Sustaining pneumococcal vaccination after transitioning from Gavi support: a modelling and cost-effectiveness study in Kenya

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Introduction

- Many low income countries will soon transition from Gavi (the Vaccine Alliance) support.
- Kenya will enter Gavi's accelerated transition phase in 2022 (Figure 1).
- We assessed the incremental cost-effectiveness of continuing the 10-valent Pneumococcal Conjugate Vaccine (PCV) use.

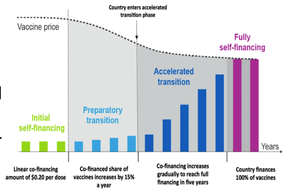

Figure 1: Gavi transition process

Methods

- We fitted a dynamic compartmental model of pneumococcal carriage to annual carriage prevalence surveys and invasive pneumococcal disease (IPD) incidence in Kilifi, Kenya.
- We then predicted disease incidence and related mortality for either continuing PCV use beyond 2022, the start of Kenya's transition from Gavi support, or its discontinuation.
- We calculated the costs per disability-adjusted-life-year (DALY) averted and associated prediction intervals (PI).

Results

- We predicted that overall IPD incidence will increase by 93% (PI: 72% - 114%) if PCV use is discontinued (Figure 2).
- Continuing vaccination would prevent 14,239 (PI: 6,130–25,256) deaths and 101,513 (PI: 4,386–196,674) disease cases during 2022-2032.
- Continuing PCV after 2022 will require an estimated additional US$15.8 million annually compared to discontinuing vaccination.
- The incremental cost per DALY averted of continuing PCV was predicted at $153 (PI: 70 - 411) in 2032.

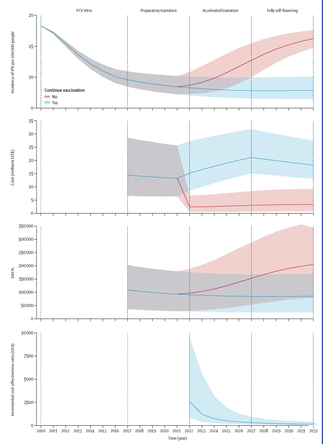

Figure 2: IPD incidence, costs, DALYs, and incremental cost-effectiveness ratio for continuing PCV use in Kenya, 2022–32

Conclusion

Continuing PCV use is essential to sustain its health gains. Based on the Kenyan GDP per capita of $1445, and in comparison to other vaccines, continued PCV use at full costs is cost-effective. These arguments support an expansion of the vaccine budget, however, affordability may be a concern.

KEMRI | Wellcome Trust · London School of Hygiene & Tropical Medicine · Gavi The Vaccine Alliance · Ministry of Health, Government of Kenya

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If Kenya continues the PCV program beyond 2022 (when rapid transition from Gavi financial support begins), every $1 million invested would result in 6,536 additional healthy years of life, compared to discontinuing. PCV use is highly cost-effective.

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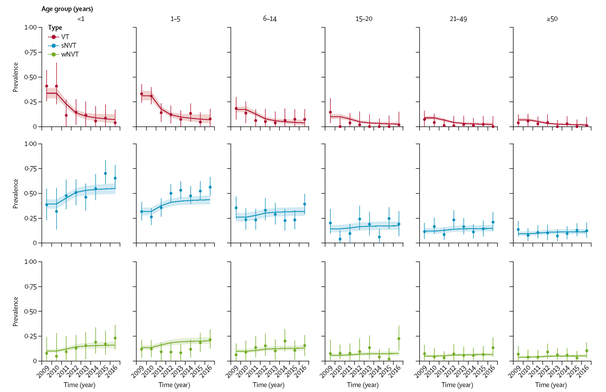
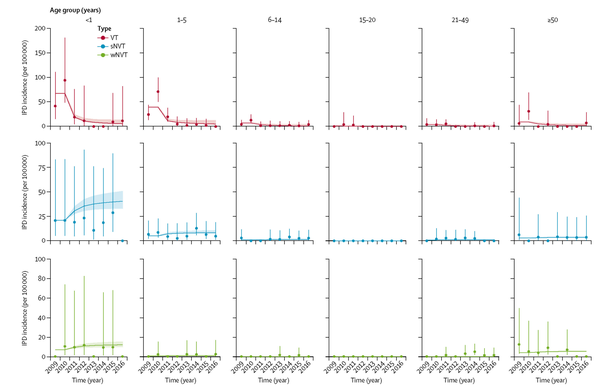
Model fit to carriage data



Model fit to IPD data



Budget impact