global health science to be fundable is neither static nor consistent, but generally projects of this character are those that constitute what is referred to as 'good science'[17]. Through the example of SHINe (Surveys on HIV Networks), one of the studies in which I conducted my ethnography, I show how this plays out ethnographically by highlighting the ways in which researchers in individual projects deal with the precarity of funding in global health science. I show how the researchers in SHINe prioritised the methodological and thematic fundability of their work above other issues in the locality in which they conducted their research – a small rural parish just outside of Mbarara. To do so I discuss how the project came about, and the 'community engagement' it entailed, but argue that despite these well-intentioned steps to make the research more relevant to the local context in which it has been conducted, the

---

[16] I use this term as my interlocutors do and will not use scare quotes around it henceforth.

[17] I use this term as my interlocutors do and will not use scare quotes around it henceforth. Good science here is commonly understood both as a methodological/epistemic and an intellectual/thematic category; it entails using highly regarded, rigorous scientific methods to produce evidence that addresses specific issues that are identified by global health scientists, funders, and policymakers as being important to tackle. In short, good science involves using the right methods, but also asking the right questions. While the epistemic dimensions of this are important, and I address these in forthcoming work, I focus here on the political-economic context in which global health science is conducted.

necessity of fundability exerts too strong a pull to ignore. I show that this resulted in a project that produces knowledge that is considered neither by its participants nor its RAs to be particularly important locally.

SHINe was initiated in the mid/late-2000s by a young, US American researcher named Johanna Donovan. Donovan was looking for a site to conduct her doctoral research, and wanted to conduct something that was, as she put it to me, "community-based" in a "resource-limited" setting. Donovan was connected to Dr Jim Graham, director of the newly established MUSCo research institute in Mbarara, by her PhD supervisor, and the two met to discuss the possibility of her coming to Uganda to devise a project. Graham had been working in Uganda since the boom in global health funding in the early/mid-2000s, and while Donovan's desire to do 'community-based' research represented a departure from MUSCo's more clinical research portfolio at the time, Graham was only too glad to bring her into the fold. Soon after her meeting with Graham and after having attained some funding through him and her supervisor to set up a research project, Donovan flew out to Uganda to meet with various faculty members from Mbarara University and set up a research collaboration that would be the foundation of the work to come. Donovan found great enthusiasm for a research partnership among these Ugandan researchers, and she then moved to Uganda for a couple of years to establish and implement her project on social networks and HIV – an unusual move in the world of global health science. While in the country, she started to set up her project's research site in a rural parish outside of Mbarara, which initially involved reaching out to members of the community alongside Mbarara University faculty. As she told me:

> We had many conversations around what are some of the issues that they see as being critical to health and wellbeing and development among the people in the villages and together we collaborated and came up with a list of topics that we thought would be important to assess in this context. We talked a lot about the idea of social networks and how relationships are important and

> people in the communities thought, 'Yeah, yeah, yeah, we get that idea, it is really important', and so from there we designed this massive, massive research project where we were going to measure the social networks of all the adults in these eight communities and collect data on a variety of health related topics that could provide some info that could enable us to do interventions, write larger grant applications, sorta some really formative work, and that could provide opportunities for students at Mbarara University and myself and others to do Master's theses and PhD theses.

Donovan explains that she then began to hire and train research assistants, many of whom have remained with the project for over a decade since its inception, and the team collected a large amount of data over the following years. In this early period in particular, Donovan, her Ugandan collaborators, her US American co-PI[18], and her research team met with their prospective research participants several times.

> We had many, many, many local leader meetings as well as community sensitisation meetings where we talked with them about what has been done, what we're thinking about doing, what are some of their concerns, what are some of the things that they've enjoyed or appreciated or benefitted from, what are their interests or foci that they'd like us to look at, so it [has] been an ongoing sensitisation, mobilisation, inquiry - conversations periodically over the past 10 or 12 years since SHINe first started. We always get really great questions and feedback from our local leaders and our community members. We have these meetings periodically to introduce new members of our team, and also before we start, as part of the creation of any new projects or new supplements to SHINe, we have these meetings to have community feedback. We also have a community advisory board so whenever we have new ideas or we get new ideas from these conversations, we meet with [them] to get their feedback on where we're at with these ideas and whether they think they're appropriate or beneficial... We also do dissemination of our findings with local leaders and whatnot and so we'll say here are some ideas that we're having, do

---

[18] Doctoral students are typically not allowed to be the sole PI on research projects.

> you have any feedback on this, do you think these are good ideas, what are some additional areas of inquiry that you'd like us to take a look at, and so we take that into consideration when we're designing these projects, and they have to sign off to support these research projects. We're not paying them or anything to sign off so they're not being financially coerced in any way… At this point, we have a decade of relationships built up and so these conversations are long-running and ongoing. And some of it is 'what do we think can get funded so we can keep this research ongoing?', because the community members want us to keep working with them and they want us to be able to get funding to do interventions and to keep working with those populations, and so some of it is in part well what can we possibly get funded. And so, I think it's a balance between trying to do what the local community needs and wants and what can get funded.

What Donovan here calls the "balance" between what the local community want and what can get funded is an idea that was commonly expressed throughout my fieldwork by Northern scientists: that there is a compromise to be made between what the community wants or needs, and what is fundable. Yet when I spoke with the very RAs mentioned by Donovan, who had worked on the SHINe project for in some cases over a decade, without exception they vocalised their lack of a belief that the project actually addressed the key issues in the parish in which it was based, and there was no mention of such a 'balance'. As one put it:

> Normally when we are starting another phase of interviews, we try to remind ourselves: we go through those questionnaires, we go through consents, we go through study procedures – why? Because we are trained to keep in our lane. And at times when you go to the village and you are running those questionnaires, you are bringing them a project, yet they needed something else. You are bringing them water, yet they needed pigs. At times, most of the projects are about [benefits to the researchers], like their own things, which don't benefit the community.

I asked the RA if this is something that they hear regularly from SHINe participants and the other RAs, to which they replied:

> Of course we get comments. We get comments from those participants. They tell us: 'Ahh last time you gave us this, but we had it already. At least if you gave us 'alternative A' it would be better'. Like they have their own needs which we can't meet, either because they're expensive or there is someone who designed the questionnaire, who designed the project and at the back of [her] mind knew at the end of this project I want to do something [in particular].

The RA added that the study team felt perfectly comfortable feeding some of this back to the management team and PIs, but that they are routinely told there is not much that can be done, as there is nothing in the budget to do additional work.

This disconnect between what Donovan told me happens during the community engagement parts of her research project and what the RAs said is neither unique nor surprising. Throughout my fieldwork I heard similar such things: Northern PIs talking with pride about how the work they do is well-tailored to the communities in which they conduct their research, and Ugandan scientists and researchers nuancing or rejecting such claims. Meanwhile, the material inequalities undergirding any engagement that takes place are argued to have substantial implications for the nature of any compromise or balance that might emerge from such discussions. As one experienced Ugandan research coordinator put it, "Local government in Uganda does not have money, so of course they cannot say 'No' to research because it brings money": it is difficult for local leaders to do anything other than encourage research projects to work in their areas given the scale of resources that these projects bring relative to the level of material wealth in, in the case of SHINe, eight rural Ugandan villages. Research perks, be they infrastructure, time-compensation for research participants (sometimes financial, but oftentimes in the form of bags of sugar or bars of soap), jobs, or interventions such as water supplies, pharmaceutical products, and so on, are extremely valuable to people living in these prospective research sites, and are opportunities not worth risking through extensive negotiations with researchers about the topic and method of research (see also Biruk, 2018).

Thus, the disconnect emerges between what PIs like Donovan claim, and what their own employees and collaborators refute.

I argue that this disconnect is affected profoundly by the precarity of funding in global health science. SHINe is in many ways uncommon, and its long-term community engagement practices are far from the norm in global health science research – a testament perhaps to Donovan's commitment to living in Mbarara for two years during the initial design of the research. Yet as Donovan acknowledged, even with the best intentions, the question for her and her fellow co-PIs remains: "What do we think can get funded so we can keep this research ongoing?" given, as she also pointed out, "the community members want us to keep working with them". Here, it is important to note the lack of incentive on the part of most global health science research funding for extensive forms of engagement with prospective participant populations and, indeed, with government departments. This latter component is particularly critical: SHINe did plenty of engagement with the village- and parish-level politicians and other leaders, but nothing at all with any department of the Ugandan government, like the Ministry of Health – a common neglect in global health science that stems from the financial incentive structures outlaid by donors. Consequently, community engagement – even where it does take place – is not a necessity for projects to get funded. Thus, much more pressure is placed on the "balance between trying to do what the local community needs and wants and what can get funded" from the side of the funder seeking good science than from the community, with resultant implications for knowledge production.

For projects to get funded, they must choose a topic that will attract the attention of funders, and which represents fundable, good science. This means picking a topic that funders have identified as a priority and studying it in a rigorous way. SHINe is an HIV/AIDS study, so it immediately hit one of the most central priorities in global health. It is also a social networks study, using complex quantitative methods to map and analyse the social networks of every individual in the parish. When SHINe began, social networks research was in vogue in some prestigious scientific journals, so its focus on the role of social networks in shaping 'health-seeking behaviours' was timely and of interest to funders - likewise for its methodological innovation and offer of statistical validity in its use of complex quantitative methods. In its first iteration, SHINe was an 'ego-centric' study: the cheaper and smaller of the two main forms of social networks research. This kind of research generally involves asking study participants to list up to a given number of social contacts – twenty is a common figure – before asking extensive questions about the nature of each of those relationships, in addition to the participant's health behaviours and perceptions of those of others in their network. Ego-centric studies survey a sample of people in a population, and this is how SHINe began. The project's initial success meant that it subsequently won funding to conduct a sociocentric study – the second variety of social networks research which is far more complex, expensive, and detailed, consisting of mapping every individual's social network in a defined population so that much more sophisticated analysis can take place. SHINe won funding to develop into a sociocentric study because it represented an exciting opportunity for good science to take place; findings from the research represented important contributions to the development of statistical methods in social analysis and advanced the literature on the importance of social networks to health seeking behaviours relevant to HIV control and beyond. These findings could be published in high profile journals. Crucially however, the publication of this work was relatively context-free, and far more about demonstrating what could be done with such complex forms of quantitative analysis than attempting to address or describe health issues amongst the population SHINe was investigating in Uganda.

Through the story of SHINe, we can begin to see the ways in which funding precarities experienced by project PIs shape the nature of knowledge production, even when these PIs have apparently good intentions about the levels of engagement they will undertake with the local community. The balance Donovan referred to is not an equitable one at all. Rather, funding incentives which reward good science over all else were the primary driving-force behind the study, and this takes the focus of knowledge production away from local or national issues and towards issues of interest to global scientific and policymaking communities.

Conclusion

The precarity of funding flows in global health science is a critical aspect of the field's political economy, with profound implications for the knowledge produced within it. This chapter has examined the nature of this precarity, how scientists seek to manage and mitigate it, and the consequent implications for knowledge production at three levels: those working in funding bodies, those in management and leadership positions within research institutes, and PIs of individual projects. Across these three scales, I have highlighted the responsiveness of scientists and researchers to the funding landscape and thus the potency of funding incentives and disincentives in constraining and enabling the production of knowledge in global health. Overall, the implications of this funding system for knowledge are myriad, and here I have but gestured toward some of these. Particularly important is the time- and cost-pressured nature of scientific knowledge production resulting from the short-term, precarious grants model, which puts pressure on any form of community or government engagement without incentivising it, while at the same time putting a premium on contributions to scientific knowledge in Northern journals and the advancement and extension of global health priorities identified far away from the locations in which projects collect data. This has significant implications for the scope of research, with the almost unending pursuit of developing fundable research protocols a process disconnected from national health policy agenda-setting and the functionings of public health systems. This leads to massive amounts of data and knowledge being produced that advance globally identified health priorities and global health science as an epistemological field, without linking this together with what might be helpful for *public* health policymaking at the national and sub-national levels.

Precarity, I have shown, undergirds this disconnect: it is a structural component of global health science and an essential aspect of the current funding system. Yet it works against a central aim of the field itself – to produce knowledge that helps reduce health inequity. If scientists are more concerned about where the next grant is coming from than about figuring out first and foremost what issues to research to improve people's lives, then this aim will remain a challenge to accomplish.

Chapter Three

Making Good Science: Knowledge Hierarchies and the Pursuit of the Universal

Introduction

This chapter is about the tensions that emerge when different epistemic communities come into contact, amidst varying visions of what constitutes 'good science'.[19] In particular, I focus on the relationships between social and biomedical scientists. As I show in what follows, such interactions do not unfold amidst an intellectual environment of equitable epistemic pluralism, but are rather indicative of unequal power relations between the many different kinds of expertise and disciplinary training that constitute global health science. These social relations between different kinds of experts and disciplines have profound implications for what and how knowledge is produced and valued. Knowledge hierarchies and the relationships between people at different levels of hierarchies play an important role in shaping knowledge production in global health. Specifically, those scientists and scientific disciplines that make the most *universalist* claims on knowledge tend to be valued most highly. As a consequence, I argue, global health science often emphasises such universal forms of knowledge at the expense of that which is more locally or nationally specific.

---

[19] I will not use scare quotes around this term henceforth in this chapter. I do not use it as a normative category in my own analysis, but rather to understand it in emic terms as a normative category deployed by my interlocutors.

By ‘universal’, I refer in this context to the extent to which the knowledge produced by a study can be understood as applying through time and space, thus targeting or aspiring to the nomothetic: the general, underlying scientific laws or principles that govern nature. I should be clear here that I am deploying the term ‘universal’ as an *etic* category. In global health, researchers often talk about the ‘external validity’, or ‘generalisability’ of their work. ‘External validity’ refers to the extent to which findings may hold true and be valid outside of the specific conditions of the study. ‘Generalisability’ refers to the extent to which findings may hold true and be valid in relation to the wider population in question of which the study sample was a part. Thus, generalisability is one aspect of external validity. Both external validity and generalisability are technical concepts that cut across all disciplines in global health science – social scientists and virologists alike consider the potential external validity of prospective findings when deliberating on the design of a study, for instance. In this sense neither of the concepts capture the knowledge hierarchies that intersect with the pursuit of external validity or generalisability: some disciplines are considered to inherently offer greater validity in general based upon their claim to the universality of the knowledge they produce.

The chapter proceeds as follows. Firstly, I describe the different epistemic communities that come together in the production of knowledge in global health science research projects and provide an overview of how multidisciplinary research teams are assembled to work on projects together. I show that amidst the diverse range of people and expertise involved in designing, implementing, and analysing research, and disseminating findings, there are many different ideas of what it means to conduct good science.

Next, I elucidate how some of these differing – and sometimes competing – ideas about what constitutes good science play out ethnographically through two vignettes. Each vignette tells the story of a clinical trial: the first, the Short-Cycle Antiretroviral Therapy (SCART) trial, which aimed to tackle issues around adolescent adherence to HIV medication by seeing if the drugs could be taken less frequently with the same effect; the second, the PrEPCoVax trial, which sought both to test whether some potential HIV vaccine candidates could generate an immune response in HIV-negative patients, and to trial a new kind of Pre-Exposure Prophylaxis (PrEP). I follow each vignette with analysis that draws out some of the main tensions between different epistemic communities involved in each trial, focusing on different ideas about what good science should entail. I thereby shed light upon the normative cultural and epistemic logics involved in producing scientific knowledge in global health research projects.

I then build upon the analysis of each of these vignettes to make a number of interlinked observations and arguments. Firstly, I argue that knowledge hierarchies between different epistemic communities in global health science projects – particularly between social scientists and biomedical scientists, with the former subordinated beneath the latter – play an important role in shaping the knowledge produced by these projects. These knowledge hierarchies are structured largely by disciplinary claims to universality, whereby methodologies and disciplines perceived to produce more universal scientific facts are valued more highly. I argue that creating such universal scientific facts necessarily involves reducing the consideration of context, contingency, and contestation around their production. Secondly, I argue that the greater value attributed to more universal kinds of knowledge creates a fundamental problem for global health policymaking: it alienates it from the specificities of the cases and contexts in which it operates. As a result, a lot of knowledge that is critical for policymaking gets left out, pushed to the side, or de-emphasised in the making of scientific facts.

Ideas about 'Good Science' in Multidisciplinary Research Teams

Throughout my ethnography, I spoke to people working at different scales, in different disciplines, with differing forms and levels of expertise in the various kinds of work that make up global health science. In all this diversity of experience, interests, convictions, viewpoints, and power, one of the few threads that connected almost everyone to whom I spoke was a commitment to good science. Good science is a fascinating, though to some extent a confounding, category. Some of my interlocutors used it to refer to the epistemic commitments and methodological necessities essential to the making of scientific knowledge, or defined it as work that tries to provide answers to important scientific questions, often by putting aside prejudice, bias, and assumptions and instead focusing wholeheartedly on what the evidence says. Others, not necessarily cynically, conflated it with 'fundability' – for these individuals, good science gets funded, so being a good scientist means that you consistently win funding for your work. In other contexts, my interlocutors used good science to refer to the professional norms that global health scientists should endeavour to follow, such as providing mentorship, advancing so-called 'equitable collaborations' with partners, and participating in 'community engagement'. Amidst calls and efforts to decolonise global health, these latter two aspects in particular have become significant markers of good science and were discussed frequently by my interlocutors. Amongst some junior Ugandan staff meanwhile, 'good science' meant adhering tightly to the research protocol and doing exactly what the boss instructs.

Much could be written about the ways in which these different ideas result in tensions – or outright debate – in the practice of scientific work in global health, but in this chapter, I am specifically interested in the epistemological aspects of what constitutes good science and the ways in which different ideas about its practice amongst scientists come into contact and shape knowledge production. There are many spaces in which different ideas around what good science is, what scientific research should target, and what it should accomplish come into contact, such as conferences, universities, research institutes, academic journals, and elsewhere in the public sphere, but it is within individual projects that these different ideas are brought to bear on the production of scientific knowledge.

What Do Multidisciplinary Research Projects Look Like?

Research projects in global health science vary significantly in their constitution, with the number and proportion of academic disciplines represented typically reflecting the specific topic of the project. Likewise, the number and roles of local staff involved in the implementation of a given project vary greatly depending on, for instance, whether there are complex interventions to conduct, surveys to collect, or if clinical staff are involved. Thus, though how and to what extent varies substantially, it is a rare global health science research project that is not in some way multidisciplinary. In the three projects in which I conducted my ethnography, there were a wealth of different disciplines represented by the Ugandan and non-Ugandan investigators leading the projects.

SHINe, the survey on HIV health-seeking behaviours and social networks, was led by two psychiatrists-turned-population health scientists, a behavioural scientist, a health economist, and a business studies researcher. MensIES, the school-based menstrual health intervention, was led by a biostatistician, and supported by various others including anthropologists, a social epidemiologist, a clinical epidemiologist, a health economist, and a statistician, among others. PrEPCoVax, the experimental HIV vaccines and PrEP trial, was a much larger project run by eighty people including scientists, social scientists (which they distinguished from other kinds of scientist), and those involved in professional support roles, community engagement, and cohort management. Represented within this large group were the disciplines of virology, anthropology, epidemiology, immunology, statistics, health economics, and others. SHINe and PrEPCoVax were also rich with clinical experience, with many of the researchers either simultaneously working or having previously trained as physicians.

Studies such as these would thus involve different kinds of academic expertise in different parts of the trial. In PrEPCoVax for instance, the social science team was tasked with helping to recruit people for the study by better understanding some of the specific issues relating to HIV prevention, care, and stigma in the locations and populations from which participants were being sought. During the trial, they were also tasked with monitoring participants' experiences and understanding why participants did or did not take PrEP. This involved initially examining their experiences within the trial itself and then later with their regular, local, non-trial provider. This was particularly important due to the significant drop in uptake when participants transitioned from the trial setting to their non-trial provider. Meanwhile, the trial's laboratory scientists were tasked with, among other things, studying the samples taken from participants to better understand the immune response to the different vaccines being trialled. The trial's epidemiologists and statisticians were involved initially in constructing the trial's cohort to maximise external validity and overseeing randomisation. Later, they monitored the safety and efficacy of the new experimental PrEP and vaccines being administered, tracked adherence to the experimental and non-experimental PrEP regimens, and conducted statistical analyses of the data produced by other team members, such as on immunogenicity.

In MensIES, there were weekly meetings of the qualitative and quantitative process evaluation teams who were responsible for ensuring that the right data was being collected in the right way and that the project was being implemented correctly. This was important given that the intervention had an adaptive trial design, in which aspects of the intervention were amended throughout to optimise impact. In MensIES, the design, implementation, and analysis during the trial was not divided up between the senior investigators based on academic discipline per se, but rather based on it being quantitative and qualitative, so some of the investigators worked in both work streams. As a consequence, the project was interdisciplinary in a way that PrEPCoVax was not, as it focused on implementing a complex intervention package in schools on a sensitive subject that required significant buy-in from study participants and the schools they attended. PrEPCoVax by comparison was multidisciplinary, but the scope for integration of the different work streams was limited. This was partly because the social science stream was added in at a late stage of the research design, but primarily due to the trial's subject matter: in being a pharmaceutical trial, there was a necessary and relatively clean division of labour between, for example, epidemiologists monitoring trial safety data and conducting statistical analyses, virologists working in laboratories conducting assays, and social scientists collecting interview data on the experiences of trial participants.

The division of work on the basis of expertise and disciplinary grounding is further evident in the kinds of journal articles published by project researchers, which are derived from the type of research they are conducting. Global health science research projects output publications throughout their life cycles. It is commonplace, for instance, for projects to begin by publishing their study protocols in academic journals, such as Trials, which specialise in the publication of such documents, and these are generally co-authored – formally at least – by the main researchers on the project. The development of the protocol and the design of the research project is usually a moment for cross-disciplinary collaboration, as the various researchers involved with the project are able to give input on the writing of survey questions, cohort design, the nature and extent of community engagement, the choice of methodology, the participation criteria, and so on. However, once the study begins, there is typically less scope for this as the research protocols are usually highly prescriptive – and thus restrictive – in terms of what activities researchers have to do. The increasingly targeted and workstream-specific nature of research from this point is reflected in the kinds of articles published throughout the project as different workstreams publish their respective outputs from their own research. In PrEPCoVax for instance, publications on the earliest findings from the trial included an immunology paper that described the specific assay that would be conducted to measure the immune response of participants to the two different HIV vaccine regimens, several epidemiology papers on the use of PrEP amongst the trial cohort, the predictors of participant loss to follow-up, and the prevalence and incidence rates and risk factors of particular demographics of participants, and a social science paper on the knowledge about PrEP amongst study participants. Across these publications, there was little crossover of authorship, as investigators worked on separate study teams.

Researchers then come back together again in discussing and writing what are referred to as the 'main' papers of a trial or study – those which are to be submitted to the most prestigious journals possible. It is often at this stage, when the study's main findings are being analysed, published, and disseminated, that the latent dynamics and power relations between different disciplines and different ideas about what good science entails play out, as I show in the two vignettes that follow.

The SCART Trial: Making Piecemeal Scientific Facts and Compartmentalising Knowledge

December 2022, London, UK

Professor Margaret Oppenheim waits for me just behind the automatic doors of her department building in central London, sheltering herself from the frigid afternoon cold. As usual, I am five minutes late, but she greets me with a warm smile and leads the way to a small café around the corner. I order a macchiato; she an Earl Grey. She pays. Margaret and I have met many times over Zoom and Teams, but only once before in person. I am – again – surprised by her. Her diminutive stature and mild manners contrast starkly with her titanic influence and reputation in CVHS.

There, she is widely and profoundly admired by everyone I met during my time in their Entebbe and Kalungu offices, while her interventions in meetings were much revered.

We indulge in a few minutes of small talk while her tea steeps; she asks me how my fieldwork went, and how my transition to writing-up is going. But the conversation quickly shifts to her; her first experiences working in Uganda in the late-1980s; her successful work over the past thirteen years fighting for social sciences research to be a part of all the clinical and epidemiological work that CVHS does; her hopes for the Centre's future.

An hour quickly slips by, but before we go our separate ways, I ask her about her experiences of working amongst virologists, clinicians, and epidemiologists as a social scientist: What has it been like dealing with the disciplinary hierarchies, and trying to get social sciences taken seriously? She tells me that it is a bit of a mixed bag. On studies like PrEPCoVax she feels respected; the virologists and clinical epidemiologists seek her guidance, support the social science staff, and value their contributions. But this isn't always the case, she says. She gives me the example of the SCART trial, on which she was a social science investigator.

The SCART trial was trying to tackle an important policy question: How to get adolescents living with HIV to adhere to their antiretroviral (ARV) treatment regimen for HIV. ARVs work by preventing HIV from replicating and thus spreading throughout the body. They do this by interfering with key stages in the life cycle of the virus, with different kinds of ARV targeting different stages of the life cycle. As a consequence, multiple different kinds of ARVs are usually concurrently administered to individual patients in what is called 'combination therapy', so that many different stages of the HIV life cycle are interrupted, and the virus cannot 'break through' by adapting to one kind of ARV. This makes drug resistance much less likely. However, ARVs cannot cure HIV because the virus can integrate itself into some of the body's cells and lie dormant within them – given ARVs only interfere with replication, dormant HIV that is not replicating can persist unharmed. This means that if the patient stops taking ARVs then the HIV will reactivate and begin to replicate again. Thus, according to conventional medical wisdom, ARVs need to be taken every day by people living with HIV (PLWH) to suppress their 'viral load' – the amount of HIV in their system. When viral load is high, the individual is much more likely to transmit HIV to another person, and if viral load remains high for a sustained period, the person will begin the transition to AIDS. PLWH who take their ARVs at odd intervals and who skip doses are much more likely to find that their viral load increases to unsafe levels (virologic failure), to pass on HIV to their children if they are a mother, and to develop drug resistance. This is because ARVs need to be present in the immune system for a sustained period to bring down the viral load, so if treatment is patchy then the viral load will be higher, meaning that there are more viruses replicating. Replication is also when mutation happens, and successful mutations can lead to HIV strains emerging that are resistant to particular ARVs, meaning that patients have to use different kinds of combination therapy to fight their infection. This means that they must move from the so-called 'first-line' ARV drugs to the more expensive 'second-line'. If adherence issues persist, further resistance can manifest, meaning that the individual must shift to even more expensive 'third-line' drugs. In much of sub-Saharan Africa, these second- and third-line drugs are also more difficult to get a hold of for PLWH, often requiring the individual to travel greater distances to get their medication. Yet despite these dangers, adolescents are widely understood to be less likely to adhere well to their ARVs than older populations, owing to stigma, discrimination, an unwillingness to suffer unpleasant side effects, and a host of other factors. Adolescents are thus seen as a vital demographic to target in HIV control.

SCART was one of thousands of studies looking at this issue. It sought to contribute to efforts to tackle the problem of adolescent adherence by seeing if it would be possible for adolescents living with HIV to only take their ARVs five days out of every seven, taking a break from the drugs two days per week (known as 'short cycle therapy'). To work this out, they enrolled 199 people from ages 8 to 24 from Europe, the USA., Thailand, Argentina, and Uganda and conducted a RCT, with roughly half of the participants taking their drugs as normal, and half on short-cycle therapy. As there are several different kinds of ARVs used across the world, they only recruited people on efavirenz-based ARVs – a commonly but not universally used ARV. They found that, after 48 weeks, both groups had low viral loads, the side effects experienced were similar, and there was no indication that short cycle therapy was any more likely to engender drug resistance.

After conveying to me the details of the trial, Margaret explains that throughout this project, social scientists were not really seen as equals of the virologists and clinical epidemiologists. Indeed, she says, "social science is often seen as a bit of a luxury to my colleagues: nice to have, but not essential". Her use of the word "luxury" to refer to the perception of social science work amongst her co-workers is well-practiced, one that she has expressed to me in exactly the same terms many times, and reflective of her tireless efforts over her lengthy career to ensure that social scientists feature on all of the projects in CVHS. But such a campaign, in the way she speaks of it, always seemed an art of persuasion on the one hand and of hustling on the other: convincing scientists that her team could add value to their projects, even in very small ways, and hunting down small pots of money to pay for their services, knowing well that their inclusion might not be budgeted for in grant proposals.

The SCART trial was not an exception in this latter regard, and the grant to conduct the trial had no provision for social scientists, so their eventual inclusion was only possible because a small, separate grant was won from a different funder. But, as Margaret tells me, the unequal position of social scientists on the grant was made most clear at the end of the project when the findings were being published in the Lancet, the world's most prestigious public health journal. Throughout the trial, Margaret and her social science colleagues had conducted interviews with trial participants, with Margaret herself overseeing the interviews with Ugandan adolescents. These adolescents had been designated as eligible for trial participation on the basis of being “exemplary adherers” to their ARV drugs, and as such they tended to be very knowledgeable about managing their viral loads, and many were open and public about their HIV status. During the trial, these adolescents, when interviewed by her Ugandan team, strongly cautioned the researchers against using these findings to inform a policy change. They told the interviewers in no uncertain terms that while they understood the details of the trial and the dangers of being poorly adherent to ARVs, many of their friends and neighbours who were living with HIV did not, and many of them already took their pills less frequently than recommended and at irregular intervals. They expressed concern that if these other people were to hear that it was safe to take ARVs less often, they might begin to take their ARVs even less than five days a week, with potentially dangerous consequences both for them and their communities. Margaret tells me that she thought this was very important context in which to couch the clinical findings. Rather than simply concluding that this regimen was clinically safe, she thought it vital that the qualitative interview findings be published alongside the clinical findings, so that people reading the paper would know not only that there were potentially significant dangers in pursuing this policy approach, but that trial participants themselves had voiced concern about these dangers in their own communities. When the findings were being published however, Margaret’s clinical epidemiologist and virologist colleagues did not include this context, explaining that there was no space within the word count of the Lancet paper to include the social science team’s findings. She continues:

> There is a paragraph in the main paper on the ‘qualitative sub-study’ results, but the main point there is to say the results were supportive of the use of short cycle therapy, which indeed they were – but they left out the important concern we raised, which we [the social science team] considered our main finding.

The project's principal investigators told Margaret that it would be better for the social science findings to be published in their own article, where they could be given fuller treatment. The principal investigators suggested that the two papers – the 'main' trial findings paper and the social science paper – should be submitted to the Lancet at the same time as linked papers. However, the 'main' paper was accepted, and the social science paper was rejected.

She is visibly exasperated while telling me this story and pauses to take a sip from her now cold cup of tea. "They just didn't think that the concern we raised was relevant to the clinical findings," she says. "It was very frustrating. I did eventually get the social science findings published a year later, but in BMJ Open" (a less prestigious journal with a much lower impact factor).

Margaret's colleagues evidently wanted to report the trial to be a success, which, clinically, it was. Doing so confirmed a hypothesis and represented an important contribution to biomedical knowledge about HIV and its treatment. Moreover, it may well contribute to improving treatment regimens for PLWH in the future and reduce the number of potent ARVs that are necessary for people to stomach – and from which to suffer side effects. It also enabled the research group to get more funding for the project, with SCART able to extend their follow-up period for a further two years. Reporting the social science team's finding that participants were vocally and fervently pessimistic about the possibility of short action therapy being scaled up and implemented as policy in national contexts would not have fit with the salient clinical finding that such therapy has no deleterious effect on the viral loads of patients.

Her eyes flick up to the barista that has come to collect my empty cup, then to her phone to check the time. She apologises and tells me she has another meeting starting shortly, and we begin to wrap ourselves in our scarves and coats in preparation for the biting cold outside.

*

The story of SCART tells us many things about the cultural and epistemic logics that undergird the production of knowledge in global health science. Firstly, it emphasises the significance of making clear, parsimonious, noise- and context-free facts in global health science. The social science findings, which complicated the notion of short-cycle therapy as a viable policy in Uganda, were not included in the main Lancet paper at the end of the trial as they were not directly "relevant to the clinical findings": the main point of the trial was to determine whether short-cycle therapy was clinically safe, and it found that it was. The clinical finding was generalisable, nomothetic, and universal: it revealed a fundamental scientific truth which, based upon the strength of the initial evidence, would likely apply everywhere, through time and space, though more studies would be needed to categorically determine so. This truth was that in PLWH, taking efavirenz-based antiretrovirals five days per week rather than seven results neither in an increase in viral load, nor in a greater risk of drug-resistance after 48 weeks, and has a superior safety profile. The social science finding that short-cycle therapy could be potentially dangerous to pursue in Uganda was of interest, but space was not made for it in the main Lancet paper. Where the clinical finding was universal, the social science finding was specific in time and space only to the Ugandan context in which it was found – it was not found in the other three countries.

Secondly and relatedly, the insistence that the social science findings were not directly relevant to the clinical ones highlights an important aspect in the way that scientific research in global health is ordered: it is important first to establish the core, foundational, basic scientific facts – in this case the clinical fact that short-cycle therapy is safer and no less effective than standard, daily ART – before *subsequently* thinking through how these facts might be instrumentalised. The programmatic implications of the SCART trial – that is, what exactly its findings meant for global/public health officials designing national and global policy – sat outside of the remit of the research. As far as the clinical epidemiologists and virologists on SCART were concerned, the most important thing was establishing that short-cycle therapy works and is clinically safe so that it can be another tool in the toolbox for policymakers, but how this piece of knowledge should be used by those in policymaking represented an altogether different question that might be more of interest to the fields of 'implementation science' or 'translational health science', but in any case was an issue to address down the line and not at that moment. This temporal logic, in which basic and clinical scientific research should predate research that looks at questions of programming and policy implementation, is significant: the 'implementation' of scientific findings is routinely and widely discussed by global health scientists as the "last mile" and framed as something that is complicated, rife with contingency, contestation, and contextual factors, but also paradoxically as something that is in some ways an 'easier' step in the science-to-policy process than figuring out more fundamental and broad-based scientific questions. It thus often sits outside of the realm of expertise of the clinical epidemiologists, laboratory scientists, and others leading global health science research projects. In this way, when the lead investigators of SCART viewed the social science finding as not relevant to the clinical finding, they did not mean that it was totally irrelevant, nor that it should not be published in an article somewhere, but rather that it simply was not relevant to what the trial was trying to accomplish and that it should be something considered at a later stage in the policymaking process in Uganda.

Thus, the story of SCART illustrates how a singular scientific fact comes to be made in global health science. Context, contingency, and contestation are minimised in favour of pared-back nomothetic parsimony, universality, and clarity. Such an observation chimes neatly with other sociological and anthropological work on scientific knowledge production (Latour and Woolgar, 1979; Latour, 1987, 1993). Latour, for instance, in his analysis of laboratory sciences, describes the importance amongst these scientists in tuning out external noise, eliminating context, and producing universally applicable truths through the process of what he terms "purification". Latour argues that despite these efforts, science is not produced in a vacuum and cannot be hermetically sealed from its wider context.

The PrEPCoVax Trial: The Value of Universal Knowledge and the Failure to Produce It

In 1984, Margaret Heckler, the Health Secretary of then-US President Ronald Reagan, pledged to the world that a vaccine for HIV/AIDS would be available within the following two years. Today, forty years later, the prospects for developing a vaccine for the disease in the next decade are dim – long gone are the expectations that such a feat would be a relatively straightforward undertaking; rather, it presents one of the toughest challenges that vaccinology has yet faced. This is in large part due to the extraordinary complexity of HIV: its genome is relatively small but highly mutative, meaning it presents a moving target for traditional vaccine technologies which cannot be trained to identify countless varieties of ever-evolving HIV virions. There is also no natural immunity to HIV amongst humans, meaning no one has ever been infected and fully and permanently recovered from infection by producing antibodies that clear all of the virus in their system, while animals that are infected with HIV do not seem to experience infection and progression to AIDS in the same way as humans. This means that scientists cannot neatly use immune responses in humans or other animals as models from which to generate a vaccine.

Nevertheless, over the years since Heckler's promise, there have been consistent efforts to develop a vaccine. These attempts have not been entirely fruitless; the hunt for a vaccine has provided scientists with a wealth of knowledge in the fields of immunology, virology, vaccinology, and others that has contributed – among many other things – to the development of the mRNA vaccine technologies used in the COVID-19 inoculations. Still, a vaccine for HIV remains elusive.

PrEPCoVax was the seventh HIV vaccine efficacy study to be conducted. Previous studies had demonstrated immunogenicity (an immune response), but had been unsuccessful at generating a sufficiently robust immune responses as to provide any kind of protection from HIV infection with one notable exception – RV144. Often referred to as 'the Thai trial', RV144 was run between 2003 and 2006 in Thailand, with its findings eventually published in 2009 in the New England Journal of Medicine. It was – and remains – the only HIV vaccine trial to date to demonstrate statistically significant protection against HIV infection, although this protection was relatively modest at 31.2% (i.e. the risk of HIV infection amongst the vaccinated group was 31.2% lower than the control group). The Thai trial tested a four-dose combination of two different HIV vaccines, each of which had previously been tested independently and shown to demonstrate immunogenicity, but to offer no protection from infection. Its finding that these previously ineffective vaccines appeared to be successful at preventing HIV infection when used in combination, even to a relatively small degree, was greatly encouraging.

Following this, another trial was conducted in South Africa called HVTN 702, or 'Uhambo'. Beginning in 2016, Uhambo trialled the same vaccine combination as the Thai trial, but tweaked it so that it would be specific to the HIV subtype that is more common in the region. The trial team also used a different adjuvant (a substance used to boost immune responses) than the Thai trial. Unfortunately, the Uhambo trial was discontinued in 2020 because it was found that its vaccine regimen was offering no protection against HIV infection and that the number of cases was in fact slightly higher amongst the group that received the combination of vaccines than amongst the control group who received a series of saline solutions.[20] Another similar trial

---

[20] It should be noted here that the number of infections was not higher amongst the group that received the vaccines because of the vaccines themselves. It is instead likely that this was caused by random chance (i.e. that one of the groups just happened to get more infections than the other because the vaccine offered them no protection).

called HVTN 705, or 'Imbokodo', was also conducted over a similar timeframe using slightly different vaccines – it was also discontinued shortly after Uhambo in 2021.

PrEPCoVax was thus the next trial to pick up the torch. Headquartered out of CVHS in Entebbe and operating in three African countries – Uganda South Africa, and Tanzania – the PrEPCoVax trial set out to test two different HIV vaccine regimens, both slightly different to those that had been tested previously, but building upon knowledge generated through the previous trials and hoping to replicate the findings of the Thai trial. Alongside this so-called 'three-arm' vaccine trial, in which participants would be randomised into vaccine regimen A, B, or a saline solution control, PrEPCoVax also conducted a trial for PrEP, looking to test the efficacy of a new PrEP drug versus a widely used older variety.

The trial began by registering a cohort of HIV-negative participants from 2018 in an observational study to track their health and any potential risk of them participating in the trial. This stage enabled the researchers to identify HIV prevalence and incidence rates amongst different groups and any risk-factors of infection in the study sample, as well as the likelihood of uptake of and adherence to PrEP, amongst other considerations. While cohort registration began in 2018, researchers at CVHS had spent many years before the trial in preparation for it, with previous studies assessing the prospective uptake of an HIV vaccine and PrEP. More broadly, CVHS had been conducting work on HIV/AIDS in the location in which the trial was being conducted for roughly 30 years, and there was already extensive work on the demographic and epidemiological profiles of the study population.

Following the registration cohort study, the researchers began formally enrolling people in the vaccine and PrEP trial in December 2020. Participants were randomised between the three arms of the vaccine trial, receiving either regimen A, regimen B, or the saline control. Within each of these three groups, participants were then also randomised between the two arms of the PrEP trial between the new PrEP drug and the older one. Part of the idea for running the two trials together was that the vaccine regimens each required four doses, taking place at weeks 0, 4, 24, and 48 of the trial, with peak immunogenicity expected after the third dose in week 24. As a consequence, the PrEP trial ran over the period of the first three doses to prevent as many of the trial participants as possible from getting HIV during time period in which they were being vaccinated, as doing so would mean that they could not be included in the trial data that tested the efficacy of the vaccine because peak immunogenicity would not yet have been reached. After the third dose, participants were referred to acquire PrEP from their normal local providers, rather than from the trial clinics, with the expectation that many would not do so.[21] This slippage of PrEP uptake amongst participants enabled the researchers to assess the efficacy of the vaccine by comparing the HIV incidence after the third dose between those who received one of the two vaccine regimens with those who received the control. The trial researchers, especially the social science team, then also conducted research to document the reasons why participants stopped taking PrEP regularly after they stopped receiving the drug from the study clinics and instead had to go to a local clinic for PrEP.

When I began part of my ethnography in PrEPCoVax in 2022, the trial was well underway, and many participants were receiving their second and third doses of the vaccine. But in late-2023, several months after I stopped attending the virtual meetings from which the trial was

---

[21] It is well-established that adhering to PrEP is difficult for many people due to various factors. These include simply the fact that taking a drug for a disease you do not have is inconvenient, as well as side-effects, which are often worsened by taking the drugs without food (something that is more common amongst socioeconomically disadvantaged groups who are most at risk of HIV infection). Importantly for the PrEPCoVax trial, these factors also include stigma and discrimination, or a fear thereof: many people who take PrEP fear that those around them will not be able to distinguish between the drugs being used for prophylactic use and those being used to supress active HIV infection, as the drugs are often the same and distributed from the same locations, and therefore will assume that they are HIV-positive.

Relatedly, some people don't believe that PrEP really works or exists because it is well known that HIV has no cure, and so the person taking them must actually be taking HIV drugs because they are HIV-positive. PrEP users also face stigma because using PrEP implies that they are practising 'risky' sexual behaviours, or that their partner is HIV-positive. In this trial, participants received PrEP from the trial clinics, which were safe spaces from which to receive medications without fear of other community members, but when they were referred back to their standard local providers, many people stopped taking the drugs.

managed, the Trial Monitoring Committee (TMC) instructed that the vaccine part of the trial be stopped due to 'futility'; that is, because there was little to no possibility that either of the vaccine regimens were offering any kind of protection against HIV infection. This was a surprise to the researchers on PrEPCoVax who, in keeping with the requirements of conducting a high-quality randomised placebo-controlled trial, were 'blinded', or prevented from seeing the trial efficacy data as it was being produced – investigators on projects like this are kept 'blinded' to prevent them from consciously or unconsciously allowing information about the performance of the trial to influence their decision-making. The Trial Monitoring Committee – an independent group of researchers in charge of assessing the trial data for safety and efficacy – were not blinded and not involved in the running of the trial. They were tasked with independently reviewing the emerging data from the trial every 6 months to check that it was still worth continuing.

Thus, much like the Uhambo and Imbokodo trials that came before it, the vaccine part of PrEPCoVax was stopped because its vaccine regimens were ineffective at preventing infection, meaning that around about as many if not more people in the groups receiving the vaccines were being diagnosed with HIV as in the placebo control group. However, at the time of writing, the PrEPCoVax investigators have not seen the trial data yet as the 'unblinding' process has not been completed, partly because the PrEP part of the trial was not stopped by the TMC and has been allowed to continue.

The termination of the PrEPCoVax trial was enormously disappointing for the scientists, researchers and trial participants involved in it, not only because the trial failed to show efficacy, but also because it confirmed longstanding fears that the Thai trial data was wrong or misleading. This in turn indicated the end of the road from this generation of HIV vaccine technology, which had been the primary subject of testing for the past 20 years. With no other prospective vaccine candidates nearing readiness for clinical trials, global health researchers, practitioners, and populations in need of protection against HIV now have to wait at least until the 2030s for the next generation of vaccines to be ready for testing.

*

January 2024, London, UK

Margaret Oppenheim and I settle into our chairs at the café around the corner from her department building in Central London. As pools of water collect beneath us from our rain-soaked coats, I am struck by the repetition of it all: just like when we met a year ago, I was five minutes late, she greeted me with a smile, and we ran around the corner to the café, ordering the same drinks and sitting down at the same table in the far corner.

We chat briefly about how my PhD write-up is going and my plans for what comes next before I ask her how her work is. She asks me if I have heard the latest news from PrEPCoVax, and I confess that I haven't – since I stopped conducting interviews and attending their meetings, I have been a bit out of the loop. Margaret explains that the trial has been stopped by the Trial Monitoring Committee because of futility, and that the team is pretty disappointed. As is the nature of these things, it had come as a bit of a shock. I ask what was happening now and what the fallout of the announcement was, and she sighs and purses her lips. "Nothing," she says, "the PrEP bit is continuing, but the vaccines have completely stopped."

As with the SCART trial, Margaret was the social science lead on PrEPCoVax, though this time alongside a Ugandan colleague and mentee who she was helping to take on such a role for the first time. Margaret has (perhaps modestly) previously told me that she has had quite a minimal role in the trial, as her Ugandan colleague was more than capable enough of handling the role independently, requiring very little oversight or guidance. Her interventions, then, were largely behind the scenes, and primarily served to ensure that the trial's leadership were aware of the social science team's requests and advice. Prior to the trial starting however, she was involved in a lot of the preparatory work around the study site in Uganda over the course of several years.

I ask Margaret to elaborate further: "So what is happening now?" She explains that when a trial stops because of futility (i.e. when the intervention is clearly not working), there is dwindling interest from the scientific community, because the product has not worked. Years of work had gone into community engagement, cohort-registration, trust-building, and meticulous social research on a plethora of health issues, particularly on HIV/AIDS, in the area of the Ugandan study site so that a vaccine trial could take place one day. But now, with the trial abruptly ending, there would be no further research with those vaccine products, and interest had abated.

Margaret continues, explaining that now that the vaccine part of the trial is over, the funding for the final part of the social science work is not available, because the funder who had supported the social science work is now focusing on other things. The trial team was therefore busy scrambling to manage the perceptions of the trial's sudden termination amongst its participants and those around them. I speculate that, given the rise in 'conspiracy theories' in certain sections of Ugandan society during the COVID-19 pandemic, particularly those around vaccinations, it could be a concern that a trial for another vaccine has suddenly and mysteriously been ended. She agrees.

*

Like SCART, the story of PrEPCoVax illustrates a lot about the cultural and epistemic logics in global health science. It highlights the slow, long-term, monkish, and progressive work of scientists in the laboratory-based fields of virology, immunology, molecular biology, and vaccinology. Spanning multiple countries and many, many years, different scientific research groups have built on one another's work meticulously and incrementally, gradually developing knowledge to contribute to or even solve a vital challenge facing humanity.

That PrEPCoVax failed is enormously disappointing to these scientists, but the work will continue, even if it means other scientists going back to the drawing board and developing new vaccine candidates. Undergirding this effort is a salient and palpable drive amongst these scientists to expand the limits of human knowledge and our technological capabilities as a species, as well as a compassionate determination to find a permanent solution to a terrible disease that one day might be completely preventable.

Relatedly, it speaks to something that came out clearly in my interviews with the scientists on the trial: a commitment to or faith in the power of vaccines to change lives and 'solve' particular diseases for good. Despite all the challenges to developing an HIV vaccine and all the immense progress that has been made in treating and preventing it that makes a potential vaccine less urgently needed than it was thirty years ago, these scientists are resolutely committed to the idea that one should be developed as soon as possible. I lost count for instance, in discussing these issues with my interviewees, of the number of times the great success of the polio vaccine was mentioned; cited as evidence of the need to develop an HIV vaccine and solve the disease once and for all – as a possibility of tantalising simplicity and straightforwardness, if only the science could be got right.

Amidst such grand ambitions, it is perhaps unsurprising that social science research is not prioritised quite so highly. The work of biomedical scientists leading similar such projects aims to produce universal truths of a magnitude and scale that exceed that of their social science colleagues.

Compartmentalisation, Universality, and Knowledge Hierarchies in Global Health Science

Within these two stories, one of success and the other of failure, there are two important, interrelated processes that merit deeper treatment: those of compartmentalisation and valuation. I discuss each of them in turn.

Compartmentalisation in Global Health Science

Compartmentalisation is an important process in producing knowledge in global health science. Throughout this chapter, I have highlighted how multidisciplinary research teams are often not interdisciplinary. In SCART, the social science team was not permitted to include their most important finding in the main trial paper in the Lancet, and their effort to have their work published separately alongside the main trial paper was rejected. Instead, the paper later wound up in a much less prestigious journal. The main paper was interested in making the clear, parsimonious, generalisable, nomothetic claim that short-cycle therapy is safe, which was the central question of the trial, and the social science paper was interested in making the point that many adolescents living with HIV in Uganda were worried that adopting short-cycle therapy as a policy would be dangerous and lead to people taking their drugs even less frequently than would be advised. Overall, this process constituted a compartmentalisation of different kinds of knowledge, with them being disseminated in journals separately.

In PrEPCoVax, the trial was focused primarily on evaluating the efficacy of the two vaccine regimens and the new kind of PrEP. Given that the trial was experimental, with the anticipation that, if effective, the vaccines would need refining before they could be rolled out, the main focus of the trial was to learn about the immune response they engendered and to figure out if they could be made into viable candidates for widespread distribution. In this framing, the social science work was seen as not essential to the project, and Margaret and her colleagues were only brought on board at a later stage, despite their involvement in previous preparatory work in and around the Ugandan trial site. The different workstreams of the various researchers involved in the trial were divided up relatively neatly between the different disciplines – the laboratory scientists conducting their assays, the epidemiologists ensuring the trial was being run effectively and rigorously, and the social scientists ensuring that there were no significant problems with the participants of the study through documenting their experiences. This, again, is reflective of the compartmentalisation that takes place in multidisciplinary research projects.

Valuation and Knowledge Hierarchies

Such compartmentalisation of research outputs and of workstreams is widespread, though not omnipresent, in global health science. The problem, I argue in what follows, emerges when one reflects on the power relations at play and the different ways in which the knowledge and contributions of different people and disciplines are valued.

One of the starkest ways in which this plays out is in the publication and dissemination of knowledge, as the story of the SCART trial illustrates. The most important clinical, molecular biological, virological, and epidemiological research tends to be published in the biggest public health and medical journals like the Lancet, the British Medical Journal, and the New England Journal of Medicine. Basic and laboratory science work is also published in these journals, or else in other journals specific to these fields. Meanwhile, social science findings or those relating to implementation and location-specific policy issues in particular contexts tend to be published elsewhere. There are typically significant disparities in prestige, 'impact', and readership between the top public and global health journals like the Lancet, which publish much more biomedical, laboratory-based, and basic science, and those publishing more qualitative and social science work. For instance, BMJ Open, where the SCART trial's main social science finding ended up a year after the main paper was published in the Lancet has an impact factor of 2.9 – a vastly inferior score to that of the Lancet, which has a score of 168.9. Such differentials in the impact factors of journals are not an exact science in terms of their correspondence with the number of people that read and cite the articles within them and with the prestige accrued by conducting and publishing important scientific work, but they are broadly indicative of the ways in which different kinds of knowledge in global health science are valued, with 'harder' sciences published more often in top journals and 'softer' sciences more often published in lesser ones.

This phenomenon has attracted attention and criticism in global health epistemic communities. As Carol Camlin and Janet Seeley (2018) note in their discussion of their own experiences working as qualitative researchers on health research trials and studies, social science research is often not published alongside the 'main' clinical or basic science papers published in top public and global health journals. When included, it is generally only done in a minimal way. Camlin and Seeley explain that the main reason given for this by their colleagues is that there is insufficient space within the word count of the 'main' trial papers, but getting social science findings published in the same journal edition as the main paper is almost impossible. Consequently, the 'main' trial papers with particular kinds of clinical and biological scientific work are published with minimal presence of social science findings, which are instead published elsewhere. As Camlin and Seeley (2018, p. 58) put it:

> The findings from qualitative research within trials offer valuable information on the ways people behave and communicate, and the complex social worlds with which research is conducted – information that is essential to the understanding of trials' results. However, we continue to find that papers

> based on qualitative methods from trials are afforded lower priority by many medical journals, despite recent efforts to urge editors to reconsider policies towards the publication of such research.

Elsewhere in their article, Camlin and Seeley note that this is reflective of a wider tendency for social science research to be rarely integrated into every stage of a research project's life cycle, and it is instead commonly used to better understand why interventions are or are not working, to recruit and retain research subjects, and to aid in 'community engagement', rather than to help generate research questions and design research protocols, facilitate adaptive trial designs, to interrogate the generalisability of findings, or to hone and devise policy recommendations.

The compartmentalisation of different kinds of scientific knowledge into distinct workstreams and journals reflects existing disparities in how these forms of knowledge are valued, while also perpetuating those disparities – social science articles 'end up' in less prestigious journals because the reviewers of the more prestigious journals do not consider them to be of equivalent value to others, but in being published in less prestigious journals these social science articles are read and cited less widely and thus are considered to be less valuable because they make less of a splash, meaning that its harder to convince 'harder' scientists running trials that social scientists can be of great value.

This system of valuation in which some kinds of knowledge are considered more significant and important than others can otherwise be referred to as a knowledge hierarchy. Knowledge hierarchies and the relationships between the different levels of these hierarchies play a vital role in shaping global health science knowledge production. As is evident in Margaret's experience trying to get the social science findings published in the main SCART paper, and in the experiences of social scientists working on medical trials more broadly as discussed by Camlin and Seeley, social science work is valued less highly than biological and clinical research. Such knowledge hierarchies in global health science are widely acknowledged, and were the source of much frustration both personally and amongst my interlocutors throughout my fieldwork. Margaret's frequent complaint that her virologist and clinical epidemiologist colleagues perceive social science as a *"luxury,"* rather than as a crucial aspect of conducting global health research, is a clear indication of this.

Knowledge hierarchies in global health science were discussed by my interlocutors in terms of having the 'harder' sciences on the top – virology and molecular biology – and 'softer' sciences on the bottom – social sciences, and particularly qualitative social research. Few of those higher up the knowledge hierarchy are aware of the differences between different social sciences disciplines – perhaps why 'social science' is typically referred to in global health science in the singular rather than the plural. Indeed, I met one US American scientist who thought Anthropology was essentially investigative journalism, rather than something rigorous, and empirical. Margaret and others explained to me that these knowledge hierarchies play out within the social sciences in global health too, with psychologists, who commonly position their work as 'more scientific' than that of anthropologists, holding and asserting higher positions in the hierarchy. Likewise at the other end of the hierarchy, clinical epidemiologists, whose work involves a blend of medical and statistical expertise, were often spoken about as sitting just beneath the virologists, vaccinologists, molecular biologists and other basic and laboratory scientists.

Professor Diana Mitchell, the biostatistician PI of the MensIES trial, was another of the interlocutors who laid out this knowledge hierarchy for me, positioning herself as a statistician above the qualitative social sciences, but very much beneath the epidemiologists and laboratory scientists. Such a position was discussed by her as deeply frustrating, especially when such colleagues told her to "'do the stats'… as if it's just a service", rather than as something integral to every stage of multi-disciplinary and multi-method research projects. Likewise, Dr Olivia Collins, a Co-Investigator on the SHINe trial – another of those in which I conducted my ethnography –

spoke about her position as a health economist as existing somewhere in the middle of the social and laboratory sciences in the global health science knowledge hierarchy, and expressed annoyance that some of her colleagues in the 'harder' sciences viewed her work as doing little more than providing cost-effectiveness analyses.

Such analyses also chime with those of medical anthropologists who have pointed to the ways in which, amidst the interconnected rise of 'evidence-based medicine' and 'experimental global health science' (discussed in chapter one), social and qualitative research has been dismissed as 'anecdotal' and 'not rigorous'; something found explicitly at the bottom of the hierarchies of evidence in evidence-based medicine (Allen, 2006; Brownson, Fielding and Maylahn, 2009; Brownson *et al.*, 2011; Merry, 2011; Adams, 2013; Biehl and Petryna, 2013b; Adams, Burke and Whitmarsh, 2014; Parker and Allen, 2014; Stegenga, 2014). At the top of these five levels of evidence lie the kinds of scientific methodologies of knowledge production that are established within the natural sciences: randomised controlled-trials and systematic reviews and meta-analyses thereof.

What, though, underlies these knowledge hierarchies? At its core, I argue, is the notion of universality. Contextual and contingent factors and the contestation of making knowledge are therefore aspects that sit outside of this epistemic framework – the tendency to produce knowledge in the diligent, painstaking, parsimonious, focused, piecemeal ways that PrEPCoVax and SCART did is illustrative of the need to tune out the noise and generate clear, scientific facts that tell us about the universe. As one slides down the knowledge hierarchy of global health science, the analytical focus, empirical attention, and epistemic commitments of disciplines to uncovering universal forms of truth progressively diminishes, and they are thus of less value in purely scientific terms.

Conclusion

Global health science is dynamic, broad, multidisciplinary, and diverse in the epistemic communities it brings together. In this chapter, I have endeavoured to analyse how these communities come into contact in scientific research projects and what the implications of this are for the production of knowledge. I have shown how scientists, in their monkish, focused, and precise work in the production of scientific facts, strive for parsimony; pursuing clear, salient truths above all else that are simply and efficiently expressed, often in no more than a sentence. In many respects this is a piecemeal undertaking – scientific work is typically slow, deliberate, and incremental, and while paradigm shifts in scientific knowledge do take place, most scientific work happens bit by bit and fact by fact. The ethnographic vignettes I have presented here have sought to illustrate this. In so doing, I have argued that the piecemeal nature of this scientific work is intertwined with a logic and norm of compartmentalisation, in which different scientific disciplines and workstreams are separated out from one another to make their respective parsimonious scientific facts. Unequal power relations between these compartmentalised disciplines and methods reflect which are valued more highly in the context of rigorous scientific research, producing hierarchies of knowledge and evidence. These knowledge hierarchies are themselves structured by the extent to which different disciplines and methodologies can make – or claim to make – universal forms of knowledge. The drive to make powerful, universal claims on truth is strong – that is, the drive to produce and verify laws, theories, or principles that carry broad applicability and are not confined to a particular temporal or spatial context. Such universal claims, in their epistemic proximity to the natural sciences, are more highly regarded, robust, and rigorous. Context, contingency, and contestation are, then, antagonistic to the making of the most valued scientific facts in global health science.

From these arguments, I make two main points. Firstly, I argue that knowledge hierarchies play important roles in shaping the construction and dissemination of scientific knowledge in global health. The cases of SCART and PrEPCoVax both illustrate the ways in which pursuing the production of highly valued, universal, nomothetic scientific facts – regardless of the success or failure of such a pursuit – is the engine of global health science. The divisions of labour, expertise, and authority within research projects has significant implications for what knowledge is produced and how it is disseminated – and therefore who is able to know it. Typically, this involves the valorisation of the production of knowledge that is closest to the natural sciences and the devaluation of social science work.

Secondly, with this point in hand, I argue that universality in global health science is over-valued in terms of the aims and ambitions of the very scientists involved in practicing and upholding the epistemic logics that undergird the production of knowledge in the field and structure the hierarchies of knowledge and evidence that pervade it. In valuing the universal so highly, these scientists necessarily de-emphasise or neglect the contextual, contingent, and contestable aspects of the interventions into the social, economic, and political worlds which they enact and recommend. Given that the multidisciplinary field of global health science holds its political commitments to reducing health inequities and ameliorating health outcomes in the Global South just as closely as its epistemic commitments to scientific rigour and evidence-based practice, the field's emphasis on universal forms of knowledge is profoundly influential for global health policymaking, which is necessarily a far more context-specific undertaking. Developing global, national, and regional public health policy is a process that requires the integration of contextual and contingent factors into decision-making processes, and one that demands a wrangling with forms of contestation both within and without the production of the scientific knowledge that informs it. In this way the over-valuation of universality in global health science contributes to the functional misalignment of the field with public health policymaking – in Uganda, at least.

Chapter Four

‘Stickiness’ and the Aetiologies of Blind Spots in Ugandan Global Health Science

Introduction

Uganda is widely considered among global health researchers and practitioners to have some of the best data and scientific research on health in Africa: groundbreaking, world-leading biomedical research has been conducted in the country since 1986, and it has been a bountiful source of data and research participants for studies published in leading public health journals. Uganda’s reputation in global health, especially since the turn of the millennium and the rise of experimental global health science, as depicted in Johanna Crane’s *Scrambling for Africa* (2013), is one of scientific excellence – albeit relative to the standards of other ‘low-income’ countries. In this chapter, I investigate this claim that health research in Uganda is some of Africa’s best, noting that while it is in a certain sense true – Uganda does indeed play host to a relative abundance of biomedical research – it is also the case that this data production focuses narrowly on relatively few people in few places on few topics, and that these foci are decided upon to a great extent by funding institutions in the Global North. As Tanya Li (2007, p. 2) notes of the work of development programmers, who “must screen out refractory processes to circumscribe an arena of intervention in which calculations can be applied [thereby addressing] some problems, and necessarily not others”, so global health scientists focus on some issues and not others, rendering the former as technical questions of efficiency and efficacy – narrowly conceived. This chapter elucidates some of those issues that are neglected, and considers the aetiologies of this neglect.

Through this, I reflect on the ways in which scientific knowledge production is constrained and enabled by the processes of obtaining funding to do scientific work, processes that are themselves reflective both of epistemic commitments to 'good science' and a precarious political-economic context.

I illustrate this through a discussion first of regional blind spots in global health science research conducted in the country and the related rise of so-called 'centres of excellence' in particular geographic locations, and second of demographic and clinical blind spots that relate to the rise of experimental global health science and the development of certain global health priorities. I then show how and why these blind spots become persistent and the difficulties that exist in rectifying them, noting in particular the difficulty of producing scientific knowledge on problems, people, or places where there is little existing data with which to justify the need for a study or intervention. I also discuss the ways in which funding incentives and conventions and the norms they engender constrain what kinds of research can be and is done. This chapter thus attempts to cast light upon the ways in which the political economy of scientific research and its history give rise to path dependencies in the production of knowledge that ultimately shape this knowledge in profound ways and illustrates just how much is not known by global health and public health decision-makers and researchers. I argue that scientific research becomes path dependent in that where more research is conducted, more data and more human and technological infrastructure is available to enable further research, making future projects simpler and cheaper to set up and implement in these places.

Through this analysis and argument, this chapter uses 'stickiness' as a means of conceptualising the ways in which allocations of resources – in this case for scientific research – are not calculated, decided upon, and distributed based purely upon technical processes and efforts to optimise outcomes, but also because of social ties and norms, cultural and epistemic logics, existing political priorities, and the importance of steady economic funding streams in a context of precarity, all of which favour the stable status quo. In other words, resource allocations – even in highly techno-scientific contexts such as global health science – are profoundly shaped by existing practices, existing priorities, existing knowledge, and existing funding arrangements, which I conceptualise as 'sticky'.

Blind Spots in Global Health Science Research in Uganda

Over the course of the research for this project, I became aware of numerous, often troubling, blind spots in global health research in Uganda. I discuss some of them in what follows. I should note however, before embarking on this course, what I mean by the term 'blind spot'. By it, I do not mean to indicate that these blind spots are total (in the sense that absolutely nothing is known about them), nor homogenously experienced (in the sense that everyone knows equally little about them – clearly people will have different levels of knowledge about different things). This is most important with respect to Ugandan clinicians and researchers, many of whom are acutely aware of the issues that I next discuss. The same can also be said about some non-Ugandan researchers with extensive experience in a particular national or local context, though this is not commonplace. What I mean to imply with the term 'blind spot' is instead that information about a particular place, group of people, or health issue has not been 'rigorously' collected, collated, and analysed in accordance with the epistemic commitments that undergird the processes of scientific knowledge-making in the way that is required for these to be rendered 'visible', in the form of data, to global health scientists and policymakers, and for information to be validated as 'objective'. In short, by blind spots, I refer to the 'gaps in the data', insofar as the field of global health understands it: things about which little has been published in internationally recognised peer-reviewed journals, which garner little attention at major global health conferences, and on which there is typically little-analysed or 'poor quality' data, if any, collected by health workers in clinics and hospitals. I explore these blind spots through two historical trajectories: the development of 'centres of excellence' for biomedical research in Uganda; and the transition from descriptive to experimental forms of research amidst the wider 'pharmaceuticalisation' of global health.

Regional Blind Spots and the Emergence of 'Centres of Excellence'

Probably the most striking blind spot in global health science in Uganda is the shortage of research that has taken place anywhere outside of the city of Mbarara and its environs, situated in Uganda's Western Region, and most of Uganda's Central Region, comprising Kampala, Wakiso, Masaka, and several more rural districts around the shores of Lake Victoria.[22] Collectively, these regions constitute just over a quarter of the country's population (UBOS, 2020). The remainder are neglected as subjects of scientific knowledge production: few research projects are conducted North or East of Kampala or West of Mbarara, and these neglected regions are rarely mentioned in journal articles.

The primary way this manifests is in the relative absence of articles in high-impact journals on districts other than those mentioned above, but this fact is, as I show here, tightly bound to the locations of the major research institutes whose projects produce these articles. The largest and most prolific research institutes are situated in the abovementioned regions and conduct their research relatively locally. Sometimes working in partnership with government hospitals, clinics, and other healthcare institutions, these research institutes produce vast

---

[22] These rural districts include: Rakai, Kyotera, Masaka, Kalungu, Bukomansimbi, Kalangala, Lyantonde, Lwengo, Ssembabule, Butambala, Gomba, and Mpigi, though to varying extents. Other districts in the Central Region are also researched, but it is those around Lake Victoria that have been most extensively studied.

amounts of scientific data, often improving the quality of both the data produced in these government institutions, and the healthcare services they provide in the process. These major research institutes are commonly referred to as ‘centres of excellence’, a term used in global health to describe institutions that consistently produce high quality academic work on health issues that is published in journals with high impact-factors, and which consistently win competitive international grant funding. Almost without exception, these centres of excellence are located in the Central Region or Mbarara, and conduct research usually within the immediate vicinity of their main campuses, although some maintain so-called ‘field stations’ in rural areas as means of facilitating research outside the urban areas to which the institutes themselves are typically confined. In Uganda, a hotspot for global health research, these centres of excellence are numerous. They are often in complex institutional arrangements overlapping with one another and with government institutions (laboratories, hospitals, universities, research institutes), and in some cases there are multiple centres – each involving transnational collaborations with different partners – housed within single institutions. Makerere University’s College of Health Sciences, for instance, plays host to the Rakai Health Sciences Program (RHSP), the Makerere University-Johns Hopkins University Research Collaboration (MU-JHU), the Uganda-Case Western Reserve University Research Collaboration (Uganda-CWRU), the Centre of Excellence for Maternal Newborn and Child Health (MCMNH), the particularly well-reputed Infectious Diseases Institute (IDI), and others. Broadly speaking though, Uganda’s centres of excellence for health research can be divided into four clusters: those associated with Makerere University in the capital Kampala, from which the RHSP conducts particularly notable and substantial research in various southwestern districts; those in the Mbarara University of Science and Technology (MUST, of which MUSCo, one of the institutes in which I conducted my ethnography, is a central part); and those affiliated with the Ugandan Virus Research Institute (UVRI) in the city of Entebbe (the most significant of which, the MRC/UVRI collaboration also does extensive work in the southwestern district of Masaka). Other important research sites exist too, but these are the most longstanding and historically productive. These centres of excellence collectively constitute a vital source of knowledge production for global health, with millions of dollars of grant funding flowing into the collaborations every year, and hundreds of high-quality publications flowing out.

Why then are so many of these institutes located in the Central Region, plus Mbarara? This question has a complex answer. Part of it relates to their history and politics, which I review in what follows.

As chapter one discusses in more detail, from the late-1960s to 1986, there was little biomedical-scientific research taking place in Uganda,[23] but with the start of the more open, internationally-facing Museveni government in 1986 and the confirmation the year prior that AIDS was present in the country (Serwadda *et al.*, 1985) – and even prevalent in some regions – transnational health research began again in earnest. This started with the arrival of three important transnational scientific research collaborations – the RHSP,[24] MRC/UVRI[25], and Uganda-CWRU[26] (founded in 1987, 1988, and 1988 respectively). The first two of these institutions quickly began cohort surveillance studies, which proved vital to Uganda's HIV control efforts, and all of them were drawn to Uganda's Central Region and to the rural districts along the northwestern and western shores of Lake Victoria. This was due to the much higher number of cases of AIDS in this part of Uganda at the time and the widespread belief that HIV was first brought into the country across the southern border from Tanzania, becoming highly

---

[23] What little research was taking place was – in fact – highly important and influential, such as that of David Serwadda and Nelson Sewankambo (1985), who showed that a disease known locally as "*slim*", or "*silimu*", was associated with HIV seropositivity and likely to be AIDS. Published in The Lancet – then an unusual occurrence for a paper with two African lead authors - this finding attracted significant global attention at a time when little data on the prevalence of HIV/AIDS was available in Africa.

[24] Then called the 'Rakai Project'.

[25] Then called the MRC/UVRI/ODA institute.

[26] In 1996, some of the US researchers in Uganda-CWRU moved to Johns Hopkins University and continued their work under a different collaboration name: MU-JHU.

prevalent in the mobile lakeside populations in the areas connecting Uganda's southern neighbour to its capital (Kinsman, 2008; Thornton, 2008; Kuhanen, 2010a, 2010b, 2010c). These locations were all also relatively accessible to foreign research projects due to the location of Uganda's only international airport in the lakeside town of Entebbe, just a few miles outside Kampala. When they arrived, the RHSP, MRC/UVRI, and Uganda-CWRU were faced with the task of conducting the basic epidemiological research necessary to understand the prevalence, incidence, and patterns of transmission of HIV/AIDS in Uganda. As Randall Packard and Paul Epstein (1991) have noted, early epidemiological work on HIV/AIDS in Africa was necessarily descriptive, with so little known about the disease and its spread at the time. As the epidemic wore on in the 1990s, the data collection continued, with the two longitudinal cohort studies of the RHSP and MRC/UVRI in particular proving critical sources of data for policymakers and health officials operating in a context in which there were few such sources of information with which to guide prevention and control efforts.

Over the course of the 1990s, the work conducted by these research collaborations – and the positive reputation it attracted – was consolidated by strong support for scientific research in Uganda from the Museveni administration, INGOs (notably the WHO, World Bank, and UNAIDS), and foreign government agencies (particularly those in the US). Throughout this period, the bulk of the research taking place in Uganda consisted of epidemic monitoring, descriptive epidemiology, and efficacy assessments of HIV prevention programmes so as to advance understandings of HIV transmission, prevention, and clinical presentation at a time in which there were no treatments options available[27]. By the turn of the century, Uganda had become a regional hotspot for HIV/AIDS research, with scientists attracted both by the opportunities for scientific research, given the scale of Uganda's epidemic, and by the favourable

---

[27] Anti-retroviral treatment became widely available in the Global North from 1996 onwards, but it wasn't until the early/mid-2000s that such treatment for AIDS became available in Uganda.

political environment, strengthened by President Museveni's fervent and deliberate efforts to encourage foreign researchers and institutions to conduct research and support public health in Uganda. This was particularly important at a time when other African leaders were facing criticism for their handling of their countries' AIDS epidemics, and when the World Bank in particular was emerging as a key player in international public health, and seeking governments with which it could work. Later, within the first few years of the 2000s, more transnational research collaborations were founded in Uganda, notably IDI at Makerere (2002) and MUSCo in Mbarara (2003/4), following high spending commitments from institutions such as PEPFAR, the Global Fund, and the BMGF, and the rollout of ART across much of sub-Saharan Africa (Crane, 2010b, 2011a, 2013)[28]. More still were founded in the 2010s as funding for global health continued to grow, and over these two decades, the health issues addressed by these research institutes also broadened, from a narrow focus on HIV/AIDS and later TB and malaria, to various other subjects including anti-microbial resistance, maternal and child health, non-communicable diseases (NCDs), neglected topical diseases (NTDs) and so on, although the former three diseases still command the great majority of global health research funding (NIH, 2023).

This history sheds light on why these research centres set up where they did. The initial draw to the country, besides the favourable political environment, was the HIV/AIDS epidemic and the scientific opportunities it offered. The research institutes thus established themselves in locations where they could study the epidemic best: the capital city of Kampala, its surroundings, and the rural, lakeside districts in each of which the disease was particularly prevalent. These institutes then developed into centres of excellence due to several reasons. Firstly, because of the quality, volume, and importance of the research that they conducted, with each of these features enabled by the increasing funding available internationally for their work. Secondly, because of

---

[28] These research collaborations in Uganda were mirrored in the mushrooming of departments for global health in universities in the Global North, particularly but not exclusively, in the US (Crane, 2011a)

consistent (and growing) flows of funding for their work. Thirdly, because of the specialisations they cultivated in studying HIV/AIDS, both in terms of their human and technological resources. Human, in that the centres have: maintained well-trained, experienced staff that have facilitated the implementation of projects; built relationships with people in the populations of study to enable the recruitment of study participants; and retained and trained many high-quality scientists (both Ugandan and otherwise) with expertise in different aspects of the control of the disease. Technological, in that the centres have built laboratories, roads, offices, and clinics and purchased trucks, fridges, laboratory equipment, and so on to implement high-quality scientific research on HIV/AIDS effectively and efficiently. These resources, while initially oriented towards HIV/AIDS, were then able to be reoriented (to varying extents) towards other diseases amidst the increases in global health funding in the 2000s and 2010s, and to different kinds of scientific research as the demands of donors – and the capabilities of the research collaborations – developed from being descriptive to being more intervention-base, a process discussed further in chapter one.

Overall then, the development of these centres of excellence in response to the HIV/AIDS epidemic in the 1980s and 1990s is a central reason for the geographic inequalities evident today and the knowledge that they produce is thus path dependent: the more research that was conducted by these institutes, the more human and technological infrastructure that was in place to conduct further research, making future projects easier and cheaper to set up and run in these locations. As global health science funding increased in the 2000s, many new projects and institutes arrived in Uganda and made use of the technological and human infrastructures that had been developed already – with access to these in the Central Region, why go elsewhere?

Demographic and Clinical Blind Spots and the Rise of Experimental Global Health Science

As I showed in chapter one of this thesis, the proliferation of global health research over the 2000s and 2010s, as well as the expansion and broadening of scope of global health practice more generally, also took place alongside a shift in the form of scientific research that was sought after by funding bodies. Where earlier research in Uganda on HIV/AIDS had been largely descriptive, the arrival of widely available ARVs on the continent with the advent of PEPFAR marked the beginning of a shift towards more intervention- and experiment-based forms of knowledge production, in evidence today in the ever-greater deployment of RCTs across Africa. This rise of experimental global health science was an important aspect of the wider "pharmaceuticalisation" of global health described by Joao Biehl (2007), in which efforts to address major health issues in the Global South sought 'magic bullet' solutions in the form of pharmaceutical products, technologies, or intervention packages. Today, to return to the words of Professor Margaret Oppenheim in the first chapter of this thesis, "funders have really moved away from 'watching things' to 'doing something about them'". What this has meant for scientific knowledge production in global health is significant, as I illustrate here through several examples of how the rise of experimental global health science has resulted in the production of some kinds of knowledge and not others. The examples are: (i) the decline in longitudinal cohort studies; (ii) the exclusion of particular groups from clinical trials; and (iii) the relative shortage of clinical and health systems research, and relatedly, research on older medical interventions. For each I discuss some of the blind spots that these changes have engendered in global health science.

The Decline in Longitudinal Cohort Studies

Let us turn to the first of these: the shift away from population-based longitudinal cohort studies, once the bread and butter of health research in Uganda. These kinds of studies track the health of a group of specific people through time. As the Wellcome Trust[29], one of the largest funders of longitudinal population studies today, explains; these studies are "a powerful way of exploring the many influences that shape people's lives – from their genes and the way they choose to live, to their local environment and the services they access – and how these come together to affect their health. They are valuable resources for researchers, who can use the findings to understand what drives health and health inequalities in different groups of people, and build on this knowledge to make scientific breakthroughs that improve health." Cohort studies were set up by two of the first three research collaborations to be established in the country in the late-1980s – MRC/UVRI and RHSP – and provided much of the early scientific research that informed HIV/AIDS policymaking in Uganda and beyond. A small number of funders continue to fund cohort studies because their descriptiveness and breadth is an asset to public health policymakers, who can better understand the health needs of many people in a particular place. They can also be launch-pads for other research, including interventions. Despite these benefits however, their popularity amongst most funders has substantially waned, partly due to the growth of global health science, which has put a premium on short-term, disease-specific research that produces knowledge about which drugs and interventions work. Population-based longitudinal cohort studies are necessarily long-term investments, and while they are relatively cheap to maintain, they are expensive and time-consuming to set-up, meaning funders divert their resources towards other initiatives that will produce solutions to problems quickly.

---

[29] https://wellcome.org/grant-funding/funded-people-and-projects/longitudinal-population-studies

Moreover, while cohort studies can enable them, they themselves do not guarantee ground-breaking scientific findings. In being primarily descriptive in their function, rather than experimental, they are difficult to continuously fund over time in a funding landscape that has in the past twenty years tended towards experiment-based research, grants for which will not cover the additional costs associated with maintaining the cohorts in question if these activities fall outside of the specific remit of the proposed intervention. In this way, the methodological preferences of experimental forms of knowledge production in global health science have led to a relative decrease in the prevalence of these cohort studies.

Another reason for their decline lies in the changes to the funding landscape that the experimental turn in global health has wrought. Many population-based longitudinal cohort studies have relied on core funding since their inceptions – a vanishing scarcity in global health. Core funding refers to funding that is granted to an institution for 'core', organisational, flexible purposes that is not tied to a specific, grant-funded project. In CVHS, where maintaining their longstanding population cohort of some 22,000 people in a rural sub-county of Kalungu district relies on the institute's core funding, senior researchers on the management team of the institute squabble frequently about whether the study should continue, or whether the money it commands should be redirected to other initiatives. As I was told in an interview with one of the researchers involved in these disputes, such discussions are a "constant battle" for those who believe that maintaining cohort studies is a vital means of ensuring that the other research carried out by the institute is addressing the "right issues", and of collecting data on the health of people throughout their lifespans, which is particularly important for health issues for which it is less easy to get funding. Debates over the use of this resource are unsurprising; core funding is increasingly uncommon in global health today and is difficult to maintain. The current structure of global health science funding, in which experimental research is prioritised, means that it is generally short-term, solution-oriented, and comes with expectations on grantees to demonstrate their exact uses of the funding in line with their proposals. Core funding has become much less popular in part because it does not come with guarantees about output and is more descriptive. As longitudinal cohort studies have relied on core funding to maintain their operations, the declines in such funding mean that these studies are squeezed.

What does this mean for what gets known in global health science? The advantages of population-based longitudinal cohort studies are numerous. They offer insights into how people's health – and their use of services or 'health-seeking behaviour', as it is often termed in global health – changes over the course of their lifespans, with data collected continuously along the way. Such data cannot be collected and tracked as easily – if at all – in non-longitudinal forms of research. Furthermore, researchers are able to see much more diverse health issues than solely those for which funding is won for research projects. Professor Margaret Oppenheim, for instance, told me that CVHS' longitudinal population cohort study – conducted as it is in the economically-poor, rural district of Kalungu – has enabled researchers to better understand cancer amongst Uganda's elderly, who often die without palliative care, diagnosis, or treatment in the backrooms of their children's homes, because neither they nor their children can afford the necessary medical bills. The decline and shortage of longitudinal cohort studies means that much less is known about the health of entire populations in given localities, and all the benefits that the breadth of a population-based study offers. Much less too is known about how disease and 'health-seeking behaviours' change over time, other than that which can be reconstructed by comparing similar studies on different people in the same place, a practice which is not as accurate: longitudinal research is useful in this regard. The absence of a cohort platform on which to build other studies also curtails what other kinds of research are viable and fundable, given the relative expense of setting them up and the fact that funders will not continue to fund the maintenance of the cohort once the grant expires, meaning researchers have to precariously chain grants together in order to sustain them, which is challenging.

The Exclusion of Particular Groups from Clinical Trials

Another element of the rise of experimental global health science is the exclusion of particular groups from clinical trials. Over the course of the 2000s and 2010s, clinical trials in the Global South became ever more commonplace in global health, and this has been the subject of some examination in critical global health scholarship (Petryna, 2005, 2009; Biehl and Petryna, 2013b; Geissler, 2015; Kelly, 2018; Kelly and McGoey, 2018). The prevalence of such trials is mirrored by similar developments in research outside of clinical settings, with other kinds of trials and intervention studies taking place with greater frequency across all areas of international development (Donovan, 2018; Webber and Prouse, 2018; Bédécarrats, Guérin and Roubaud, 2020). Clinical trials differ from other forms of research in that they consist of the evaluation of the efficacy of biomedical interventions, such as pharmaceutical products, treatment approaches, or devices, on patients. They adhere to a rigorously applied set of methodological and safety requirements that often include randomisation and the existence of both 'control' and ‘experiment' groups of patients, the latter of which receives the intervention in question. For global health ‘centres of excellence', hosting major clinical trials is the gold standard, and immense pride is taken in the hosting of such studies, as doing so enables the production of potentially game-changing scientific knowledge. They are also expensive and complex to run, meaning that if funding is won to complete one, then the research institute hosting it will experience a host of benefits, from increasing and retaining staff, to improving administrative capacity, and so on. Today, an additional benefit of hosting clinical trials is that they enable the possibility of upskilling and ‘capacity building' the host institution, as was the case in PrEPCoVax for instance, where many of the more junior researchers and administrators were doing their jobs for the first time. Though to a lesser extent now than in the 2000s, clinical trials in global health also enable clinicians involved access to technologies, devices, and products to help treat their patients to which they otherwise would have no or limited access.

Clinical trials now make up a large proportion of global health spending. Though there is no data available on exactly how much and what proportion, as I discussed in greater detail in chapter two, Policy Cures Research collate annual data on Research and Development (R&D) spending in global health, and estimate that pre-pandemic, in 2019 such spending totalled US$6bn, before almost doubling the following year. R&D spending includes basic, pre-clinical, and clinical research[30], and so its figures do not give an exact indication of clinical trial expenditure, but the scale of the sum gives an indication of the centrality of such trials in global health. The dramatic increase in clinical trials funding during the COVID-19 pandemic strengthens this claim, and illustrates that such studies have become dominant forms of knowledge-making in global health, along with other RCTs.

While such studies ask and answer vital questions, their dominance in the funding landscape carries with it unintended, but important, consequences for knowledge. One such consequence is the exclusion criteria for these trials. As Professor Emily Wright, a British pharmacologist with more than two decades of experience working in global health told me: "If you look at the exclusion criteria of most trials, it will be: pregnant or breastfeeding, age under eighteen, age over sixty-five, BMI less than eighteen or over forty, renal failure, psychiatric disorders, on any current medication, and various others." These exclusions take place because of concerns around safety, consent, the fact that clinical interventions have often been designed for non-pregnant adults, and the diverse presentations of health issues amongst under-18s and the difficulties in comparing a 17-year-old with a 4-year-old, for instance, among other concerns.

---

[30] 'Pre-clinical research' refers to an array of different kinds of research, all of which involve the development of an intervention for clinical trials. This might include experiments on animals, or under microscopes in petri dishes, but could also include working out how much of a drug to give in the experiment, or how to deliver it, be that in the form of a tablet, injections, or something else.

In the context of the Global South, these exclusions become more pronounced and are compounded by the lack of capacity and knowledge to run safe, paediatric clinical trials, as well as complex regulatory environments. But as a practising physician, both in the UK and in Uganda, Wright explained that the systematic exclusion of these groups presents a problem, as "that's most of our patients that we actually treat." She gave the example of pregnant and breastfeeding women:

> Many people don't want to do research on pregnant and breastfeeding women because they don't want to cause harm, and that's right, you don't want to cause harm, but the argument is that if the drug is gonna be used in a population where there's high fertility rates, low access to contraception, and women of childbearing age are gonna be taking the drug, then pregnancies will occur and if you don't do a trial then basically you're just shifting the risk, you're moving the risk from a place you can monitor it carefully like in a clinical trial and youre shifting it over into the clinical domain because you can kind of pretend it's not happening because it's not your responsibility… [And this is ultimately about] perceptions of risk, because when people think about risk, they always think the comparator is zero, so what they don't realise is if you don't do a study, you may actually be exposing a population to far greater risk than if you do a study.

In a context in which so much global health knowledge is produced through clinical trials, the exclusion of particular demographics creates a blind spot with potentially serious implications for those concerned. The short-term grant-funded model of global health science imposes methodological constraints – the necessity of exclusion criteria to preserve particular understandings of comparability and safety within a narrow temporal frame – which then go on to have unknown implications for public health. This blind spot is thus indicative of the ways in which the pursuit of 'global' health knowledge diverges from the needs of 'public' health.

The Relative Shortage of Clinical and Health Systems Research

A third aspect engendered by the growth of experimental global health science that I will discuss is the shortage of research on older, existing medical interventions, clinical research, and health systems research, and instead a focus on the testing of new medical interventions. As I noted in the previous section, the experimental turn in and pharmaceuticalisation of global health has led to a dramatic upsurge in funding for R&D in the field. The vast majority of this research is involved with the generation of new technologies. While the development of new technologies is important and can lead to major scientific breakthroughs with great clinical implications, it is also true that in most healthcare contexts in Africa, these new technologies are often much more expensive and administratively complex for clinicians to use regularly. For instance, generic drugs that have been in circulation for some time are more readily available and affordable and have more stable supply chains than brand new ones. Thus global health's emphasis on the production of new biomedical interventions has been the subject of critique, given that existing interventions, if implemented in the right ways, might be effective in some cases (e.g. Cueto, 2013). However, health systems and clinical research on the usage and organisation of older, existing clinical interventions and drugs is often neglected.

Such issues were pronounced amongst Ugandan clinicians during my fieldwork, many of whom felt deeply frustrated that so-called 'global' health was not equipping them appropriately to conduct their work in their own medical settings, but rather producing knowledge about things that didn't help them do their jobs better, with excessive research on HIV, due to the ease of winning funding for it, the commonest complaint. Such a point was made clearly to me for instance by Dr Edwin Mukisa, mentioned in the Preface of this thesis: an experienced anaesthetist at Mbarara Hospital. Mukisa expressed his deep frustration with global health research for not addressing the clinically relevant problems he encounters daily in his ward rounds:

> We can ask a thousand and one questions within our clinical practice!... I would like to say every patient does get, for example, proper laboratories before they get to the operation rooms, but in our circumstances, a thousand and one patients will go there without proper labs. Ok let's get somebody and say we are going to follow this and see what was the end result, what havoc did we do in the process?... We don't know!

Dr Mukisa's complaints were far from uncommon. African clinicians have long been frustrated by the lack of sufficient funding for public hospitals and inequalities in access to treatments (e.g. Prince and Marsland, 2014), but the need for clinical and health systems research remains relatively unmet, accounting for very small proportion of global health spending. Dr Mukisa continued:

> Everybody talks about research [this], research [that], but the truth is we are forgetting the fundamentals. So, if we could look at are we wrong [to follow international clinical guidelines for treatment], or actually for some of these things we are the ones who are wrong [in not following them] because there are so many mistakes that people make. Any they can't tell. I had a Canadian [researcher who visited], and she was shocked [at what we do] – she asked me: 'What are you doing?' And I'm like I'm going to give a spinal and we are going to give a cholecystectomy.[31] And she asked me and said 'What?! You mean you do cholecystectomies under spinal?' and I said, 'Yes we do.' 'Why?' Then I brought out a bottle of inhalation anaesthetics [which are normally used for cholecystectomies in the Global North] and I told her, 'This is all I have. I have to spare it for the kids, I have to spare it for everybody else who'll come needing it, but this guy if I do it, he will probably handle it and he can easily go.' So, we

---

[31] A cholecystectomy is a surgical procedure to remove the gallbladder. In high-income settings, the operation is usually performed with inhalational, general anaesthetics, but these products are more expensive than spinals and require closer monitoring by highly trained medical staff, making the labour costs more expensive too.

> went in with her and actually she saw us doing it and she was amused, and she was like, 'But you also have a reason why you are doing it,' and I'm like, 'yes!' And that is something like for her she learnt what happens to you when you are in this kind of resource setting where you cannot afford to get each and every thing you need. So, who has even bothered even to do a research on that? Who has ever bothered to do research on that? To find out whether it really makes sense?

What Dr Mukisa raises here resonates with the experiences of other clinicians across the continent, whose limited access to medical treatments means that they face no choice but to improvise, making the most of the resources that they do have (e.g. Livingston, 2012; see also Muyinda and Mugisha, 2015 for evidence of such practices in Uganda). Such improvisations are as masterful and necessary as they are risky however, with potentially damaging consequences for patients, as Dr Mukisa acknowledges in his call for research on the topic. Yet the research conducted in global health today is far more preoccupied with running experiments testing the efficacy of new technologies than in producing knowledge that is relevant to the heavily financially constrained medical decision-making that takes place daily in African hospitals.

Other examples abound. The director of Mbarara Hospital's HIV clinic for instance, Dr Linda Ngabirano, described to me a case in which a new antiretroviral drug that had been approved for use by the WHO and which had been distributed en masse to various African countries, proved to be hepatotoxic when combined with a common TB drug. Resultantly, Dr Ngabirano lost a patient, but the WHO took six months to change treatment guidelines with consequences for people living with and undergoing treatment for HIV and TB. Thus while the new ARV had been tested rigorously and at great expense, sufficient checks had not been carried out on its interaction with another drug treating a disease that is at its most prevalent in people living with HIV. But these programmatic aspects of the testing of the medical intervention did not form part of the clinical trials used to declare the drug safe. This resonates with what Dr Emily Wright told me about the shifting of risk – in the case of including pregnant and breastfeeding women in clinical trials – from within a controlled trial space to one in the realm of healthcare delivery. Such is often the nature of knowledge-making in global health, in which the time- and space-bound experiments take place outside of the realm of public health practice and programming. Clinical and health-systems research is thus another important blind spot that has been precipitated by the rise of experimental global health science.

How Global Health Science Remains Blind to its Blind Spots

The blind spots that I have discussed so far are troubling and important. In Uganda, global health science knows little about people outside of the Central and Southwestern regions of the country, little about changes in cohorts over time, little about the children, adolescents, and pregnant and breastfeeding women who are excluded from clinical trials, little about clinical issues facing medical staff, and little about the daily reality of the functioning of Uganda's health system and its implications for patients. Collectively, these blind spots are substantial. To remind the reader, none of these blind spots are total, nor are all global health actors equally blind to them, but the relative focus of knowledge production on the issues I have discussed so far is much less than on the primary foci of global health, leading to frustrations amongst clinicians and researchers.

In this section I advance some observations on why this happens today – why these blind spots persist, even when some people are aware that they do, and why other issues receive relatively so much more attention. My explanations revolve around the relationship between getting funding to conduct research and the identification of priorities for funding to target. These explanations are not comprehensive – every blind spot has its own aetiologies and context just as every priority and focus area does. Scholarship in global health has made clear that the macro-politics of funding for global health – the support of the WHO, Global Fund, PEPFAR, UN agencies, government agencies, philanthropic organisations, and so on – are critical in determining what and how much money can be dedicated to addressing global health equity (Packard, 2016). Rare viruses like Ebola can go from neglected to being the recipients of much investigation quickly when they threaten the Global North (e.g. Lakoff, 2015; Benton, 2017), while diseases like COVID, which seemed to cause little excess mortality in most of sub-Saharan Africa, can also be the recipient of significant attention for the same reason. Other factors are also important, such as the need for global health to be seen as a successful enterprise so as to continue to have donors dedicate money to it, even if this means bending the truth or turning a blind eye to some issues (e.g. McGoey, 2012; Parker and Allen, 2014).

But my interest here is not to address these overarching issues, but instead to note something rather more banal, which has nonetheless important implications for global health knowledge. The central argument I make here is that in global health science, knowledge tends to beget knowledge: when there is existing research on an issue and it is better described, it becomes more visible; when it is more visible, it is easier for researchers to win funding to study it further and for funders to defend spending money on it. This in turn makes global health priorities, around which consensus amongst global health actors has been built, 'sticky' and difficult to get away from, for at least two reasons. Firstly, justifying scientific excursions from the mainstream typically requires an equal burden of proof as working in the mainstream does, despite dramatic inequalities in the amounts of data describing one versus the other. Consequently, it is easier to win funding to study something on which there is already good data than it is to win funding to study an issue or a place that is poorly described. Secondly, the histories of capacity building in global health science that have resulted in the production of efficient, local expertise in project implementation have created regional and topical specificity that compounds this 'stickiness' and a resultant path dependency. I address each of these two points in turn in what follows.

The Need for Existing Data

When HIV/AIDS research institutes and projects arrived in Uganda from 1987 onwards, following decades of political instability, they were presented with a catastrophic epidemic about which little was known. In these early days of the return of biomedical research to the country, the job was to collect data and understand the disease better. Over the 1990s though, the Ugandan government began to take on more and more responsibility for collecting descriptive data on HIV/AIDS. Museveni's administration established and strengthened a network of antenatal sentinel surveillance, in which pregnant women coming in for prenatal check-ups would be tested for HIV, collecting data which gave useful indications of the epidemic's progression outside of the research sites of the three research collaborations. This marked a change that happened across much of Africa – over the 2000s and 2010s, government-led disease surveillance became an essential, definitional component of global health (Lakoff, 2010). Meanwhile, over the course of the late-1990s and 2000s, amidst the explosion of 'global health' funding and research, there began to be a shift in the way that funding was disbursed for HIV/AIDS – and indeed for many other diseases and health issues too. Counting the number and rate of infections and the dynamics of progression was important, but governments could increasingly do this for the diseases considered the most important – malaria, TB, and HIV/AIDS – and donors wanted to know what policies and interventions they should support, not just more descriptions. New donors arriving on the scene, as well as then-established ones, also began to invest more money in the development of pharmaceutical solutions to global health issues, largely in vertical and disease-specific ways; dubbed then and since as the "pharmaceuticalisation" of global health (Biehl, 2007). This transition towards intervention and pharmaceutical development was generally well-received by many of those working for these research institutes, who wanted to try and use their knowledge about the diseases they researched to contribute to efforts towards remedying and controlling them.

As these changes took root over the 2000s and into the 2010s, and more and more researchers began to conduct work in global health, the process of applying for and receiving grant funding to conduct research became more competitive, while donors wanted more evidence on which interventions to support to address global health priorities. Where previously transnational, biomedical, scientific research was largely descriptive in Uganda, tracking epidemics and trying to provide basic answers for policymakers about what might be working, the turn towards experiment and intervention in what has become known as global health science substantively changed the nature of such research. A crucial aspect of this trend – particularly as the competitiveness of funding awards increased – has been the need for pre-existing data to justify the need for an intervention and to describe the population or sub-population in which the intervention will take place. For example, if a study is to assess the efficacy of a novel intervention encouraging the uptake of condoms on the number of new cases of HIV in a given population, the grant proposal would need to include a quantitative description of the population, information on the HIV prevalence rates and estimates of incidence and relative 'risk' amongst the population, as well as a summary of previous work on this issue both within the specific context and elsewhere.

As a consequence of this major structural shift in donor funding over the past twenty-five years, pre-existing data for global health science research has become extremely important. Today, in order to win funding to conduct global health research, one typically needs some form of existing data on a given theme in a given population to demonstrate that research is needed, and against which to measure the effectiveness of an intervention or experiment. This data is generally – but not universally – quantitative, and typically comes from previous studies, or from government health data, or both. Grant proposals use such data on particular populations, illnesses, transmission dynamics, co-morbidities, and so on as a way to illustrate the importance and relevance of the research question and thereby gain funding.[32] Indeed, in a paper entitled "How to write a grant proposal", published by a group of Canadian-, French-, and US American-based clinician-researchers, the authors highlight the vital importance that pre-existing data can have in winning grant funding. As they note: "Describe the magnitude of the problem to be addressed. What is the patient population you are targeting? What is the incidence of the problem?... justify the study you are proposing. Describe how the result of your study will benefit society. You need to convince the granting agencies that it is worth their money" (Zlowodzki *et al.*, 2007, p. 24).

Pre-existing data then, is an important component of global health science, but here I should add a brief caveat that it is not always completely essential. Exceptions from the need to cite pre-existing data on the population and location in which the proposed study will take place include, for example, during epidemic emergencies, such as Ebola, for which funding is disbursed much more rapidly. In such cases though, the nature of the research itself is much more descriptive than it is experimental, as health officials try to work out the scale of the problem and the primary means of transmission, as well as obtaining quick glances at how the population are responding to particular disease control efforts. Similarly, when there is a scientific breakthrough of some kind or other, researchers may scramble to gather data on something they had not looked at before in light of some new finding,[33] though this tends to still take place in the same locations as previous studies and amongst similar populations. This is not to say that it is impossible to win funding to conduct research on something or somewhere that has not been studied before and/or

---

[32] This is particularly important for proposals for clinical trials research, in which there has been a boom in the Global South over the course of this century amidst a cost-effectiveness-inspired shift of clinical trials from North to South has taken place (Drain *et al.*, 2018; Aguilera, Degrazia and Rid, 2020).

[33] For example, in cases on an emerging infectious disease outbreak for which a vaccine has recently been developed, descriptive work on the attitudes of the population on question towards vaccines might be conducted where such work had not been conducted before.

on which there is little good clinical data collected by health workers in clinics and hospitals. However, such cases are extremely rare, with negligible funding available. Such funding is also generally not offered by the biggest funders, like the NIH. When I asked a senior NIH official what he suggested that researchers do if they want to research something that has not been research much previously and for which there is not good quantitative data to justify the need for a research project, he shrugged and told me that obtaining this kind of funding was "just very difficult" and the shortage of it was "a problem". Exceptions to the need for pre-existing data in order to win short-term grant funding to conduct global health science research are, then, limited.

Instead, the practices described by Zlowodski and colleagues are central to conducting good scientific research in global health and are cost-effective and time-efficient ways of producing new knowledge: conducting research on a population or health issue about which little data has been collected requires the collection of initial, descriptive data to detail the population or issue in question, and this is generally expensive and time-consuming. With donors keen to figure out 'what works' in addressing global health priorities, projects which can conduct work quickly and cost-effectively are rewarded. For instance, in the PrEPCoVax trial,[34] previous grants from other research projects enabled the researchers to develop datasets about the populations in which the trial is taking place and enabled them to build cohorts on which to later test the pharmaceutical products of the trial. This made the trial's funding application more competitive as it obviated the need for the expensive, time-consuming work of building data on a population to take place as part of the trial funding.

A further point to be made here is that the rising importance of control trials and other studies testing interventions in the Global South over the course of this century has further

---

[34] One of those in which I conducted my ethnography.

heightened the need for pre-existing data to win funding for scientific research in global health. Baseline data are a methodological imperative of this form of knowledge production, and winning funding to conduct a trial on a population which is poorly known in statistical and scientific terms will inevitably elevate the cost of collecting baseline data – and indeed the complexity of running the experiment itself, as I will come to next. As one US American scientist told me, "What was nice about proposing this research in Kampala is that there was already a lot of literature published… and I think that background information is super important especially when you're looking at intervention studies". This means that there is a strong systemic incentive in global health science to run trials especially in locations in which research has previously taken place – though this point remains broadly true for most studies whether control trials or otherwise – in addition *to* a methodological one. This means that every time a study is run in a particular place, more is known about the population that lives there, which makes it easier and more convenient to apply for funding to conduct a new study asking a different question, or testing a different intervention.

Such an incentive structure elevates the importance of centres of excellence. As I explain next, these centres have become specialised in conducting research in particular locations, amongst particular populations and on particular issues, thus facilitating transnational research on those topics. The result of this specialisation is that they offer highly efficient means of conducting scientific research. The gravitational pull of centres of excellence as important nodes in the network of global health science knowledge production is thus very strong, with ensuing implications for what gets known and what does not.

The Efficiency of Research Infrastructure

Another important aspect of why the abovementioned blind spots persist in global health is the efficiency savings that research infrastructures and centres of excellence offer researchers. Simply put, having an established institute with trained, experienced research assistants and data managers, equipped laboratories, computers, internal ethical review boards, established supply chains for importing pharmaceutical products and laboratory reagents, accounting teams, administrators, office space, and longstanding connections and goodwill between those that work in the institutes and those recruited into studies, as well as other factors, dramatically reduce the start-up costs for research projects – both in terms of money and time. In Uganda, the development of this human, physical, and scientific research infrastructure has taken place over decades as a part of what global health researchers and practitioners call 'capacity building'. While, as I noted in chapter one, the histories of scientific research institutes and biomedical practice in Uganda are rich and long, 'capacity building' in its current form within research collaborations became predominant in the years after Museveni's arrival as President in 1986 and sped up dramatically with the growing funding for global health work from the 2000s onwards.

Today, 'capacity building' remains an issue about which much is said in global health science – every conference has sessions that aim to 'upskill' African colleagues, teaching them how to write journal articles, master grant applications, develop their understandings of research methods, seek out mentorship, and so on. Such efforts have, in Uganda's case, been remarkably successful in producing scientific researchers of high repute with advanced degrees from top universities globally and first-author publications in the most elite public health and medical journals. Consequently, the centres of excellence described earlier in this chapter are blossoming, producing cutting-edge scientific work and consistently winning major research grants that keep these sites of scientific production alive.

Such sites are, however, not immune from history, politics, economics, and geography. As I noted earlier, almost all the main research institutes in Uganda are based in and around

Kampala, around the western shores of Lake Victoria, and in Mbarara, with little elsewhere. These institutes are very well set up to work with new and existing international partners to conduct more research, and they do so in the localities into which their research infrastructure extends: where they have connections with 'community leaders' and local politicians and dignitaries; where they have research assistants who speak the local language (especially important in a country with more than forty indigenous languages from four completely different language groups); where they know that there is the necessary physical infrastructure to ferry fieldworkers, samples, and sometimes research subjects in and out with ease.

With this infrastructure in place, there are enormous temporal and financial savings to be made from working with these existing centres of excellence, and reputational and scientific benefits to be gained from working with established experts. Yet where such expertise is targeted at particular places and health issues, this leads to research that 'sticks' to what has come before it. To diverge from these places and issues requires not only locally-specific knowledge, of which Northern scientists are rarely in possession, but also significant effort and financial investment, as building research infrastructure where there is none is difficult, whether in terms of topical or locational specificity.

Conclusion

This chapter has examined the politics of knowledge production in global health from a wide angle by looking at how the structural incentives of global health funding shape knowledge production. It has looked at what research actually ends up getting done and what does not, using this as an entryway into understanding where the spotlight of global health knowledge production shines and where it does not – and why. In discussing the emergence of so-called 'centres of excellence' in the country during the worst of the HIV/AIDS epidemic, I have pointed out the dramatic regional inequalities in health data production that the geographic distributions of these centres have since precipitated. Bringing the history of these centres to the present, I discussed the manifold reasons why global health scientists continue to do research in the same places and on the same people. Amidst a wider trend away from descriptive research on health issues and towards intervention- and experiment-based forms of knowledge making, I have argued that global health research is made much easier to propose and fund when there is good, pre-existing, descriptive, and typically quantitative data from which to illustrate the need for research or to test a given intervention. Consequently, there is a strong incentive to do research on people, places, and problems to which attention has already been paid, while deviating from these established areas is difficult. The efficiency savings provided by existing research infrastructure compounds these issues – without a systemic incentive to produce nationally representative data and knowledge, global health science pursues new knowledge, in line with existing priorities, on similar issues and in similar places to where it has before, thus creating path dependency.

All this is compounded by the disease-specificity and verticality of global health that is part and parcel of its pharmaceuticalisation, as scientific knowledge is made about the things that funders identify as important, which means that they know more about them, which means they are better able to identify further problems. They are able to defend spending on these issues because they are better described, and it is also difficult to justify spending money on a health issue that doesn't have an existing consensus of action around it – as HIV/AIDS does – because the lack of data makes it hard to build this consensus in the first place. Thus, when global health policymakers are left with the task of allocating resources to the biggest problems, they do so based on the available data, and thus to the issues that have already been agreed on as important and consistently shown to be so in the data they have commissioned, rather than on health issues that are lesser known and worse described. I have conceptualised these dynamics as being 'sticky':

originating not from technical calculation of outcome optimisation, but rather from cultural and epistemic logics, social norms, and political-economic contexts.

Overall, this highlights the dissonance between the incentives of global health and the needs of public health policymakers, medical practitioners, and (often but not always Ugandan) scientists committed to working on critical issues to Ugandan people, a point I take up later in this thesis.

Chapter Five

Africanising Global Health Science: Co-Optation and the Drive for Scientific Sovereignty

> Marilyn Strathern, writing in this volume about communication between practitioners and subjects, asks us to 'Suppose that there were people who did not invest in epistemology in the same way that permeates Euro-American science'. When we are talking about physicians, however, what is both fascinating and crucial is the degree to which physicians in Africa, who invest in epistemology in exactly the same way as their European or American counterparts, come to a radically different yet extremely fruitful understanding of the knowledge that is needed to improve healthcare. They are embedded in the world of sick people in a very different way from their international counterparts. They must gain bodies of knowledge that their counterparts cannot fully imagine from a distance. They have their own very different embodied, and moral and scientific understanding of their work. And they do this under conditions of normal emergency. (Feierman, 2011, p. 193).

Introduction

In 1990, the Beninois philosopher Paulin J. Hountondji published a paper entitled *Scientific Dependence in Africa Today*. In it, he argues that science in Africa is just as fundamentally "'extroverted' [sic], as externally oriented, as its economic activity" (1990, p. 7). For Hountondji, as he has expressed across various publications throughout his lengthy career, Africa's dependence on the 'Global North' for scientific expertise and technology is one of the lingering hallmarks of colonialism, and indicative of the subjugation of Africa to global capitalism.

Some 30 years later, Uganda's President Yoweri K. Museveni has echoed Hountondji's contentions, albeit in rather a different intellectual context, arguing that scientific knowledge production is a building-block of liberation from neocolonialism. Speaking at the launch of clinical trials for a Ugandan-made COVID-19 drug, shortly after having announced the progress made by Ugandan scientists in developing a COVID-19 vaccine, Museveni proclaimed: "We shall not accept dependency. [We] must build an independent Uganda. We are working on the vaccine and treatment by ourselves… [This is] a liberation struggle of a new type: [an] intellectual liberation struggle [to rid ourselves of] slavery and dependency!" (*Global Press Journal*, 2021).

In this chapter, I highlight that Museveni's comments here are in many ways representative of a wider movement among Ugandan scientists to assert a kind of sovereignty over the knowledge produced about Ugandan people and their health. In so doing, I endeavour to answer Hountondji's (1990, pp. 14--15) call to develop "a sociology of [African] science" by illustrating the "conditions of the production of knowledge" in Uganda. Specifically, I look at the ways in which space is carved out in transnational research projects for work framed as more relevant and useful to the country's people, and how these might be understood as a means of "[opposing] the dependency machine… [and making] Africa free and self-reliant in the field of [scientific] knowledge and know-how".

I begin the chapter by discussing the strong sense among my interlocutors that the global health science research being carried out in Uganda is concerned primarily with Northern "interests", and connect this to Hountondji's discussion of the extraversion of scientific activity in Africa. I then unpack the ways in which scientists try to make the most of, or resist, a globalised system of funding and knowledge production that they perceive to be oriented fundamentally towards a Northern public. I do this through describing the creative ways in which scientists – generally but not solely Ugandan – co-opt research projects and leverage relationships with Northern funders and scientists to produce scientific knowledge that is more relevant to domestic, Ugandan issues – or at the very least, to provide biomedical services to underserved Ugandan citizens. Through this I show that co-optation is a vital form of action amongst these scientists, and I theorise this term to illustrate the prominence of it in unequal relations of power. Conceptualising the co-ordinated actions of the scientists described in this chapter as co-optation is fruitful, I argue, in revealing the wider political significance of this practice. Lastly and relatedly, I argue that underpinning this co-optation is a salient notion among these scientists that Uganda should establish what I call 'scientific sovereignty': that data-collection and scientific practice taking place within a country's national boundaries should relate to, as so many of my Ugandan interlocutors put it, their "local issues" – issues of public policy and public health – rather than priorities set and established in the 'Global North'. Thus, I build upon Hountondji's ideas to illustrate how "scientific dependence" is experienced, creatively co-opted, and consequently mitigated, or resisted, by Ugandan scientists. I highlight that these scientists not only have an agenda – albeit one quietly expressed – but moreover that this agenda to establish scientific sovereignty is increasingly successful; reconfiguring the relationships between global health actors, the Ugandan government, science, and society.

"Research is about foreign interests": Perceptions of Extraversion and the Northward Orientation of Global Health Science

> The only way you can attain equity is if our people here [in Uganda] have their own resources to support their own research that they think is important to them. We can chip at equity, by being sympathetic to some of the sensitivities of the local research community, but in principle it still remains almost impossible to say you will use British or American or European taxpayer money to do research in Africa that is responsive to African needs. That's a lie. Because that money belongs to other people who also have their own priorities. You

> cannot force priorities with people with their money to be priorities of another group of people. So, I think that is really a reality-check: that all this push for equity can only happen if people are economically empowered to support their own research. And perhaps that's where the conversation needs to go.
>
> - Dr Francis Bitwire, a senior epidemiologist at MUSCo

Across many conversations, observations, and interviews during my fieldwork, I heard and was told that global health research does not really address Ugandan problems, and that it is rather a product of Northern "interests". Time and again, Ugandan scientists and researchers would say: "I think we're doing the wrong research", or; "Of course the research we do is not about our local problems", or; "Research is about foreign interests", or; "Do you really think that the United States government cares about the health of Ugandan people? Of course not – research is about their interests", and so on. As the above quote from one of my interlocutors, Dr Francis Bitwire, emphasises, there is a profound and widespread sense among Ugandan researchers that scientific research taking place in Uganda generally addresses foreign priorities and "interests" first and foremost, and not those of their own country. Similarly, in an interview with one of Uganda's most prominent and prolific physician-scientists who has held dozens of grants, co-authored more than three-hundred publications, and served a technical advisor for dozens of major global health, I was told: "A lot of these [global health research] projects are addressing quite peripheral issues – even if those projects are in the thousands they will not change anything".

While many such Ugandans affirmed that elements of the projects they were working on dealt in small ways with domestic issues, there was a much more fundamental view: while it was possible to try to make this research useful and relevant to local people, the underlying motivations for funding global health science research were clearly about 'Northern interests'. This position was expressed to me countless times, sometimes with irritation or bitterness, but more often in a tone that seemed to indicate that such an observation was obvious, self-evident, or even axiomatic: of course global health science funding dealt primarily with Northern interests, why else would they give the money? When I questioned what these interests might be specifically, the answer was almost universally “I don’t know”, or “They don’t make sense”.

I should note here that many, though not all, of my Northern interlocutors presented an altogether different picture of global health research and funding. Indeed, as I have shown throughout this thesis, many of them told me with enthusiasm of the enormous advances in equity in research collaborations, and their efforts to “engage with local stakeholders”, “devise priorities collaboratively”, and “support independent African-led research”. At the same time, these individuals also noted that “the funders call the shots”; that government funding bodies like the NIH in the US are ultimately accountable to taxpayers and must illustrate how the work they fund is in the national interest; and that the vast majority of global health science funding comes from institutions that position themselves first and foremost as funders of “good science”, rather than development.

Thus, while some Northern scientists believed that global health science was ultimately about serving those in the Global South and enabling Southern scientists to conduct important scientific work themselves, it is easy to see how this was not a perspective shared by most of my Ugandan interlocutors. This feeling that global health science does not sufficiently address Ugandan issues is compounded by and related to another issue, also commonly expressed among my interlocutors: that they feel a sense of dependence upon Northerners to help them win funding due to inequalities in knowledge on how to win grants. Many Ugandan scientists told me that winning grants independently was difficult, and that their Northern colleagues know far more both about how to write a successful proposal and how to find out about the calls for proposals in the first place. Indeed, I was told regularly that “funders are not going to give Africans money”, and that “America will only give funding if we go with their people”, as “no-one will fund [Ugandan researchers] alone”. While such perspectives are empirically false in absolute terms, as a small but growing number of Ugandan scientists do hold grants independent of Northern collaborators, these quotes highlight the extent to which Ugandan scientists feel that they are alienated from some processes integral to global health science: the interconnected processes of writing successful grant proposals and coming up with a study design or intervention that is scientifically innovative and answers important global health questions. Consequently, many of my Ugandan interlocutors felt that the know-how of winning grants is out of reach for many of them – generally only accessible to those who work with Northerners for extensive periods of time and thereby learn the necessary grant-writing skills. These feelings of alienation cut across the different levels of seniority of Ugandan researchers with whom I spoke: those more junior were frustrated at what they felt were often limited opportunities for career growth and mentorship, which precluded them from having the requisite experience, qualifications, and knowledge to apply and win grants. More senior researchers meanwhile emphasised the need to "play the game" and pitch things in the right way to get funded, though also complained that such strategies were imperfect and often meant doing research that was not as useful or interesting as it could be. However, even those professing to have these skills expressed feelings ranging from bemusement, to confusion, to outrage at some of the grants that win funding, arguing that they "don't make sense", are "stupid", constitute "a waste" of resources, or that they "will not change anything".

These notions – that global health science taking place in Uganda primarily speaks to Northern interests and priorities, and that funding for scientific research is difficult to obtain without Northerners as PIs or without specific and hard-to-obtain expertise in how to win money from Northern funders – resonate with the critique of African "scientific dependence" by Paulin J. Hountondji. Hountondji's assessment of science in Africa, contends that such activity is "extroverted" [sic], or "externally oriented" (1990, p. 7), "directed toward a Western public or readership" (2006, p. 49), and "organized to respond to a demand (theoretical, scientific, economic, etc.) that comes from the 'centre' of the world market" (2006, p. 46). He argues that this external, Western (or Northern) orientation of science represents a kind of scientific dependency and a lingering hallmark of colonialism. Hountondji thus advocates for an end to this dependency through reorienting the focus of scientific knowledge production onto issues important to African people, African states, and African problems, and for African scientists and scholars to engage in discussions with one another, rather than with those outside the continent. In other work critiquing African Studies, Hountondji refers to this as having "horizontal discussions with other African scholars", rather than "vertical [ones] with his/her counterparts from the North" (Hountondji, 2009, p. 128).

But Hountondji does not advocate 'reinventing' science or the scientific method. Indeed, his position on this aspect of knowledge production remains consistent with his other well-known opus of work on ethnophilosophy: the philosophical approach that treats beliefs, worldviews, and the systems of thought underlying social practices as being specific to a cultural or ethnic group (Hountondji, 1976). For Hountondji, African ethnophilosophy is problematic in that it essentialises a kind of 'African thought', implies ahistorical precolonial intellectual histories on the continent, grants primacy to oral philosophical traditions over written ones, and precludes the possibility of critical reflection by individuals by venerating more communitarian practices. Hountondji thus argues that there is a need for African philosophy that addresses African questions and is relevant to African peoples, but that doesn't do away with a philosophical aspiration towards universalism. Bringing a parallel argument to science then, Hountondji argues that 'African science' would not necessarily involve discarding existing scientific knowledge, methods, or indeed epistemologies, but would rather constitute African scientists engaging with one another on issues important to African people and places. They would use the tools that science has to offer, and no doubt develop new ones born out of a more direct engagement with their material circumstances and surroundings. That such engagement and practice is not the norm, Hountondji posits, is indicative of the manifold ways in which production in Africa – of which scientific knowledge is one part – is extraverted; subjugated to unequal power relations and to the extractivism of global capitalism to the benefit of the Global North.

A crucial point here relevant to this chapter is Hountondji's observations regarding the orientation of science. Hountondji is not presenting 'Northern science' as something altogether insulated from Africa. Indeed, he follows Megan Vaughan (1991) and many others discussed in chapter one of this thesis in noting that African scientists have long played a role in co-producing scientific knowledge, and further suggests that, today, "the 'Third World' features structures of scientific and intellectual production where extremely important work is done, the results of which sometimes have a resounding, world-wide impact. It is out of the question to downplay that production or ignore its value" (Hountondji, 2006, p. 45). Instead, Hountondji (2006, pp. 45–46) argues that:

> The problem lies rather in knowing how [such production] functions, by whom and in whose service it is exploited, and what position it holds in the world-wide knowledge economy in general. In other words, are the [structures of scientific and intellectual production in the 'Third World'] truly autonomous? Do they favour the collective uptake by societies in the South of the scientific knowledge available in the world? Or to the contrary are they, today as yesterday, still peripheral back-benchers in the service of knowledge accumulation at the 'centre'?

This critique of scientific knowledge production and dependency in Africa resonates strongly with the insights of my interlocutors, whose exasperation regarding the service of global health science research to Northern priorities, or the orientation of science towards a Northern public, was palpable.

Co-Opting Research: Topics, Locations, Services

Having established the widespread and longstanding perception amongst Ugandan scientists that global health science is oriented towards a Northern public and Northern priorities, and the concordance of such a perception with the analysis of Paulin Hountondji, I now turn to the nature of the resistance against this system of knowledge production. Dr Duncan Oloro, a junior Ugandan clinician and scientist, explained succinctly to me how he and his colleagues try to make the most of this system, as inequitable as they acknowledge it to be, by trying to adhere to the following framework:

> First, there is helping the people in Uganda, then there is helping yourself with where you want to go, and thirdly, there is this other group of people that appear like they want to help you but are actually in it for themselves. [So, the question is:] How do I achieve what I want to achieve, how do they achieve what they want to achieve, and how do our patients achieve what they want to achieve?

This framework is one that was explained to him by more senior Ugandan colleagues once he began to work with some US collaborators. Oloro further explained that the priority among Ugandan researchers like him is always to keep the lucrative partnerships with Northern institutions going, while doing what they can for their own career growth and for the benefit of their patients and compatriots, knowing all the while that the latter two are not the primary focus of the research enterprise. This is what I mean by 'co-optation': the ways in which research projects, funding, and grants are used by researchers to accomplish something other than that with which the application for funding or grant proposal is primarily concerned. In particular, I look at how Ugandan scientists and researchers use research projects and the funding they bring to make global health knowledge production more relevant, as they see it, to 'Ugandan' public health issues, through creative assimilation with funders' interests. This section thus unpacks the agency of researchers caught up in the constrained ecosystem of scientific knowledge production.

There is a plethora of ways in which co-optation takes place. I thus do not argue that co-optation is a novel phenomenon, nor a distinctively 'African' one. Indeed, co-optation is as rife in the field of global health as it is in academia and development practice more broadly. One might also point out, as Hountondji (2006) does, that the expertise of African scientists in getting research done is also co-opted, with their Northern collaborators often entirely dependent upon their knowledge and relationships with ethical review boards, participants, research assistants, and so on for research to be set up and projects to be implemented. In such circumstances, co-optation might be articulated in more Gramscian terms, in which more powerful Northern researchers assimilate and neutralise the ideas of their Southern counterparts in the furthering of their own aims. The focus of this section, however, is on how Ugandan researchers push back against what they see to be the Northward orientation of global health science to produce knowledge about people, places, and conditions that they think are more important to Ugandan public health. A critical way in which this happens, I argue here, is through co-optation and through leveraging relationships with institutions and individuals in the Global North. To this end, I describe three of its salient forms that illustrate how scientists co-opt projects and institutes to make them more responsive to 'Ugandan issues': (1) the co-optation of research location; (2) the co-optation of research topic; and (3) the co-optation of project funding and 'capacity-building' to provide services and facilitate future research. I argue that these forms of co-optation are critical means of making Ugandan citizens visible to policymakers and researchers, which in turn facilitates demands for action and intervention to improve the health of Ugandan people according to a different set of criteria and priorities than those established in the global health orthodoxy.

Co-Opting Research Location

In chapter four, I show that the geography of scientific knowledge production in Uganda is unbalanced, centred around Kampala, Entebbe, Rakai, Masaska, and Mbarara in the country's Central and South-Western regions. I discuss the multitude of factors that explain this, ranging from the high infrastructural costs of starting up research in a new location, to the difficulties in hiring experienced research assistants in a place in which little research has been done in the past and in a country with at least forty different languages spoken across four very different language groups. However, I argue that the unintended consequence of this system is that there are large geographical blind spots in global health science data, with this system paired as it is alongside a relative shortage in funding for pilot projects that aim to create baseline data about people on whom little data has so far been collected. There are thus significant administrative and financial constraints that disincentivise the redirection of knowledge production towards new places and the people that occupy them, and one of the principal means of resistance against this system of constraints is co-optation.

Co-optation of research projects' locations usually entails Ugandan researchers, clinicians, or scientists leveraging existing interpersonal connections and resources – generally through links to people and institutions in the Global North – to propose, design, and implement new projects in a location different to that in which they have so far worked. The purpose of doing so is manifold, but includes: making people in a neglected location visible through producing data about them; bringing economic resources to a location (which generally entails researchers bringing projects to the places they originally come from); and generating initial data about people in a particular location so as to create a baseline upon which to base future research. Across these purposes, the effect is to address the blind spots discussed in chapter four by working against the incentives of the global health knowledge production system to produce data on people in places in which little data has so far been produced.

Doing so however, is a contested, complex, and delicate process. Global health science often values asking new, different, innovative questions – regardless of the location in which they are being asked – over asking similar questions to those that have been asked before, but in a new place and population. Thus, the pursuit of universality (discussed in chapter three) and contributions to scientific knowledge take this knowledge away from local relevancy and towards the general and the generalisable; away from public policy and towards 'global' health science. Consequently, Ugandan researchers have to be able to justify why conducting research on a new population in a different place would be a valuable endeavour – generally not to Ugandan public health policy, but to the advancement of 'global' scientific knowledge. This is not always straightforward, in particular given the North/South imbalance in knowledge of how to win grants, discussed in the previous section.

An indicative example of the ways in which co-optation works in practice is borne out of the history of MUSCo, one of the two institutes in which I conducted my ethnography. The institute was first initiated in 2003/4, built on the back of a small HIV/AIDS clinic associated with Mbarara's hospital and university. At this stage, HIV/AIDS was a major cause of mortality and morbidity across Uganda, but Mbarara's small HIV clinic had also only just begun to upscale its treatment to prescribe cheaper Indian-made generic ARVs to seropositive patients, as previously available branded ARVs were too expensive for most Ugandans to afford. Thus, as the supply and accessibility of ARVs increased, so too did the demand, and the small clinic began to see its patient numbers increase rapidly. Meanwhile, public health research was beginning to turn its gaze towards Africa. Prior to this point in the early-2000s, health research in Uganda was limited to Kampala, Entebbe, Rakai district, and Masaka district, with MRC/UVRI and what is now called the RHSP the primary research institutes producing data on Uganda's HIV crisis, largely through their flagship population cohorts. Uganda thus had some of the best HIV data on the continent. Dr Jim Graham, a US American clinician and researcher, had consequently been drawn to the country as a hotspot for HIV research. Graham had worked on the frontlines of the US HIV epidemic and had been looking to get involved in helping combat similar epidemics in Africa. On a trip to Kampala, he happened to meet Dr Thomas Muhangi at an HIV-medicine training programme in which Muhangi was enrolled. Muhangi worked for the small clinic in Mbarara and carried with him what would be the foundation for the partnership to come: a register of his patients in Mbarara – hand-written and meticulously logged. Dr Muhangi had begun to fill in this patient register because he had become fed up with not having a definite answer to the question of how many patients the clinic had. Dr Graham saw in this register an opportunity. He predicted that with the arrival of cheap Indian generic ARVs, provision of these drugs for free by the Global North to the Global South would soon follow. This register indicated the potential for researchers to see the effects, in real-time, of what mass-rollout of ARVs in a 'treatment naïve' population (that is, one which has had little exposure to any medical treatment for HIV) would look like and entail. Following their meeting in Kampala, Graham visited Muhangi and the clinic in Mbarara, and shortly thereafter, they agreed that Graham would move his HIV research project from Kampala to the clinic – as long as he was willing to pay $100 to renovate a disused metal shipping container box for clinical and administrative purposes. A partnership between Graham, Muhangi, and Muhangi's clinical colleagues in Mbarara was thus born. Following the explosion in global health funding in the mid-2000s, the partnership birthed hundreds of further studies in the following two decades that preceded my arrival in MUSCo, bringing in millions of dollars' worth of funding for research and medical infrastructure, pharmaceuticals, data production, and so on. MUSCo was thus transformed from a small HIV clinic to a site of global scientific research.

This brief history illustrates how Ugandan scientists and clinicians use connections with Northern partners to change the location of research projects. This example is particularly striking in the Ugandan context – MUSCo is now a major player in health research in the country, and Mbarara has become a hotspot of scientific knowledge production nationally, rivalling Kampala, Entebbe, Rakai, and Masaka. There is no similar case of another city in the country developing such strong research capacity according to similar logics. Where this case is representative however, is in the ways in which the co-optation and leveraging happens, if not on the same scale and with the same 'success'. In the case of MUSCo, Dr Muhangi leveraged his position as an intermediary between the burgeoning field of global health science, desperate for research participants, and his patients to bring substantial and sustained funding, data production, infrastructure, and knowledge transfers to his town and region. This leverage was made possible through the patient register he happened to carry with him to Kampala for the clinical training programme. It should be noted however, as it is both in Crane's (2013) ethnography and amongst my own interlocutors, that there is some ambivalence to characterise the explosion in research and donor funding in Mbarara as purely a 'success' – many view it as simply covering up and distracting from the failures of the state and international aid.

This notwithstanding, the effect of Muhangi's co-optation of Graham's project has been substantial, leading to the expansion not only of MUSCo, but moreover of the university and hospital with which it is affiliated. This is not to say that the expansion of these institutions would not have happened without Muhangi's connection to Graham, but it is clear that the relocation of Graham's project was followed by many other researchers, including many of Graham's colleagues, mentees, and PhD students, coming to conduct research in Mbarara. Indeed, the vast majority of the more senior US American interlocutors working with MUSCo, in describing how they came to work in Uganda, referenced their connection to Graham and his to Mbarara as foundational to the genesis of their first projects in the region.

Collectively, the resources brought by the countless projects that have passed through MUSCo since its birth have been followed by substantial and progressive improvements in medical, academic, scientific, and research infrastructure, and have also led to the production of baseline data upon which further interventions and scientific research have been and are being proposed (see chapter four). MUSCo's history thus serves as an illustrative example of the ways in which Ugandan scientists and clinicians can leverage their relationships with colleagues (prospective or otherwise) from the Global North to direct the infrastructures of knowledge-making to different locations.

These themes also emerged more contemporaneously during my time at MUSCo and CVHS, and in my interviews with researchers at other institutions. At MUSCo for instance, the volume and consistency of projects passing through the institute has led to Mbarara University of Science and Technology – with which the institute is affiliated – having developed a reliable and well-reputed 'grants office'. The grants office is where the administration, accounting, and human resources management of the research institute as a whole takes place, and it is also responsible for ensuring accountability in research ethics, compliance with protocol, and adherence to Ugandan and international regulations. Important to the development of this widely respected institution have been the various 'capacity building' grants and projects won by MUSCo's US partners that have enabled Ugandan administrators to be trained in grant management, financial accountability practice, and research ethics compliance. MUSCo's grants office has thus become a model that advocates for 'equity' in global health science have used as inspiration to help equivalent institutions grow at other African universities. The Chancellor of Mbarara University, along with a longstanding senior US American colleague from Harvard, capitalised on this in his application for a 'capacity building' grant to be used at the university in his hometown of Lira in northern Uganda. The project consisted both of financial support for the university in terms of the development of its physical research infrastructure, but also administrative support, with employees of MUST's grants office helping to train their equivalent numbers at Lira University. Lira University is by no means an obvious choice here: many other universities in other towns and cities would also benefit substantially from this kind of investment. In this sense, it is not speculation to tie the Chancellor's place of birth to his choice of Lira for the recipient of the grant – the Chancellor leveraged his position and connections, and co-opted the 'capacity building' grant to direct these resources to a location in the country that is lacking in investment.

At CVHS meanwhile, an officemate of mine, Dr Dave Okot, told me of his desire to bring more projects close to his northern Ugandan home in the city of Gulu – somewhere where little global health science research takes place (see chapter four). Dr Okot is an early-career researcher, still in the process of making the transition from a clinical doctor – trained, incidentally, at Mbarara University – to a researcher in immunology, and hopes to pursue a PhD in the subject soon. And yet, despite being so junior, Dr Okot was clear in his intentions to redress some of the imbalance in knowledge-production, in which northern Uganda is neglected in favour of the country's Central and South-western regions, and thus to leverage his experience, position, and connections within CVHS to bring projects northwards.

Such practices were not practised solely by Ugandan researchers, however. In a couple of instances, similar logics exposed themselves among British and US American interlocutors. For example, Emily Wright, a Professor of Pharmacology in the UK with a wealth of experience conducting research in Uganda, including more than a decade living in the country, told me very directly in an interview that she tries to support her Ugandan colleagues to shift projects out of the main hubs in the South and Central regions and towards eastern and northern parts of the country. Wright explained that doing so was crucial to address the blind spots and data inequalities in Uganda, and that she had a number of strategies to do this, including recruiting research assistants for projects in the Central region who already speak eastern Ugandan languages, such that future efforts to bring projects eastwards would be more viable, as there would be a critical mass of staff for the project that could work in the local context.

Dr Olivia Collins meanwhile, a US American post-doctoral researcher in health economics working with MUSCo, confessed to me in one conversation that her “dream” was to bring research projects to Madagascar, where she spent two years living during her service with the Peace Corps. She explained that doing so would only be possible with the connections she would make and the experience she would develop in working with MUSCo, and that later in her career she would try and leverage these connections to bring projects to Madagascar – somewhere almost totally neglected by global health science.

Collectively, these examples highlight the manifold ways in which scientists leverage their connections and co-opt projects to try to reorient the focus of global health knowledge production towards places on which little data has thus far been produced. While the most successful examples of these, such as MUSCo, are those which align with the priorities of global health science at any given moment (such as Graham’s need for a ‘treatment naïve’ population for ARV studies), other examples highlight forms of co-optation of connections and access to resources so as to slowly try to move valuable projects to localities of interest.

Co-Opting Research Topic

Another important way in which global health science research is co-opted by scientists is with respect to the topic of research projects. As I highlighted in chapter two, global health science research is strongly influenced by the priorities and calls for proposals put out by funders in the Global North. This can result in it focusing narrowly on particular issues and neglecting others, with many Ugandan scientists arguing that these neglected issues are oftentimes the ones most important to “local needs”. However, while the overwhelming focus of Ugandan researchers is on maintaining their lucrative partnerships with colleagues in the North, some scientists attempt to reorient the focus of knowledge production towards particular health issues or people that they perceive to be neglected. Efforts to reorient knowledge production in this way typically involve researchers leveraging their access to funding and relationships with Northern colleagues in order to produce data about the people and/or conditions that they see as important to public health in Uganda, but neglected by global health science.

This co-optation and leveraging takes place in many forms, and is often delicately performed and heavily constrained by funding arrangements, which are central in shaping what data is produced. Here I discuss three ways in which scientists co-opt funding priorities and leverage connections to: (1) produce data on neglected sub-populations; (2) produce data on neglected health issues; and (3) obtain scientific infrastructure that enables independent knowledge production on neglected topics in the future.

Regarding the first among these, some scientists leverage their connections with successful colleagues in the North to study neglected sub-populations in the South. Dr George Mirembe is one such example. His work in recent years has focused on men who have sex with men ('MSM' as they are known in public health), and trans-women in Uganda. LGBTQIA+ people in Uganda face significant stigma, with same-sex intercourse illegal and punishable by lengthy prison terms. While studying these populations is not technically illegal, there is almost no one working on them due to the various difficulties researchers imagine they would face in doing so. These include: obtaining access to what is a heavily stigmatised population that is not easy for foreign researchers in particular to locate; struggling to conduct effective scientific research on the populations due to concerns about losing contact with highly mobile participants with precarious economic, social, and political lives; upsetting government partners with whom strong relationships have been carefully built over decades; and – most prominently amongst Ugandan researchers – the risk of illegally and accidentally 'promoting' LGBTQIA+ 'behaviour', a poorly defined yet theoretically capacious crime under Ugandan law. Dr Mirembe, however, is different and is one of the few people studying queer populations in Uganda. This work has been made possible, as he told me, through his experiences studying in the US, where he found numerous mentors who diligently trained him in grant-writing and research design through a master's and PhD. Once he was experienced enough, he applied for and won his own post-doctoral funding to conduct a clinical trial on HIV self-testing and oral PrEP among female sex workers in Kampala. But through talking to these women during the study, Mirembe began to hear about male sex workers, who he didn't know existed, so he decided to bring them into the trial too. From these men, he then heard about trans sex workers, and again decided to recruit them, in small numbers. As he told me:

> It was through talking to these communities that I got to find that there is a community – hidden, invisible – but at high risk of HIV. And so I wrote another grant, again to the NIH, to fund a study of HIV self-testing and PrEP for trans-women. I [then] wrote yet another grant to the National Institute of Mental Health to do a study of HIV in trans-men.

Dr Mirembe now leads on numerous grants studying LGBTQIA+ people in Uganda, with almost all his work taking place in Kampala. Winning grants with such apparent ease as a Ugandan PI – often now without a US counterpart – is uncommon, and a testament, as he acknowledges, to the education and mentorship that he received from his US colleagues (which he now seeks to pass on to the next generation of Ugandan scientists), as well as his own tenacity in establishing his niche and creating cohorts for research. Mirembe's ability to leverage these relationships to obtain the critical knowledge needed to write successful grant applications was thus central to him winning these grants. Moreover, Mirembe practised co-optation even within his own projects, using the trial funding to incorporate trans men and women into the study, producing data on them, and using this data to apply for further grants. This was made possible by Mirembe demonstrating that these sub-populations were at high risk of HIV, something much needed when proposing a clinical trial of self-testing and PrEP, as the high risk of contracting HIV among these groups elevates the statistical power of control-trials studying them. It was thus through leverage and co-optation that Mirembe was able to produce scientific knowledge about these "hidden, invisible" groups, about whom little was previously known.

Another way in which connections are leveraged and projects co-opted with the aim of shifting the focus of global health science onto neglected topics, is borne out in the case of MensIES. The trial's origins lie in the commitment of its initiator – Dr Dennis Lutalo – to the menstrual health and education of girls in Uganda. Until his untimely death in 2016, Lutalo was a senior research scientist at CVHS – a demanding role, but one that enabled him to develop strong connections with Northern colleagues in the UK and beyond. As his colleagues remember it, Dr Lutalo was passionate about girls' education and menstrual health, no doubt aware, with daughters himself, of how common it is for Ugandan girls to skip multiple days of school every month during menstruation, be it due to period cramps, the teasing of their classmates, or a sense of shame and 'internalised stigma'. Lutalo thus came up with the idea to develop an intervention in local schools to improve menstrual health, and through it, mental health and education. Lutalo wanted the intervention to be one that emerged out of engagement with schoolchildren, parents, teachers, Ministry-officials, and NGOs: to create something 'sustainable', something with the support of the schools' local communities, but also something cost-effective, given the very real budgetary constraints of the Ugandan government. Lutalo's idea was supported by his CVHS colleagues the UK, and he found a co-Principal Investigator (PI) in Jim Banks. Banks in turn found funding for an initial pilot study through a PHIND[35] grant (Public Health International Development) from the UK government's Medical Research Council (MRC), but

---

[35] PHIND is one of the few funds that supports pilot and early-stage intervention work in Africa,

he would later leave the UK university at which he was based for a job at the WHO, to be replaced by the project's current PI, Professor Diana Mitchell. As Mitchell described it in an interview:

> He [Banks] found funding for [what we might call] MensIES-1, which was the formative work around perceptions of menstrual health and the impact of it on education, so I think he and George – I don't know exactly how that partnership functioned – but essentially Jim Banks was the PI that got the funding… I got involved early-on, but I wasn't leading it – there was Jim and there was Dennis.

But after Banks left, Mitchell was asked to step in to replace him. As she put it:

> So, I was then working with Dennis, and Dennis basically ran everything on the ground. It was his idea, I mean, it was his baby, if you like, and I was working more on the technical side. I mean, we were working together, but it was his idea initially, and I was working with him to make it rigorous research, and make it happen, and the money – I was the PI for the grant. So that was 2015-2016.

With data from the pilot coming in, it was apparent that menstrual health was, as Mitchel put it, "a major problem", and the "stakeholders" involved were strongly supportive of a prospective intervention to help tackle the issue. Over the course of 2016, Mitchell and Lutalo then worked together to write a second grant proposal for "MensIES-2", as it was known amongst project staff. MensIES-2 was to consist of trialling a number of interventions that had been devised to target key needs and problems identified in the first pilot study. Sadly, Lutalo passed away just a month after the proposal was submitted, and a month prior to Mitchell receiving notice of its approval. This put Mitchell in a strange position. As she told me:

> In my mind it was very much his baby. It was something he was really passionate about, and it was quite unusual for a man, an African man, to be so passionate about girls [and] something which is so feminine, if you like – menstrual health. So, he was quite a visionary, and this was something he was very passionate about… He was a very compassionate man who had family, had

> daughters. He cared… He had a clear vision… So, then it got funded and it was really mixed emotions, you know, because obviously glad the grant's been funded, but I saw it as bittersweet, because it's Dennis' thing, and then he's not here. So, one aspect was thinking we do it in his memory – what would he have wanted? He would have wanted the work to carry on. So, it was very clear we were doing it in his memory.

Mitchell then carried out MensIES-2 with the team she assembled with Lutalo. This in turn paved the way for the much larger cluster-randomised trial: MensIES-3, in which I was embedded during my fieldwork. In keeping with Lutalo's vision, MensIES-3 has involved substantial, prolonged engagement with the Ministries of Health, and of Gender, Labour, and Social Development, so as to work out how the findings of the trial can be implemented meaningfully in Ugandan schools. It has also incorporated a cost-effectiveness sub-study, and has emphasised school 'ownership' of the intervention by facilitating 'Menstrual Health Action Groups' made up of important people within the schools who are tasked with ensuring the intervention lasts beyond the end of the study. The MensIES-3 trial has also adopted an 'adaptive study design', in which the intervention and trial activities can be altered in real time according to feedback received by the participating pupils, teachers, and researchers.

While many of the elements that make up MensIES-3 have been developed since Lutalo's death, often in conversation with the participating schools, Mitchell and others on the project credit the central idea to him. It was Lutalo who established the foundational motivation for the project and who helped create a strong and dedicated team that was the envy of other CVHS researchers on different projects – something that was vocalised to me often. Lutalo's decision to push for menstrual health research came out of an awareness on his part that this was an important and neglected topic in Uganda, and his leveraging of his connections with Northern researchers like Banks and Mitchell enabled the project to win grant funding through their help to make it, as Mitchell put it, "rigorous research".

A third way in which scientists leverage relationships with Northern partners and co-opt research with the aim of producing scientific knowledge on neglected topics is through the co-optation of laboratory equipment and training in how to use it. Scientists co-opt both 'global health security' and 'global health partnerships' discourses in order to obtain the equipment and training to do other research.

The 'global health security' discourse is one that has been widely critiqued and interrogated (e.g., King, 2002; Ingram, 2005; Elbe, 2006; Lakoff, 2010, 2015). It refers to efforts to securitise emerging infectious disease threats in the Global South by actors in the Global North, constructing them as existential risks to national security and economic productivity, and prompting the release of significant funding aimed at insulating the North against such threats. Relevant to this chapter is one of its essential constitutive components: surveillance. Northern governmental and multilateral institutions have invested heavily in developing epidemic surveillance capacity in the South, with the primary aim being to detect pathogens in the South and stop them from spreading to the North. In order to conduct effective pathogenic surveillance, states require laboratories and people to staff them. Consequently, Northern funders have spent considerable amounts of money in kitting out African laboratories – with, in some cases, some fairly sophisticated equipment – and in training African scientists in how to detect diseases from samples, sequence the genomes of viruses and bacteria, and so on. In countries like Uganda, with longer histories of scientific research and associated infrastructure, such training more often takes the form of either master's and PhD qualifications, or short training courses based in universities in the Global North, rather than narrower trainings for laboratory technicians. As a result, a small but growing number of Ugandan scientists and researchers have received training in microbiology, immunology, virology, and other laboratory-based scientific disciplines, with many of these going on to obtain master's and doctoral qualifications in these fields. Ugandan laboratory capacity has been strong, relative to other countries on the continent, for at least the past twenty years,[36] owing in large part to the duration and breadth of HIV/AIDS research in the country, but funding for laboratory capacity improvements has persisted with mounting concerns about anti-microbial resistance (AMR). Funding also increased continent-wide following the 2014-2016 West African Ebola epidemic (Vernooij *et al.*, 2020; Policy Cures Research, 2023). The COVID-19 pandemic only consolidated this positive trend, something that was made apparent to me early in my fieldwork when I attended the INTEREST conference in Kampala – Africa's largest HIV/AIDS conference. There, multiple presentations noted the dramatic rise in genomic sequencing capacity in Africa over the course of the pandemic. With the fear of deadly COVID-19 variants spreading from South to North, Northern governments, philanthropic organisations, and multilateral institutions – led in large part by the WHO and the US CDC – funded the expansion of 'next-generation sequencing' (NGS) technology across the continent, with the aim of mapping viral genomes and identifying new COVID variants early.[37] Indeed, in 2019, before the pandemic began, just seven countries on the continent – including Uganda – had NGS capacity in public health laboratories, compared with forty-eight that did not, but by September 2022 forty African states possessed NGS capacity in public laboratories (Inzaule *et al.*, 2021). This considerable increase, in what represents one of the fastest North-South technology transfers of the past decade, is indicative of a wider trend in global health to increase laboratory capacity more broadly in the pursuit of improving capacity to detect and surveil pathogenic threats, and thereby contain them within regional or national borders. This example illustrates the scale of the resources that have been mobilised for global health security initiatives,

---

[36] See chapter one for a discussion on earlier scientific research in Uganda, including the development of the UVRI/CVHS laboratories and its antecedents.

[37] NGS was initially made commercially available in the North in 2005 and represented an important shift from the earlier Sanger sequencing methods: Sanger sequencing took over a decade to completely map a human genome (e.g., the 'Human Genome Project', which ended in 2003), while modern NGS technologies can map a genome within a single day. Yet despite benefits posed to research and clinical practice, NGS technologies had low levels of penetration into African states' public health sectors prior to 2020.

and for pathogenic surveillance in particular. The product of these kinds investments in laboratory capacity is scientific infrastructure and knowledge in laboratory sciences.

The 'global health partnerships' discourse has also been co-opted by Ugandan scientists and researchers to develop laboratory science capacity and knowledge. This discourse refers to efforts to build 'equitable' collaborations, or partnerships, between individuals and institutions in the Global North and South, often involving the 'capacity building' of Southern partners. These partnerships are exemplified by the research institutes discussed in this thesis, but also extend into practice, where many projects and institutes conducting global health work providing drugs, healthcare, and technical expertise involve partnerships between Northern and Southern institutions to enable funding and flows of expert knowledge. As Hannah Brown (2015, p. 340) has noted in her study of partnerships in Kenya, "For Kenyans, partnerships animated a politics of sovereign responsibility in which they often felt a deep sense of managerial disenfranchisement. For their foreign collaborators, partnership relations legitimized the interventions they organized." Alongside and intertwined with the prevailing security discourse, recent concerns regarding 'equitable partnerships' in global health have resulted in many funders and Northern scientists trying to allocate money on grants – or to specifically apply for 'capacity building' grants – that target basic and laboratory science capacity in Africa. Uganda has been a notable recipient this funding over the years, although the turn toward basic and laboratory science research as the object of these 'capacity building' initiatives is a much more recent development, with previous funding more often targeting epidemiology and various clinical sciences. In many of my interviews with Northern scientists, working towards 'equity' in basic and laboratory sciences was discussed as a particularly pressing issue and a 'new frontier' of 'equity' initiatives in global health. Consequently, there are a small but growing number of opportunities for Ugandan scientists to travel to the North to be trained in laboratory sciences under the banner of 'equity'. An example of this is Dr Okot, whom I mentioned earlier in this chapter. Dr Okot travelled to the UK in the last weeks of my fieldwork for a six-month training course on how to collect lymph node samples and analyse them in a laboratory through conducting functional, serological, and genetic assays. The research project with which Dr Okot works included in its grant application a budget allocation for 'capacity building' in Uganda, even though most of its samples will come from people in the UK, which enabled Dr Okot to go to the UK to learn how to take samples and conduct assays in the lab. Dr Dave aims to use these connections and skills to get a place on a PhD programme in immunology, and then to continue to do immunological research in Uganda. 'Capacity building' initiatives such as this are by no means common, but global health science's 'equity' turn is making them more common, thereby increasing the levels of African expertise in fields previously very difficult to access.

Collectively, 'global health partnerships' and 'global health security' discourses have generated growing opportunities for African scientists to develop their knowledge in laboratory sciences and improved physical laboratory infrastructure and capacity across much of the continent, but particularly in Uganda. This is not to say, however, that serious issues in these fields do not persist. For instance, many of the laboratory scientists at CVHS complained regularly about the length of time it took to do laboratory work in Uganda due to lengthy delays in obtaining expensive reagents or the lack of specialist engineers in East Africa who could come to fix faulty laboratory equipment, resulting in delays to research sometimes totalling six months or more while they wait for someone to fly in from South Africa or Europe. Moreover, laboratory science education often does not follow conventional university models, in which PhD students do some of the more basic tasks in labs, and then contribute to writing journal articles and interpreting results, because PhD students in Uganda are much more expensive than laboratory technicians. Consequently, where in Europe laboratory technicians are expensive and PhD students are cheap, Uganda has the opposite problem, meaning that a far greater burden of academic work falls on the senior laboratory scientists. Another problem often discussed is that senior laboratory scientists often lack the foundational training in basic laboratory processes, such as doing an assay, as they have either been trained to do particular laboratory tasks for specific projects, or have gone abroad to study only at the PhD level, and have therefore not had the opportunity to learn the laboratory skills that would be taught to undergraduate and master's students in the North. Lastly, many Ugandan scientists complained that laboratory science findings are not taken anywhere near as seriously when pronounced in the South versus in the North, including by Uganda's own government, which "doesn't even trust their own people", as one such scientist put it.

Despite these legitimate complaints however, it is nonetheless clear that Ugandan laboratory capacity, both technologically and in terms of the expertise of Ugandan scientists, has increased in recent years. Evidence of this can be seen in the ways in which these components of technology and expertise among Ugandan scientists have begun to translate into, in some cases, quite fundamentally different forms of research. An example of this is the effort to produce a Ugandan-made COVID vaccine, which began in 2021 – after vaccines had been developed in the Global North and China, but before these were made accessible to countries in the South.[38] Financed by the Ugandan government's own scientific research funding, which totals around US$10 million, the initiative was led by the CVHS and UVRI director, Professor Ignatius Ssemakula, with the actual laboratory work done by Dr Beatrice Namukasa and her colleague Dr Annet Nakimera. The project set out to develop two vaccines for COVID-19: one using an adenovirus vector taken from a Ugandan chimpanzee from Kabale National Park, and the other using an inactivated coronavirus. This represented one of the first examples of basic science work in Uganda, and while neither of these vaccines have yet begun clinical trials in humans, the purpose of the adenovirus-vector vaccine candidate in particular was not primarily to provide a

---

[38] Similar projects were announced elsewhere in Africa by the governments of South Africa, Ghana, and Egypt.

strong alternative to the major COVID-19 vaccines developed by major pharmaceutical companies and Northern universities – not least because Uganda lacks the manufacturing capacity to produce vaccines at scale. Instead, as Professor Ssemakula put it in a press briefing in July 2022, “we wanted to get [our own vaccine] because when we get it, it will also be used for research on other diseases. I think the key feature here is developing capacity for the future and infrastructure” (*New Vision*, 2022). What Professor Ssemakula means here is that the vaccine platform – the adenovirus vector – once developed, can be used for other diseases, with the need only to replace the COVID-19-specific element of the vaccine with another virus. Consequently, the principle aim of this vaccine project is less about making the vaccine specific to a particular virus and more about developing the vehicle through which information about a virus is delivered to the immune system to prompt antibody production. This vehicle, or platform, can in the future have alternative information plugged into it to make the adenovirus-vector vaccine specific to a particular virus.

Such an initiative is the product of decades worth of ‘capacity building’ projects in Uganda, the purpose of has been to build up technological and infrastructural capacity, alongside human resources and expertise to build a strong scientific research community capable of conducting independent scientific research in the national interest. As President Museveni himself put it in an address regarding the vaccine project: “We shall not accept dependency. You must build an independent Uganda. We are working on the vaccine and treatment by ourselves” (*Office of the President, Republic of Uganda*, 2021). It should be noted here that the decision at CVHS to prioritise funding for the vaccine trial and its associated laboratory work was not uncontroversial - many of my interlocutors were deeply unhappy about it, variously referring to it as a “vanity project”, “a waste of time and money”, and “pointless”. They argued that making a Ugandan COVID vaccine was not a good use of Uganda’s limited funding primarily because it would only make sense if Uganda had domestic vaccine manufacturing capacity and expertise, which it does not, meaning that whatever vaccine Uganda made would have to be manufactured abroad anyway. Moreover, given the dearth of funding that the cash-strapped Ugandan government can spare for scientific research, spending it on a COVID vaccine was a poor investment because it did not create data that could be used to draw more funding from donors and serve as a platform for more research into important national issues.

Whatever one makes of these critiques, that Uganda now has the capacity to develop its own vaccines is nonetheless indicative of the ways in which laboratory sciences in the country have grown, and of the ways in which this growth has enabled – through co-optation – the focus of biomedical research to be directed towards issues understood – by some, at least – to be of local and national importance.

Co-Opting Research for Medical Service Provision

The third way in which co-optation takes place is as a means of using research projects and the funding, technology, infrastructure, drugs, and expertise that they bring to help improve the provision of biomedical services. This is perhaps one of the more visible – and impactful – ways in which research projects are co-opted: given the limited sway that Ugandan scientists and clinicians have over what gets researched, trying to ensure that this research contributes substantively to helping sick people is one of the few ways that such researchers are able to make their work directly impactful to the communities they serve. This is part of what Dr Oloro meant – in the quote I cited earlier in this chapter – when he asked, “How do I achieve what I want to achieve, how do [our Northern partners] achieve what they want to achieve, and how do our patients achieve what they want to achieve?”

Many of the examples and evidence discussed in this chapter thus far illustrate this co-optation of research projects to deliver and improve biomedical care. At MUSCo for instance, Dr

Muhangi helped to bring Dr Graham's project to Mbarara, where it helped deliver not just administrative support and patient management systems, but valuable antiretrovirals. The institute grew as more and more projects began to collaborate with it, bringing funding, more clinical oversight, and drugs, each of which have benefitted patients and research subjects to varying extents. Similarly, in the aspirations of Dr Dave, who seeks to bring immunological research northwards, or in the ways in which Professor Wright works with her Ugandan colleagues to set up research sites in eastern and western Uganda, we see that research brings with it not just data – and thus visibility – and knowledge, but also resources that can benefit patients and research subjects. Dr Mirembe did just this for LGBTQIA+ populations in Kampala, while Dr Lutalo's and Professor Mitchell's MensIES studies have at the very least provided a whole host of interventions to as many as sixty schools, even if the trial is ultimately ignored by policymakers.

But in addition to the flows of financing, data, drugs, and expertise, improvements to physical medical infrastructure are also brought about through research funding. Again, this takes place largely through co-optation. A good example of this is the ways in which research funding targeted at improving laboratory capacity works to improve medical care. While research laboratories in Uganda, as I noted in the previous section, are still very much in the process of development, clinical laboratories in the country – that is, laboratories that serve hospitals and that try to diagnose disease in patients – are better established, even in spite of constraints to obtaining the relevant equipment. Grants issued by the NIH for example, the largest funder of biomedical research in Africa, almost universally prohibit the purchase of laboratory equipment – as well as cars, buildings, and other things essential to research, but which might remain in use after the end of a project. Applicants to NIH grants who lack an essential piece of laboratory equipment to conduct their study, or who need a car to send research assistants to the field and a small building in which to give them office space, have to indicate how they will obtain these without purchasing anything outright, meaning that many projects rent offices, hire cars, and pay to send samples to an outside laboratory for analysis. Not all funders have these rules, however, and where there is scope to purchase equipment, Ugandan scientists often find ways of doing so.

Elijah Maniraguha, Professor of microbiology at Mbarara University, is one such example. The bulk of his academic work is on antimicrobial resistance (AMR), funded in large part by the UK government's National Institute for Health Research (NIHR), but he also works with the Fleming Fund; a UK government international aid programme that also aims to tackle AMR, but through the strengthening of surveillance systems in 'low- and middle-income countries', rather than research. It is through the Fleming Fund that Professor Maniraguha has got a hold of a lot of the laboratory equipment he needs for surveillance, research, and teaching work. Professor Maniraguha explained this to me in an interview in his office in a building straddling the campuses of Mbarara University, and Mbarara Regional Referral Hospital. His office was grey, large, and dark, on account of its unpainted concrete walls and floor, and in spite of it having a row of windows running along one side of the wall. "Of course [the Fleming Fund] has its problems", he tells me, "but one thing I like about [it] is it's able to give equipment… actually most of the money goes to equipment. So they have equipped a lot of laboratories with a microbiology focus." The purpose of the fund, he explained, is to build capacity and "give people tools" to do "the real work" of surveillance. Research then comes secondarily, but is still important. For Professor Maniraguha though, one of the strongest benefits of these laboratories is what they mean for treatment:

> Establishing these laboratories [means] it's not just AMR that is going to benefit. For example, here we've established – the hospital has established – a microbiology laboratory, so it's not only drug-resistance that's going to benefit, it's diagnosis. Anything that will require culture will be able to be done, which was not done before.

This form of co-opting research equipment to enhance biomedical care is common, with various hospitals, clinics, and research institutes using grant money to purchase laboratory equipment and collect data with it, before repurposing this equipment in a healthcare setting.

The final form of co-optation discussed here is the co-optation of data production to improve biomedical care. Dr Francis Bitwire, a MUSCo epidemiologist whom I cited earlier in this chapter, expressed his strong opinions to me on this topic a number of times during my fieldwork. His view was that many research institutes and projects do next to nothing to actually help Ugandan people. "I'll give you an example", he told me in one conversation.

> We've had a big program called the [name of research institute redacted] that has done research since the early-90s and we've learnt a lot about HIV, [from] its interactions with sexual transmitted infections, to home-based counselling and testing, male medical circumcision… But the HIV burden of the area [where the institute does a lot of work] is probably among the worst in Uganda. So, what's the impact of [this] research on HIV?

He laughed dismissively and gesticulated with evident exasperation before continuing:

> The whole idea of research is to reduce the burden of disease, to reduce suffering and misery and death from the condition. So, what does it mean? There have been a lot of studies done on the disease, but the burden has worsened. So, is that equitable research? I mean we've learnt so many good things, but who have they benefited? So, I think there are many examples in Uganda and Africa where you can see that research has no impact on the population at all.

Bitwire's point here, that a lot of research is done without any clear improvement to the lives of the subjects involved, is one expressed frequently in 'Comment' pieces in *The Lancet* and at the conferences I attended, as well as in my interviews and conversations with interlocutors. Sometimes, this notion is expressed with a sense of injustice or resignation, but for Bitwire – and indeed for many other senior clinicians and scientists – this perspective has led to efforts to seek more directly to improve the lives of the populations from whom research subjects are sought. As one of Bitwire's US American collaborators put it to me, there should be "no research without service, although there often is."

It is this notion that has underpinned recent work by senior researchers affiliated with MUSCo and based both in Uganda and the US to use data and the research findings thereof to approach NGOs, multilaterals, and – most successfully – billionaire philanthropists for funding for development projects. MUSCo's data and the scientific research it conducts has been used in recent years to make visible the barriers to good health and the epidemiology of the diseases from which local people suffer. This data has enabled these researchers to fundraise from donors and to design and provide financing for projects that – broadly – tackle some of the issues identified by the research MUSCo does.[39] In Mbarara, recent efforts like this have resulted in millions of dollars' worth of donations from US American sponsors to fund expansions and improvements to the city's hospital, and to improve clean water provision to villages in the surrounding countryside. This kind of development work represents a diversion from the conventional activities of research institutes and researchers, who are more often focused on implementing their research projects and on 'the science' they are producing, rather than the direct impact that they themselves will have on the locality in which their research takes place. This leveraging of data to obtain funding for the improvement of medical service provision thus represents another way in which scientists co-opt research to benefit their patients.

---

[39] The MUSCo team involved in fundraising from philanthropists to implement these development projects have little engagement with the Ugandan Ministry of Health. While the incumbent Minister of Health – Ruth Aceng – was invited at the time of my fieldwork to a ribbon-cutting ceremony for a new wing of the Mbarara public hospital in Mbarara, funded by a US American billionaire, the Ugandan government were otherwise not consulted much. The focus for this development fundraising was to use the data and knowledge produced by MUSCo research to appeal to philanthropic donors' interests for funding, rather than appealing to the Ugandan government for more resources that it would be unable to give.

Reflecting on Co-optation

This chapter has thus far depicted the manifold ways in which co-optation is practised by Ugandan researchers and scientists to make research more relevant to issues that they perceive to be important domestically. This takes place in response to a sense that, overall, global health science research is oriented towards a Northern public and addresses Northern priorities. These researchers do this through trying to shift the locations from which global health science draws its participants, or through trying to start research on neglected topics, and often try to make projects (whether or not they are seen to be important locally) offer or improve biomedical care for people in need of it. These acts of co-optation are not always effective, nor are they formulaic; their consequent effects are highly contingent upon context and the experience of the co-opters themselves. They are, however, consistently practised in one way or another, to lesser and greater extents, in global health science research projects and institutes across Uganda.

While this chapter has focused almost entirely on the co-optation practiced by Ugandan scientists, it is important to note that it is also practiced to similar ends by non-Ugandans. Dr Emily Wright, whose comments on blind spots I discussed in chapter four, is one such example. Dr Wright is British, but lived in Uganda for more than a decade earlier in her career, and spent much of that time conducting research on maternal and child health, during which she institutionalised the practice of co-optation into her successive research projects. She began by applying for grants on mother-to-child transmission of HIV/AIDS and on drug-interactions in patients with TB and HIV. These topics were well-established as important global health issues, but many of Wright's participants and patients were concerned about other issues, such as drug-interactions relating to other health conditions and the impacts of strong antiretroviral drugs on breastfeeding children, while many of her Ugandan colleagues were concerned about the shortage of data on pharmacovigilance. As a result, Wright began to write proposals that, on the face of it, targeted the big issues that donors wanted to address, but which included a section, sometimes hidden in an appendix, entitled 'Exploratory Aims'. This section would include several questions around issues that participants and the Ugandan clinicians working on her projects have voiced as concerns, and Wright would find creative ways of slotting in means of collecting this data into the research protocol. The data collected on these exploratory aims was then used as part of subsequent grant proposals to make a case to funders that they should fund her research on these neglected issues, which has been successful.

In a similar vein, a senior researcher and practitioner from the US who had worked as a country director of Partners in Health told me of the importance of the "diagonal" usage of funding: applying for money on the basis of doing something that the donor wants, but in practice using it to do something else that is "more important". In his case, this often meant applying for money to carry out vertical interventions for priority diseases like HIV/AIDS, but then implementing these projects in such a way that it strengthens health systems more horizontally. Such practice is an art form – too egregious a deviation will make funders less likely to fund the applicant in the future, and figuring out ways to accomplish what the donor wants at least superficially while at the same time pursuing alternative aims requires careful and creative planning. But, such researchers emphasised, it is not impossible. Nevertheless, co-optation in this form with the aim of redirecting allocations of resources towards goals that are more locally relevant in Uganda remains an enterprise primarily conducted by Ugandan scientists.

Co-optation is thus a centrally important mode of action amidst the unequal relations of power that shape global health science – it is a primary strategy in what Noémi Tousignant (2018, p. 4), in her ethnography of Senegalese toxicologists, calls the "struggle for capacity": the efforts on the part of these scientists to "gain, keep, and stretch the material and institutional capacity needed to" conduct scientific work. Yet, Tousignant does not discuss co-optation specifically. Co-optation can thus be understood as a kind of "weapon of the weak" (Scott, 1985), in which more marginalised scientists can outwardly conform to the desires of centres of scientific power and decision-making (what Scott calls the "public transcript") while subverting these through their co-optive practices (what Scott calls the "private transcript"). While such a conceptualisation is evidently crude in this context – many of these Ugandan scientists are hardly "weak" and are not particularly marginalised in Uganda, the parallels between the forms of resistance against the unequal power relations described by Scott and those described here highlight the significance and political context of co-optation as a form of action.

Conclusion: Africanising Science and Scientific Sovereignty

How, then, can we make sense of these trends to make research more relevant to the Ugandan context through co-optation? What does such widespread and politically motivated co-optation mean more broadly? One way of conceptualising this is through the prism of 'Africanisation'; a term that has been deployed in relation to various different fields to refer to the ways in which African intermediaries – situated between a regime of action informed by a non-African epistemology and an African population – endeavour to make this action more appropriate for the local context, or to increase the extent to which this action has beneficial repercussions among the population it affects. Marissa Mika for instance, in her recent book *Africanizing Oncology* (2021), outlines the history of Uganda's National Cancer Institute in Kampala, and discusses the various ways that the institute has been transformed by Ugandans working within it since the country's independence. Mika argues that these people have used "research as a powerful resource for mobilizing and extending care, even if they do so in a highly unequal world" (2021, p. 9). Mika thus deploys the concept of 'Africanisation' to refer to "the ways in which physician-researchers, especially Ugandans, refashioned the resources and oncological technologies brought through transnational cancer research partnerships to meet the needs of

Ugandan cancer patients and their caretakers" (2021, p. 9), thereby transforming the Institute from a small research unit to a 'centre of excellence' in cancer care.

While other usages of the term abound (e.g. Schumaker, 2001; or Kwame Nkrumah's 'Africanization' post-colonial policy agenda), Mika's usage clearly resonates with much of the evidence presented in this chapter. Among many of my interlocutors, and to return to the dependency theory-imbued lexicon of Paulin Hountondji, there is a feeling among Ugandan scientists that they and the knowledge they produce are fundamentally 'peripheral'; tasked with supplying the 'centre' with data, publishing in the 'centre's' journals and languages, applying for funding from the 'centre's' donors, and addressing African issues only via those priorities outlined by experts in the 'centre' – even if these priorities are claimed to be devised 'collaboratively. As Dr Bitwire put it to me:

> It still remains almost impossible to say you will use British or American or European taxpayer money to do research in Africa that is responsive to African needs. That's a lie. Because that money belongs to other people who also have their own priorities. You cannot force priorities with people with their money to be priorities of another group of people.

The resultant attitudes of some of my interlocutors was a profound sense of alienation from the processes of global health science knowledge production, so little did they feel that the knowledge they were co-producing actually addressed Ugandan issues in a genuine, accountable way. Indeed, some even speculated that all forms of funding, from international aid to research funding, should be stopped, as this would be the only way that they could demand accountability from the Ugandan state. To this end, many noted the dependence of Ugandan government institutions on international donors: the Ministry of Health, for instance receives about 50% of its budget from foreign entities. How then, asked one interlocutor of mine, with whom I shared an office in MUSCo for a number of months, "can we hold the government to account when they don't even have their own money to spend? We cannot!" This lack of a sense of national sovereignty over policymaking and over data and scientific knowledge produced within the country's borders was a point only ever quietly articulated. Those that called for all the donor funding to end so as to force the Ugandan government to "take responsibility" and thereby be held accountable were, I am sure, not calling for it with the expectation that such an event would ever come to pass. Yet this does nonetheless speak to the sincerity of feeling that the current system of global health science funding, knowledge production, and subsequent policymaking circumvents the state and undermines national sovereignty.

It is in this context that many Ugandan scientists view their role as something of an intermediary: trying to make scientific knowledge production more relevant to domestic issues and data inequalities where possible, or at least using research funding, just as the physician researchers described by Mika have done, to improve biomedical service provision for patients, participants, and compatriots. This, certainly, would depict the 'Africanisation' of global health science. To misquote Ramah McKay (2018), this might represent a kind of 'science in the meantime'; an endeavour to make the most of the current situation while waiting for the systemic and structural changes that may or may not ever come.

Yet, I would argue, such an analysis only captures part of the picture in conceptualising the actions of the Ugandan researchers discussed in this chapter, and, indeed, their perspectives. As Professor Elijah Maniraguha said to me in our interview, "Things are moving in the right direction". He pointed to a clinical trial for COVIDEX – an herbal treatment for COVID created by a Ugandan scientist, and to the Ugandan government's US$10 million fund for domestic scientific research, a major recipient of which was the CVHS COVID-19 vaccine development research discussed earlier. Maniraguha also pointed to President Museveni's efforts to counter the 'brain drain' of the country's top scientific minds to other countries, particularly the US, where they will be paid more, with the President making it a priority to pay government scientists well enough for them to remain in Uganda and contribute to the country's scientific community.

These examples are indicative of something more profound: not solely a way in which global health science is being mediated and 'Africanised' by intermediary scientists, but something larger, more positive, more coordinated, and more coherent.

In many respects this constitutes what Hountondji demands: "a new way of doing science" (2006, p. 54). Hountondji (2002; cited in Hountondji 2006, 54) states that African scientists:

> Can no longer be satisfied with being recognized and co-opted by the international scientific community. He or she must progressively put an end to extraversion, such as to enable his or her own society to judge his or her work freely and critically. He or she must favour the emergence of a local scientific community primarily concerned with the resolution of local problems; this local community does not exclude, but rather domesticates or tames, the universal.

Central to the emergence of such a local scientific community, in Hountondji's normative argument, is an emphasis on *horizontal* discussion amongst African scientists about African issues, rather than vertical ones with Northern counterparts. Evidently, such a reality in its totality is not evident today. But it is undeniable that, in Hountondji's words, such a community is emerging, giving rise in the process to the production of scientific knowledge production that is in thematic and political-economic terms 'Afrocentric', and concerned first and foremost with producing knowledge that is relevant to Ugandan issues and policymaking. Such production, I have shown in this chapter, is framed explicitly by researchers as doing work that benefits Ugandans and is concerned with local issues, and thus works to reorient the production of scientific knowledge to whatever extent possible away from the "interests" of the Northern donors and towards those of Ugandan people. In this way, we might conceptualise this practice as articulating a form of what I call 'scientific sovereignty' – an effort to alter the production of scientific knowledge in the interest of the nation – broadly and vaguely understood, perhaps.

Thinking through this prism sheds different light onto the forms of co-optation and leveraging discussed throughout this chapter. These forms of action on the part of Ugandan scientists do more than solely try to make the most of the research that is taking place in a narrow, material sense. Rather, this action, in shifting the focus of global health science research onto different people, health conditions, and places, works to expand the scientific conversation within Uganda, making these people, conditions, and places visible – yes, to global health science – but also to domestic communities of policymakers and scientists, amongst whom a discussion has long-since begun.

Scientific sovereignty conceived thus is perhaps in its early stages, but its motivations and purpose have already been seized by Uganda's political elite. To return to quotes from President Museveni in the introduction to this chapter, Museveni called Uganda's medical research "a liberation struggle of a new type — [an] intellectual liberation struggle [to get out of] slavery and dependency!" (*Global Press Journal*, 2021).

Conclusion

In the introduction to this thesis, I referenced Didier Fassin's (2012) discussion of global health as an "obscure object". Fassin describes global health as obscure because of its complex, dynamic, diffuse, and diverse nature – it evades easy categorisation as a force for good that advances health equality, or indeed as just another means through which the Global North can dominate the Global South. On the contrary, its goals, methods, and impacts are far from straightforward, involving a jumble of different – and often competing – ethics, interests, and political, social, and economic dynamics that make it difficult to pin down or define clearly. Per Fassin, global health is thus a domain with layered complexities and tensions between idealism and pragmatism in its practices and logics.

In this thesis, I have shone a light on some of these dimensions in the context of global health science. I have charted some of the multi-scalar and multi-sited tussles and negotiations over what global health science comes to be in the face of wider political-economic, cultural, and epistemic forces. I have argued that global health science becomes disconnected from the people and contexts it is claimed to serve through these negotiations and as a consequence of these forces.

In chapter one, I showed how large-scale historical changes and continuities both globally and in Uganda shaped the emergence and practice of global health science, figuring that country as a hotspot for its practice. In this chapter, I illustrated the change in biomedical research from being descriptive to being experimental between the 1980s and the present. I showed how this transition also resulted in a change in the scale of research: where in the 1980s and 1990s the scientific research being conducted was tied to Uganda geographically, infrastructurally, and in terms of focus, being concerned largely with the country's HIV/AIDS epidemic, this shifted in the 2000s and 2010s as funders sought scalable, global answers and solutions to global problems.

In the next four chapters, each built around a central concept, I illustrated how and why the multi-scalar tussles and negotiations play out over what global health science comes to be in the present. In chapter two, the concept of 'precarity' illustrated how instabilities in funding flows, and the related anxieties and decision-making pressures they exert, emphasise fundability over localisation. I showed how this plays out at three scales: funding institutions, research institutes, and individual research projects. In each case, people made decisions to fund, support, or conduct research that would not jeopardise their sources of funding, which largely came from institutions (and particularly governments) in the Global North. The pressure to continue to win funding meant that the interests of funding bodies were taken much more seriously than the interests of the people and places in which research was taking place.

In chapter three, I used the concept of 'universality' to illustrate the differential valuation of kinds of scientific evidence. I showed that evidence which makes the most universal claims on truth, and which has the widest applicability, is the most valued. I argued that this results in a strong incentive amongst researchers to produce knowledge that is not locally specific, but rather of wider global relevance, again disconnecting the focus of knowledge production from Ugandan contexts.

In chapter four, 'stickiness' offered a way of understanding the social, political, and economic processes that direct the allocations of resources towards priorities and programmes that are already established. I argued that the allocation of resources for global health science is thus not simply a technical process that distributes funding for knowledge production according to objectively calculated need and potential for impact, but rather one that is shaped by knowledge that is already produced and by established macro-political consensus. 'Stickiness' thus illustrates the ways in which transnational flows of expertise, infrastructure, knowledge, and funding produce a magnetism from which it is difficult – though not impossible – for scientists to deviate. This produces numerous, important blind spots in knowledge on public health issues in Uganda.

In chapter five, 'co-optation' described how scientists – and in particular physician-scientists – attempt to creatively resist and make the most of these structural limits, bending the incentives and constraints of global health science system to the benefit of them, their participants, and their patients. I argued that, viewed collectively, these actions by networks of scientists in Uganda – not all of whom are Ugandan – represent an effort to assert a kind of scientific sovereignty: a reorientation of scientific knowledge production around the needs of the nation, rather than the priorities of the funders.

Collectively, these chapters reveal the ways in which global health science is shaped by wider contexts and underlying logics, as well as the interactions and frictions between them. Through this, I show how global health science gets blown off the course that global health scientists intend – and in some cases believe – it to follow, though also show how people try to mitigate this.

Limitations

This project has a number of limitations. Studying the cultural and epistemic logics of global health science is challenging as an outsider to the field. While half of my undergraduate degree in Human Sciences was in the biological sciences and another quarter in demography (which is similar in many ways to epidemiology)[40], I have not done a master's degree in global/public health, or worked professionally in the field. The scope for my active participation in the work of the projects and institutes I studied was limited in this respect, and I did more observing than

---

[40] The other quarter was in anthropology.

participating. Of course, I did what I could to mitigate these limitations – I read an enormous amount of global health literature and developed personal relationships with my interlocutors in the offices. However, not having a sense of the processes of education of scientists in global health presented hurdles to fully understanding the epistemic logics and systems of rationality that undergirded their decision-making. Reading Simon Sinclair's (1997) ethnography *Making Doctors* while I was on fieldwork, in which, for instance, he describes the inculcation of UK medical students with the doctrine of evidence-based medicine, made me realise that I had no such access to equivalent spaces and processes. In future work, I would like to correct this blind spot of mine to better understand how scientists understand 'good science' by doing an ethnography of a master's programme in global or public health.

Another related important limitation was the scale and scope of my project. While the total duration of my research was fourteen months, my endeavour to critically analyse global health science as a field was no small undertaking – its multi-scalar and transnational form make it a challenging object of study. This project is thus in many senses an initial contribution, as there is certainly an enormous amount more to say. For instance, I had little sense throughout my fieldwork of the involvement of the Ugandan government, which seemed almost totally absent as an actor in shaping the research agenda, other than in the context of research ethics. That the Ministry of Health, for instance, barely appeared throughout my ethnography is interesting in itself, but understanding the nature and form of engagement with the government by scientists (or lack thereof) in greater depth would certainly strengthen this project.

Furthermore, this project was focused on Uganda and not anywhere else. As I noted in the introduction, Uganda's particular history and the hands-off and inviting approach of the government makes it an interesting place to study global health science, in that Northern scientists are able to conduct research on their own terms perhaps to a greater extent than is the case in many other countries in sub-Saharan Africa. However, this assumption, while reasonable, is untested and presents a limitation to this study – I have discussed global health science in Uganda, and there may well be important particularities to the Ugandan case about which I am unaware, and which are not discussed in this thesis that more comparative work would reveal.

Contributions to Literature

Nevertheless, this thesis makes important contributions to the literature in critical global health. It represents the first effort to critically analyse global health science as a coherent field. Johanna Crane's (2013) work comes closest to this, but it does not try to unpack the various forces that shape the decision-making of scientists and thus the production of knowledge as this project does. I have also shown how and why these forces result in particular blind spots in what is known in global health science, with important implications.

My focus on global health science speaks to enduring interests in critical global health on health inequalities and their relation to knowledge. This thesis has shown how scientific knowledge is produced often with the intention of making inequalities visible, or with the intention of trying to mitigate inequalities and advance health equity, but ultimately is undermined in these goals by a variety of political-economic, cultural, and epistemic forces. Scientific knowledge is a vital part of decision-making and agenda setting processes in global health, and provides crucial solutions (pharmaceutical and otherwise) to major causes of health inequalities. In critical global health, scholars have critiqued this, arguing that important things are missed out in the datafication of global health and with the efforts to govern globally by numbers (Adams, 2016b; Wendland, 2016a; Gimbel *et al.*, 2018; Reubi, 2018b). Yet these accounts do not centre the people making the numbers themselves and do not show how these people square their own idealistic political, moral, and epistemic commitments with a pragmatic bottom line, nor do they show the extent to which these people have their action shaped by overarching, complex, and overlapping forces beyond their control. In this, I think my thesis makes an important contribution. Moreover, these accounts tend not to illustrate how this pragmatic bottom line is itself shaped by a coalescence of many processes: political-economic, cultural, and epistemic.

In pursuing these interests, this project has also involved a multi-scalar analysis of a web of transnational networks that form part of global health science. In the critical global health literature, there is a call for more work of this sort, that connects the different scales of analysis targeted by different scholars and disciplines within the field and shows how they influence one another (Pfeiffer and Nichter, 2008; Feierman *et al.*, 2010; Fassin, 2012; Biehl and Petryna, 2013a; Prince and Marsland, 2014; Rieder, 2016).

Another contribution of this thesis is to the literature on extractivism and collaboration. As I noted in the introduction, this literature offers nuanced but punchy analyses of the power relations that undergird action in global health science (Crane, 2013; Geissler and Tousignant, 2016; Biruk, 2018; Fouad, 2018). Whilst they foreground the agency of Southern researchers, scientists, and clinicians and avoid Manichean depictions of inequality between these people and their Northern colleagues, they nevertheless argue, in a postcolonial intellectual tradition, that global health science is an extractivist project: one that benefits those in the North more than the South. This is not a position with which I completely disagree. However, this thesis has, unlike much of this literature, given plenty of room for the experiences, justifications, and visions of Northern scientists. Indeed, in an early presentation of some of this work at a conference, I was accused by one colleague of taking this too far and “going native”. What I hope this thesis has revealed through this is that we should take the multi-scalar negotiations that shape transnational action of this kind very seriously. This is important analytically – more good happens in global health science than some of these scholars give credit for – but also in terms of communicating the valid critiques – it does little to tell these scientists they are simply emissaries of neocolonialism without an appreciation of the structural constraints in which they are operating and the creativity they express in trying to circumnavigate these.

Decolonising Global Health; or: So What, and Where Do We Go From Here?

This thesis does not argue that the demands of funders for cost-effective, accountable, generalisable/scalable, and/or biomedically driven scientific research that targets important issues in a somewhat coordinated way are absolutely unreasonable. Many of the decisions to fund and conduct research like this are pragmatic when considered in isolation – blank cheques cannot reasonably be written, and biomedical research can offer transformative solutions to dire problems, as I discussed in chapter one with the successes of ART in Uganda. Thus, rather than to completely condemn the interests and demands of funders as profoundly flawed and problematic, my aim here has been to show how these emphases shape knowledge production: they end up shining a light on some things and necessarily not others. This, I have suggested, may be a problem, particularly if we leave uninterrogated the reasons why this light is shining where it is. I have thus tried to show not that this kind of knowledge is bad or unjust, but rather that it is incomplete. In a context of limited economic resources for global health, I would suggest not scrapping these commitments altogether, but rather adhering to them less dogmatically, and acknowledging the gaps and blind spots that are undeniably important in producing a more representative and more useful global health science.

This brings me back to the literature I referenced in the introduction on decolonising global health. As I mentioned then, there is no standard conception of what this actually means and there are many competing visions of it. I do not attempt here to offer one (Abimbola and Pai, 2020; Khan *et al.*, 2021). Nevertheless, a strong preoccupation of this literature, found in the comment sections of global and public health journals, is in relocating centres of global health decision-making to the Global South and in finding better ways to localise research and policymaking (Abimbola, 2024).

A particularly vocal and well-respected advocate of this position is the Nigerian researcher, Seye Abimbola. In a recent essay in *BMJ Global Health*, Abimbola (2021) argues that the current model of knowledge production in global health does not work: knowledge should not be made in scattered fashion across the Global South and fed upward to boards of decision-makers in lands far away for deliberation and policy-setting processes that aim to create general guidance for great swathes of diverse nations. Instead, Abimbola argues for a principle of subsidiarity: decentralising decision-making and knowledge production to smaller geographical units that nevertheless fit within a greater meta-structure so as to still benefit from larger-scale technical expertise where it is needed and relevant.

Such a model is one that chimes with many of the arguments I have made in this thesis. The current model, I have shown, does not work. In being stretched so far transnationally across vast spaces, global health science becomes divorced from the contexts it tries to serve. Perhaps the best way forward then, as Abimbola argues, is to break this up into smaller parts. For Abimbola, this is what decolonising global health is at its core – repositioning the architectures of decision-making such that decisions are made closer to the people they are made for. Localising knowledge is essential for this.

Bibliography

Abdalla, S. M. *et al.* (2020) 'What is considered as global health scholarship? A meta-knowledge analysis of global health journals and definitions', *BMJ Global Health*, 5(10), pp. 1–9. doi: 10.1136/bmjgh-2020-002884.

Abimbola, S. (2018) 'On the meaning of global health and the role of global health journals', *International Health*, 10, pp. 63–65. doi: 10.1093/inthealth/ihy010.

Abimbola, S. (2019) 'The foreign gaze: Authorship in academic global health', *BMJ Global Health*, 4, p. e002068. doi: 10.1136/bmjgh-2019-002068.

Abimbola, S. (2021) 'The uses of knowledge in global health', *BMJ Global Health*, 6, p. e005802. doi: 10.1136/bmjgh-2021-005802.

Abimbola, S. (2024) *The Foreign Gaze: Essays on Global Health*. iRD Éditions.

Abimbola, S. and Pai, M. (2020) 'Will global health survive its decolonisation?', *The Lancet*. Elsevier Ltd, 396(10263), pp. 1627–1628. doi: 10.1016/S0140-6736(20)32417-X.

Adams, V. (2005) 'Saving Tibet? An inquiry into modernity, lies, truths, and beliefs', *Medical Anthropology: Cross Cultural Studies in Health and Illness*, 24(1), pp. 71–110. doi: 10.1080/01459740590905651.

Adams, V. (2010) 'Against Global Health? Arbitrating Science, Non-Science, and Nonsense through Health', in Metzl, J. M. and Kirkland, A. (eds) *Against Health: How Health Became the New Morality*. New York: New York University Press, pp. 40–58. Available at: http://www.jstor.org/stable/j.ctt9qg6sk.7.

Adams, V. (2013) 'Evidence-Based Global Public Health: subjects, profits, erasures', in Biehl, J. and Petryna, A. (eds) *When People Come First: Critical Studies in Global Health*. Princeton, NJ: Princeton University Press. doi: 10.23943/princeton/9780691157382.003.0004.

Adams, V. (2016a) 'Introduction', in *Metrics: What Counts in Global Health*. Durham: Duke University Press.

Adams, V. (2016b) *Metrics: What Counts in Global Health*. Edited by V. Adams. Durham: Duke University Press.

Adams, V. (2016c) 'Metrics of the Global Sovereign: Numbers and Stories in Global Health', in *Metrics: What Counts in Global Health*. Durham: Duke University Press.

Adams, V. (2016d) 'What is critical global health?', *Medicine Anthropology Theory*, 3(2), pp. 186–197. doi: 10.17157/mat.3.2.429.

Adams, V. and Biehl, J. (2016) 'The work of evidence in critical global health', *Medicine Anthropology Theory*, 3(2), pp. 123–126. doi: 10.17157/mat.3.2.432.

Adams, V., Burke, N. J. and Whitmarsh, I. (2014) 'Slow Research: Thoughts for a Movement in Global Health', *Medical Anthropology: Cross Cultural Studies in Health and Illness*. Routledge, 33(3), pp. 179–197. doi: 10.1080/01459740.2013.858335.

Adams, V., Craig, S. R. and Samen, A. (2016) 'Alternative accounting in maternal and infant global health', *Global Public Health*, 11(3), pp. 276–294. doi: 10.1080/17441692.2015.1021364.

Aguilera, B., Degrazia, D. and Rid, A. (2020) 'Regulating international clinical research: An ethical framework for policy-makers', *BMJ Global Health*, 5(5), pp. 1–9. doi: 10.1136/bmjgh-2020-002287.

Allen, T. (2006) 'AIDS and evidence: Interogating some Ugandan myths', *Journal of Biosocial Science*, 38(1), pp. 7–28. doi: 10.1017/S0021932005001008.

Allen, T. and Heald, S. (2004) 'HIV/AIDS policy in Africa: What has worked in Uganda and what has failed in Botswana?', *Journal of International Development*, 16(8), pp. 1141–1154. doi: 10.1002/jid.1168.

Allen, T. and Parker, M. (2016) 'Deworming Delusions? Mass drug administration in East African schools', *Journal of Biosocial Science*, 48(S1), pp. S116–S147. doi: 10.1017/S0021932016000171.

Asiimwe-Okiror, G. *et al.* (1997) 'Change in sexual behaviour and decline in HIV infection among young pregnant women in urban Uganda', *Aids*, 11(14), pp. 1757–1763. doi: 10.1097/00002030-199714000-00013.

Associated Press (1985) 'British-born Judge Sworn In As Uganda's Chief Justice', *AP*, 16 August. Available at: https://apnews.com/article/d700ef50b859abb065f26c90994eb8ab.

Baer, H. A., Singer, M. and Susser, I. (2003) *Medical Anthropology and the World System*. Westport: Praeger.

Bédécarrats, F., Guérin, I. and Roubaud, F. (2020) *Randomized Control Trials in the Field of Development: a critical perspective*. Edited by F. Bédécarrats, I. Guérin, and F. Roubaud. Oxford: Oxford

University Press.

Belshaw, D., Lawrence, P. and Hubbard, M. (1999) ‘Agricultural tradables and economic recovery in Uganda: The limitations of structural adjustment in practice’, *World Development*, 27(4), pp. 673–690.

Benezra, A. (2016) ‘Datafying microbes: Malnutrition at the intersection of genomics and global health’, *BioSocieties*, 11(3), pp. 334–351. doi: 10.1057/jphp.2016.21.

Benton, A. (2017) ‘Whose Security? Militarization and Securitization During West Africa’s Ebola Outbreak’, in Hofman, M. and Sokhieng, A. (eds) *The Politics of Fear: Médecins sans Frontières and the West African Ebola Epidemic*. Oxford: Oxford University Press, pp. 25–50.

Bhattacharya, S., Medcalf, A. and Ahmed, A. (2020) ‘Humanities, criticality and transparency: global health histories and the foundations of inter-sectoral partnerships for the democratisation of knowledge’, *Humanities and Social Sciences Communications*. Springer US, 7(1), pp. 1–11. doi: 10.1057/s41599-020-0491-7.

Biehl, J. (2007) ‘Pharmaceuticalization: AIDS Treatment and Global Health Politics’, *Anthropological Quarterly*, 80(4), pp. 1083–1126. doi: 10.1353/anq.2007.0056.

Biehl, J. (2021) ‘The Pharmaceuticalization and Judicialization of Health: On the Interface of Medical Capitalism and Magical Legalism in Brazil’, *Osiris*, 36(1), pp. 309–327. doi: 10.1086/713426.

Biehl, J. and Petryna, A. (2013a) ‘Critical Global Health’, in Biehl, J. and Petryna, A. (eds) *When People Come First: Critical Studies in Global Health*. Princeton, NJ: Princeton University Press, pp. 1–20.

Biehl, J. and Petryna, A. (2013b) *When People Come First: Critical Studies in Global Health*. Edited by J. Biehl and A. Petryna. Princeton, NJ: Princeton University Press.

Biruk, C. (2012) ‘Seeing Like a Research Project: Producing “High-Quality Data” in AIDS Research in Malawi’, *Medical Anthropology: Cross Cultural Studies in Health and Illness*, 31(4), pp. 347–366. doi: 10.1080/01459740.2011.631960.

Biruk, C. (2018) *Cooking Data: Culture and Politics in an African Research World*. Durham and London: Duke University Press.

Biruk, C. (2019) ‘The MSM category as bureaucratic technology: Reflections on paperwork and project time in performance-based aid economics’, *Medicine Anthropology Theory*, 6(4), pp. 187–214.

Biruk, C. (2021) ‘The Politics of Global Health’, *PoLAR*, 44, pp. e161–e180. doi: 10.3828/mb.48.4.58.

Blouin, G. G. (2020) ‘Data Performativity and Health: The Politics of Health Data Practices in Europe’, *Science Technology and Human Values*, 45(2), pp. 317–341. doi: 10.1177/0162243919882083.

Boahene, K. (1996) ‘The IXth international conference on AIDS and STD in Africa’, *AIDS Care - Psychological and Socio-Medical Aspects of AIDS/HIV*, 8(5), pp. 609–616. doi: 10.1080/09540129650125560.

Bothwell, L. E. *et al.* (2016) ‘Medicine and Society Assessing the Gold Standard — Lessons from the History of RCTs’, *New England Journal of Medicine*, 374(22), pp. 2175–2181.

Boum II, Y. *et al.* (2018) ‘Advancing equitable global health research partnerships in Africa’, *BMJ Global Health*, 3(4), p. e000868. doi: 10.1136/bmjgh-2018-000868.

Boum II, Y. (2018) ‘Is Africa part of the partnership?’, *Medicine Anthropology Theory*, 5(2), pp. 25–34. doi: 10.17157/mat.5.2.527.

Boum, Y. *et al.* (2018) ‘Advancing equitable global health research partnerships in Africa’, *BMJ Global Health*, 3(4), pp. 5–8. doi: 10.1136/bmjgh-2018-000868.

Branch, A. (2013) ‘Gulu in War .. and Peace? The Town as Camp in Northern Uganda’, *Urban Studies*, 50(15), pp. 3152–3167. doi: 10.1177/0042098013487777.

Brett, E. A. (2008) ‘State failure and success in Uganda and Zimbabwe: The logic of political decay and Reconstruction in Africa’, *Journal of Development Studies*, 44(3), pp. 339–364. doi: 10.1080/00220380701848350.

Brown, H. (2015) ‘Global health partnerships, governance, and sovereign responsibility in western Kenya’, *American Ethnologist*, 42(2), pp. 340–355. doi: 10.1111/amet.12134.

Brown, H. and Kelly, A. H. (2014) ‘Material Proximities and Hotspots: Toward an Anthropology of Viral Hemorrhagic Fevers’, *Medical Anthropology Quarterly*, 28(2), pp. 280–303. doi: 10.1111/maq.12092.

Brown, T. M., Cueto, M. and Fee, E. (2006) ‘The World Health Organization and the transition from international to global public health’, *American Journal of Public Health*, 96(1), pp. 62–72. doi: 10.2105/AJPH.2004.050831.

Brownson, R. C. *et al.* (2011) *Evidence-Based Public Health*. Second. Oxford: Oxford University Press. doi: 10.1201/9781315155722-7.

Brownson, R. C., Fielding, J. E. and Maylahn, C. M. (2009) 'Evidence-based public health: A fundamental concept for public health practice', *Annual Review of Public Health*, 30, pp. 175–201. doi: 10.1146/annurev.publhealth.031308.100134.

Camlin, C. S. and Seeley, J. (2018) 'Qualitative research on community experiences in large HIV research trials: what have we learned?', *Journal of the International AIDS Society*, 21((S7)), p. e25173. doi: 10.1002/jia2.25173.

Castro, R. and Fleischer, S. (2020) 'Scientific policies and ethical economies in the development of vaccines against Zika', *Ilha Revista de Antropologia*, 22(2), pp. 63–95. doi: 10.5007/2175-8034.2020v22n2p63.

Clinton, C. and Sridhar, D. (2017) 'Who Funds Global Health?', in *Governing Global Health: Who Runs the World and Why?* Oxford: Oxford University Press, pp. 83–113.

Cousins, T. *et al.* (2021) 'The changing climates of global health', *BMJ Global Health*, 6(3), pp. 1–6. doi: 10.1136/bmjgh-2021-005442.

Craddock, S. (2017) 'Making Ties Through Making Drugs: Partnerships for tuberculosis drug and vaccine development', in Herrick, C. and Reubi, D. (eds) *Global Health and Geographical Imaginaries*. London: Routledge.

Crane, J. T. (2007) *Resistant to Treatment: AIDS, Science, and Power at the Dawn of Uganda's 'Treatment Era'*. University of California, San Francisco. doi: 2019.

Crane, J. T. (2010a) 'Adverse events and placebo effects: African scientists, HIV, and ethics in the "global health sciences"', *Social Studies of Science*, 40(6), pp. 843–870. doi: 10.1177/0306312710371145.

Crane, J. T. (2010b) 'Unequal "Partners". AIDS, Academia, and the Rise of Global Health', *Behemoth*, 3(3). doi: 10.1524/behe.2010.0021.

Crane, J. T. (2011a) 'Scrambling for Africa? Universities and global health', *The Lancet*. Elsevier Ltd, 377(9775), pp. 1388–1390. doi: 10.1016/S0140-6736(10)61920-4.

Crane, J. T. (2011b) 'Viral cartographies: Mapping the molecular politics of global HIV', *BioSocieties*, 6(2), pp. 142–166. doi: 10.1057/biosoc.2010.37.

Crane, J. T. (2013) *Scrambling for Africa: AIDS, Expertise, and the Rise of American Global Health Science*. Ithaca: Cornell University Press. doi: 10.1177/002193479902900503.

Crane, J. T. *et al.* (2019) 'The politics of funding research in global health partnerships', in García, J. and Parker, R. (eds) *Routledge Handbook on the Politics of Global Health*. London and New York: Routledge, pp. 53–62.

Cueto, M. (2004) 'The origins of primary health care and selective primary health care', *American Journal of Public Health*, 94(11), pp. 1864–1874. doi: 10.2105/AJPH.94.11.1864.

Cueto, M. (2013) 'A Return to the Magic Bullet?', in Biehl, J. and Petryna, A. (eds) *When People Come First: Critical Studies in Global Health*. Princeton, NJ: Princeton University Press.

Cummiskey, J. R. (2017) *Placing Global Science in Africa: International Networks, Local Places, and Virus Research in Uganda, 1936-2000*. Johns Hopkins University.

Dammann, O. (2019) 'Data, Information, Evidence, and Knowledge: A Proposal for Health Informatics and Data Science', *Online Journal of Public Health Informatics*, 10(3). doi: 10.5210/ojphi.v10i3.9631.

Davis, K. E., Kingsbury, B. and Merry, S. E. (2012) 'Indicators as a Technology of Global Governance', *Law and Society Review*, 46(1), pp. 71–104. doi: 10.1111/j.1540-5893.2012.00473.x.

Davis, S. L. M. (2020) 'The Uncounted: Key Populations', in *The Uncounted: Politics of Data in Global Health*. Cambridge University Press, pp. 45–64.

Dijkstra, A. G. and Van Donge, J. K. (2001) 'What does the "show case" show? Evidence of and lessons from adjustment in Uganda', *World Development*, 29(5), pp. 841–863. doi: 10.1016/S0305-750X(01)00007-9.

Dinwiddy, H. (1983) 'The Ugandan Army and Makerere under Obote , 1962-71', *African Affairs*, 82(326), pp. 43–59.

Donovan, K. P. (2018) 'The rise of the randomistas: on the experimental turn in international aid', *Economy and Society*. Taylor & Francis, 47(1), pp. 27–58. doi: 10.1080/03085147.2018.1432153.

Drain, P. K. *et al.* (2018) 'Global migration of clinical research during the era of trial registration', *PLoS ONE*, 13(2), pp. 1–13. doi: 10.1371/journal.pone.0192413.

Elbe, S. (2006) 'Should HIV/AIDS Be Securitized? The Ethical Dilemmas of Linking HIV/AIDS and Security', *International Studies Quarterly*, 50(1), pp. 119–144. doi: 10.1111/j.1468-2478.2006.00395.x.

Epstein, H. (2007) *The Invisible Cure: Africa, the West, and the Fight Against AIDS*. New York: Farrar, Straus, and Giroux.

Erikson, S. L. (2015) ‘Secrets from Whom? Following the money in global health finance’, *Current Anthropology*, 56(Supplement 12), pp. S306–S316. doi: 10.1086/683271.

Erikson, S. L. (2016) ‘Metrics and Market Logics of Global Health’, in *Metrics: What Counts in Global Health*. Durham: Duke University Press.

Erikson, S. L. (2019) ‘Faking Global Health’, *Critical Public Health*. Taylor & Francis, 29(4), pp. 508–516. doi: 10.1080/09581596.2019.1601159.

Farmer, P. E. (1996) ‘Social Inequalities and Emerging Infectious Diseases’, *Emerging Infectious Diseases*, 2(4), pp. 259–269.

Farmer, P. E. (1999) *Infections and Inequalities: The Modern Plagues*. Berkeley and Los Angeles: University of California Press.

Farmer, P. E. (2003) *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Berkeley and Los Angeles: University of California Press.

Farmer, P. E. (2004) ‘An Anthropology of Structural Violence’, *Current Anthropology*, 45(3), pp. 305–325.

Farmer, P. E. *et al.* (2013) *Reimagining Global Health: An Introduction*. Edited by P. E. Farmer et al. Berkeley and Los Angeles: University of California Press. Available at: https://www.ncbi.nlm.nih.gov/books/NBK558907/.

Fassin, D. (2008) ‘The embodied past. From paranoid style to politics of memory in South Africa’, *Social Anthropology*, 16(3), pp. 312–328. doi: 10.1111/j.1469-8676.2008.00045.x.

Fassin, D. (2012) ‘That Obscure Object of Global Health’, in Inhorn, M. C. and Wentzell, E. A. (eds) *Medical Anthropology at the Intersections: Histories, Activisms, and Futures*. Durham: Duke University Press, pp. 95–115. doi: 10.2307/j.ctv123x786.8.

Faure, M. C. *et al.* (2021) ‘Considering equity in global health collaborations: A qualitative study on experiences of equity’, *PLOS ONE*. Public Library of Science, 16(10), p. e0258286. Available at: https://doi.org/10.1371/journal.pone.0258286.

Feierman, S. *et al.* (2010) ‘Anthropology, knowledge-flows and global health’, *Global Public Health*, 5(2), pp. 122–128. doi: 10.1080/17441690903401338.

Feierman, S. (2011) ‘When physicians meet: Local medical knowledge and global public goods’, in Geissler, P. W. and Molyneux, C. (Sassy) (eds) *Evidence, Ethos and Experiment: The Anthropology and*

History of Medical Research in Africa. Berghahn Books, pp. 171–196.

Fisher, J. (2012) ‘Managing donor perceptions: Contextualizing Uganda’s 2007 intervention in Somalia’, *African Affairs*, 111(444), pp. 404–423. doi: 10.1093/afraf/ads023.

Fisher, J. (2014) ‘When it pays to be a “fragile state”: Uganda’s use and abuse of a dubious concept’, *Third World Quarterly*. Routledge, 35(2), pp. 316–332. doi: 10.1080/01436597.2014.878493.

Fouad, T. M. (2018) ‘Academic dependency: A postcolonial critique of global health collaborations in oncology’, *Medicine Anthropology Theory*, 5(2), pp. 127–141.

Foucault, M. (1976) *The Birth of the Clinic: An Archaeology of Medical Perception*. Routledge.

Foucault, M. (1978) *The History of Sexuality, Volume 1: The Will to Knowledge*. New York: Pantheon Books.

Foucault, M. (1980) *Power-Knowledge: Selected Interviews and Other Writings, 1972-1977*. New York: Pantheon Books.

Foucault, M. (1991) ‘Governmentality’, in Burchell, G., Gordon, C., and Miller, P. (eds) *The Foucault Effect: Studies in Governmentality*. Chicago: University of Chicago Press, pp. 87–104.

Garcia-Basteiro, A. L. and Abimbola, S. (2021) ‘The challenges of defining global health research’, *BMJ Global Health*, 6, p. e008169. doi: 10.1136/bmjgh-2021-008169.

Geissler, P. W. (2015) *Para-States and Medical Science: Making African Global Health*. Durham: Duke University Press.

Geissler, P. W. (2018) ‘Global Health Interventions and Research’, *The International Encyclopedia of Anthropology*. John Wiley & Sons. doi: 10.1002/9781118924396.wbiea2256.

Geissler, P. W. and Tousignant, N. (2016) ‘Capacity as history and horizon: infrastructure, autonomy and future in African health science and care’, *Canadian Journal of African Studies*. Routledge, 50(3), pp. 349–359. doi: 10.1080/00083968.2016.1267653.

Gimbel, S. *et al.* (2018) ‘Donor Data Vacuuming: Audit culture and the use of data in global health partnerships’, *Medicine Anthropology Theory*, 5(2), pp. 79–99. doi: 10.17157/mat.5.2.537.

Global Press Journal (2021) ‘A COVID-19 “Cure” - or a Waste of Taxpayer Money?’, 15 July. Available at: https://globalpressjournal.com/africa/uganda/covid-19-cure-waste-taxpayer-money/.

Goldenberg, M. J. (2012) ‘Innovating Medical Knowledge: Understanding Evidence-Based Medicine as a Socio-Medical Phenomenon’, in Sitara, N. (ed.) *Evidence-Based Medicine*. InTech Publications.

Available at: https://www.intechopen.com/books/advanced-biometric-technologies/liveness-detection-in-biometrics.

Graboyes, M., Gallagher, D. and Tappan, J. (2022) ‘Introduction to the special section: Histories of Global Health in Africa’, *Health and Place*. Elsevier Ltd, 77(June), p. 102863. doi: 10.1016/j.healthplace.2022.102863.

Gray, R. H. *et al.* (2007) ‘Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial’, *Lancet*, 369(9562), pp. 657–666. doi: 10.1016/S0140-6736(07)60313-4.

Green, E. (2008) *District Creation and Decentralisation in Uganda*. 24.

Haas, P. M. (1992) ‘Introduction: Epistemic communities and international policy coordination’, *International Organization*, 46(1), pp. 1–35. doi: 10.4324/9781315251981-10.

Hamdy, S. F. (2008) ‘When the state and your kidneys fail: Political etiologies in an Egyptian dialysis ward’, *American Ethnologist*, 35(4), pp. 553–569. doi: 10.1111/j.1548-1425.2008.00098.x.

Hansen, H. B. and Twaddle, M. (1991) *Changing Uganda: The Dilemmas of Structural Adjustment and Revolutionary Change*. Edited by H. B. Hansen and M. Twaddle. London: James Currey.

Harris, J. and White, A. (2019) ‘The sociology of global health a literature review’, *Sociology of Development*, 5(1), pp. 9–30. doi: 10.1525/sod.2019.5.1.9.

Headrick, D. R. (2014) ‘Sleeping Sickness Epidemics and Colonial Responses in East and Central Africa, 1900-1940’, *PLoS Neglected Tropical Diseases*, 8(4). doi: 10.1371/journal.pntd.0002772.

Herrick, C. and Reubi, D. (2017) *Global health and geographical imaginaries*, *Global Health and Geographical Imaginaries*. doi: 10.4324/9781315723525.

Holmes, D. R. and Marcus, G. E. (2005) ‘Cultures of Expertise and the Management of Globalization: Toward the Re-Functioning of Ethnography’, *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, pp. 235–252. doi: 10.1002/9780470696569.ch13.

Holmes, D. R. and Marcus, G. E. (2006) ‘Fast Capitalism: Para-Ethnography and the Rise of the Symbolic Analyst’, in Fisher, M. S. and Downey, G. (eds) *Frontiers of Capital*. Duke University Press, pp. 33–57. doi: 10.1215/9780822388234.

Hountondji, P. J. (1976) *African Philosophy: Myth and Reality*. Bloomington: Indiana University Press.

Hountondji, P. J. (1990) ‘Scientific Dependence in Africa Today’, *Research in African Literature*, 21(3), pp.

5–15.

Hountondji, P. J. (2002) *The Struggle for Meaning. Reflections on Philosophy, Culture and Democracy in Africa*. Ohio University Centre for International Studies.

Hountondji, P. J. (2006) 'Global Knowledge: Imbalances and Current Tasks', in Neave, G. (ed.) *Knowledge, Power and Dissent: Critical Perspectives on Higher Education and Research in Knowledge Society*. Paris: UNESCO Publishing, pp. 41–60. Available at: https://ris.utwente.nl/ws/portalfiles/portal/48111043/Neave2006knowledge.pdf#page=36.

Hountondji, P. J. (2009) 'Knowledge of Africa, Knowledge by Africans: Two Perspectives on African Studies', *RCCS Annual Review*, (1). doi: 10.4000/rccsar.174.

IHME (2021) *Financing Global Health 2021: Global Health Priorities in a Time of Change*. Seattle. Available at: https://www.healthdata.org/policy-report/financing-global-health-2021-global-health-priorities-time-change.

Iliffe, J. (1998) *East African Doctors: A History of the Modern Profession*. Cambridge: Cambridge University Press. doi: 10.2307/525235.

Iliffe, J. (2006) *The African AIDS Epidemic: A History*. Athens: Ohio University Press.

Ingham, K. (1958) *The Making of Modern Uganda*. London: George Allen and Unwin Ltd.

Ingram, A. (2005) 'The New Geopolitics of Disease: Between Global Health and Global Security', *Geopolitics*, 10(3), pp. 522–545. doi: 10.1080/14650040591003516.

Ingram, A. (2018) 'Critical Approaches to Global Health', in McInnes, C., Lee, K., and Youde, J. (eds) *The Oxford Handbook of Global Health Politics*. Oxford: Oxford University Press, pp. 85–100. doi: 10.1093/oxfordhb/9780190456818.013.5.

Inzaule, S. C. *et al.* (2021) 'Genomic-Informed Pathogen Surveillance in Africa: opportunities and challenges', *The Lancet Infectious Diseases*. Elsevier Ltd, 21(9), pp. e281–e289. doi: 10.1016/S1473-3099(20)30939-7.

Jensen, N. (2019) *Proofs and Politics: Re-assembling evidence-informed health policy in global health as a matter of and for care*. Goldmsiths, University of London.

Kaida, A. *et al.* (2008) 'The relationship between HAART use and sexual activity among HIV-positive women of reproductive age in Brazil, South Africa, and Uganda', *AIDS Care*, 20(1), pp. 21–25. doi:

10.1080/09540120701426540.

Kaleebu, P. *et al.* (2015) 'The Medical Research Council (UK)/Uganda Virus Research Institute Uganda Research Unit on AIDS - "25 years of research through partnerships"', *Tropical Medicine and International Health*, 20(2), pp. E1–E10. doi: 10.1111/tmi.12415.

Kaleebu, P. (2020) *Director's Message, Uganda Virus Research Institute*. Available at: https://www.uvri.go.ug/directors-message (Accessed: 4 November 2020).

Kelly, A. H. (2018) 'Ebola vaccines, evidentiary charisma and the rise of global health emergency research', *Economy and Society*. Taylor & Francis, 47(1), pp. 135–161. doi: 10.1080/03085147.2018.1448557.

Kelly, A. H. and McGoey, L. (2018) 'Facts, Power and Global Evidence: a new empire of truth', *Economy and Society*. Taylor & Francis, 47(1), pp. 1–26. doi: 10.1080/03085147.2018.1457261.

Kelly, R. *et al.* (1999) 'Age of male circumcision and risk of prevalent HIV infection in rural Uganda', *AIDS*, 13(3), pp. 399–405. doi: 10.1097/00002030-199902250-00013.

Kenworthy, N. J., Thomas, L. M. and Crane, J. T. (2018) 'Introduction: Critical perspectives on global health partnerships in Africa and beyond', *Medicine Anthropology Theory*, 5(2). doi: 10.17157/mat.5.2.615.

Khan, M. *et al.* (2021) 'Decolonising global health in 2021: A roadmap to move from rhetoric to reform', *BMJ Global Health*, 6, p. e005604. doi: 10.1136/bmjgh-2021-005604.

King, N. B. (2002) 'Security, Disease, Commerce: Ideologies of Postcolonial Global Health', *Social Studies of Science*. doi: 10.1177/030631270203200507.

King, N. B. and Koski, A. (2020) 'Defining global health as public health somewhere else', *BMJ Global Health*, 5(1), pp. 2019–2021. doi: 10.1136/bmjgh-2019-002172.

Kinsman, J. F. (2008) *Pragmatic Choices: Research, Politics, and AIDS Control in Uganda*. University of Amsterdam.

Kinsman, J. F. (2010) *AIDS Policy in Uganda Evidence, Ideology, and the Making of an African Success Story*. New York: Palgrave-Macmillan. doi: 10.1017/CBO9781107415324.004.

Kleinman, A. (1995) *Writing at the Margin: Discourse between Anthropology and Medicine*. Berkeley and Los Angeles: University of California Press.

Kleinman, A. (2010) 'Four social theories for global health.', *Lancet*, 375(9725), pp. 1518–1519. doi:

10.1016/S0140-6736(10)60646-0.

Knorr Cetina, K. (1999) *Epistemic Cultures*. Cambridge, MA: Harvard University Press.

Konde-Lule, J. K. (1995) 'The declining HIV seroprevalence in Uganda: what evidence?', *Health Transition Review*, 5, Supplem(The Third World AIDS Epidemic), pp. 27–33.

Konde-Lule, J. K., Tumwesigye, M. N. and Lubanga, R. G. (1997) 'Trends in attitudes and behaviour relevant to AIDS in Ugandan community.', *East African Medical Journal*, 74(7), pp. 406–10. Available at: http://www.ncbi.nlm.nih.gov/pubmed/9491169.

Koplan, J. P. *et al.* (2009) 'Towards a common definition of global health', *The Lancet*, 373(9679), pp. 1993–1995. doi: 10.1016/S0140-6736(09)60332-9.

Kuhanen, J. (2008) 'The Historiography of HIV and AIDS in Uganda', *History in Africa*, 35, pp. 301–325. doi: 10.1353/hia.0.0009.

Kuhanen, J. (2010a) '"Balinsalamu embawo?" AIDS and the context of sexual behaviour adjustment in Rakai, Uganda, c. 1975-90', *Journal of Eastern African Studies*, 4(1), pp. 20–43. doi: 10.1080/17531050903550108.

Kuhanen, J. (2010b) 'Challenging power and meaning: Outlining the popular epidemiology of HIV and AIDS in Rakai, Uganda, c. 1975-1990', *African Journal of AIDS Research*, 9(1), pp. 81–94. doi: 10.2989/16085906.2010.484584.

Kuhanen, J. (2010c) 'Sexualised space, sexual networking & the emergence of AIDS in Rakai, Uganda', *Health and Place*, 16(2), pp. 226–235. doi: 10.1016/j.healthplace.2009.10.001.

Kuhanen, J. (2015) '"No sex until marriage!": moralism, politics and the realities of HIV prevention in Uganda, 1986–1996', *Journal of Eastern African Studies*. Taylor & Francis, 9(2), pp. 270–288. doi: 10.1080/17531055.2015.1036500.

Lachenal, G. (2015) 'Lessons in Medical Nihilism: Virus Hunters, Neoliberalism, and the AIDS Pandemic in Cameroon', in Wenzel Geissler, P. (ed.) *Para-States and Medical Science: Making African Global Health*. Durham and London: Duke University Press.

Lakoff, A. (2010) 'Two Regimes of Global Health', *Humanity: An International Journal of Human Rights, Humanitarianism, and Development*, 1(1), pp. 59–79. doi: 10.1525/9780520968417-004.

Lakoff, A. (2015) 'Global Health Security and the Pathogenic Imaginary', in Jasanoff, S. and Kim, S.-H.

(eds) *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press, pp. 300–320. doi: 10.7208/chicago/9780226276663.003.0014.

Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge: Harvard University Press.

Latour, B. (1988) *The Pasteurisation of France*. Cambridge, MA: Harvard University Press.

Latour, B. (1993) *We Have Never Been Modern*. Cambridge, MA: Harvard University Press.

Latour, B. and Woolgar, S. (1979) *Laboratory Life: the Social Construction of Scientific Facts*. Beverley Hills: SAGE Publications Ltd.

Law, J. and Urry, J. (2004) 'Enacting the social', *Economy and Society*, 33(3), pp. 390–410. doi: 10.1080/0308514042000225716.

Lawrence, D. S. and Hirsch, L. A. (2020) 'Decolonising global health: transnational research partnerships under the spotlight', *International Health*, 12(6), pp. 518–523. doi: 10.1093/inthealth/ihaa073.

Leopold, M. (2020) *Idi Amin: The Story of Africa's Icon of Evil*. New Haven: Yale University Press.

Lezaun, J. (2018) 'The deferred promise of radical cure: pharmaceutical conjugations of malaria in the global health era', *Economy and Society*. Taylor & Francis, 47(4), pp. 547–571. doi: 10.1080/03085147.2018.1528075.

Li, T. M. (2007) *The Will to Improve: Governmentality, Development, and the Practice of Politics*. Durham and London: Duke University Press.

Livingston, J. (2012) *Improvising Medicine: An African Oncology Ward in an Emerging Cancer Epidemic*. Durham and London: Duke University Press. doi: 10.3366/soma.2016.0179.

Lorway, R. and Khan, S. (2014) 'Reassembling epidemiology: Mapping, monitoring and making-up people in the context of HIV prevention in India', *Social Science and Medicine*. Elsevier Ltd, 112, pp. 51–62. doi: 10.1016/j.socscimed.2014.04.034.

Lowe Morna, C. (1989) 'Back to School: The Revitalization of Makerere', *Africa Report*. New York, 34(2), pp. 48–51.

Mahajan, M. (2008) 'Designing epidemics: Models, policy-making, and global foreknowledge in India's AIDS epidemic', *Science and Public Policy*, 35(8), pp. 585–596. doi: 10.3152/030234208X377227.

Mamdani, M. (1983) *Imperialism and Fascism in Uganda*. London: Heinemann.

Marcus, G. E. (1995) ‘Ethnography in/of the World System : The Emergence of Multi-Sited Ethnography’, *Annual Review of Anthropology*, 24(1995), pp. 95–117.

Masekela, R. *et al.* (2022) ‘Building research capacity to correct global health’s wrongs.’, *The Lancet. Global health*, 10(2), pp. e175–e176. doi: 10.1016/S2214-109X(21)00491-5.

Mbulaiteye, S. M. *et al.* (2002) ‘Declining HIV-1 incidence and associated prevalence over 10 years in a rural population in south-west Uganda: A cohort study’, *The Lancet*, 360, pp. 41–46. doi: 10.1016/S0140-6736(02)09331-5.

McCoy, D., Chand, S. and Sridhar, D. (2009) ‘Global Health Funding: how much, where it comes from and where it goes’, *Health Policy and Planning*, 24, pp. 407–417. doi: 10.1093/heapol/czp026.

McGoey, L. (2012) ‘Strategic unknowns: Towards a sociology of ignorance’, *Economy and Society*, 41(1), pp. 1–16. doi: 10.1080/03085147.2011.637330.

McInnes, C. and Lee, K. (2012) *Global Health and International Relations*. Cambridge: Polity Press.

McKay, R. (2018) *Medicine in the Meantime: The Work of Care in Mozambique*. Durham: Duke University Press. doi: 10.1353/anq.2019.0029.

Meinert, L. and Whyte, S. R. (2014) ‘Epidemic Projectification: AIDS Responses in Uganda as Event and Process’, *The Cambridge Journal of Anthropology*, 32(1), pp. 77–94. doi: 10.3167/ca.2014.320107.

Merry, S. E. (2011) ‘Measuring the World: Indicators, Human Rights, and Global Governance’, *Current Anthropology*, 52(SUPPL. 3), pp. 83–95. doi: 10.1086/657241.

Messac, L. and Prabhu, K. (2013) ‘Redefining the Possible: The Global AIDS Response’, in Farmer, P. et al. (eds) *Reimagining Global Health: an Introduction*. Berkeley: University of California Press, pp. 117–119.

Mika, M. (2015) *Research is our Resource: surviving experiments and politics at an African Cancer Institute, 1950 to the present*. University of Pennsylvania.

Mika, M. (2021) *Africanizing Oncology: Creativity, Crisis, and Cancer in Uganda*. Athens: Ohio University Press.

Mills, D. (2006) ‘Life on the Hill: Students and the Social History of Makerere’, *Africa*, 76(2), pp. 247–266.

Montgomery, C. M. *et al.* (2017) ‘Critique and Complicity: STS and Global Health’, *Science and Technology*

Studies, 30(3), pp. 2–12.

Morgan, L. M. (2005) ‘Political Economy of Health’, in Restivo, S. P. (ed.) *Science, Technology, and Society: An Encyclopedia*. Oxford: Oxford University Press, pp. 401–406.

Morris, C. N. and Ferguson, A. G. (2006) ‘Estimation of the sexual transmission of HIV in Kenya and Uganda on the trans-Africa highway : the continuing role for prevention in high risk groups’, *Sexually Transmitted Infections*, 82, pp. 368–371.

Morris, C. N., Morris, S. R. and Ferguson, A. G. (2009) ‘Sexual Behavior of Female Sex Workers and Access to Condoms in Kenya and Uganda on the trans-Africa Highway’, *AIDS and Behavior*, 13, pp. 860–865. doi: 10.1007/s10461-008-9431-z.

Morsy, S. (1979) ‘The Missing Link in Medical Anthropology: The Political Economy of Health’, *Reviews in Anthropology*, 6(3), pp. 349–363. doi: 10.1080/00988157.1979.9977458.

Moyi Okwaro, F. and Geissler, P. W. (2015) ‘In/dependent Collaborations: Perceptions and Experiences of African Scientists in Transnational HIV Research’, *Medical Anthropology Quarterly*, 29(4), pp. 492–511. doi: 10.1111/maq.12206.

Mugyenyi, P. (2008) *Genocide by Denial*. Kampala: Fountain Publishers. doi: 10.1016/s1473-3099(08)70252-4.

Mulder, D. *et al.* (1995) ‘Decreasing HIV-1 seroprevalence in young adults in a rural Ugandan cohort’, *British Medical Journal*, 311(7009), p. 833. doi: 10.1136/bmj.311.7009.833.

Mungherera, M. *et al.* (1997) ‘HIV/AIDS-related attitudes and practices of hospital-based health workers in Kampala, Uganda.’, *AIDS*, 11 Suppl 1(112), pp. S79-85. Available at: http://www.ncbi.nlm.nih.gov/pubmed/9376105.

Mutibwa, P. (1992) *Uganda Since Independence: A Story of Unfilfilled Hopes*. London: Hurst.

Muyinda, H. and Mugisha, J. (2015) ‘Stock-outs, uncertainty and improvisation in access to healthcare in war-torn Northern Uganda’, *Social Science and Medicine*. Elsevier Ltd, 146, pp. 316–323. doi: 10.1016/j.socscimed.2015.10.022.

Nakanjako, D. *et al.* (2022) ‘Infectious Diseases Institute at Makerere University College of Health Sciences: a case study of a sustainable capacity building model for health care, research and training’, *African Health Sciences*, 22(2), pp. 1–10. doi: 10.4314/ahs.v22i2.3S.

New Vision (2022) ‘Uganda making progress on COVID vaccine development’, 28 July. Available at: https://www.newvision.co.ug/category/news/uganda-making-progress-on-covid-vaccine-devel-139563.

Nguyen, V. K. (2009) ‘Government-by-exception: Enrolment and experimentality in mass HIV treatment programmes in Africa’, *Social Theory and Health*, 7(3), pp. 196–217. doi: 10.1057/sth.2009.12.

Nguyen, V. K. (2010) *The Republic of Therapy: Triage and Sovereignty in West Africa’s Time of AIDS*. Durham and London: Duke University Press.

Nguyen, V. K. and Peschard, K. (2003) ‘Anthropology, inequality, and disease: A review’, *Annual Review of Anthropology*, 32, pp. 447–474. doi: 10.1146/annurev.anthro.32.061002.093412.

NIH (2023) *NIH RePORT*. Available at: https://report.nih.gov/ (Accessed: 24 May 2023).

Nunes, J. (2023) ‘Rewriting global health’, *Saude e Sociedade*, 32(3), pp. 1–12. doi: 10.1590/S0104-12902023230316en.

Office of the President, Republic of Uganda (2021) ‘President launches clinical trials for UBV-01N COVID-19 drug’, 1 September. Available at: https://op.go.ug/article?id=1 (Accessed: 8 March 2023).

Oyugi, J. H. *et al.* (2004) ‘Multiple validated measures of adherence indicate high levels of adherence to generic HIV antiretroviral therapy in a resource-limited setting’, *Journal of Acquired Immune Deficiency Syndromes*, 36(5), pp. 1100–1102. doi: 10.1097/00126334-200408150-00014.

Packard, R. M. (2016) *A History of Global Health: interventions into the lives of other peoples*. Baltimore: Johns Hopkins University Press.

Packard, R. M. and Epstein, P. (1991) ‘Epidemiologists, social scientists, and the structure of medical research on AIDS in Africa’, *Social Science and Medicine*, 33(7), pp. 771–783. doi: 10.1016/0277-9536(91)90376-N.

Parker Allen, J. (2025) ‘“The Donors are Everything”: Precarity and the Political Economy of Knowledge Production in Global Health Science’, *Medicine Anthropology Theory*, 12(1).

Parker, M. and Allen, T. (2014) ‘De-Politicizing Parasites: Reflections on Attempts to Control the Control of Neglected Tropical Diseases’, *Medical Anthropology: Cross Cultural Studies in Health and Illness*. Routledge, 33(3), pp. 223–239. doi: 10.1080/01459740.2013.831414.

Parkhurst, J. O. (2001a) ‘A Unique Policy: The Evolution of HIV/AIDS Prevention under the National

Resistance Movement', in Musisi, N. and Dodge, C. (eds) *Transformations in Uganda*. Kampala: Makerere Institute of Social Research and Cuny Centre, pp. 297–309.

Parkhurst, J. O. (2001b) 'The Crisis of AIDS and the Politics of Response', *International Relations*, 15(6), pp. 69–87.

Parkhurst, J. O. (2002) 'The Ugandan success story? Evidence and claims of HIV-1 prevention', *The Lancet*, 360(9326), pp. 78–80. doi: 10.1016/S0140-6736(02)09340-6.

Parkhurst, J. O. (2008) '"What worked?": The evidence challenges in determining the causes of HIV prevalence decline', *AIDS Education and Prevention*, 20(3), pp. 275–283. doi: 10.1521/aeap.2008.20.3.275.

Parkhurst, J. O. (2012) 'Framing, ideology and evidence: Uganda's HIV success and the development of PEPFAR's "ABC" policy for HIV prevention', *Evidence and Policy*, 8(1), pp. 17–36. doi: 10.1332/174426412X620119.

Parkhurst, J. O. (2017) *The Politics of Evidence: From evidence-based policy to the good governance of evidence*. Abingdon: Routledge. doi: 10.4324/9781315675008.

Parkhurst, J. O. and Lush, L. (2004) 'The political environment of HIV: Lessons from a comparison of Uganda and South Africa', *Social Science and Medicine*, 59(9), pp. 1913–1924. doi: 10.1016/j.socscimed.2004.02.026.

Patton, C. (1990) *Inventing AIDS*. New York: Routledge.

Pepin, J. (2011) *The Origins of AIDS*. Cambridge: Cambridge University Press. doi: 10.1017/CBO9781139005234.

Petryna, A. (2005) 'Ethical Variability: Drug Development and Globalizing Clinical Trials', *American Ethnologist*, 32(2), pp. 183–197.

Petryna, A. (2009) *When Experiments Travel: Clinical Trials and the Global Search for Human Subjects*. Princeton, NJ: Princeton University Press.

Pfeiffer, J. and Nichter, M. (2008) 'What Can Critical Medical Anthropology Contribute to Global Health ? A Health Systems Perspective', *Medical Anthropology Quarterly*, 22(4), pp. 410–415. doi: 10.1111/j.l548-1387.2008.00041.x.

Policy Cures Research (2023) *Methodology*, *G-Finder Methodology*. Available at:

https://gfinderdata.policycuresresearch.org/assets/media/pdf/About_G-FINDER_Methodology.pdf.

Porter, H. (2017) *After Rape*. doi: 10.1017/9781316841297.

Porter, T. M. (1992) 'Quantification and the Accounting Ideal in Science', *Social Studies of Science*, 22, pp. 635–652.

Power, M. (1997) *The Audit Society: Rituals of Verification*. Oxford: Oxford University Press.

Prince, R. J. and Marsland, R. (2014) *Making and Unmaking Public Health in Africa: Ethnographic and Historical Perspectives*. Edited by R. J. Prince and R. Marsland. Athens: Ohio University Press. doi: 10.1093/afraf/adw064.

Pringle, Y. (2015) 'Investigating "Mass Hysteria" in Early Postcolonial Uganda: Benjamin H. Kagwa, East African Psychiatry, and the Gisu', *Journal of the History of Medicine and Allied Sciences*, 70(1), pp. 105–136. doi: 10.1093/jhmas/jrt055.

Pringle, Y. (2016) 'Crossing the divide: Medical missionaries and government service in Uganda, 1897-1940', in *Beyond the State: The colonial medical service in British Africa*. Manchester: Manchester University Press, pp. 19–38.

Raees, M. Q. *et al.* (2023) 'Capacity Building in Pediatric Critical Care-Global Health Research and Education: The Blantyre Experience.', *The American journal of tropical medicine and hygiene*, 109(2), pp. 225–227. doi: 10.4269/ajtmh.22-0445.

Reid, R. J. (2017) *A History of Modern Uganda*. Cambridge: Cambridge University Press.

Reubi, D. (2018a) 'A genealogy of epidemiological reason: Saving lives, social surveys and global population', *BioSocieties*. Palgrave Macmillan UK, 13(1), pp. 81–102. doi: 10.1057/s41292-017-0055-2.

Reubi, D. (2018b) 'Epidemiological accountability: philanthropists, global health and the audit of saving lives', *Economy and Society*. Taylor & Francis, 47(1), pp. 83–110. doi: 10.1080/03085147.2018.1433359.

Reubi, D. (2020) 'Epidemiological Imaginaries of the Social: Epidemiologists and Pathologies of Modernization in Postcolonial Africa', *Medical Anthropology Quarterly*, 34(3), pp. 438–455. doi: 10.1111/maq.12609.

Riedemann, A. (1993) *Science that Colonises: A Critique of Fertility Studies in Africa*. Philadelphia: Temple University Press.

Rieder, S. (2016) 'Interrogating the global health and development nexus: Critical viewpoints of neoliberalization and health in transnational spaces', *World Development Perspectives*, 2, pp. 55–61. doi: 10.1016/j.wdp.2016.10.004.

Ronald, A. R. *et al.* (2011) 'The Infectious Diseases Institute at Makerere University, Kampala, Uganda', *Infectious Disease Clinics of North America*, 25(2), pp. 369–383. doi: 10.1016/j.idc.2011.02.007.

Rottenburg, R. (2009) 'Social and public experiments and new figurations of science and politics in postcolonial Africa', *Postcolonial Studies*, 12(4), pp. 423–440. doi: 10.1080/13688790903350666.

Sackett, D. L. *et al.* (1996) 'Evidence based medicine: what it is and what it isn't', *BMJ*, 312(7023), pp. 71–72. doi: 10.1136/bmj.312.7023.71.

Schrecker, T. (2022) 'What is critical about critical public health? Focus on health inequalities', *Critical Public Health*. Taylor & Francis, 32(2), pp. 139–144. doi: 10.1080/09581596.2021.1905776.

Schumaker, L. (2001) *Africanizing Anthropology: Fieldwork, Networks, and the Making of Cultural Knowledge in Central Africa*. Durham: Duke University Press.

Schwartländer, B. and Sittitrai, W. (1998) 'Commentary: HIV/AIDS in the 1990s and beyond', *Bulletin of the World Health Organization*, 76(5), pp. 437–443.

Scott, J. C. (1985) *Weapons of the Weak: Everyday Forms of Peasant Resistance*. New Haven: Yale.

Scott, J. C. (1998) *Seeing Like a State: why certain schemes to improve the human condition have failed*. New Haven: Yale University Press.

Seeley, J. *et al.* (1991) 'The development of a community-based HIV/AIDS counselling service in a rural area in Uganda', *AIDS Care*, 3(2), pp. 207–217. doi: 10.1080/09540129108253064.

Serwadda, D. *et al.* (1985) '"Slim" Disease: a new disease in Uganda and its association with HTLV-III infection', *The Lancet*. doi: 10.1016/S0140-6736(85)90122-9.

Serwadda, D. *et al.* (1992) 'HIV risk factors in three geographic strata of rural Rakai District, Uganda.', *AIDS*, 6(9), pp. 983–9. doi: 10.1097/00002030-199209000-00012.

Serwadda, D. *et al.* (1995) 'The social dynamics of HIV transmission as reflected through discordant couples in rural Uganda.', *AIDS*, 9(7), pp. 745–50. doi: 10.1097/00002030-199507000-00012.

Sinclair, S. (1997) *Making Doctors: An Institutional Apprenticeship*. London: Routledge.

Slutkin, G. *et al.* (2006) 'How Uganda reversed its HIV epidemic', *AIDS and Behavior*, 10(4), pp. 351–360. doi: 10.1007/s10461-006-9118-2.

STD/AIDS Control Programme (1995) *HIV/AIDS Surveillance Report, March 1995*. Entebbe.

Stegenga, J. (2014) 'Down with the Hierarchies', *Topoi*, 33(2), pp. 313–322. doi: 10.1007/s11245-013-9189-4.

Stoler, A. L. (2008) 'Epistemic Politics: Ontologies of Colonial Common Sense', *Philosophical Forum*, 39(3), pp. 349–361. doi: 10.1111/j.1467-9191.2008.00303.x.

Strathern, M. (2000) *Audit Cultures: Anthropological Studies in Accountability, Ethics and the Academy*. London: Routledge.

Strong, A. E. (2020) *Documenting Death: Maternal Mortality and the Ethics of Care in Tanzania*. Oakland: University of California Press.

Sturdy, S. (1992) 'The political economy of scientific medicine: Science, education and the transformation of medical practice in sheffield, 1890–1922', *Medical History*, 36(2), pp. 125–159. doi: 10.1017/S0025727300054983.

Taylor, E. M. and Harper, I. (2014) 'The Politics and Anti-Politics of the Global Fund Experiment: Understanding Partnership and Bureaucratic Expansion in Uganda', *Medical Anthropology: Cross Cultural Studies in Health and Illness*. Routledge, 33(3), pp. 206–222. doi: 10.1080/01459740.2013.796941.

Tenny, S. and Varacallo, M. (2022) 'Evidence Based Medicine', in *StatPearls*. Treasure Island, Florida: StatPearls Publishing, pp. 2–4. Available at: https://www.ncbi.nlm.nih.gov/books/NBK470182/.

The Economist (1999) 'AIDS in the Third World: a global disaster', *The Economist*, January, pp. 42–44.

The New Humanitarian (2006) 'Profile of Yoweri Kaguta Museveni', *The New Humanitarian*, February. Available at: https://www.thenewhumanitarian.org/report/58146/uganda-profile-yoweri-kaguta-museveni.

The New York Times (1996) 'Some Hope on Third-World AIDS', *The New York Times*, 7 October.

Thornton, R. J. (2008) *Unimagined Community: Sex, networks, and AIDS in Uganda and South Africa*. London: University of California Press. doi: 10.1163/156921009x458154.

Tilley, H. (2011) *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific*

Knowledge, 1870-1950. Chicago: University of Chicago Press.

Tilley, H. (2016) 'Medicine, Empires, and Ethics', *AMA Journal of Ethics*, 18(7), pp. 743–753.

Tousignant, N. (2018) *Edges of Exposure: Toxicology and the Problem of Capacity in Postcolonial Senegal*. Durham and London: Duke University Press. doi: 10.1080/00083968.2019.1662576.

Treichler, P. A. (1999) *How to Have Theory in an Epidemic*. Durham: Duke University Press. doi: 10.1215/9780822396963.

Tsing, A. (2005) *Friction: An Ethnography of Global Connection*. Princeton, NJ: Princeton University Press.

Twaddle, M. (1988) 'The emergence of politico-religious groupings in late nineteenth-century buganda', *The Journal of African History*, 29, pp. 81–92. doi: 10.1017/S0021853700036008.

UBOS (2020) 'Population Projections by District 2015-2021'. Kampala: Government of Uganda. Available at: https://www.ubos.org/wp-content/uploads/statistics/Population-projections-by-district-2015-2021.xlsx.

UNAIDS (1998a) 'AIDS Epidemic Update: December 1998', *UNAIDS Joint United Nations Programme on HIV/AIDS*, (December), pp. 1–17.

UNAIDS (1998b) *Partners in prevention: International case studies of effective health promotion practice in HIV/AIDS, UNAIDS Best Practice Collection*. Available at: http://whqlibdoc.who.int/publications/1998/a61421.pdf.

USAID (1999) *Uganda and HIV/AIDS: Key Talking Points*. Available at: www.info.usaid.gov/pop_health.

Vaughan, M. (1991) *Curing their Ills: Colonial Power and African Illness*. Cambridge: Cambridge University Press.

Vernooij, E. *et al.* (2020) *Laboratory strengthening in public health emergencies: perspectives from Sierra Leone*.

Viergever, R. F. (2013) 'The mismatch between the health research and development (R&D) that is needed and the R&D that is undertaken: an overview of the problem, the causes, and solutions.', *Global Health Action*, 6(1), p. 22450. doi: 10.3402/gha.v6i0.22450.

Wahlberg, A. and McGoey, L. (2007) 'An Elusive Evidence Base: The Construction and Governance of Randomized Controlled Trials', *BioSocieties*, 2(1), pp. 1–10. doi: 10.1017/s1745855207005017.

Wailoo, K. *et al.* (2010) *Three Shots at Prevention: The HPV Vaccine and the Politics of Medicine's Simple*

Solutions. JHU Press.

Wawer, M. J. *et al.* (1991) 'Dynamics of spread of HIV-I infection in a rural district of Uganda', *British Medical Journal*, 303(6813), pp. 1303–1306. doi: 10.1136/bmj.303.6813.1303.

Wawer, M. J. *et al.* (1994) 'Incidence of HIV-1 infection in a rural region of Uganda', *British Medical Journal*, 308(6922), p. 171. doi: 10.1136/bmj.308.6922.171.

Wawer, M. J. *et al.* (1997) 'Trends in HIV-1 prevalence may not reflect trends in incidence in mature epidemics: Data from the Rakai population-based cohort, Uganda', *AIDS*, 11(8), pp. 1023–1030. doi: 10.1097/00002030-199708000-00011.

Webber, S. and Prouse, C. (2018) 'The New Gold Standard: The Rise of Randomized Control Trials and Experimental Development', *Economic Geography*. Routledge, 94(2), pp. 166–187. doi: 10.1080/00130095.2017.1392235.

Weisz, G. and Tousignant, N. (2019) 'International health research and the emergence of global health in the late twentieth century', *Bulletin of the History of Medicine*, 93(3), pp. 365–400. doi: 10.1353/bhm.2019.0049.

Wendland, C. L. (2016a) 'Estimating Death: a close reading of maternal mortality metrics in Malawi', in Adams, V. (ed.) *Metrics*. Durham: Duke University Press, pp. 57–81.

Wendland, C. L. (2016b) 'Opening up the black box: looking for a more capacious version of capacity in global health partnerships', *Canadian Journal of African Studies*. Routledge, 50(3), pp. 415–435. doi: 10.1080/00083968.2016.1266675.

Wendo, C. (2004) 'Uganda begins distributing free antiretrovirals', *The Lancet*, 363(9426), p. 2062. doi: 10.1016/s0140-6736(04)16496-9.

Whyte, S. R. *et al.* (2013) 'Therapeutic Clientship: Belonging in Uganda's Projectified Landscape of AIDS Care', in Biehl, J. and Petryna, A. (eds) *When People Come First: Critical Studies in Glwobal Health*. Princeton University Press.

Willyard, C. (2007) 'Cutting the Risk: Bloomberg School researchers working in Uganda have shown that circumcision is a surprisingly effective way to prevent HIV transmission', *Johns Hopkins Magazine*, September. Available at: https://pages.jh.edu/jhumag/0907web/cutting.html.

Winslow, C. (1920) 'The untilled field of public health', *Modern Medicine*, 2, pp. 183–191.

Witeska-Młynarczyk, A. (2015) 'Critical medical anthropology – A voice for just and equitable healthcare', *Annals of Agricultural and Environmental Medicine*, 22(2), pp. 385–389. doi: 10.5604/12321966.1152099.

World Bank (1997) *Confronting Aids: Public Priorities in a Global Epidemic*, *World Bank Policy Research Report*. Edited by M. Ainsworth and A. M. Over. New York: Oxford University Press. doi: 10.2307/2807998.

World Bank (2001) *World Development Report 2000/2001: Attacking Poverty*. New York: Oxford University Press.

World Bank and UNAIDS (2001) *AIDS, Poverty Reduction, and Debt Relief: A Toolkit for Mainstreaming HIV/AIDS Programs into Development Instruments*.

Zlowodzki, M. *et al.* (2007) 'How to Write a Grant Proposal', *Indian Journal of Orthopaedics*, 41(1), pp. 23–26. doi: 10.4103/0019-5413.30521.