

Epistemological rehabilitation of “shoe leather” epidemiology: the lesson of cholera in Haiti

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In December 2016, the United Nations Secretary-General, Ban Ki-moon, finally apologized to the Haitian people for role that the U.N. played in the cholera epidemic in Haiti, which has impacted the country since October 2010 (<https://www.un.org/sg/en/content/sg/statement/2016-12-01/secretary-generals-remarks-general-assembly-new-approach-address>, accessed July 11, 2017). He affirmed that cholera must be eliminated in Haiti and promised to do much more to combat the epidemic. Despite the accumulated evidence that a peacekeeper contingent imported the epidemic from Nepal by contaminating a river with camp sewage [1], the U.N. continued to deny their unfortunate role and consistently declared immunity to avoid facing the victims' damage claims. Although understanding the origin of this epidemic should impact the strategies to eliminate cholera and the acquisition of necessary resources, influential scientists and experts opined that it was unhelpful and unfair to blame responsibility on a stabilization and aid force [2]. Furthermore, of 220 articles referenced in PubMed with search terms “cholera” AND “Haiti” between 2010 and 2016, only 26% mentioned or evoked the hypothesis of cholera importation from Nepal. This may also have epistemological explanations.

The epidemic was initially traced back to a Nepalese U.N. camp by a spatiotemporal analysis of case records and two field investigations published by Piarroux et al. [3] in the July 2011 issue of *EID*. Their conclusions were soon confirmed by the quasi perfect similarity of the whole genome sequences of the *Vibrio cholerae* clinical isolates

from both countries [4]. However, the initial investigations of the “shoe leather” variety were often considered unreliable and anecdotal, as their results were nearly ignored in the 23 articles in the November 2011 *EID* special issue on cholera in Haiti (<https://wwwnc.cdc.gov/eid/articles/issue/17/11/table-of-contents>, accessed July 11, 2017).

Interestingly, a completely different scientific field—ecology—has experienced similar epistemological issues. The dynamics of the wolf population in Yellowstone Park, since its reintroduction in 1995, has been explored by numerous studies using statistics, prey/predator mathematical modeling or population genetics, as published in classical ecology journals (http://www.yellowstonewolf.org/yellowstone_wolf_bibliography.php, accessed July 11, 2017). However, the most accurate insight may have been provided through the day-to-day field observations of wolf packs and the innovative use of social sciences such as psychology, ethnography and history. Such results dealt with chaos and wolf personalities, which were confined to popular science books often signed by the same researchers [5].

In a legitimate effort to improve the reliability and reproducibility of published science, biomedical journals have generally restricted accepted manuscripts to quantitative standardized studies exhibiting statistical significance. By doing so, research may not adequately capture contingent and non-replicable human-driven events at the origin of numerous epidemics. Understanding such phenomena may also require non-gold standard narrative methods drawn from historical sciences. A low rank in the hierarchy of evidence does however not systematically signify a low rank of result relevance, and vice versa. A century and a half ago, core medical journals were hesitant to report the cholera observations of John Snow, William Budd and others, which rebutted the miasma theory. Their

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reports declared cholera a prototypical waterborne bacterial infection and revolutionized public health in spite of important methodological biases, which were gradually corrected in the following decades. Current journals would benefit from epistemological introspection on the role of qualitative research and the possible processes to produce evidence, encouraging more editorial risks to detect future paradigm shifts.

Since 2010, significant progress against cholera in Haiti has been achieved, although the pace of the battle often lagged. Findings of the initial “shoe leather” investigations have proven to be much more than anecdotal, although they continue to remain nearly powerless to trigger significant and stable funding.

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Compliance with ethical standards

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