



# Comparative Analysis of Flooding Events and Cholera Incidence Dynamics in the Lake Chilwa Basin, Malawi, 2013

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## Abstract

Cholera remains a significant public health threat in Malawi, with the Lake Chilwa basin a recurrent hotspot. Flooding events are frequently hypothesised as drivers of outbreaks, but a detailed comparative analysis of this association is lacking. This study aimed to compare the temporal and spatial dynamics of cholera incidence with major flooding events in the Lake Chilwa basin to determine the nature and strength of their association. A comparative ecological study was conducted. Data on confirmed cholera cases were obtained from district health surveillance records. Hydrometeorological data, including lake water levels and rainfall, were used to identify and characterise flooding events. Time-series and spatial analyses were performed to compare flooding and cholera incidence patterns across the basin's administrative units. A clear temporal association was observed, with cholera outbreaks consistently following major flooding events with a lag of approximately 6–8 weeks. Spatial analysis showed cholera incidence was 2.3 times higher in lake-bordering districts experiencing direct inundation compared to those that did not. Major flooding events are a significant precipitating factor for cholera outbreaks in the Lake Chilwa basin, influencing both the timing and geographical distribution of cases. Public health preparedness and early warning systems should integrate real-time flood monitoring data. Cholera prevention resources, including vaccination campaigns and water treatment supplies, should be pre-emptively mobilised to high-risk areas following flood events. cholera, flooding, disaster epidemiology, environmental health, Malawi, Lake Chilwa This study provides empirical evidence quantifying the link between floods and cholera in a key endemic region, offering a basis for targeted, timely public health interventions.

**Keywords:** *Cholera epidemiology, Flooding, Disease outbreaks, Southern Africa, Environmental health, Comparative analysis, Malawi*

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