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REVIEW ESSAYS

Research as Development

Book Forum

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Introduction

Tom Widger

Research as Development: Biomedical Research, Ethics, and Collaboration in Sri Lanka, by anthropologists Salla Sariola and Bob Simpson (2019), is a book about how running international clinical trials in Sri Lanka became not just a mechanism *for* development but also a form *of* development. Through rich ethnographic description, the authors describe how local actors worked to attract, translate, and make viable two trials in the Sri Lankan context. While social studies of clinical trials have become a well-established niche in recent years, the book's significance lies in its careful study of how such interventions, when couched in a developmentalist discourse of 'collaboration' and 'capacity building' of and for global health and development, are taken up by different groups for diverse ends. *Research as Development* reminds us that local staff are not passive subjects within international collaborations but that they actively transform them—shaping research and policy agendas in often novel and surprising ways.

This book forum includes four reader commentaries on the book and a response from the authors. The aim of the forum was to cultivate a discussion around *Research as Development* from the perspective of academic readers as well as that of the central figures featured in its pages. Two of the contributors—toxicologists Michael Eddleston and Andrew Dawson—were chief architects of the 'paraquat poisoning trial' that Sariola and Simpson studied. When I invited the two toxicologists to contribute to the forum, I had assumed they would read the book

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very differently from how the two other contributors—Noémi Tousignant, a science and technology studies scholar, and Nari Senanayake, a cultural geographer—would do. Not only was I asking them to comment on an ethnographic monograph (as toxicologists, something perhaps outside their zone of comfort), but also to report back on how Sariola and Simpson had reported on them!

The synergies *between* the readings offered by the four commentators kindle something of the themes of interdisciplinary collaboration, translation, and anticipation that *Research as Development* itself explored. How they have anticipated the task and promise of ethnography as a kind of writing illuminates a fascinating difference between how Tousignant and Senanayake as practitioners of, and Eddleston and Dawson as participants within, ethnography as a kind of research understand the task and value of the book. Tousignant and Senanayake approach these issues on the level of the book's theoretical agenda, noting how Sariola and Simpson's ethnography helps us to make sense of the temporalities of global medical research (Tousignant) and 'the Covid present' (Senanayake). For Eddleston and Dawson, it is through how being observed and written about has helped them (or not) to understand the ethical, social, and political dimensions and dilemmas of their own activities. Tousignant and Senanayake read outwards from the text to address the big issues of global health and development. Eddleston and Dawson read inwards to the specificities of the paraquat project and their own professional and personal subjectivities; Dawson also reflects on what the study of a single trial might tell him about trials more generally. The result is a forum that moves between positions, directions, and scales that, like the trials Sariola and Simpson studied, *Research as Development* captures so well.

I would like to thank Noémi Tousignant, Michael Eddleston, Andrew Dawson, and Nari Senanayake for their thoughtful and generous reflections on *Research as Development*, and Salla Sariola and Bob Simpson for their reply. I would also like to thank Cornell University Press for making review copies of the book available, and *Medicine Anthropology Theory* for agreeing to host this forum. Finally, it is a pleasure to say that thanks to a grant from The National Endowment for the Humanities, *Research as Development* is now open access and available to download for free from the publisher's website.

Ethics as landing strip and the temporalities of global clinical research

Noémi Tousignant

Towards the middle of *Research as Development*, authors Salla Sariola and Bob Simpson conjure a striking image, in which they liken preparation to host a transnational clinical trial to 'some landing strip from a latter-day cargo cult' (113).

Building this runway entails demonstrating that conditions on the ground are apt to meet the scientific and ethical standards of the ‘global laboratory’ of clinical research. Thus, they write, ‘conditions for successful reception of this new form of wealth creation had to be built in anticipation’ (Ibid.)

This image calls attention to the complex temporalities of clinical research as a global endeavour, and particularly to how these unfold, and fold back, through expectation and transformation—two of the rich thematic seams that run through *Research as Development*. Through close examination of two collaborative clinical trials conducted in Sri Lanka, Sariola and Simpson explore how expectations of the ability of research to transform healthcare, research capacity, professional trajectories, and a small, low-income country’s ‘place in the world’ thus shape the ways in which actors engage with the promises and demands of research.

Yet as per the landing strip analogy, the transformation begins before research ‘arrives’, in expectation of its protocols, contracts, medicines and budgets and through delicate negotiation of what subjects, doctors, and relations of care, protection, and authority have already become. To be transformed by research, Sri Lankan researchers have, the authors show, been ‘proactive in their efforts’ to attract and shape global trials, and to collaborate ‘on their own terms’ (9) but also to remake themselves, their institutions, and potential subjects as future research collaborators.

This attentiveness to the anticipatory dimensions of collaboration ties into a nuanced approach to biomedical research ethics. *Research as Development* makes insightful contributions to a growing body of ethnographic work on ethics-in-practice, examining how regulatory prescriptions are ‘localized’ (Chapter 5) as ‘accretions upon […] existing modes of subjectification’ (99) or how they become ‘precarious’ (Chapter 7) as they encounter the destabilising effects of social suffering, stigma, medical crisis, and under-resourced healthcare. However, the book’s originality, I would argue, is in keeping formal regulatory ethics, alongside the ‘quotidian ethics’ of trial practice, within the ethnographic frame, thereby calling attention to the performative and ‘infrastructural’ dimensions of ethical rules and procedures.

For example, in describing the ‘joint pain trial’, which Sri Lankan researchers hoped would attract further trials by demonstrating their capacity (scientific and ethical) to run trials, Sariola and Simpson observe that ‘it was not the weakness of regulatory mechanisms in Sri Lanka that proved attractive to the company [the private trial sponsor], but their apparent robustness’ (61). Thus, demonstrating familiarity with and capacity to implement global guidelines, including through a stringent ethical clearance process, is one of the ways in which researchers and institutions built the ‘landing strip’ of clinical trials. In turn, rigorous review of the trial by the committee had a performative function of sending ‘a signal’ both to trial researchers and sponsors, and to local audiences, that adherence to standards was being adequately controlled (63). The authors return to this theme in Chapter 4, which explores ‘strategic’ uses of ethics as critique of, but also as an enabling environment for, global medical research. However, what kind of research environment should be supported by ethical review—and how—proved to be a difficult matter to settle. Amid the debate, some insisted that ‘a smoothly functioning regulatory system’ (152) was a crucial component of an attractive, trustworthy, and ‘functioning trial environment’ (153).

Research as Development is about becoming people and places of global medical research and imagining what that will bring. How imagined research futures are enacted in the present is revealed as a way in which local and global are coproduced, as always already entangled but never completely conflated on the map of medical knowledge-making.

Performing clinical trials: Being inside, looking out, being watched (and helped)

Michael Eddleston

In 2001, I was getting ready to move back to Sri Lanka for my Wellcome Trust fellowship, to run two trials within a cohort of pesticide self-poisoning (often inaccurately termed ‘attempted suicide’) patients. It was an exciting time for trial ethics. After years of argument in journals about the ethics of trials in low-income countries, the Nuffield Council on Bioethics’ report was getting close to publication (Nuffield Council of Bioethics 2002). I visited the Council and met the person coordinating the report, ending up talking about my plans. We agreed that it would be good to ‘study the study’: its setting up, and the ethical issues that would certainly arise. Unfortunately, as a junior researcher, I didn’t have the funds and it didn’t happen.

Such a shame. Less than two years later, I was accused of killing a patient in Kurunegala (a town in the North West Province where my study was located) and of using Sri Lankans as ‘guinea pigs’. The Sri Lankan media started referring to me as the ‘foreigner who calls himself a doctor’, while intense debates started up over whether my study should continue in particular hospitals. Commentators reproached me for having an inadequate ethics review (due to my mentor being on an ethics committee). A contact offered me safe shelter in the World Health Organization building, and, after two months, my study was shut down.

When I first arrived in Sri Lanka, I realised that as a young foreign white doctor working with patients who had harmed themselves, my life might sometimes become complicated. I therefore gathered a small group of senior Sri Lankan academics to be my guides, and to provide advice. But how good it would have been to have also had an ethicist, sociologist, or even an anthropologist familiar with the study to talk to! Someone to discuss the issues pouring over me each day and the decisions I had to make. How could I tell the funder about the shitstorm I was in? About the cry of unethical research that surrounded me? A meeting in Oxford offered me some respite. A discussion with a trialist who had faced similar problems resulted in the advice: 'You will only start again if the local people want you to'. This became my refrain as I quietly worked to restart.

I met Salla Sariola and Bob Simpson during the following years. When Sariola asked whether they could study our paraquat poisoning trials (described in Chapter 4 of *Research as Development*) it was easy to say yes, particularly with the trust we had already built up. (Had I not already personally known the two researchers I might not have agreed so quickly, though I think I would have done so eventually.) Being watched performing clinical trials in difficult conditions can be stressful. Things do happen. Problems do occur. All of them visible to people watching closely. As we worked on our trials, we looked out at our observers, watching for their reactions—in their faces, in our discussions, in their publications. Observers improve how one performs. Reading *Research as Development* caused me to relive many episodes from my time conducting studies in Sri Lanka, with their observations striking home. It felt useful to see our work reported by independent observers.

The idea of 'precarious ethics', developed in Chapter 7, gives a name to feelings of discomfort when seeking informed consent from patients who have harmed themselves in a society that emphasises familial roles in decision making. The issue is often raised during ethics reviews of our trials in the UK and Sri Lanka. The high recruitment ratios—e.g., 93% among eligible patients in a trial of activated charcoal (Eddleston et al. 2008)—provides some reassurance that patients and their families want to be in studies which may benefit them and their communities. At the same time, the 30% refusal ratio in the more complex randomised controlled trial of pralidoxime (Eddleston et al. 2009) reassures me that patients and families do feel able to say no. We were not forcing them into studies. In addition, ethics was also precarious because it could be weaponised, as the authors clearly show.

Patients who self-harmed were not always treated with compassion by staff in the hospitals, as noted elsewhere (Jones et al. 2015). The presence of doctors with an interest in their condition certainly made a difference to their care on the ward, in their transition from what Sariola and Simpson call 'abject to object to subject' (Chapter 7). It was noticeable that relatives of patients already in the trial encouraged relatives of new patients being recruited to enter the study. In contrast to the perception of ethics committees, many patients were not deeply depressed and were happy to be in the trials (Figure 1). Patients who were recruited while unconscious, via consent obtained from their relatives, chose to remain in the study when they recovered and could give consent directly (Figure 2).

Figure 1. A study patient on the second day after his recruitment to the charcoal study, 2002. Image by the author Michael Eddleston, with consent from the study participant.

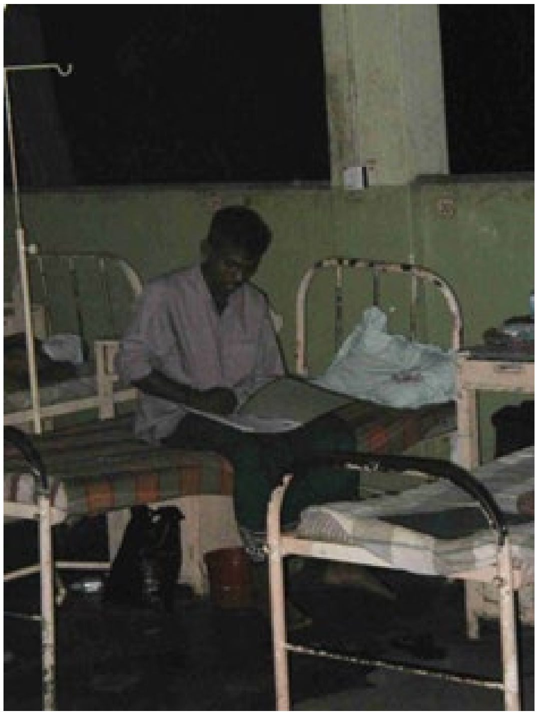

Figure 2. A study patient reading the Patient Information Sheet in his medical notes after regaining consciousness, 2002. Image by the author Michael Eddleston, with consent from the study participant.

The term ‘precarious’ could also be used to describe the local permissions needed for the studies to go ahead, as clearly noted by Sariola and Simpson. Seeking and gaining permissions involved walking on shifting sands that were rarely solid under foot, as has been noted in relation to other global research arenas (Street 2016). Mutual trust was certainly required for collaboration and had to be developed, through work.

A key aim of the trial we ran was the removal of academic and clinical hierarchies to help support the flow of information and trust in our work. Another reason for removing hierarchies was to encourage feedback from research assistants—who could understand much better than I could what was happening on the ground and anticipate the potential problems on every horizon. I recall being taken aside by two pre-intern doctors and being advised that I should stop chastising a researcher for mixing up samples. Such advice would have been very difficult within the usual strict hierarchy, and I was grateful for it.

It was interesting to read views of the events around the patient’s death in Kurunegala in Chapter 8. I do not agree with some of the views Sariola and Simpson report, illustrating perhaps my limited personal perspective of what happened. But this shows again the value of independent observers, although here observing more than five years after the event.

I recently submitted a grant to perform more poisoning trials in Asia, with a social anthropologist colleague at the University of Edinburgh, Alice Street. She made the fascinating and welcome proposal that her team should, at monthly investigator meetings, provide rapid anthropological feedback on the study’s set-up and progress, allowing ongoing improvements to be made in its processes and interactions with others. If funded, this model will place us together in the centre, all of us benefiting from colleagues observing the study. Such close combined working of anthropologists and trialists will benefit trials and their participants and should perhaps become the norm.

Leading clinical trials: Can anthropology help me understand what I was doing?

Andrew Dawson

Research as Development explores the complexity of the conduct of research. While the study was conducted in Sri Lanka, many of the core observations are generalisable to research in other settings. The book explores two different research projects, one an isolated clinical trial and the other a clinical trial that sat within a clinical research programme. The second trial was conducted by the South Asian Clinical Toxicology Research Collaboration (SACTRC). I was the Sri Lanka-based director of that programme from its establishment in 2004 until 2009. The focus of SACTRC's clinical research programme was much broader than a single clinical trial. Research programmes allow independence and the latitude to explore and research in multiple areas. SACTRC's overarching twin goals of building research capacity and reducing deaths from poisoning was clearly stated and understood at the outset. In contrast to industry-funded contracted research the primary outcome for the funder of a research programme is a well-conducted and compliant research study, while an increase in research capacity is a welcome outcome for the local investigator.

SACTRC's clinical research programme's projects undertaken to achieve these goals were diverse and the linkages between these projects not always obvious. Many specific projects and trials were unanticipated, resulting from new clinical observations or responses to local needs. Consequently, SACTRC had a rapid expansion in activity and staffing increased from about 20 to more than 140 within a year. At that point, SACTRC and I were approached to become subjects in the study that led to *Research as Development*. I told the researchers that I hoped they could explain to me what we were doing! I was interested in an external and objective analysis of our group and its activity. As a principal investigator, there were elements to my role perhaps somewhat akin to being a circus ringmaster—overseeing research conduct and strategy, finding and mentoring new researchers, and being a responsible employer. Effective communication with research staff and local collaborators and their staff over a broad range of projects was a clear challenge.

To sustain such a programme the research needed to be conducted successfully to support both local capacity and science. The strength of examining an individual study like the paraquat poisoning trial featured in *Research as Development* in detail is that it allows description of many issues that are generalisable to the conduct of any research. The limitation is that the anthropologists' perspective may be restricted to the specific project they are undertaking. For SACTRC, individual clinical trials had much less impact than the contribution of the sum of all the trials that made up the whole research programme in helping to maintain the large and longer-term observational cohort study used for policy change. The specific study described in the book, along with other studies of paraquat we conducted, provided evidence that led to the restriction of the use of paraquat in Sri Lanka and other countries, resulting in a large reduction in deaths from poisoning. That long-term and larger picture is more difficult for short-term research staff to recognise.

When I agreed to participate in the *Research as Development* study, I had hoped the anthropologists would be able to tell me what I was doing. Ultimately, Sariola and Simpson weren't able to provide a simpler explanatory model of SACTRC programme activity. This was probably an unrealistic expectation, as the research activity and environment was too complex and dynamic to be explained by a simple model. Successful conduct of individual research projects is essential in order to achieve a successful research programme. Instead, *Research as Development* has provided a useful framework that helps in analysing the complex activity of an individual research project within its micro-environmental context. There are other important participants who are essential to the successful conduct of a broader research programme but who are not directly involved in a specific research project. They include senior academics, government departments, policy makers, and research funders working within their own dynamic environment. These participants are more difficult to access and their role is not clearly represented in *Research as Development*. The success of a research programme is highly dependent upon engagement with these groups and is an area that needs further exploration.

Research as Development describes many of the predictable and unpredictable challenges that occur in clinical research. The great majority of the principal challenges facing the paraquat poisoning trial arose from the research environment and trial participants rather than from the science itself. *Research as Development* clearly describes those environmental challenges. Communication can be difficult in environments like Sri Lanka which has strong hierarchical models based upon seniority. SACTRC's intent to have a flatter organisational structure to promote open communication may have been a welcome contrast for some staff but unfamiliar and confusing for others. As the trial research staff were junior and external to the institutions where trials took place, they were generally at the lowest level of the hospital hierarchy, often negotiating with and explaining to other junior staff who were poorly informed about the research as well as being concerned about their own position. *Research as Development* highlighted the need for high levels of trust required to navigate the pitfalls of clinical research and the important role of junior research staff in building and maintaining professional relationships in the field. The book has described multiple perspectives of researchers and research staff working in the clinical trial components of the research programme. Most were at early stages of their career and many had come to research because of an absence of alternative career paths or because they saw the potential of research to improve their career path. Their stories highlight the individual differences in beliefs about research, but also their resilience and belief that the research was worthwhile.

Navigating the uneven geographies of international clinical trials and our COVID-19 present

Nari Senanayake

In the short time since *Research as Development* was published, we have all been enrolled (albeit unevenly) in a global assemblage of COVID-19 research, care, and collaboration. The experience of living within this fraught 'viralcene' raises the stakes of Salla Sariola and Bob Simpson's intervention: if the global struggle to track disease variants and develop and administer effective vaccines reveals anything, it is that the 'conceptual vocabulary of research, ethics and collaboration' (2) continues to be profoundly unstable. Consequently, in this brief commentary, I reflect on two of the authors' core arguments and how they reveal important lessons for navigating the uneven geographies of our COVID-19 present.

The first point relates to the authors' account of what happens when clinical trials—and their conceptual armoury of ethical protocols, universal human subjects, and randomisation—are transported to 'resource-poor' and 'developing world' contexts. Here the book's arguments focus on an empirical discussion of two clinical trials held in Sri Lanka. One case study is an outgrowth of philanthropic intervention designed to alleviate pesticide poisoning among local farmers. The other documents a multinational industry-sponsored trial of a drug to relieve joint pain. Cutting across these two examples is a focus on how engagement with the 'global clinical trial assemblage' shapes local geographies of research, care, and collaboration. Or, perhaps more accurately, the text is tied together by an investigation of how local research worlds are shaped by their entanglement in global scientific networks, but not necessarily according to plan. For Sariola and Simpson these trials are ethnographically interesting because they function as transformative failures. In both cases, the compounds at the centre of research failed to demonstrate pharmaceutical efficacy. Yet, as the authors take pains to document, the trials were still highly productive: variously building local capacity; expanding access to care and resources; and hailing new subjectivities (among researchers, clinicians, and trial participants alike). In short, the authors tell compelling stories of how the trials generate what they call 'second order effects' (20). The key point here is how the enrolment of Sri Lankan researchers into global bioethics assemblages becomes a vector for materialising key epistemic shifts and broader notions of development, as well as for expanding experiences of care among trial participants.

Importantly, this account of 'localization' and 'second order effects' is generative for understanding the uneven geographies that have emerged in the wake of COVID-19. As it collides with other epidemics (chronic and infectious, social and biological), the pandemic has produced its own array of emergent effects, including dynamic co-morbidities and new possibilities for reorganising the design and implementation of public health programmes. By moving beyond the archetypal space of the trial or the clinic, this book brings into sharp relief a wider field of ethical concerns that are particularly salient to this moment—concerns, for example, about global biomedical collaborations; waivers of intellectual property rights for COVID-19 vaccines; uneven access to medicines and personal protection equipment (PPE); as well as the rise of new digital technologies for health surveillance and monitoring.

Alongside an analysis of second order effects, *Research as Development* also theorises the practice of collaboration and how it generates 'novel and emergent geographies' (169). The crux of the authors' argument is a critique of diffusionist 'hub-spoke' models of biomedical knowledge production, where expertise, development, and resources are assumed to move in a singular direction from the centre to the periphery (9–10). Instead, Sariola and Simpson highlight 'important circularities' (14) in the knowledge produced by clinical trials.

This account of how biomedical research unfolds across contexts is important for understanding the geographies of international collaboration that characterise responses to COVID-19. Networks of global connectivity and scientific collaboration have, for example, helped fast track the identification of the genetic code of the virus. Similarly, the landscape of vaccine development encompasses more than 40 countries (at least half of these countries have had one or more vaccines in clinical trials), and disruptions in vaccine supply chains unsettle global vaccine-sharing initiatives (Li et al. 2021). All of these factors re-configure the maps of vaccine access in dynamic ways. As with the efforts that Sariola and Simpson document in this text, biomedical research, care, and collaboration in the shadow of COVID-19 is characterised by rhizomatic relationships, productive frictions, and creative improvisations.

Reading this book in mid-2021 amid uneven vaccination rollouts, circulating variants, and uncertain viral futures helps highlight the value of rhizomatic frameworks for understanding collaboration and its failures in the shadow of COVID-19. In their ethnographically rich text, Sariola and Simpson conclude that 'what ethics is matters less than what it can do' (161). As we navigate our precarious and highly uneven transition to a 'post-pandemic' future, we would do well to heed the lessons contained in this text.

Authors' response

Salla Sariola and Bob Simpson

We would like to begin by expressing sincere thanks to the four reviewers for their responses to *Research as Development*. It is very gratifying to have had our work subject to such careful and insightful readings. Each reviewer has given us food for thought by way of their distinct and critical readings of our work. It has been intriguing and informative to see our work through the eyes of others: Noémi Tousignant focuses on transformation in research cultures and the ethical issues involved; Michael Eddleston and Andrew Dawson elaborate on their role as clinical trialists and what it means to be a subject of anthropological enquiry; and Nari Senanayake reflects on the book in light of present-day COVID-19 concerns and the wider failure to achieve transformative effects in global health research. These different readings suggest that what we have produced is not simply a static record of things that happened when clinical trials made their appearance in Sri Lanka, but a stimulus to further thinking about collaborations, cultures, and global science as praxis more widely.

Although the responses address very different aspects of *Research as Development,* we would like to highlight two threads which run through each of the pieces. These concern time or, more specifically, the study of clinical trials as temporal objects on the one hand, and collaborative relationships on the other. One of the contributions we believe we have made in the book is to situate clinical trials in a longer timeframe than is usually the case. By focusing on the long-term developments of research, we were keen to show that trials have a 'before' and 'after' as well as a 'during' and with this process social relationships between researchers are crucial (and that includes those formed with ourselves as social scientists).

An analogy that we weave into our account is that of the landing strip. This image is borrowed from anthropological writings on millenarian movements and their anticipation of future arrivals of goods, people, and much else. Noémi Tousignant picks up on the value of this analogy and the extensive preparations that had to be put in place to get clinical trials to 'land' in Sri Lanka. In the book, we describe activities such as the setting up of ethics committees (so that research applications might be evaluated), the development of collaborations among local and international partners, the building up of trust between these partners, and the creation of research infrastructures capable of running the trials. Tousignant highlights anticipation and expectation as key to making future research activities compatible with existing research cultures and managing tensions that exist between different groups working in biomedical research in Sri Lanka.

Michael Eddleston looks back to his experiences in Sri Lanka in the early 2000s when doing research with patients who had self-harmed using various toxins. This work was extremely fraught and raised some complex ethical issues. The challenges he describes were cultural in that Sri Lankan society can be hierarchical and hard to navigate for an outsider, as well as clinically demanding, given that poisoning patients are very ill and also greatly stigmatised in Sri Lankan society. Eddleston gives a personal and frank account of what went on 'during' the trials that he was involved with. He provides critical insights into what it is like to conduct research into clinical trials in developing world settings and, moreover, to have that research be the object of attention by third parties. His review highlights how funding and policy feature in the managerial drive to collaborate. Crucially, the success of this drive is based on relationships of trust that have to be built rather than assumed. Significantly, as spaces have opened for social scientists to routinely collaborate in research teams, we also figure in this process of making and managing collaborative relationships. The process is one in which a range of different expectations are in play regarding aims and objectives. To capture the folds which appear as we collaborated with researchers who were themselves developing collaborations between one another was an important dimension of what our study was about. Eddleston's reflections suggest that our presence was productive for his work. We particularly appreciate his reference to our notion of precarious ethics. His reading of the term extends our own usage by showing how clinical decision making is situated within the wider social context, giving clues as to how these challenges are managed in real-time situations.

Andrew Dawson writes from the perspective of Research Director of the South Asian Clinical Toxicology Research Collaboration (SACTRC), which was one of the main sites of fieldwork for the book. Like Eddleston, Dawson gives important insights into the complexities of research collaboration on the ground. He touches on differences of power and status between researchers, such as those arising from scholarly hierarchies, funding opportunities, and access to research networks. Dawson's comments highlight how trials are part of collaborations that are shaped by research governance frameworks that define both ethical and practical conduct. When randomised controlled trials are novel, as they were in this context, researchers are not just mere implementers of protocols and procedures but innovators and pioneers. Indeed, the context into which trials 'land' is not just an 'empty space' but one that requires complex navigation skills on the part of research managers as that space has its own social and political history. For example, there is the long shadow of colonial medicine; Sri Lanka also has its own established structures for health delivery; and Sri Lankan medical students receive a distinctive Anglophone induction into biomedicine. These are all factors that must be taken into consideration in organising trials locally. These are the external factors that Dawson alludes to at the end of his commentary; they have significant impacts on the culture and conduct of local research practice but are mostly absent from scientific protocols, methods, or outputs. In the book, we document how researchers navigated these particular conditions and worked to turn them into positive clinical and scientific outcomes even though diverse ideas were in circulation as to the kind of research culture that people were working towards.

Nari Senanayake provides a novel and inspiring link between the themes we develop in *Research as Development* and the current COVID-19 crisis. Her account points to the longer-term consequences of shifts in the trial practices that we studied. She suggests that the COVID-19 pandemic changes the temporal frame in which the book might be situated. While the 1990s and 2000s saw an increasing momentum for clinical trials and collaborations to be carried out in low- and middle-income countries, the pandemic has revealed a far more limited picture of what now travels. While clinical trials of COVID-19 vaccines are conducted worldwide through channels established prior to the pandemic, intellectual ownership and the majority of the production of the COVID-19 vaccine remains in the global north. The justification is usually made in terms of there being limited capacity for vaccine production in the global south. Senanayake's review astutely connects our critique of defining countries in the global south as places of 'lack' and 'lag' to the structures of power underlying such claims. She draws attention to the long-term development of *scapes* of global knowledge, asking to whose ends those are currently being built. Behind the rhetoric of collaborative intent, corporate actors continue to hold on to the foundational structures of global knowledge ecologies, producing and reproducing 'uneven epistemic geographies'.

We argue in the book that, as clinical trials leave town, they leave behind outcomes that are multiple and unexpected and, crucially, ones which go way beyond reported scientific results. Our book is an attempt to document biomedical collaboration as well as the place of social science collaboration within this research. Our analysis brings to the fore the structured labour and informal tinkering that scientists deploy in order to accomplish a successful trial. These insights rarely feature in scientific publications and hence are only visible in broader ecologies of global knowledge production in which centre-periphery models of scientific endeavour are critically scrutinised.

About the authors

Tom Widger is an anthropologist based at Durham University, UK. With a primary focus on Sri Lanka, he has a broad range of interests across social, health, and environmental fields. He has written extensively on topics including self-harm and suicide, charity, philanthropy, humanitarianism, and agrochemical regulation.

Noémi Tousignant is Lecturer in Science and Technology Studies at University College London, and currently holds a Wellcome Trust University Award. Her research combines historical and ethnographic methods, and focuses on science, medicine, and health in West Africa. Her first book, *Edges of Exposure* (Duke, 2018), was awarded the Ludwik Fleck Award by the Society for Social Studies of Science in 2020.

Michael Eddleston is Professor of Clinical Toxicology and Director of the Centre for Pesticide Suicide Prevention, University of Edinburgh, and Consultant Physician at the National Poisons Information Service, Royal Infirmary of Edinburgh. His primary research aim is to reduce deaths from pesticide self-poisoning in rural Asia, a cause of more than 150,000 premature deaths each year and a key global means of suicide. To do this, he works with poisoned patients (to improve their clinical treatment), with communities (to change—if possible—how they use pesticides), and with governments and international organisations (to facilitate effective pesticide regulation).

Andrew Dawson is a clinical toxicologist who has worked extensively in Australia and Sri Lanka. His major research interests are in toxicovigilance, public health, and self-harm.

Nari Senanayake is an Assistant Professor in the Department of Geography at the University of Kentucky. Her research bridges geographic work on health/disease, agrarian environments, and scholarship on the politics of knowledge, science, and expertise. In particular, her current research project focuses on everyday encounters with a severe and mysterious form of chronic kidney disease (CKDu) in Sri Lanka's dry zone.

Salla Sariola is the Director of the Centre for the Social Study of Microbes at University of Helsinki and a Finnish Academy Research Fellow in sociology. Her current research includes exploring changing scientific practices on environmental microbes and antimicrobial resistance and well as developing fermentation as an experimental research method. She is the author of four books and her fieldwork has taken her to feminist, queer, and HIV activist movements in India and Kenya, hospitals of Sri Lanka, and rural laboratories in Benin and Burkina Faso, as well as to fermentation enthusiasts in Finland and the northeast of India.

Bob Simpson is Emeritus Professor of Anthropology at Durham University, UK. His interests mainly lie in the anthropological study of bioethics, biomedicine, and biotechnologies. His current research interests centre on tissue economies and moralities as these relate to organs, gametes, and embryos. His work has also explored the encounter between challenging technological developments and local systems of values and beliefs in South Asia.

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