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Research Article

Mapping Evidence on the Evaluation of Cholera Control Programs and Policies: A Scoping Review Protocol

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Abstract

Background: Cholera remains a major global public health challenge, particularly in settings with inadequate water, sanitation, and health system capacity. Although effective interventions such as water, sanitation and hygiene (WASH), oral cholera vaccines (OCV), surveillance systems, and outbreak response strategies are widely implemented, there is limited consolidated evidence on how these programs and policies are being evaluated in real-world settings.

Methods: This scoping review will follow the Joanna Briggs Institute (JBI) methodology and adhered to PRISMA-ScR checklist. A comprehensive search will be conducted in PubMed, EMBASE, Web of Science, Scopus and google scholar, along with grey literature sources. Studies evaluating cholera-related programs and policies across all settings will be included based on the CoCoPop (condition-context-population) framework. Two independent reviewers will perform study selection and consensus will be resolved through discussion. Data will be extracted using a structured form capturing study characteristics, intervention details, evaluation approaches, outcomes, and implementation factors. Quantitative data will be summarized using frequencies and proportions, whereas qualitative data will be synthesized narratively.

Discussion: This review will provide a critical evidence base to strengthen the evaluation of cholera control efforts worldwide. By systematically mapping existing approaches and identifying key gaps, it will guide the development of standardized and context-responsive evaluation frameworks. The findings are expected to enhance program effectiveness, improve accountability, and support evidence-informed decision-making, thereby accelerating progress toward sustainable cholera elimination.

Keywords: Cholera; Water; WASH; Oral cholera vaccine; Program evaluation; Health systems; Disease surveillance

Introduction

Cholera has long shaped the evolution of public health, contributing to foundational advances in epidemiology, microbiology and disease control. Despite these advances, it remains a significant global health challenge particularly in setting with limited safe water access, sanitation and health system capacity [1–3]. According to the World Health Organization (WHO), there are about 1.3-4.0 million cases and 21,000-1,43,000 deaths annually worldwide [4]. In 2022, UNICEF (United Nations International Children's Emergency Fund) reported that the number of reported cholera cases had increased by 14.5% compared to the previous five-year average [5]. According to the Weekly Epidemiological Record in 2024, over 560,000 cases and 6,000 deaths have been

reported globally [6]. These findings indicate a concerning increase in cholera incidence globally, reflecting both true epidemiological resurgence and improved detection in fragile settings.

The persistence of cholera is driven by a complex interplay of structural, environmental and socioeconomic determinants including inadequate access to safe drinking water, poor sanitation, weak health systems and population vulnerabilities. These factors disproportionately affect low-resource and humanitarian settings, reinforcing cholera as a disease of inequity. Climate- related factors such as flooding and temperature changes have further exacerbated the conditions suitable for outbreak risks, underscoring the need for integrated, multisectoral control strategies [7,8].

Key cholera control and prevention strategies include Water, Sanitation, and Hygiene (WASH), Oral Cholera Vaccination (OCV), strengthened surveillance systems, community engagement and timely outbreak response mechanisms [9-11]. Development of affordable killed whole-cell oral vaccines against cholera and newer bivalent oral vaccines against cholera have been shown to provide moderate to high levels of immunity for both individual protection and herd immunity when vaccination coverage is sufficiently high [12]. WHO has launched Global Task Force on Cholera Control (GTFCC), a global roadmap to end cholera in 2017, which is set to reduce cholera-related deaths by 90% and eliminate transmission in at least 20 countries by 2030 [13]. owever, health system preparedness including rehydration services and routine surveillance to tackle cholera outbreak is fragmented. A robust surveillance system is required to quickly identify areas with cholera problems so that vaccines can be targeted to those areas. These interventions are most effective when implemented as integrated packages tailored to local contexts. Additionally, the GTFCC roadmap recognizes the importance of mapping hotspots to deliver targeted intervention packages [13]. However, a key challenge in cholera control lies in the distinction between biological efficacy and programmatic effectiveness. While interventions such as vaccines and WASH have demonstrated efficacy under controlled conditions, their real-world impact depends on health system capacity, implementation fidelity, and contextual factors.

Despite the expansion of cholera control initiatives globally, there remains limited consolidated evidence on how cholera prevention and control programs are evaluated across different contexts. Existing literature is largely fragmented, focusing on individual interventions or specific settings, with considerable heterogeneity in evaluation frameworks, indicators, and methodological approaches. This fragmentation limits the ability to compare findings, assess effectiveness comprehensively, and derive standardized evaluation practices [14].

Given this gap, there is a critical need to systematically map how cholera control programs and policies are evaluated globally. This scoping review aims to synthesize existing evidence on evaluation frameworks, methodologies, indicators, and implementation contexts used in cholera control programs and policies across global level, identifying key gaps and informing the development of more standardized and context-responsive evaluation approaches.

Methods

This scoping review will follow the Joanna Briggs Institute (JBI) 2020 methodological guidance and adhered to PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) checklist [14].

Search Strategy

A comprehensive literature search will be conducted across various database includes PubMed, EMBASE, Web of Science, Scopus, google scholar and government database/website, along with grey literature sources using free text terms/keywords such as “cholera”, “oral cholera vaccine”, “WASH interventions”, “surveillance”, “outbreak response”, “program evaluation”, “policy evaluation”, “implementation”, “health systems”. Search terms iteratively refined based on the database specification to improve sensitivity and specificity of search. The preliminary search strategy for each database provided in supplementary appendix (S1). In addition to database searches, reference lists of included studies will be manually screened (snowballing), and forward citation tracking will be conducted to identify additional relevant publications. No restriction will be placed on the year of publication, as cholera is a longstanding public health problem with a substantial body of evidence spanning several decades, reflecting the evolution of diverse control programs, policies, and interventions over time. Only studies published in the English language will be included. Studies that do not focus on the evaluation of cholera control programs or policies, editorials, commentaries, conference abstracts without full text, and articles lacking sufficient methodological details will be excluded.

sEligibility Criteria

Eligibility criteria were defined by using the CoCoPop framework (Condition-Context-Population) in accordance with JBI methodology [14].

Condition:

Cholera, an acute diarrheal disease caused by Vibrio cholerae, with a focus on its prevention, control, and public health management through structured interventions and policies.

Context:

All geographic regions and settings will be considered, including endemic areas, outbreak-prone regions, humanitarian settings, and resource-limited environments where cholera transmission is most prevalent. The review will capture variations across different health system capacities and implementation contexts.

Population:

Individuals, communities, or population groups targeted by cholera prevention and control programs globally, including vulnerable and high-risk populations such as those with limited access to safe water, sanitation, and healthcare services.

Concept:

Evaluation of cholera-related programs and policies,

encompassing program-level and policy-level assessments of key interventions such as vaccination campaigns, water, sanitation and hygiene (WASH) initiatives, disease surveillance systems, outbreak response mechanisms, and national cholera control strategies.

Data management

Search results from all selected databases will be exported in RIS/nbib formats and imported into Rayyan, a web-based platform for managing and screening review records. Duplicate entries will be identified using automated tools within Rayyan and further verified manually before the screening process.

Study Selection

A two-step screening process will be undertaken.

Step 1: Title and Abstract Screening

Two reviewers will independently screen title and abstract in a blinded manner, classifying each record as "include," "exclude," or "maybe." Following this stage, decisions will be unblinded and any discrepancies will be resolved through discussion, with consultation from a third reviewer when necessary.

Step 2: Full-Text Screening

Full texts of potentially eligible studies will be independently reviewed by two reviewers. Any discrepancies will be resolved through consensus, with arbitration by a third reviewer if necessary.

The study selection procedure will be documented and presented in accordance with the PRISMA 2020 flow diagram. All included studies will subsequently be exported for data charting and synthesis using Microsoft Excel. In line with scoping review methodology, no formal critical appraisal of study quality or certainty of evidence will be performed.

Data Charting and Synthesis

A predefined data extraction form will be used to systematically capture relevant information from included studies. Study characteristics will include country, region, income classification, setting, study design, and study period. Population-related variables will capture the target population, sample size, and inclusion and exclusion criteria. Details of the intervention will include name of the intervention, level of implementation, and duration. Program and policy-related information will include program name, implementing agency, policy framework, and integration with health systems. Evaluation characteristics will cover type of evaluation, evaluation framework used, evaluation objective, and comparator. Outcome measures will include health outcomes, coverage indicators, system outcomes, behavioural outcomes, economic outcomes, and equity outcomes. Key implementation factors such as facilitators and barriers will be documented. Quantitative data will be summarized as frequencies and proportions, wherever appropriate, while qualitative data including contextual influences, implementation barriers, governance factors, and lessons learned will be synthesized narratively to provide a comprehensive overview of global evaluation practices.

Discussion

Although cholera remains a preventable disease, recurrent outbreaks highlight persistent weaknesses in health systems, WASH infrastructure, surveillance, and emergency preparedness. While numerous interventions have been implemented globally, systematic synthesis of how these programs and policies are evaluated is lacking.

This review will address this gap by consolidating global evidence on cholera program and policy evaluations. By identifying common evaluation frameworks, indicators, and methodological approaches, the review will provide insights into best practices and highlight areas where evaluation mechanisms are underdeveloped.

The findings will support efforts to strengthen accountability, improve resource allocation, and enhance multisectoral coordination in cholera control. By mapping global experiences, this review will contribute to evidence-informed decision-making and may guide countries in designing more effective, equitable, and sustainable cholera control strategies aligned with global elimination targets. The findings of this review will be disseminated through publication in a peer-reviewed journal. In addition, concise knowledge translation outputs, such as policy briefs and evidence summaries, will be developed to improve accessibility and facilitate the application of findings in program planning and decision-making processes.

Strengths and Limitations

This scoping review will provide a comprehensive overview of evaluation practices across diverse cholera intervention contexts by including multiple intervention types vaccination, WASH, surveillance, and policy frameworks it will generate a broad evidence map to inform future research and implementation strategies. However, consistent with scoping review methodology, the study will not include a formal quality appraisal of included literature. Additionally, restricting inclusion to English-language publications may introduce language bias. Despite these limitations, the review will offer a foundational synthesis of program and policy evaluation approaches in cholera control.

Competing Interests

The authors declared that have no financial or non-financial conflicts of interest related to this work.

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Authors Contributions

Conceptualization: Vanessa Ravel (VR), Sona Priyanka Auroprem (SPA) and Harmanmeet Kaur (HK); Methodology: VR, SPA and HK; Writing – Original Draft: VR, SPA and HK; Writing – Review & Editing: VR, SPA and HK; Supervision: HK; Project Administration: HK; All authors approved the final version of the

manuscript, and agree to be accountable for all aspects of the work. HK acts as the guarantor for this work.

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