

## Community-based bundled interventions for reproductive and child health in informal settlements: evidence, efficiency, and equity



Community-based bundled health interventions are complex and challenging to implement, monitor, and assess in informal settlements (slums). Such settlements in urban areas are generally characterised by congestion, squalid conditions, deprivation, violence, crime, and poor sanitation. In Asia and Africa, the numbers of informal settlements have grown exponentially in the large and mega cities of low-income and middle-income countries in the past few decades.<sup>1</sup> Their growth has been driven by rapid urbanisation and economic opportunities, leading to and prompted by rural-to-urban migration of skilled and unskilled workers. Populations in these informal settlements, particularly women, children, and, increasingly, the elderly, are vulnerable to poor and multiple physical and mental health issues that include violence-related and self-inflicted injuries.

In *The Lancet Global Health*, Neena Shah More and colleagues<sup>2</sup> present evidence from a cluster-randomised, controlled trial in which they assessed the effects of community-based integrated interventions on reproductive and child health outcomes in informal settlements in Mumbai. The bundled intervention was implemented systematically by an experienced non-governmental organisation, the Society for Nutrition, Education and Health Action (SNEHA), and was designed primarily to address multiple health needs of women and children (reproductive, maternal, neonatal, and child health, immunisation, nutrition, and prevention of violence). 40 clusters of similar sizes were randomly assigned to have a resource centre providing and arranging help for the community (n=20, 12 614 households) or to have no additional resources (control; n=20, 12 239 households). Data for the indicators used to assess change were obtained through censuses done before and 2 years after the intervention was implemented. Postintervention data were available for 8271 women and 5371 children younger than 5 years in the intervention group, and 7965 women and 5180 children in the control group. Several outcome indicators improved significantly in favour of the

intervention group. For example, met need for family planning was greater in the intervention clusters than in the control clusters (odds ratio [OR] 1.31, 95% CI 1.11–1.53). Full immunisation among children aged 12–23 months was similar in the two groups when assessed by intention to treat, but improvement was seen in the per-protocol analysis (ie, children who had been resident in intervention clusters for the entire intervention period; OR 1.73, 95% CI 1.05–2.86). Childhood wasting was improved at the cluster level after 2 years of intervention. These results confirm the feasibility and effectiveness of a community-based resource model, and the authors have called for replicating the approach in other informal settlements to be considered.

The strength of this community intervention was the integrated approach, which mixed health promotion with outreach activities, such as provision of information, communication, supervision, referral and follow-up services, day care, supplementary nutrition for malnourished children, counselling, home visits, liaison with local public systems, and community-based events. SNEHA engaged full-time, paid, and trained community organisers to monitor health and wellbeing and provide these services. They also involved clinicians to provide treatment, medication, and referrals.

Although the evidence supporting bundled intervention was statistically robust, I question whether these findings can be generalised to other informal settlements. Generalisability will depend on the causes and degree of association between the intervention components and outcome indicators, effect modification, and the variation in reported statistical associations when controlled for potential confounders and external characteristics.<sup>3</sup> To assess the internal validity and causal pathways would require a systematic assessment of adherence to the intervention, health and health-care behaviours, and potential economic, cultural or religious barriers in the intervention clusters. For example, husbands' or fathers' involvement and care and economic support from the immediate social

See [Articles](#) page e335

and family networks (relatives and neighbours) might positively affect the health of women and children in informal settlements. In contrast, patriarchal risk behaviours, such as substance and alcohol misuse, can adversely affect women's health outcomes through domestic violence and negligence.<sup>4</sup> Factors within households, such as food security, consumption, and expenditure and childcare, are important, and might mitigate the relation between intervention components and (child nutrition) outcomes.<sup>5</sup>

The SNEHA intervention was complex, involving the operation of parallel strategic actions to achieve multiple outcomes. Although establishing causality is difficult, systematically disentangling the independent and joint effects of specific intervention components on outcome indicators should be attempted. More importantly, to quantify the effect, relevant process indicators need to be defined and measured at different phases of the intervention. Shah More and colleagues<sup>2</sup> discuss the criteria and assessment of the indicators framework, but do not adequately describe or analyse the output and process indicators. Not reporting details of intervention processes in evaluation research is concerning.<sup>6</sup> Evaluation studies seldom apply the theory of change or logic models to document systematically the preconditions necessary to achieving the desired outcomes.<sup>7,8</sup> Conceptual models based on theories, such as diffusion, health belief models, and reasoned action and planned behaviour, offer better insights about the effects and effectiveness of complex multifactorial health interventions.<sup>9</sup>

Informal settlements are heterogeneous, complex, and vulnerable. The positive effects among the people who were residents for the whole period of intervention might be subject to selection effects and bias. Such biases are difficult to fully eliminate or explain by merely repeating the analysis in a subgroup within intervention clusters. Cultural factors are also prominent in the

study context. In India, pregnant women in informal settlements usually return to their parental home or village for childbirth<sup>10</sup> and remain for a few months afterwards. The factors underlying temporary migration behaviours are important to consider while assessing the effects of bundled interventions. Equally important is to ensure that the interventions are effective and equitable for all beneficiaries, especially the most economically deprived groups.

*Sabu S Padmadas*

Centre for Global Health, Population, Poverty and Policy, University of Southampton, Southampton SO17 1BJ, UK  
S.Padmadas@soton.ac.uk

I declare no competing interests

© The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY-NC-ND license.

- 1 UN Habitat. Urbanization and development: emerging futures. World cities report 2016. Nairobi: United Nations Human Settlements Programme, 2016.
- 2 Shah More N, Das S, Bapat U, et al. Community resource centres to improve the health of women and children in informal settlements in Mumbai: a cluster-randomised, controlled trial. *Lancet Glob Health* 2017; **5**: e335–49.
- 3 Victora CG, Habicht JP, Bryce J. Evidence-based public health: moving beyond randomized trials. *Am J Public Health* 2004; **94**: 400–45.
- 4 Nair S, Raj A, Saggurti N, Naik DD, Dasgupta A, Balaiah D. Reproductive health concerns of women contending with spousal violence and husband's alcohol use in a Mumbai slum community. *Int J Gynaecol Obstet* 2013; **122**: 268–69.
- 5 Goudet S, Griffiths P, Bogin B, Madise N. Interventions to tackle malnutrition and its risk factors in children living in slums: a scoping review. *Ann Hum Biol* 2016; **44**: 1–10.
- 6 Breuer E, Lee L, De Silva M, Lund C. Using theory of change to design and evaluate public health interventions: a systematic review. *Implement Sci* 2015; **11**:1–17.
- 7 Connell JP, Kubisch AC. Applying a theory of change approach to the evaluation of comprehensive community initiatives: progress, prospects, and problems. In: Fulbright-Anderson K, Kubisch AC, Connell J, eds. *New approaches to evaluating community initiatives*. Washington, DC: Aspen Institute, 1998: 15–44.
- 8 Nutbeam D, Padmadas SS, Maslovskaya O, Wu Z. A health promotion logic model to review progress in HIV prevention in China. *Health Promot Int* 2015; **30**:270–80.
- 9 Nutbeam D, Harris E. *Theory in a nutshell: a practical guide to health promotion theories*. Sydney, NSW: McGraw-Hill, 2004.
- 10 Das S, Bapat U, More NS, Chordhekar L, Joshi W, Osrin D. Prospective study of determinants and costs of home births in Mumbai slums. *BMC Pregnancy Childbirth* 2010; **10**: 2–10.