Climate Change Implications for Health-Care Waste Incineration Trends during Emergency Situations

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Abstract
Healthcare waste (HCW) incineration practices in the global South countries are among the major sources of black carbon (BC) emissions or smoke. This study analyzes HCW incineration trends during emergency situations and smoke from HCW incineration processes in Haiti. The study was prompted by the current arguments about the climate change and the growing health effects associated with BC emissions. The conceptual framework was based on both adverse health effects from BC emissions exposure and climate change potential of BC emissions. Therefore, the goal was to determine whether cardboard HCW sharps containers emit lower BC emissions to the atmosphere during the incineration process, relative to the plastic sharps containers, and the pattern of emergency HCW incineration before and after the 2010 earthquake and cholera emergencies in Haiti. This was an observational study conducted with secondary data on HCW incinerated weights from January 2009 to December 2013 and primary data on average smoke densities. Linear regression analysis of the pattern of HCW incinerated weights revealed a relatively linear pattern ($R^2 = 0.164$) with fluctuating scenarios (peak sharp rise in 2012). Independent samples t-tests demonstrated significantly lower smoke emission during the incineration processes of cardboard sharps HCW containers as compared to plastic containers ($95 \% CI, p = 0.003$). Implications for positive social change include provision of quantitative evidence of the benefits of cardboard sharps HCW containers in reducing smoke during incineration activities, potential data for policy formulation, suggestions for review of existing HCW guidelines, and additional research on potential health impacts of emergency HCW disposal and BC emissions.