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*Model assumptions and corresponding implications for control of a cholera outbreak.*

In some ways, we have understood how cholera is spread for more than 150 years when John Snow's investigations of cholera outbreaks in London identified the contamination of the Broad Street water pump. However, according to a March 2010 position paper on cholera vaccines by the World Health Organization, there are likely 3 - 5 million annual cases of cholera worldwide that in turn lead to more than 100,000 annual deaths. It is known that cholera is endemic to our environment, leading to disease in humans in populations with poor sanitation. Additionally, endemic and epidemic cholera outbreaks have differing dynamics, as do outbreaks caused by differing strains of bacteria. The WHO underscores the need for finding cost-effective combinations of known treatments (especially vaccination and public health measures) for cholera outbreaks in different settings. Using optimal control theory, I consider several choices of model assumptions for a cholera outbreak, and discuss the differing biological assumptions of those models and, in turn, the impact of model choice on public health policy recommendations. (Received September 14, 2010)