

Continuing pneumococcal vaccination in Kenya after transitioning from Gavi support is cost-effective

The cost to the Government of Kenya of continuing to include pneumococcal conjugate vaccine (PCV) in its routine immunization schedule once Gavi funding stops is estimated at \$153 per DALY averted, which is around one tenth of the WHO cost-effectiveness threshold of one GDP per capita (\$1,455 in Kenya, 2016).

Summary

As their economies grow and they transition out of Gavi financial support, many low-income countries will need to consider the value of continuing their previously-subsidized vaccine programs at full cost. Using Kenya as a case example, this brief highlights results and policy implications of a study assessing the incremental cost-effectiveness of continuing PCV use between 2022 and 2032. The results can be used to inform Kenya's decision whether to continue PCV use.

If Kenya continues the PCV program beyond Gavi transition in 2022, every \$1 million invested would result in 6,536 additional healthy years of life, compared to discontinuing.

Results and policy implications

Results

- If Kenya stopped administering PCV, rates of invasive pneumococcal disease would return to pre-vaccine levels within a decade.
- Continuing the PCV program is cost-effective but affordability is a concern.

Policy implications

- In order to keep PCV in its immunization schedule, Kenya needs to substantially increase its vaccine budget as subsidies diminish.

Why is PCV cost-effectiveness data needed?

The majority of African countries have introduced pneumococcal conjugate vaccines (PCVs) into their childhood immunization schedules which has led to a substantial reduction in pneumococcal disease. Although PCVs are among the most expensive vaccines available (\$9.15 per course, vs \$0.13 for a course of measles vaccine), affordability and cost-effectiveness were not concerns initially, because Gavi, the Vaccine Alliance, heavily subsidized vaccine introduction.

However, countries are expected to gradually take on the full costs of administering the PCV program once their three-year-average Gross National Income per capita exceeds a Gavi-defined threshold (which was \$1,580 in 2019).

This increase in cost to governments means that countries including Kenya will need to independently assess the cost-effectiveness and the affordability of continuing PCV use.

Kenya as a case study

Kenya introduced the 10-valent PCV (PCV10) in 2011 with Gavi support. By 2022, Kenya is due to enter into an accelerated transition phase in which the cost to the government increases annually until it is fully self-financing the PCV program at a cost of \$3.05 per dose, a 11-fold increase on the current price of \$0.28 (2019). For Kenya, full financing would be anticipated in 2027.

This study assessed the incremental impact and cost-effectiveness of continuing PCV use in Kenya. The results can be used to inform decisions about continued PCV use, including the value of continuing the PCV program past the accelerated transition-phase, when the country needs to fully self-finance its program.

Kenya is a good case study as it is the only one of nine African countries expected to transition from Gavi support in the next five years with robust vaccine impact data.

Study limitations

We have used health impact data from surveillance studies in Kilifi, which might not well represent the rest of the country. However, we compared national health and health system indicators (such as under five mortality, rate of acute respiratory illnesses and service availability and readiness measures) to those from Kilifi and found that they were similar.

Definitions

Disability-adjusted-life-year (DALY)

DALYs are a measure of the overall disease burden that combine morbidity and mortality; that is, they measure the burden of disease in terms of healthy years lost to death and disability. DALYs help to compare the overall disease burden.

Cost-effectiveness

The additional cost of an intervention (e.g. the cost difference between continuing and discontinuing PCV) required to prevent one DALY is normally compared against the GDP per capita of a country to judge whether the intervention is cost-effective i.e. provides value for money. If the cost per DALY averted is below the GDP per capita then the intervention is considered highly cost-effective.

Results

Stopping PCV use has a big health impact

If children born after 2022 no longer receive PCV, Invasive Pneumococcal Disease (IPD) incidence is predicted to bounce back from 8.5 in 2022 to 16.2 per 100,000 per year in 2032 – a 93% increase that will equal pre-PCV levels.

Continuing with PCV is predicted to result in additional small reductions in IPD incidence to 7.9 per 100,000 per year in 2032, and to avert 14,329 deaths and 101,513 IPD and non-bacteraemic pneumonia cases during the 11 years considered, compared to discontinuing PCV in 2022.

Continuing the PCV program is cost-effective but affordability is a concern

By 2032, the cost per disease case averted is estimated to be \$952, the cost per death averted is \$6,856 and the cost per DALY averted is \$153. This is highly cost-effective when based on Kenya's 2016 GDP per capita of \$1,455. **It means, one year of healthy Kenyan life saved will require a \$153 annual investment in the PCV program.**

If pneumococcal vaccination stopped in 2022 the average annual treatment cost for pneumococcal disease in Kenya over the coming decade is estimated at \$2,898,780. To sustain the PCV program, the average annual treatment and vaccination cost is estimated at \$18,747,118. **So, although highly cost effective, continuing the PCV program is expensive.**

Policy implications

Sustaining PCV use is essential

Maintaining PCV use is essential to sustain the decreased burden of pneumococcal disease. Every \$1 million invested in continuing PCV use would result in 6,536 additional healthy years of life compared to discontinuing PCV use.

Increasing investment in routine immunization is essential to sustaining the life-saving benefits of the PCV program

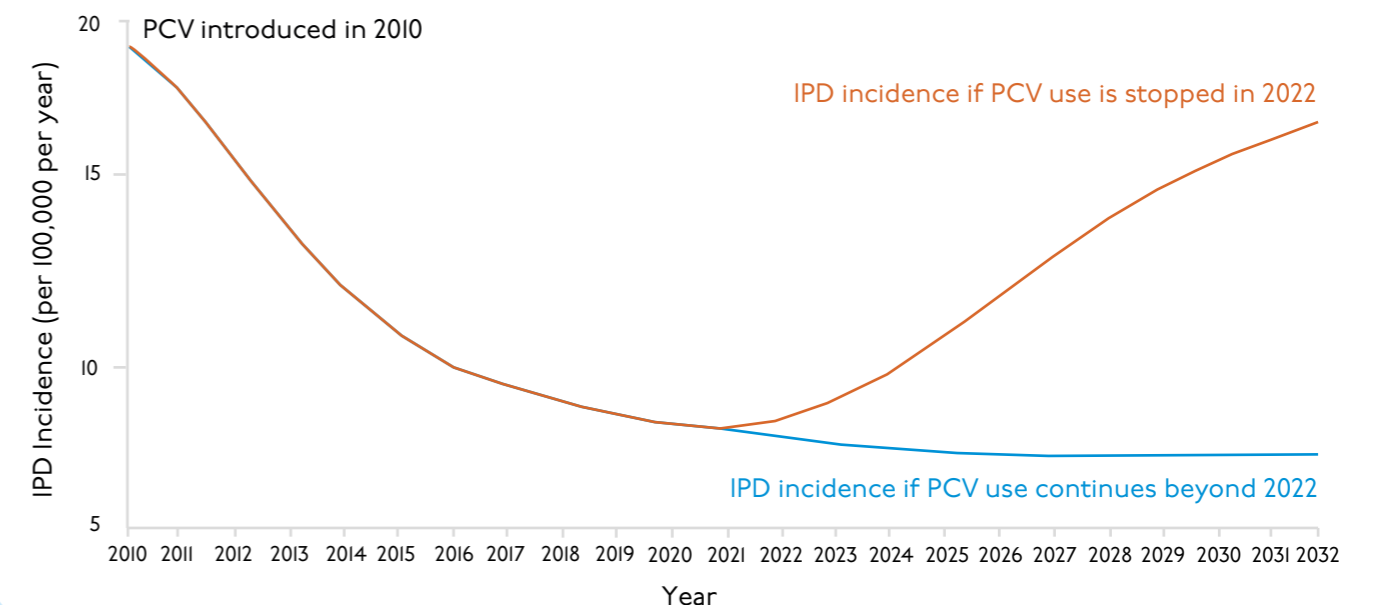
As subsidies diminish, Kenya will need to invest more in vaccines. To sustain the PCV10 program, Kenya will need to invest more than two and a half times its current total childhood vaccine budget.

Discussion

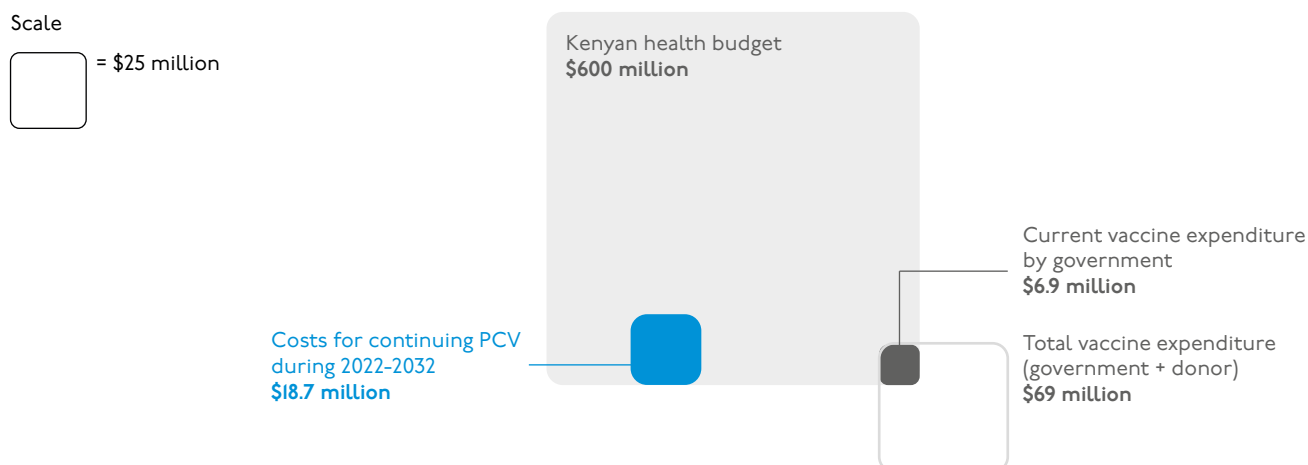
PCVs may become more affordable in the future

Competition in the PCV product market and research into the effectiveness of fewer and smaller vaccine doses may help reduce the cost of PCV in the future.

Comparison of IPD incidence if Kenya's PCV program is stopped in 2022 and if it continues beyond 2022

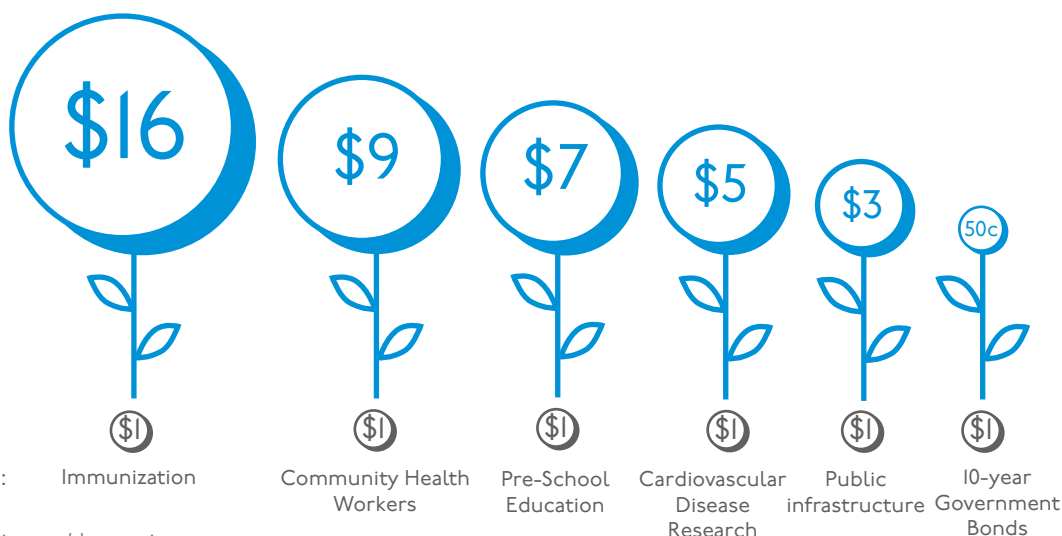


Kenya's PCV program: Annual costs for continuing PCV during 2022-2032 in context



Child and community health through immunization is one of the best investments governments can make

Return on investment...
Savings in healthcare costs, lost wages and productivity due to illness



Source: immunizationeconomics.org/dove-roi

References

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