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Harmful algal bloom and associated health risks among users of Lake Victoria freshwater: Ukerewe Island, Tanzania

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Harmful algal bloom and associated health risks among users of Lake Victoria freshwater: Ukerewe Island, Tanzania

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Abstract

There is a global concern regarding the occurrences of harmful algal blooms (HABs) and their effects on human health. Lake Victoria (LV) has been reported to face eutrophication challenges, resulting in an increase of bloom-forming cyanobacteria. This study is aimed at understanding the association of HABs and health risks at Ukerewe Island. A cross-sectional study conducted on 432 study subjects and water samples for cyanobacteria species identification were collected at LV shores. The results reveal that concentrations of cyanobacteria cells are beyond (WHO) acceptable limits; species of *Microcystis aeruginosa* range from 90,361.63 to 3,032,031.65 cells/mL and *Anabaena* spp. range from 13,310.00 to 4,814,702 cells/mL. Water usage indicates that 31% use lake water, 53% well water and 16% treated supplied pipe water. Vomiting and throat irritation was highly reported by lake water users as compared to wells and pipe water ($P < 0.001$). Gastrointestinal illness (GI) was significantly elevated among lake water users as compared to pipe and well water users ($P < 0.001$). Visible blooms in lake water were associated with GI, skin irritation and vomiting as compared to water without visible blooms ($P < 0.001$). The concentration of cyanobacteria blooms poses greater risks when water is used without treatment.

Keywords: cyanobacteria, harmful algae blooms, health effects, Lake Victoria