

Effective pneumococcal vaccination campaigns in displaced populations

Generating evidence on optimal vaccination strategies to protect children in humanitarian settings against pneumococcal pneumonia.

Substantial protection to be gained from a PCV campaign

Pneumococcal vaccines delivered at high coverage in a single dose one-off campaign to children up to at least five years old can provide substantial protection against pneumococcal disease in displaced populations. Partial protection in unvaccinated birth cohorts can be sustained for three to five years through herd protection. Campaigns targeting only children at highest risk for disease (those under two) are less effective and less efficient.



Corrugated sheet housing in Digaale camp for internally displaced people (mostly due to food insecurity) near Hargeisa, Somaliland. Photo by Kevin van Zandvoort.

Background

Pneumococcal pneumonia is a leading cause of child death globally. The high prevalence of malnutrition, crowded living conditions, limited access to curative care and disrupted routine immunisation (typically 3 doses in infancy for PCV) see populations affected by crises at particularly high risk. This study aimed to estimate the effectiveness of pneumococcal vaccines, if delivered in a single campaign, to improve child health before routine immunisation services can be restored.

How the research was conducted

A population representative cross sectional nested risk factor and pneumococcal carriage survey was conducted in a camp for internally displaced people in Digaale, near Hargeisa, Somaliland. The team then simulated the effect of a single-dose one-off vaccination campaign in Digaale and other crises affected populations.

Key findings

Based on information on risk factors from 509 participants across 464 households (65% of inhabited unique shelters) and 454 swabs:

- High prevalence of risk factors for respiratory illness: crowded living conditions; 20% of <5y olds stunted
- High disease burden: pneumococcal carriage rates like in rural Kenya; 46% of children with self-reported recent pneumonia; high crude death rates
- Vaccination of <1y olds only has limited and short-lived effects
- Vaccination of <5y olds at high coverage can
 - prevent about 30% of severe pneumococcal disease in the 2 years following the campaign,
 - can partially protect unvaccinated infants for 3-5 years after the campaign due to reduced transmission,
 - is cost effective: it prevents a similar amount of disease per dose administered as routine use in infants in Kenya
- If migration rates are high or vaccine coverage is low, extending campaigns to older children can retain indirect protection.

Implications for humanitarian practitioners and policymakers

These findings imply that humanitarian actors should consider integrating pneumococcal conjugate vaccine campaigns for at least <5-year-old children into their routine humanitarian response portfolio.

This could be done through co-administration with measles containing vaccines and Vitamin A in the acute phase of a humanitarian crisis.

To have the most impact, a PCV campaign should target not only the children most at risk of severe disease (those under two) but also key transmitters (mainly older children aged 2 to 10). Campaigns limited to only children most at risk are less effective and less efficient in offering durable protection.

Recommendations for future research

Future research should investigate the value of re-vaccination campaigns if routine immunisation services cannot be instated by the time that campaign protection wears off.

A demonstration implementation study is currently ongoing to further substantiate the model predictions. The results are expected in early 2025.

About the study team

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Keywords

Pneumococcal disease; Pneumonia; Vaccination; Children; Refugees; Humanitarian response

Articles and further reading

[Manuscript: Pneumococcal conjugate vaccine use during humanitarian crises](#)

[Manuscript: Social contacts and other risk factors for respiratory infections among internally displaced people in Somaliland](#)

[ESPICC project webpage](#)

[YouTube Video for pneumonia awareness in Somaliland](#)



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