Dispensing With Reductionism and Dualism: Biological Anthropological Perspectives Towards Understanding Disease, Epidemics, and Pandemics

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Commentary

Dispensing with reductionism and dualism: Biological anthropological perspectives towards understanding disease, epidemics, and pandemics

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At no time in recent history has the topic of disease, epidemics and pandemics been more at the forefront of public conversation than it is now. Previously, the threat of epidemics such as Ebola, the 1918 influenza pandemic, and the plague, were commonly framed as “back then” or “over there.” Perhaps COVID ended the public’s delusion. For biological anthropologists, however, the perspective has differed appreciably. Pandemics and epidemics are viewed as integral and repeated aspects of human existence, and the kindling to start an outbreak of gargantuan proportion has been delicately stacked for centuries (if not millennia). If the public (or anyone, for that matter) still clings to the notion that epidemics are “back then” (or maybe done) or “over there” (or affects ‘other people’) please READ THIS SPECIAL ISSUE. Here, the co-editors Andrew Wooyoung Kim and Sabrina Agarwal and invited authors offer insightful and innovative approaches towards understanding disease, epidemics and pandemics, past and present. They offer multiscalar approaches and grapple with complex sampling and methodological biases. They also lay foundations for future research.

This special issue makes clear what biological anthropologists know, the medical field has lost, and the public overlooks: the importance of adopting a holistic approach when exploring disease. The tenet is not new. In the 1870s, amidst intense rivalry between Louise Pasteur who espoused the germ theory of disease, Antoine Béchamp, a French doctor known for his expertise in cytology, biochemistry and physics, proposed that disease naturally occurred as a chemical reaction (akin to fermentation) and was associated with “the terrain”; that is, internal and external environments influencing natural biochemical processes. Béchamp wrote, “the experiment showed me that in parts subtracted from the living animal, the microzymas being no longer in their normal conditions of existence, produced therein chemical alterations, called fermentation, which inevitably led to tissue disorganizations…” (Bechamp, 1911:46). Decades later, in spite of the unilateral adoption of germ theory and the commensurate rise of the pharmaceutical industry that espoused a reductionist view that human disease is caused solely by pathogenic invasion and that, in fact, there is a magic bullet to end disease, Rene Dubos quipped that, “A virulent microbe reaches a susceptible host, multiplies in its tissues and thereby causes symptoms, lesions, and at times death. What concept could be more reasonable and easier to grasp? In reality, however, this view of the relationship between patient and microbe is so oversimplified that it rarely fits the facts of disease. Indeed, it corresponds almost to a cult—generated by a few miracles, undisturbed by inconsistencies and not too exacting about evidence” (Dubos, 1955: p. 31–35). Biological anthropologists agree.

Alongside the biological anthropological message that adopting a holistic approach is critical to our understanding of disease, epidemics and pandemics, indispensable points are emphasized throughout this special issue. First, virtually all authors make it clear that oversimplification of complex variables masks key factors contributing to the onset, limits, and conclusion of disease outbreaks. If we simplify the past by offering sweeping conclusions and simplistic explanations, we learn little about today and/or the future. This warning is emphasized by Houldcroft and Underdown (2023), who assert that promulgating broad explanations for Pleistocene population change, such as climate fluctuation, widespread interpersonal conflict, or the advent of agriculture, overlooks the role that infectious diseases played in the past and knowledge we gain from investigating the long-standing and complex interactions between host and pathogen. Joseph and Lindo (2023) argue that the paucity of knowledge regarding millennia of Indigenous populations’ health in the Americas and the emphasis on European contact overshadows and minimizes dynamics associated with widespread and variable patterns of disease—a point emphasized...
by Honap et al. (2023) who found distinct bacterial lineages in the oral microbiomes of pre-contact Native Americans. In addition, van Doren and Kelmelis (2023) warn that focusing intently on morbidity and mortality during pandemic years masks contributing factors that might play critical roles in the outcome of disease outbreaks. The age of onset of respiratory disease, environmental contexts such as urban and rural settings, and varying nutrition, were key factors associated with mortality prior to, during, and after the 1918 flu epidemic in Newfoundland. Lastly, Cepen-Robins et al. (2023) show in their modern sample of 20 children that health outcomes, such as intestinal inflammation, helmint infection, and immune response, are strongly linked to complex environmental conditions—conditions brought on by systemic inequality that influence exposure to stressors and the body’s response.

Another essential message offered by the authors is the benefit of adopting an evolutionary approach. The trope that epidemics or pandemics are recent human phenomena created by new pathogens ignores insights offered by subfields of biological anthropology: primatology, paleopathology, and biomolecular anthropology. Werner et al. (2023), for instance, in their assessment of undoc-umented zoonotic parasites in nonhuman primates, warn of parasitic spillover between non-human and human populations and urge continued monitoring of high-risk host populations (of all taxa). This message is reinforced by the contribution of Radhakrishna (2023), whose focus on emerging infectious diseases concludes that, “...there is an urgent need for more in-depth studies on human-primate interactions, for a comprehensive understanding of how human actions can drive disease outbreaks” (Radhakrishna, 2023: p. 8). Paleopathology, too, has offered tremendous insight into the appearance, dissemination, change, and/or disappearance of pathogens and host responses. Rather than taking an “orthodox approach”, which asserts that many diseases affecting humans today result from changes in subsistence strategy and population density, Houldcroft and Underdown (2023) advocate for continued biomolecular search that consistently indicates that infectious agents in the past may not have been substantially different from those isolated today. They remind us that “infectious disease is, and has always been, a fellow traveler of humanity” (Houldcroft & Underdown, 2023:11).

Lastly, perhaps one of the most important contributions offered in this special issue is the commitment to adopting a biocultural approach to the study of disease, epidemics and pandemics. To the credit of every author, the study of disease is framed as a complicated tale of biology and behavior, whether investigating the past, present, or future. Explicitly, however, Zuckerman et al. (2023) provide a review of studies that focus on biocultural approaches to disease and epidemics and offer, based on their evaluation of respiratory disease mortality between 1912 and 1925 in the Mississippi State Asylum, conclusions revealing that ecosocial and syndemic factors, along with gender, race, and intersectionality influenced mortality at the facility. Complex variables associated with disease are also evaluated by Kim et al. (2023).

Here, the authors explore the effects of childhood psychosocial stress and trauma on adult mental health. Their results divulge that childhood stress is significantly associated with increased Post Traumatic Stress Syndrome severity in adulthood and they lay the groundwork for further study into other measurable affects (immunological responses, for instance) of childhood trauma and disease later in life.

Clearly, as emphasized by all authors in this special issue, understanding disease, epidemics and pandemics will never be achieved by reducing the study to simplistic dualistic approaches: focusing solely on dichotomies between host/pathogen, now/then, us/them, human/animal, or biology/behavior. Rather, as the authors make abundantly clear and tackle head-on, complexity must be embraced in order to peek into the past and cast our eyes ahead to the future.

**AUTHOR CONTRIBUTIONS**

Anne L. Grauer: Conceptualization (equal); writing – original draft (equal); writing – review and editing (equal).

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