

## Assessing Diagnostic and Evaluation Tools for Use in Urban Immunisation Programming: A Critical Narrative Review and Proposed Framework

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**Abstract :** Background: Due to both the increasing scale and speed of urbanisation, urban areas in low and middle-income countries (LMICs) host increasingly large populations of under-immunized children, with the additional associated risks of rapid disease transmission in high-density living environments. Multiple interdependent factors are associated with these coverage disparities in urban areas and most evidence comes from relatively few countries, e.g., predominantly India, Kenya, Nigeria, and some from Pakistan, Iran, and Brazil. This study aimed to identify, describe, and assess the main tools used to measure or improve coverage of immunisation services in poor urban areas. Methods: Authors used a qualitative review design, including academic and non-academic literature, to identify tools used to improve coverage of public health interventions in urban areas. Authors selected and extracted sources that provided good examples of specific tools, or categories of tools, used in a context relevant to urban immunization. Diagnostic (e.g., for data collection, analysis, and insight generation) and programme tools (e.g., for investigating or improving ongoing programmes) and interventions (e.g., multi-component or stand-alone with evidence) were selected for inclusion to provide a range of type and availability of relevant tools. These were then prioritised using a decision-analysis framework and a tool selection guide for programme managers developed. Results: Authors reviewed tools used in urban immunisation contexts and tools designed for (i) non-immunization and/or non-health interventions in urban areas, and (ii) immunisation in rural contexts that had relevance for urban areas (e.g., Reaching every District/Child/ Zone). Many approaches combined several tools and methods, which authors categorised as diagnostic, programme, and intervention. The most common diagnostic tools were cross-sectional surveys, key informant interviews, focus group discussions, secondary analysis of routine data, and geographical mapping of outcomes, resources, and services. Programme tools involved multiple stages of data collection, analysis, insight generation, and intervention planning and included guidance documents from WHO (World Health Organisation), UNICEF (United Nations Children's Fund), USAID (United States Agency for International Development), and governments, and articles reporting on diagnostics, interventions, and/or evaluations to improve urban immunisation. Interventions involved service improvement, education, reminder/recall, incentives, outreach, mass-media, or were multi-component. The main gaps in existing tools were an assessment of macro/policy-level factors, exploration of effective immunization communication channels, and measuring in/out-migration. The proposed framework uses a problem tree approach to suggest tools to address five common challenges (i.e. identifying populations, understanding communities, issues with service access and use, improving services, improving coverage) based on context and available data. Conclusion: This study identified many tools relevant to evaluating urban LMIC immunisation programmes, including significant crossover between tools. This was encouraging in terms of supporting the identification of common areas, but problematic as data volumes, instructions, and activities could overwhelm managers and tools are not always suitably applied to suitable contexts. Further research is needed on how best to combine tools and methods to suit local contexts. Authors' initial framework can be tested and developed further.

**Keywords :** health equity, immunisation, low and middle-income countries, poverty, urban health

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