

## Comparative mortality analysis of the 2023/2024 cholera outbreak in Lusaka, Zambia

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### **Background**

Zambia faced its largest recorded cholera outbreak from 2023-2024, with an estimated 24,567 cases and 770 deaths reported from October 2023 to April 2024. Lusaka City accounts for an estimated 90% of these deaths. We investigated cholera-related deaths in Lusaka City, comparing community and in-patient deaths, to propose interventions for the outbreak response.

### **Methods**

We conducted a mixed-methods observational study from October 2023 to April 2024, focusing on cholera-related deaths. Data were collected from cholera treatment centers and health facility records, including demographic details, symptom onset, hospitalization, and death. We used an event capture questionnaire to describe deaths by time, person, and place, and gathered additional information from family members through a risk factor questionnaire and verbal autopsies. Statistical analyses compared community and in-patient deaths to identify patterns and potential hotspots.

### **Results**

Of the 517 recorded deaths, 502 (97%) were captured, with a peak in January 2024 and declined by March 2024. The majority of deaths, 325 (68%), were males, with no significant difference between community and in-patient deaths by sex ( $p = 0.9$ ). Community deaths had a lower median age (30 years [IQR: 5.0-41.0]) compared to in-patient deaths (38 years [IQR: 24.0-52.0],  $p < 0.001$ ) and occurred more rapidly after symptom onset (median 1.5 days [IQR: 0.5-2.5] vs. 3.2 days [IQR: 2.0-4.5]).

Geographic mortality hotspots were identified in Old Kanyama, George, and Garden Park, with these areas showing significantly higher community death rates ( $p = 0.004$ ). Kanyama, Matero, and Chipata had higher community deaths compared to in-patient deaths ( $p = 0.004$ ). The plurality of community deaths among under 5 years (18%) occurred in George. For in-patients, there was no significant difference in the timing (shift) of death across different times of the day

### **Conclusion**

In Lusaka City, community deaths involved younger individuals and more under-fives and occurred more rapidly after symptom onset

compared to in-patient deaths. We proposed targeted interventions in mortality hotspots, improving water supply and quality monitoring, setting up Oral Rehydration Points (ORPs), distributing chlorine, and enhancing risk communication.