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Precarious connections: Making therapeutic production happen for malaria and tuberculosis

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ABSTRACT

The One Health Movement has been a primary advocate for collaboration across disciplinary and organizational sectors in the study of infectious diseases. There is potentially much to be gained by incorporating the interrelations of animal and human ecosystems, as well as the expertise of veterinary, medical, and public health practitioners. Too often, however, the idea rather than the realities of collaboration become valorized within One Health approaches. Paying little to no attention to the motivations, ontologies, and politics of collaborative arrangements, however, is a critical mistake, one that diminishes considerably One Health framework explanatory powers. Using Anna Tsing's framework of friction, in this paper I take the examples of malaria and tuberculosis pharmaceuticals collaborations, often called Product Development Partnerships, to argue for the need to attend to the conditions under which collaborations across divergent disciplines, geographies, organizations, and institutions might work productively and when they do not.

1. Introduction

Concepts of connectivity have held traction in global health approaches for a while now. The One Health Movement is a recent example of this, with its call to recognize the interrelations among animal, ecosystem, and human health; and for its claim that greater collaboration among veterinary, medical, public health, and – to a lesser extent – social science arenas are essential to "ensure well-being within human, animal, and ecosystem interfaces" (Papadopoulos and Wilmer, 2011, 1). Undergirding this interface of the animal, human, and environment is the broader notion also maintained within the global health field writ large that disease impact in one part of the world ultimately impacts the rest of the world. In this paper, I want to take malaria and tuberculosis as infectious diseases that illustrate on the one hand the promise One Health holds for more effective interventions into any number of diseases by highlighting the need for collaborative approaches, and for mitigating the balkanization of scientific practice within disciplines and institutions. On the other hand, malaria and tuberculosis illustrate as well the limits to One Health's approach given how connectivity plays out across divergent nonprofit, philanthropic, and industry actors, and within larger contexts of inequitable global health politics and finance.

The kind of connectivity that One Health espouses, and its insistence on bringing to bear upon a particular disease or health problem the expertise of multiple partners, suggests the kinds of possibilities that Anna Lowenhaupt Tsing discusses in her book *Friction*: *An Ethnography of Global Connection* (2005). Focusing on her case study of logging in Indonesia, Tsing discusses the conditions under which actors who typically maintain competing if not conflicting agendas might come together to work tentatively but collaboratively towards a common goal. These conditions are unpredictable and not necessarily lasting, yet one of her points is that for the duration of the collaborative moment, the 'friction' of having very different actors trying to work together can be highly productive if not transformative because it can be "the stuff of emergent politics" making "new objects and agents possible" as it creates the political, scientific, or financial conditions to move beyond entrenched ways of seeing and responding (2005, 247).

Yet Tsing also recognizes that these collaborations hold within their very infrastructure the threat of cooptation as funders or international organizations wield their inequitable degrees of power, and when the ideas of community – or diseases – get 'imagined and imposed' by outside actors with particular, and particularly entrenched, visions (ibid, 264). In the case studies I present below, I argue that friction is indeed productive for the most part, yet the end goals of the actors in collaborations focused on malaria and tuberculosis therapeutic development can create a friction that stalls rather than accelerates any movement towards emergent

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politics. Positive achievements still occur, yet the end result is unpredictable because the political, financial, and ontological relations bringing actors together are shifting as well as potentially incompatible. Tsing's ability to see both the productive potential of 'global connection' but also the fundamental precariousness of having actors of divergent scale, power, and vision is key. The One Health movement only sees the productive side minus the precariousness of connection and collaboration, and this is a critical mistake.

In particular, One Health's call to collaborate across fields and populations sounds a peculiarly flattened note despite the compelling reasons for initiating it. Absent is any recognition of the stakes creating parameters of institutional or individual action, and dictating their often competing rather than coordinating agendas. In One Health's focus on infectious diseases, for example, discussions of connections between humans, animals, and vectors (where relevant) unfold with little to no reference to the social or political forces shaping specific coordinates of interaction, or the highly uneven geopolitical fields within which understandings of, and responses to, infectious disease outbreaks occur. Indeed, it is precisely in times of alarming disease outbreak that this unevenness can become much more accentuated given that the stakes of who gets what resources, who appears responsible for initial transmission, and which borders are the most threatened become immeasurably higher. These stakes and their consequences were evident during the recent SARS and H1N1 epidemics, for example, despite the outbreaks providing further momentum for the One Health movement (cf Zinnstag et al., 2012).

For these kinds of 'crossover diseases' – that is, outbreaks threatening both the global North and South – coordination of agencies and surveillance systems was accomplished in part because it was in the direct interests of Canada, the US, and the EU to galvanize action in efforts to mitigate impact of these diseases within their respective borders. Though it is beyond the scope of this paper to elaborate the problems inhering in these efforts, it is important to note that institutional, surveillance, professional, and governmental 'coordination' at times supported, and at other times did nothing to alleviate, misguided public policies, racialized scapegoating, and highly uneven allocations of resources (cf Ali and Keil, 2008; Giles Vernick and Craddock, 2010). It cannot be presumed, in other words, that partnering always generates mutual understandings, or more equitable and effective responses.

The efforts of One Health to expand from large-scale infectious diseases to food security, zoonotic diseases, and neglected diseases including malaria and tuberculosis are commendable given the movement's encompassing approach (Zinnstag et al., 2011), but in addition to the concerns raised above is the additional concern that collaboration and coordination for many of these issues become more difficult in the absence of adequate financing. Those diseases and threats to wellbeing that do not pose risks to the majority of the world – that in fact belie the One Health label in impacting only particular and predominantly low-income regions – are precisely those that struggle consistently to garner a level of resources that would enable cross-professional or institutional attention, much less effective responses. Zinnstag et al. (ibid, 155) in discussing ongoing challenges for the One Health movement, question why for example there still is no effective new vaccine for tuberculosis.

The discussion below will go towards answering that and other questions regarding some current responses to tuberculosis and malaria. I focus specifically on Product Development Partnerships in Global Health, dynamic collaborations among nonprofit organizations, academic researchers, funders such as the Bill and Melinda Gates Foundation, and pharmaceutical companies to develop new therapies for infectious diseases such as tuberculosis and malaria that have seen few or no new drugs or vaccines in decades. For this paper and the larger book project of which it is a part, I utilize dozens of interviews I conducted with nonprofit officers, representatives of the Gates Foundation, pharmaceutical industry researchers, scientists, and WHO officials, among others. I also draw from news releases generated by the nonprofits and pharmaceutical companies, and from conversations, formal interviews, and notes taken at international conferences on tuberculosis, vaccines, and malaria. Finally, I draw from a clinical trial site visit outside of Cape Town, South Africa. Using Tsing's framework of global friction, I discuss these partnerships and how they exemplify why collaboration is necessary in responding to many infectious diseases, but why it remains nevertheless precarious in accomplishing what it sets out to do. In what follows, I first highlight a few of the tuberculosis and malaria PDP initiatives before elaborating on the variable nature of collaborative frictions inhering in endeavors to develop new therapeutics for these diseases.

2. Tuberculosis

The statistics on tuberculosis are compelling. An estimated nine million new or relapsed cases occur every year, and in 2012 around 1.4 million people died of the disease (WHO, 2012). High rates of AIDS in turn fuel higher rates of tuberculosis: of the 13.7 million estimated total number of tuberculosis cases worldwide in 2007, an estimated 687,000 were co-infected with HIV (Jassal and Bishai, 2010). Though effective drug therapy exists and is inexpensive, it takes six to nine months to complete – a factor that in part explains lower rates of adherence and the growth of multidrug resistant tuberculosis. A vaccine has existed for decades, but is ineffective outside of pulmonary tuberculosis in infants. For these reasons, product development partnerships, or PDPs, emerged in the early 2000s to develop new tuberculosis vaccines and drug regimens for the first time in over four decades. The Global Alliance for Tuberculosis Drug Development (TB Alliance) and Aeras are the principle nonprofit organizations spearheading efforts to generate new drug and vaccine candidates, respectively; and they in turn form various collaborations with academic and industry partners with funding primarily from the Bill and Melinda Gates Foundation, but also USAID, the Wellcome Trust, government donors, and others.

On the positive side, these collaborations have succeeded in getting numerous compounds and vaccines in the research and development pipeline where ten or twelve years ago there were none at all. Most of these are in the preclinical phase – that is, just coming out of the laboratory or in the animal testing phase; some however have reached Phase II clinical trials – mid-level trials that test the efficacy and safety of new therapies in individuals at high risk of tuberculosis (in the case of vaccine testing) or who have been diagnosed with the disease (in the case of drugs). The exact way the partnerships work varies. Aeras and TB Alliance both proactively seek partners from universities, pharmaceutical companies, biotech firms, governments, or foundations who display either promising research discoveries or relevant funding priorities; but individuals from these sectors also approach Aeras and TB Alliance when they need particular kinds of expertise or financial subsidization for moving discoveries down the development pipeline. The Gates Foundation in particular galvanized both TB Alliance and Aeras into being, shaping their mandates for drug and vaccine development and generously funding their efforts. Despite their Gates-driven parameters, the relative novelty of what PDPs are trying to accomplish and their departure from the highly privatized norms of therapeutic production create latitude for greater malleability in the structural and qualitative architecture of collaborations. Every partnership that Aeras or TB Alliance forges differs to fit the particularities of each partner, the products