



# A Policy Analysis of Extended-Spectrum Beta-Lactamase Producing \*Escherichia coli\* in Lusaka's Hospital Effluent and Adjacent Water Sources, 2004

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## Abstract

The discharge of untreated hospital effluent is a public health concern in low-resource settings. Such effluent can contain antimicrobial-resistant bacteria, including Extended-Spectrum Beta-Lactamase-producing *Escherichia coli* (ESBL-E. coli), risking contamination of adjacent community water sources and amplifying resistance spread. This policy analysis aimed to examine the public health risks from ESBL-E. coli in hospital wastewater and nearby water sources in Lusaka, Zambia. Its objectives were to determine the prevalence and genetic characteristics of the bacteria and to assess the adequacy of relevant environmental and health policies. A mixed-methods approach was used. Primary microbiological data on ESBL-E. coli prevalence and genetic markers from a Lusaka study were reviewed. This was synthesised with a critical analysis of national and local policies on healthcare waste, water quality, and antimicrobial resistance using a standard policy analysis framework. A critical policy-practice gap was identified. Microbiological data showed a high prevalence of ESBL-E. coli in hospital effluent, with identical genetic strains present in adjacent water sources, confirming environmental transmission. Existing policies were fragmented, under-resourced, and poorly enforced, failing to effectively mitigate this contamination route. The contamination of water sources with ESBL-E. coli from hospital effluent poses a direct threat to community health in Lusaka and worsens the antimicrobial resistance burden. Current policy frameworks are inadequate to manage this environmental health challenge. An integrated, intersectoral policy for healthcare effluent management must be developed urgently, supported by dedicated funding and enforcement mechanisms. Immediate steps should include infrastructure upgrades for wastewater treatment and strengthened surveillance of water sources for antimicrobial resistance. antimicrobial resistance, ESBL-E. coli, hospital effluent, policy analysis, water contamination, Zambia. This analysis provides evidence linking hospital effluent to community water contamination with resistant bacteria and highlights critical deficiencies in the governing policy framework, offering a basis for intersectoral action.

**Keywords:** *Antimicrobial resistance, Extended-spectrum beta-lactamase, Hospital effluent, Sub-Saharan Africa, Waterborne pathogens, Environmental surveillance, Zambia*



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