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## The Anthropology of Epidemic Control: Technologies and Materialities

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The twenty-first century began with unusual optimism. The halting of the Severe Acute Respiratory Syndrome (SARS) epidemic in 2003 was hailed as the result of rigorous quarantine and isolation measures, with the “de-emergence” of the disease (Peckham 2016a) fostering the legitimacy of these sixteenth-century technologies of epidemic control. Ten years later, the 2014–2016 Ebola epidemic in West Africa came to brutally deflate this quarantine euphoria, proving the implementation and efficiency of the particular anti-epidemic measure to be far a more debatable and contentious matter than advocated by the proponents of the “lesson of SARS.” Soon after, the Zika crisis in South America saw another turn, this time toward an epidemic control method that had been largely discredited within the growing Health paradigm: vector eradication. Newspapers and screens were filled with images of a popular Victorian epidemic-control technique: fumigation.

A first reading of responses to these highly mediatized outbreaks may suggest that the last line of defence against epidemics on the ground is far less technologically subtle and more “material” than narratives of an electronically dematerialized world may lead us to assume. However, as anthropologists, we need to take seriously the self-positioning of epidemic control as technologically advanced, and consider the contemporary entanglement between counter-epidemic technologies of different historical provenance on the ethnographic ground. This is not so as to make yet another argument for hybridization, but to elucidate the material and technological aspects of the way in which epidemic control does not simply result from but is formative of epistemic frameworks and power relations.

The articles in this special issue engage with the material politics of epidemic responses. From the production of meticulous legal claims, to bodies encumbered by protective clothing, and from racial aspects of contact tracing to colonial interventions on burial rituals, these contributions expand our understanding of the technological contours and the material forms of epidemic control. Several of the articles demonstrate that canonical questions in the historiography and anthropology of epidemic control are far from exhausted. They offer new ways of understanding the links between technologies of epidemic control and the distribution of mortality and vulnerability during and after an epidemic.

Traditionally both historians and anthropologists have focused on epidemic control measures from a socio-political vantage point. Historical literature has been dominated by the examination of three measures: quarantine, vaccination, and vector control. The main aim of historical scholarship on quarantine has been to illuminate debates and struggles to control epidemics like cholera, yellow fever, and plague, which have stemmed from diverse understandings of disease etiology. These include but are not limited to what Erwin Ackerknecht (2009) has framed as “contagionist” and “anti-contagionist” approaches. Proceeding with challenging this dichotomy and exploring the subtle political and social impact of quarantine in different parts of the world, more recently, historians have focused on the ways in which quarantine fostered, challenged, or instituted economic and power relations on the ground (see Bashford 2016; Chircop and Martinez 2018). Historical scholarship on vaccination has similarly focused on etiological debates while also advancing an examination of how immunization technologies have impacted embodied aspects of class, race, and gender

relations (Anderson 2007; Arnold 1993; Colgrove 2006; Holmberg, Blume, and Greenough 2017). Finally, in focusing on vector control, historians of tropical and colonial medicine have also emphasized embodied power relations and the domination of “nature,” as well as on sovereign aspects of vector eradication (Biehler 2013; Leys Stepan 2013; Packard 2016; Roy 2017). In historical terms, then, epistemological, economic, and political aspects have been the three spheres dominating the discussion of counter-epidemic measures and policies. Anthropological studies of infectious diseases in turn have traditionally focused on social, political and cultural aspects of the means employed in the control of infectious disease outbreaks. Particular spheres of medical anthropological interest have included stigmatization and marginalization (Kleinman and Lee 2006; Biehl 2007; Hyde 2007; Littleton, Park, and Bryder 2010; Venables 2017), geographies of blame (Farmer 1992), community participation and resistance (Pellechia 2017; Richards 2016; Wilkinson et al. 2017), colonial legacies (King 2002), and social, economic, or communicative inequalities (Briggs and Mantini-Briggs 2016; Lockerbie and Herring 2009).

In recent years, however, a growing number of historians have placed technological and material aspects at the centre of the examination of epidemic control. Graham Mooney (2015) has contributed a major study of isolation, disinfection and contact tracing in nineteenth century England, showing how these effectively merged domestic and laboratory spaces. Besides focusing on the entanglement of such measures with emerging liberal forms of government and notions of citizenship, Mooney places particular attention on technological aspects of the chemical disinfection of domestic spaces. He examines the contested use of disinfection apparatuses and the way in which different designs were developed in an effort to avoid material damage to household items. Similarly, Robert Peckham (2016b) has turned his attention to the materiality of disinfection, and in particular to the way in which disinfection measures during Hong Kong’s 1894 plague outbreak rendered Chinese domestic items (in particular working class ones) into “junk.” At the same time, historians have begun to examine architectural, engineering, and design aspects of epidemic control and prevention infrastructures. This includes studies of the controversial use of bamboo in the construction of Alexandre Yersin’s microbiological laboratory in plague-stricken Hong Kong (the site of the discovery of the disease’s bacillus) (Peckham 2013), and the examination of the architectural history of lazarettos (Bonastra 2008), plague hospitals (Stevens Crawshaw 2012), and Fascist anti-malarial planning in Italy (Caprotti 2007). Researchers have not, however, been limited to the examination of technological and material aspects of epidemic control from the view of those aiming to control, prevent, and contain. For instance, a number of recent studies have examined the material culture in Sydney’s quarantine station from the perspective of those contained in it (Bashfold and Hobbins 2015; Hobbins, Frederick, and Clarke 2016; Longhurst 2017). These studies focus on inscriptions left on the rocks of the open spaces of the station by inmates over decades, and on the latter’s interaction with built structures in it. They thus highlight the importance of examining not simply the interaction of targets of epidemic control measures with technological aspects of quarantine, but the inmates’ own technological and material practices within these structures of confinement.

Medical anthropologists too have begun to examine the material and technological aspects of epidemic control. A subject attracting sustained attention in recent anthropological studies of epidemic control technologies has been the shift from a public health focus on prevention to one on preparedness. Whereas this is conventionally dated as originating in what Nicholas King (2004) has called “the emergence of emergence” in the early 1990s, Andrew Lakoff (2017) has pointed at the Cold War genealogy of this biosecurity doctrine. Borrowing technologies of simulation and ideologies of risk in response to nuclear warfare, Lakoff shows preparedness to be not simply a replacement of prevention, but a hybrid biopolitical terrain of epidemiological theory and practice. Preparing for what is forecasted as an unpreventable event of disease emergence leading to a pandemic, and its existential risk to humankind, involves the development and mobilization of surveillance, modelling, simulation, and sentinel technologies. While some scholars aim at the detection of spillovers, in other words, the proverbial jump of a novel virus from domestic or wild animals to humans, others focus on preparing human societies for pandemic impact. Preparedness

thus relies on early detection or early warning technologies (Caduff 2014), and on technologies fostering resilience in spheres that Collier and Lakoff (2015) have identified as “vital systems” of our technoscientific societies.

Anthropologists have illuminated how the articulation of preparedness in different parts of the world depends on the development of local technologies of epidemic control. In his study of influenza preparedness in Hong Kong, for instance, Keck (2015) has underlined how different bird-oriented technologies have been deployed: “Killing chickens around infected farms and markets was considered a way to mitigate the threat. Farms were confined, which meant that instruments of biosecurity strengthened their borders with the outside world: nets, ponds, boots, vaccines. Material equipment reaffirmed the distinction between wild and domesticated birds.” At the same time, Hong Kong virologists employed live chickens as “sentinel devices” for the early detection of the emergence of new flu strains in and around Hong Kong. By contrast to the public visibility and ubiquitous visual culture of culling, which may be said to stabilize the pandemic threat of influenza on a symbolic level, “as sentinel devices produce signs of an invisible threat”, Keck (2016:221) argues, “they are at the line between the visible and the invisible.” As part of broader biosecurity systems tracing “potential uncertainty” (Samimian-Darash 2013:2), sentinels thus entail “not a subjective position through a temporality of waiting but a structural position on a border where events occur” (Keck 2014:51). In other words, they are the material manifestations of a viral futurity. They are therefore instituted as epidemiologically meaningful technologies only to the extent that they entail what Carlo Caduff (2014) has identified the prophetic faculty of regimes of pandemic preparedness.

The arcane heart of preparedness should not, however, mislead us to overlook the materiality of its technologies and how they are embedded in the everyday and the ordinary. As medical anthropologists like Lyle Fearnley (2015) and Natalie Porter (2013) have shown, the anticipation of viral emergence sets in place distinct spatial and material rearrangements in areas or spaces considered as potential spillover ground zeros. Preparedness has been shown to have transformative effects on laboratory experimental systems (MacPhail 2014; Porter 2016), hospital practices (Wolf 2017), and the visual representations of zoonotic infection in the course of epidemic control (Lynteris 2016, 2017). In this issue, Meike Wolf and Kevin Hall examine how preparedness “organizes people around specific emergency infrastructures and communication routines.” Focusing on emergency exercises in a specialized isolation ward, they propose the notion of “cyborg preparedness” in order to underline that this technology of epidemic control “cannot solely be reduced to conceptual guidelines or technological arrangements, but requires *techne*, bodies, and human actors.” What the authors’ ethnographic account underlines is the active entanglement between bodies, spaces and devices in pandemic preparedness. As they describe, hospital spaces were divided in three categories, “contaminated space, clean space, and liminal space,” each requiring “a specific set of movements, surfaces, pressure and materials.” In the course of the emergency, the authors note, whereas the architecture of the hospital is fixed, the zones are constituted through embodied techniques involving the use of devices such as personal protection equipment, as heavily in the containment of Ebola (2014–16), which present challenges to the caring body and adjust both the performance and the meaning of care.

Christos Lynteris’ article on masks and masking as an anti-contagion strategy also develops questions around PPEs. In his article, he examines the emergence of anti-epidemic masks during the Manchurian pneumonic plague outbreak of 1910–11. Stressing the significance of the visual, Lynteris argues that the mask’s efficacy relied not simply in blocking airborne plague bacteria, but also in its biopolitical ability to transform a pre-modern population (the Chinese of late imperial Manchuria) into a subject of medical reason. At the same time, however, Lynteris shows that counter-epidemic technologies developed within a modern scientific framework may be recuperated by local communities and re-deployed as ritual techniques against epidemics: anti-contagion masks turned into talismans through the

application of temple seals, and carbolic acid used to exorcise plague demons, were common phenomena in early twentieth century China.

Still, as both historians and anthropologists have shown, counter-epidemic measures are not always accepted or accommodated by the communities to which they are applied. Resistance to epidemic control has been common to public health crises (Fairhead 2016). This resistance, focused on counter-epidemic policy and its biopolitical framework, often takes as its concrete object specific technologies of epidemic control. Cases of opposition to vaccination, disinfection, quarantine and isolation form the staple of historical studies of epidemic control (Arnold 1993; Baldwin 1999; Benedict 1996; Bhattacharya, Harrison, and Worboys 2005; Echenberg 2002). In the wake of resistance to efforts to suspend traditional burials in West Africa during the Ebola epidemic of 2014-16, anthropologists placed these conflicts within a geographically and historically broader question of the infectious corpse (Lynteris and Evans 2018; Fairhead 2018). In her article in this special issue, Branwyn Poleykett examines Malagasy and French conceptualizations of hygienic burial during the colonial period. She argues that rather than being characterized by a clash between two incommensurable ways of handling the bodies of those who died during epidemics, ritual life was open to technical adjustment, hygienic reform, and careful adjustment to the norms of biomedicine. In arguing for a textured form of epidemiological explanation and understanding of the matter and mattering of the dead, Poleykett demonstrates that attentiveness to technique at intimate scales can highlight cooperation and consensus between cultural obligations that were seemingly opposed. At the level of materiality, performativity, and intentionality, Poleykett argues, ritual and hygiene became transparent and mutually intelligible.

In both contemporary West Africa and colonial Madagascar, improvised burial norms came into sharp focus at the point of their suspension. Counter-epidemic technologies became particularly visible in their reception and negotiation on the ground. These visibilities and public confrontations shaped the reception and acceptability of counter epidemic interventions. Using the 2014 TB outbreak in Perry County, Alabama, Lichtenstein and colleagues show that when White pharmacy students, escorted by the police, arrived to set up a TB testing table, they came under attack by members of the African American community, and had to leave. The choice of setting the testing table on a male-only space (trailer park) in full public view reinforced local community notions of targeting, and feelings of stigmatization. “The visibility of the TB testing table”, the authors stress, referring to a study by Nations and Monte (1996), “recalls similar missteps elsewhere, such as Brazil’s cholera tents that were set up to treat patients in affected favelas, but which angered the community and were shunned because of the stigma of a “filthy” disease. This technology of epidemic control assumed a material visibility that also made visible how the epidemic was handled exclusively by Whites, despite that African Americans comprise one third of the total health care force in the county, so undermining community trust. This approach also reduced management capacity in face of active opposition and more subtle individual and community practices, so confounding a cornerstone technology of epidemic control: contact tracing.

The articles in this special issue demonstrate the central importance of dialogue between historical and ethnographic cases of epidemic control. As James Fairhead has recently argued for Ebola, an important missing piece of the expert response was “insights that might have been drawn from comparative historical analysis concerning the social dynamics of epidemics and their (mis)handling, past and present” (Fairhead 2018:214). At the same time, a number of articles in this issue contribute to ongoing anthropological debates about the synergy between material and immaterial aspects of epidemic control technologies. Deploying ethnography and working in careful concert with epidemiologists, anthropologists continue to conceptually extend our understanding of the social etiologies of disease and to excavate epidemic emergences that are not captured by hegemonic outbreak narratives. Such works focus away from highly mediatized outbreaks of emerging diseases. They thus highlight the importance of technological aspects in understanding and controlling epidemics that occur below the

threshold of visibility and public consciousness and require persistent, attentive labor to monitor them (Brown et al. 2015; Nading 2014; Kelly and Lezaun 2014).

In their article, Alex Nading and Lucy Lowe ask “how and when social justice might become a technology of epidemic control?” In their contribution to this special issue, they interrogate the “cause” of epidemics as these emerge in advocacy movements for social justice in global health through focusing on the Zika epidemic in South America as a “ground” for discussing reasonable, proportionate and just responses to epidemics. On the one hand, they show that claims for social justice are a form of counter-epidemic response, and should be considered entangled in the production of knowledge about epidemics. On the other hand, they argue that “the terms of social justice frequently become overdetermined by the technological demands of global health,” demands which in turn require an alignment of “cause as etiology, cause as common ends, and cause as reasonable grounds.” If this, the authors argue, provides a distributive vision of social justice that offers itself as an effective tool of epidemic control, we should still consider other forms of social justice, such as reproductive and environmental justice, which as technologies of “epidemic entanglement,” the authors argue, “hold much greater potential for countering ‘power over’ while promoting ‘power to do.’”

Similarly focused on the interconnections of epidemic control and social justice, Benjamin N. Lawrance provides a new, and much needed, perspective on how the control of Ebola, as a public health emergency of international concern (PHEIC), entangled different actants far away from epidemic hotspots, hospitals and burial sites. In his article on Ebola’s “would be refugees,” he shows how epidemics are configured as crises in international refugee law, stimulating new knowledge production and practice in an area–jurisprudence—that is often overlooked by anthropologists of global health. Through a close analysis of legal documents relating to asylum claims made by West Africans, and the legal technology employed to evaluate them, Lawrance illuminates medical humanitarianism in practice: he shows how claims about the epidemic’s impact and its after effects bolster and undermine “credible” claims to asylum in the United Kingdom. He also underlines how the recent Ebola epidemic can help us understand, more broadly, the ways that “institutional networks, such as refugee determination apparatuses, marshal and obfuscate knowledge production” in the context of “emerging crises, when biomedical knowledge is incomplete or if data are equivocal.”

Seen as a technique of epidemic control, media interventions form part of what Charles Briggs (2009) has called “biocommunicability,” so bringing together the ephemeral, durable, and material nature of health communication. If biocommunicability builds links between the spectacular, the discursive and the biosocial circulation of knowledge about epidemics, Briggs (2016) most recently shows how, in the context of infectious disease outbreaks, “ecologies of evidence” involve “broader assemblages of interlocking ways of producing specific types of evidence and rendering them mobile, demoting other forms to the status of ignorance, superstition, or pathology, and simply rendering others unthinkable.” Both Lawrance and Lowe and Nading make a significant contribution to the study of technique as positioned between symptom and diagnosis, case and narrative, and, ultimately, between material and immaterial aspects of counter-epidemic work. Focusing on routine, habit, technique, and matter, Lawrance, and Lowe and Nading, forces us to consider new points at which countering an epidemic requires work of media. In the absence of epidemiological evidence, the medical is mediatized in the pursuit of social justice. It matters, as Lowe and Nading put it, “who gets to spin the web.”

In this special issue on the technologies and materialities of epidemic control, we aim to unsettle our policy-focused medical anthropological gaze, so as to explore the technical arrangements of controlling infectious disease outbreaks as key aspects of the way in which the latter become both platforms for and sites of emergence of political, epistemic and ethical relations.



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