



Accuracy, Feasibility, and Acceptability of Three Novel Methods for Estimating Vaccination Coverage in Conflict-Affected Areas of Ethiopia and Somalia

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Background: Household surveys are the standard method for estimating vaccination coverage but are often infeasible in conflict affected or inaccessible settings. This study assessed whether alternative methods can provide comparable coverage estimates in fragile contexts.

Methods: A multi-method cross-sectional study was conducted in selected regions of Ethiopia and Somalia to estimate coverage of DTP3, MCV1, and OPV3 among children aged 12–59 months. Four methods were compared: (1) a gold-standard multi-stage cluster household survey (664 children), (2) embedded enumeration (EE) using trained community members (851 children), (3) telephone-based respondent-driven sampling (RDS) (933 children recruited through 21 seeds), and (4) Network scale-up method (NSUM) using proxy reporting (864 participants including 323 with eligible children). Methods were evaluated based on agreement with household survey estimates, internal precision, and operational feasibility, including cost and implementation time.

Results: Across both countries, alternative methods generated vaccination coverage estimates broadly consistent with the household survey. In Ethiopia, NSUM showed the closest agreement with household survey estimates, particularly for vaccines with higher coverage. EE also produced broadly similar estimates, whereas RDS tended to overestimate coverage. In Somalia, RDS most closely matched household survey results across antigens and preserved relative coverage patterns more consistently than NSUM. All methods were acceptable to communities and feasible to implement.

Conclusion: EE, RDS, and NSUM show promise as practical alternatives for estimating vaccination coverage when household surveys are not feasible. Although performance varied by setting and antigen, all methods produced estimates broadly comparable to household survey results, supporting their potential use in hard-to-reach populations.