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Limitations of chlorine disinfection of human excreta: Implications for Ebola disease control

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Various NGO guidelines suggest that human excreta may be disinfected by the application of concentrated (e.g., 0.5%) chlorine solutions. However, chlorine-based disinfectants are thought to rapidly lose their bactericidal and virucidal properties in contact with high levels of organic matter and chlorine application results in the production of toxic chlororganic compounds. To evaluate the disinfection efficacy of chlorine solutions (HTH, NaDCC and household bleach) against viruses and bacteria within excreta matrices, laboratory-scale disinfection experiments were undertaken. Human excreta matrices containing raw wastewater, with 0%, 10% and 20% (w/v) added faecal sludge, were disinfected with chlorine solutions at a ratio of 1:10 (chlorine solution: excreta matrix). Contact time was set at 30 minutes and bacterial (FC and IE) and viral (SOMPH) indicators were used to measure disinfection efficacy. Results demonstrated that at high levels of solids content, disinfection efficacy was significantly reduced. These results support the need to find a more effective means of disinfecting human excreta in future Ebola outbreaks.

Introduction

The first widespread Ebola virus disease (EVD) outbreak occurred between December 2013 and January 2016, in which a total of 28,638

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