
What's new in pneumococcal disease control?

A report on the opportunities available to rapidly improve the impact of pneumonia vaccination programs in the context of tight budgets.

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World Immunization Week 2026

This report was produced by Secure PCV, a global network of scientific experts in pneumococcal vaccination dedicated to sustaining high coverage of pneumococcal conjugate vaccines (PCVs) to reduce child and adult mortality and morbidity and hasten achievement of the Sustainable Development Goals (SDGs).

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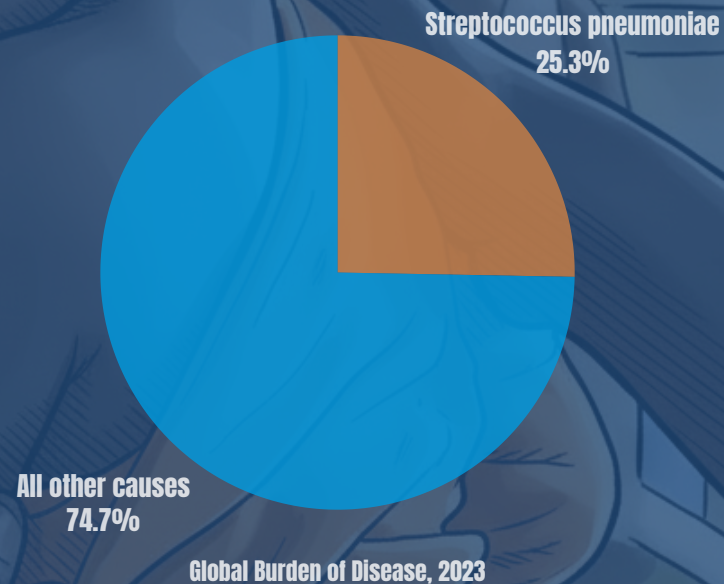
Why now?

*Pneumonia remains the leading infectious cause of death among children and adults, responsible for an estimated 2.5 million deaths in 2023, including 610,000 among children under five. One quarter of all pneumonia deaths are caused by one bacteria which is vaccine-preventable - *Streptococcus pneumoniae*.*

As new data underscore the ongoing burden of pneumococcal disease and pressures on vaccine financing intensify, advances in vaccines, simplified dosing schedules, and secondary benefits are making high-coverage pneumococcal vaccination programs even more cost-effective.

Eligible governments that act now to leverage these opportunities can save more lives, reduce health and economic costs, and accelerate progress toward 2030 health goals.

Figure 1: Global pneumonia deaths, by cause



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1. New Data on Disease Burden

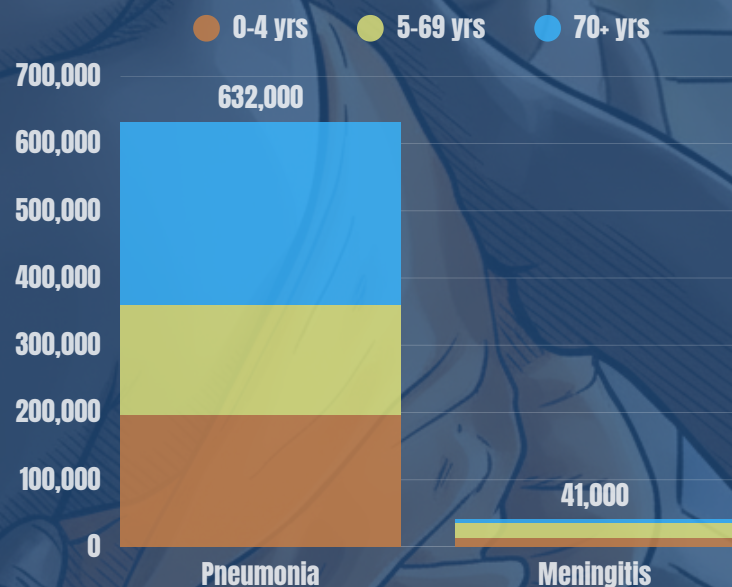
Global Burden of Disease (GBD) estimates show that *Streptococcus pneumoniae* remains a leading cause of death from pneumonia and meningitis, especially among children under five and adults over 70 years.

In 2023, pneumococcal disease caused an estimated 674,000 deaths across all ages, including 632,000 from pneumonia—25% of all pneumonia deaths—and 41,000 from meningitis—16% of all meningitis deaths.

Among children under five, there were 211,000 pneumococcal deaths, including 197,000 from pneumonia—32% of child pneumonia deaths—and 14,000 from meningitis—16% of child meningitis deaths.

In adults over 70, pneumococcal disease caused 275,000 deaths, including 271,000 from pneumonia—23% of pneumonia deaths in this age group—and 4,000 from meningitis—15% of elderly meningitis deaths.

Figure 2: *Streptococcus pneumoniae* deaths, by



Global Burden of Disease, 2023

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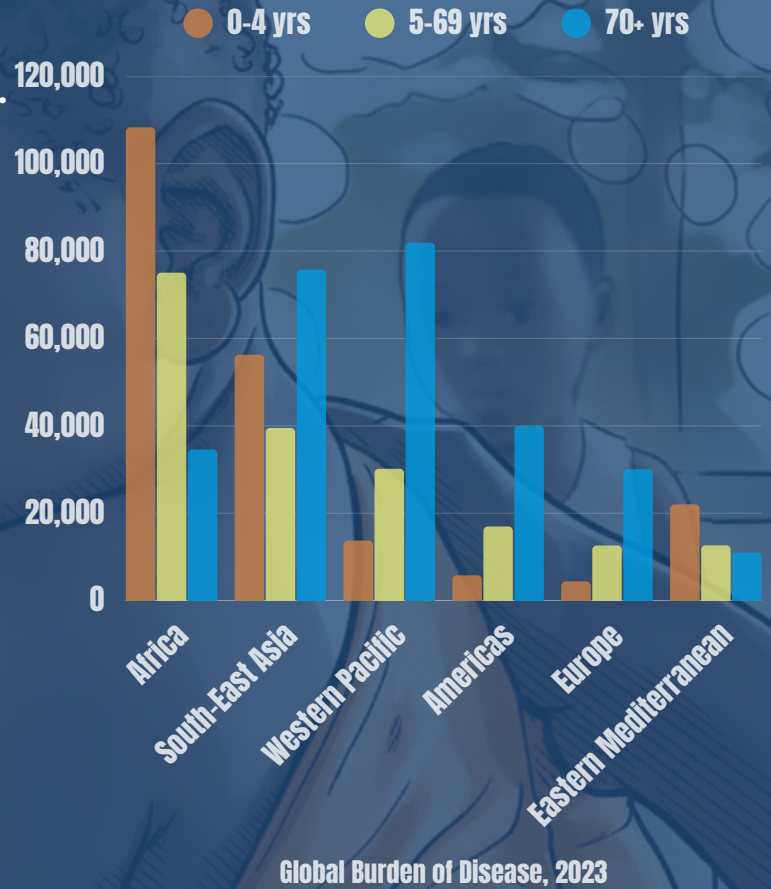
Africa bears the largest burden of global *Streptococcus pneumoniae* deaths. One third (218,000) of 674,000 global deaths occur on the continent, including 51% (108,000) of 211,000 child deaths caused by the bacterium.

Other data confirm these estimates.

Child Health and Mortality Prevention Surveillance Network (CHAMPS) results show that the most common bacterial cause of child pneumonia deaths in the community or within 72 hours of hospital admission is *Streptococcus pneumoniae* (35%), followed by *Klebsiella pneumoniae* (26%) and non-typable *Haemophilus influenzae* (12%).

CHAMPS data also show that *Streptococcus pneumoniae* is responsible for 10% of hospital-acquired pneumonia deaths in children.

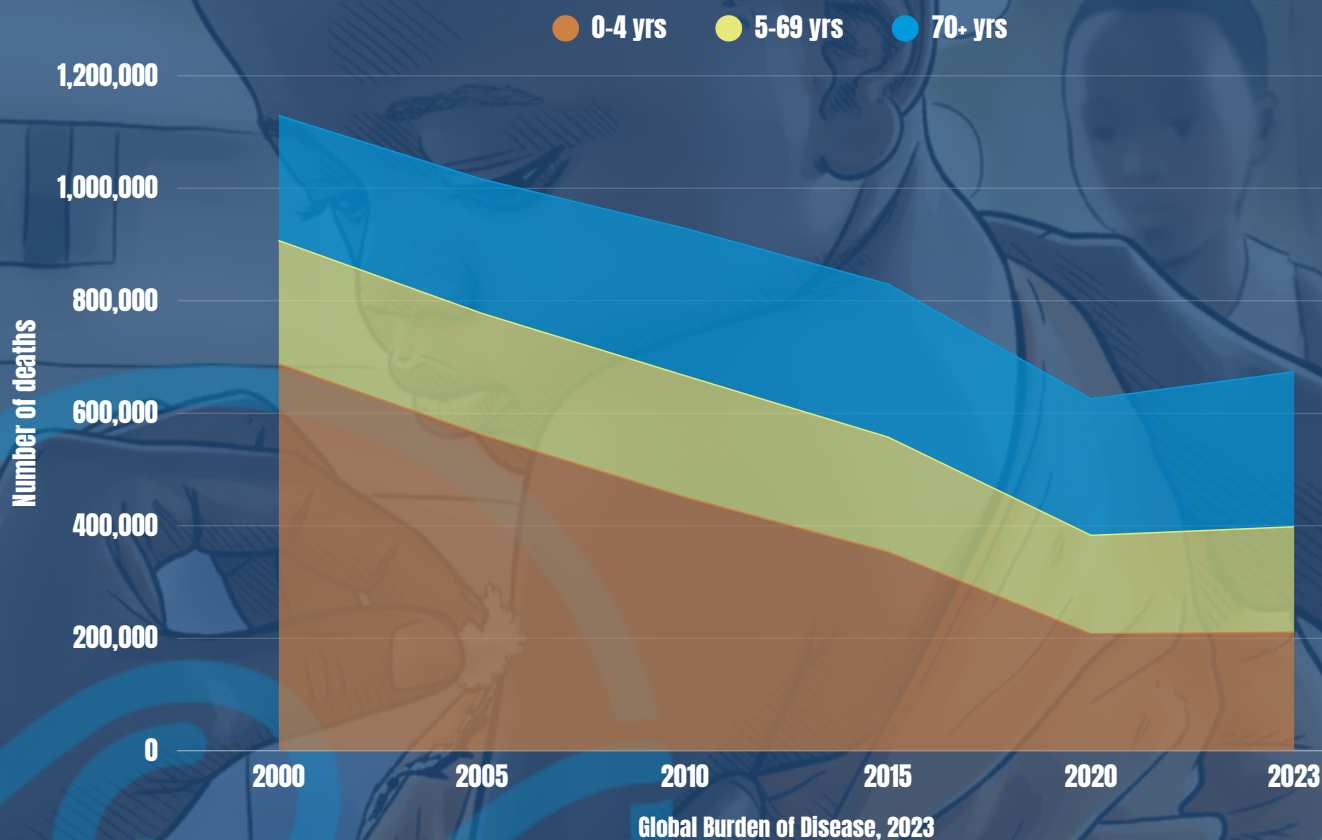
Figure 3: *Streptococcus pneumoniae* deaths, by age group and WHO region



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Between 2000 and 2023, pneumococcal disease deaths fell by 40% across all ages—from 1.1 million to 674,000—and by 70% among under fives—from 688,000 to 211,000. In contrast, among the over 70s, pneumococcal deaths increased by 24%—from 222,000 to 275,000.

Figure 4: Streptococcus pneumoniae deaths, by age



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New studies show that pneumococcal serotype distribution is shifting rapidly. Research from South Asia, Mongolia, Vietnam, Brazil, and Kenya demonstrates that the 13 serotypes (1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F) which historically caused most severe invasive pneumococcal disease worldwide remain common where vaccine coverage is limited, while non-vaccine serotypes such as 6C/D, 23A, 15A, and 31 are increasingly observed in carriage and invasive disease in high-vaccine coverage settings.

With vaccine and non-vaccine serotypes contributing to disease in different settings, these findings highlight the need for serotype-specific, regional surveillance to track which serotypes are causing severe disease in different countries and sub-populations. Without it, national vaccine policies may miss the strains most likely to cause death.



What is a serotype?

*A specific strain of *Streptococcus pneumoniae*, distinguished by small differences in the molecules on its outer surface. While there are over 100 known serotypes, a small number cause most deaths—3, 6A, 11A, 15A, 19F, and 31. Serotype 3 is particularly deadly.*

Takeaway

****Streptococcus pneumoniae*** remains a leading cause of pneumonia and meningitis deaths across all ages, but especially among young children and the elderly. Both vaccine and increasingly non-vaccine strains are causing a heavy burden of sickness and death, especially across Africa and South-East Asia.*

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2. New Advances in Vaccines

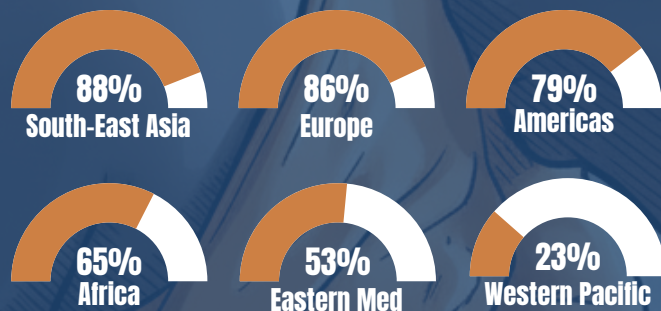
Recent advances in pneumococcal vaccination have included the introduction of a lower-priced conjugate vaccine for children costing US\$2 per dose for low- and middle-income countries (LMICs), and higher-valency conjugate vaccines, mainly for adults (PCV15, PCV20, PCV21).

In addition, a maternal vaccine to prevent pneumonia in infants caused by RSV is available, promising significant impact on hospitalization and deaths, especially among infants under six months of age.

Despite these advances, global coverage of pneumonia vaccines remains low. In 2024, just 67% of the world's children aged one year were protected with three doses of PCV, with wide variation across regions.

Just nine LMICs are using the lowest cost PCV (Cuba, Fiji, India, Kenya, Kyrgyzstan, Laos, Maldives, Timor-Leste, and Uzbekistan) and very few are opting for higher-valent PCVs. Uptake of Merck's PCV 15 and 21 and Pfizer's PCV 20 is concentrated among 40 high-income countries in Europe and North America.

Figure 5: PCV coverage, 2024



WHO/UNICEF, 2025

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Further, there are only two LMICs (Argentina and Brazil) among the 20 countries to introduce the RSV vaccine into routine immunization.

Vaccines for Group B Streptococcus (GBS) and *Klebsiella pneumoniae* are not yet available but countries need to monitor their progress. Several GBS vaccines are in clinical trials (GBS6, Minervax, Inventprise), while vaccines to prevent *Klebsiella pneumoniae* among adults are in early clinical trials (Kleb4V and CHO-V08).

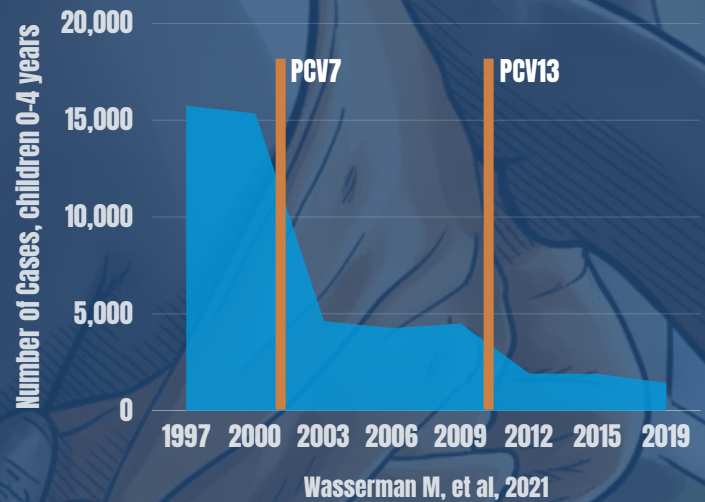
- The maternal GBS vaccine from Pfizer targeting six different serotypes is in Phase 3 trials, while Minervax’s GBS-NN protein vaccine and Inventprise’s GBS-06 are in Phase 2.
- *Klebsiella pneumoniae* vaccines are in early stage clinical trials and likely a decade or more away from approval.



What is a conjugate vaccine?

Conjugate vaccines (e.g., PCV 10, 13, 15, 20, 21) pair sugar with protein for stronger, longer protection. In contrast, polysaccharides (e.g., PPSV23) use sugar alone (weaker, shorter protection), while emerging protein vaccines use protein only to trigger strong immunity.

Figure 6: Pneumococcal Cases (0-4 yrs), USA



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Impact of higher-valent vaccines

Current PCVs have cut pneumococcal disease among children significantly, with dramatic reductions in high-income countries. Disease reductions in Africa and Asia have generally been lower (20–40%) due to coverage, health system, and disease burden differences.

PCV vaccines have also reduced disease among adults, generating strong “herd immunity” by lowering transmission and protecting unvaccinated populations. This effect is well-documented in many settings.

Higher-valent PCVs are expected to prevent at least as many deaths as current vaccines and potentially more, since they target additional disease-causing serotypes, strengthening herd immunity. Their impact depends on which serotypes are common locally and how severe the disease is.



What is herd immunity?

*High PCV coverage in children reduces the spread of *Streptococcus pneumoniae*, protecting vulnerable groups—this is herd immunity. About 90% of reduced adult pneumonia hospitalizations comes from this effect.*

Recent studies suggest these vaccines could prevent a substantial portion of remaining pneumococcal cases in countries with extensive use of PCV 10 or 13.

For example, in the UK, overall pneumococcal carriage in children hasn't changed much since PCV13 was introduced, but most cases are now caused by strains not covered by the vaccine.

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Another recent study suggests that pneumococcal vaccines could save more lives by targeting immunocompromised adults and moving beyond age-based strategies.

Other studies have suggested that in the future, protein-based PCVs, such as a candidate from Virometix AG now in early trials, could eventually protect against all serotypes, representing a potential step toward universal pneumococcal prevention.

Almost all of this evidence comes from high-income settings, meaning the economic value of higher-valent PCVs in LMICs is largely inferred—though likely substantial given higher disease burden. The overall impact will depend heavily on vaccine price, local epidemiology, and delivery costs.



Higher-valent vaccines aren't always better; their extra coverage only helps if the additional serotypes are common locally. Cost, supply, and feasibility also affect which vaccine is most appropriate.

Takeaway

Countries now have highly effective vaccines that prevent the main bacterial and viral causes of pneumonia in children and adults, dramatically reducing illness, hospitalizations, and deaths. To maximize impact, they need to choose the most cost-effective mix of vaccines – carefully assessing the relative benefits of lower and higher-valent PCVs, and the costs of switching.

3. New Dosing Schedules

In 2025, following a Systematic Review by the Strategic Advisory Group of Experts on Immunization (SAGE), the World Health Organization (WHO) released a Position Paper endorsing the option of PCV 1+1 schedules—one primary dose and one booster—for countries with strong PCV coverage and surveillance systems.

The studies cited in the review found that the PCV 1+1 schedule did not result in worse disease outcomes compared with three dose schedules and was equally effective at reducing transmission—a key factor in protecting entire populations.

The paper concluded that the second (booster) PCV dose does most of the work, giving strong immune protection even with fewer primary doses.

WHO underscored that some uncertainty remains due to limited data, especially from high-burden countries, and that strong results will depend on high PCV coverage and strong health systems.

Critically, countries considering switching to PCV 1+1 should be able to demonstrate sustained pneumococcal disease population immunity. WHO suggested several criteria, including:

- Average PCV coverage of $\geq 80\%$ for the five preceding years
- OR recent multi-age PCV campaigns with $\geq 80\%$ coverage among children under five years
- OR low levels of vaccine-type carriage or disease, as indicated by high-quality surveillance or carriage surveys

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Countries should also have the capacity to administer vaccinations between 9 and 18 months (e.g., PCV booster, measles, yellow fever, meningococcal, polio) with average coverage of $\geq 80\%$ during the five preceding years.

Further, WHO approved the use of “fractional” doses of PCV in countries with strong immunity among children under five, where each child receives 40% of PCV13 for each of three scheduled doses. This means a vaccine vial labeled for four full doses would provide up to 10 fractional doses.

WHO recommended that countries meeting the criteria for reduced or fractional dose schedules should carefully assess the costs, risks, and benefits beforehand and conduct surveillance to detect unexpected increases in pneumococcal transmission afterwards. They should also be ready to run catch-up campaigns or return to the standard schedule if protection declines.



What is a “fractional” dose?

A “fractional dose” gives each child only part of the standard vaccine for each scheduled dose, letting more children be immunized. Used in emergencies, it stretches limited supply to protect more quickly, and control outbreaks faster.

To date, only the UK has switched to the PCV 1+1 schedule, with strong results since 2020.

To support countries considering switches and other changes to their vaccination programs, the Global NITAG Network (GNN) has released a Vaccine prioritization and portfolio optimization (VPOP) toolkit. The toolkit includes step-by-step guidance for countries exploring PCV vaccine product or dosing switches in the context of overall vaccine portfolio optimization.

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Takeaway

The new WHO guidance on PCV 1+1 and fractional doses offers flexible, evidence-based ways to reduce vaccine program costs without compromising protection. While these approaches save on vaccine, cold-chain, and delivery costs, they require strong immunization systems, trained staff, and surveillance to maintain protection and track disease. The VPOP Toolkit can help eligible governments make smart decisions.



There are 47 LMICs with average PCV coverage $\geq 80\%$ over the past five years who are eligible for a 1-1 switch according to WHO guidance. Of these, 25 are Gavi-eligible, including 19 in Africa (Table 2)

Table 1: PCV Schedules

Schedule	Primary dose/s	Booster
1+1 (2 doses)	≥ 6 weeks	≥ 9 months
2+1 (3 doses)	6, 14 weeks	9–12 months
3+0 (3 doses)	6, 10, 14 weeks	NA
3+1 (4 doses)	6, 10, 14 weeks	12–15 months
Fractional (0.2 mL or 40% of 1 dose)	As per country dosing schedule	

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Table 2: Gavi countries eligible* to switch to PCV 1+1

Group	Country	Current PCV Schedule	Product	Eligibility (WUENIC 2024)
<u>Gavi Initial Self-financing</u>	Burkina Faso	2, 4, 9 months	Prevnar13	PCV3 91% and MCV1 88%.
	Burundi	6, 10, 14 weeks	Prevnar13	PCV3 88% and MCV1 86%.
	Eritrea	6, 10, 14 weeks	Prevnar13	PCV3 95% and MCV1 93%.
	The Gambia	6, 10, 14 weeks	Prevnar13	PCV3 80% and MCV1 83%
	Malawi	6, 10, 14 weeks	Prevnar13	PCV3 92% and MCV1 89%.
	Niger	6, 10, 14 weeks	Prevnar13	PCV3 86% and MCV1 81%
	Rwanda	6, 10, 14 weeks	Prevnar13	PCV3 98% and MCV1 97%.
	Sierra Leone	6, 10, 14 weeks	Prevnar13	PCV3 93% and MCV1 90%.
	Togo	6, 10, 14 weeks	Prevnar13	PCV 89% and MCV1 81%
	Uganda	6, 10, 14 weeks	Prevnar13	PCV3 91% and MCV1 90%.
Gavi Preparatory Transition	Cambodia	6, 10, 14 weeks	Prevnar13	PCV3 83% and MCV1 83%.
	Kenya	6, 10, 14 weeks	PNEUMOSIL	PCV3 89% and MCV1 88%
	Kyrgyzstan	2, 5, 12 months	PNEUMOSIL	PCV3 86% and MCV1 96%.
	Lesotho	6, 10, 14 weeks	Prevnar13	PCV3 86% and MCV1 90%.

*WHO recommendation: average PCV coverage $\geq 80\%$ and average MCV1 coverage $\geq 80\%$ for the five preceding years.

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Table 2 c'td: Gavi countries eligible to switch to PCV 1+1

Group	Country	Current PCV Schedule	Product	Eligibility (WUENIC 2024)
	Mauritania	6, 10, 14 weeks	Prevnar13	PCV3 85% and MCV1 93%.
	Nepal	6, 10 weeks, 9 months	Prevnar13	PCV3 96% and MCV1 97%.
	Pakistan	6, 10, 14 weeks	Prevnar13	PCV3 87% and MCV1 86%.
	Senegal	6, 10, 14 weeks	Prevnar13	PCV3 91% and MCV1 87%
	Solomon Islands	6, 10, 14 weeks	Prevnar13	PCV3 88%and MCV1 78%
	Tanzania	6, 10, 14 weeks	Prevnar13	PCV3 82% and MCV1 84%
	Zambia	6, 10, 14 weeks	Synflorix	PCV3 91% and MCV1 88%
	Zimbabwe	6, 10, 14 weeks	Prevnar13	PCV3 91% and MCV1 90%
Gavi Accelerated Transition	Bangladesh	6, 10, 14 weeks	Synflorix	PCV3 97% and MCV1 96%
	Ghana	6, 10, 14 weeks	Prevnar13	PCV3 96% and MCV1 90%
	São Tomé and Príncipe	6, 10, 14 weeks	Prevnar13	PCV3 86% and MCV1 87%

According to WHO guidance, non-Gavi middle-income countries eligible to switch include Algeria, Armenia, Bhutan, Botswana, Colombia, El Salvador, Fiji, Georgia, Guatemala, Kazakhstan, Kiribati, Malaysia, Mauritius, Mongolia, Morocco, Serbia, South Africa, Tunisia, Turkiye, Turmenistan, Tonga, Tunisia, and Uzbekistan.

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4. New Financing Arrangements

Gavi, the Vaccine Alliance (Gavi) has announced a new financing approach for 2026–2030 (Gavi 6.0) described as “one budget, one grant, one application.”

Instead of multiple funding streams for vaccines, health systems, and campaigns, Gavi-eligible countries will receive one pool of funding aligned to their national immunization plans. Streamlined grant management and digitised systems should also deliver faster, more transparent use of funds.

This will give governments greater flexibility to allocate Gavi resources according to their national vaccine strategies. It also means that countries will face financial incentives to prioritize specific vaccines and optimize their vaccine programs, according to local disease burden.

Eligible countries will still be expected to increase their domestic contributions as they grow economically, with Gavi support gradually tapering over time.

Gavi is also extending or adjusting transition phases and co-financing requirements in certain contexts — by offering multi-year waivers or downward adjustments for fragile states and small island developing states — and allowing more nuanced support as economies grow.

As PCV is Gavi’s largest vaccine expense— 30% (US\$1.47 billion) of the total US\$5 billion vaccine budget for 2021–2025—and a major driver of country co-financing, there is a strong incentive for all stakeholders to procure more affordable PCVs.

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In non-eligible Gavi countries, PCV prices remain very high—often US\$12–US\$15 per dose or more—and in high-income markets, PCVs can cost hundreds of dollars per dose.

The combination of high per-dose prices and multi-dose schedules means PCV programmes are also among the largest single cost drivers in middle-income national immunisation budgets.

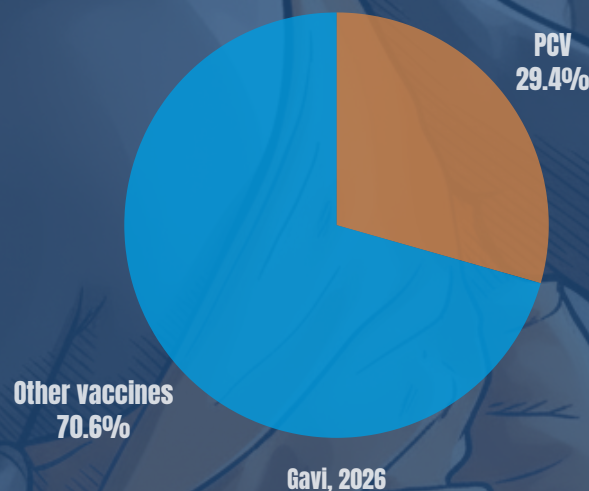
While middle-income countries can secure the lowest priced PCVs (\$US2 per dose) if they purchase via the pooled procurement mechanisms offered by UNICEF and PAHO, most do not. For example Cuba is the only PAHO country using the US\$2 per dose Serum Institute of India PCV.

There are also emerging efforts to lower prices by manufacturing PCVs in Africa and Latin America. PCV is identified as a candidate in the African Vaccine Manufacturing Landscape and South Africa’s



Gavi 6.0 incentivizes eligible countries to choose cost-effective PCVs and reduced schedules, potentially freeing funds to introduce new vaccines like RSV. Evidence shows RSV and PCVs work synergistically, preventing more pneumonia together than alone.

Gavi Vaccine Budget, 2021-2025



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Biovac Institute is partnering with **Pfizer** to accelerate African production. Africa is expected to need **126 million PCV doses** annually by 2030, most of which is currently imported via UNICEF.

In Argentina, PAHO, Pfizer, and local manufacturer **Sinergium Biotech** have announced steps toward production of PCV20, aiming to strengthen regional supply, improve affordability, and expand access to PCVs across Latin America

Takeaway

Under Gavi's "one budget" approach, eligible countries are incentivized to choose the most cost-effective PCVs, including lower-cost products and 1+1 schedules, freeing up resources to invest in other vaccines (e.g., RSV).



What is a Gavi country vaccine budget?

Under Gavi 6.0, eligible countries get a vaccine budget - one combined funding envelope instead of multiple separate grants—to pay for vaccines and related programs over a five-year period.

This prioritization and optimization has the potential to reduce more child deaths for the no or limited additional budget outlay. Eligible middle-income countries can access affordable PCVs through pooled procurement mechanisms (UNICEF, PAHO), but for many, product and schedule switches and increased regional production of PCVs may be a more sustainable path to lower-cost PCV programs.

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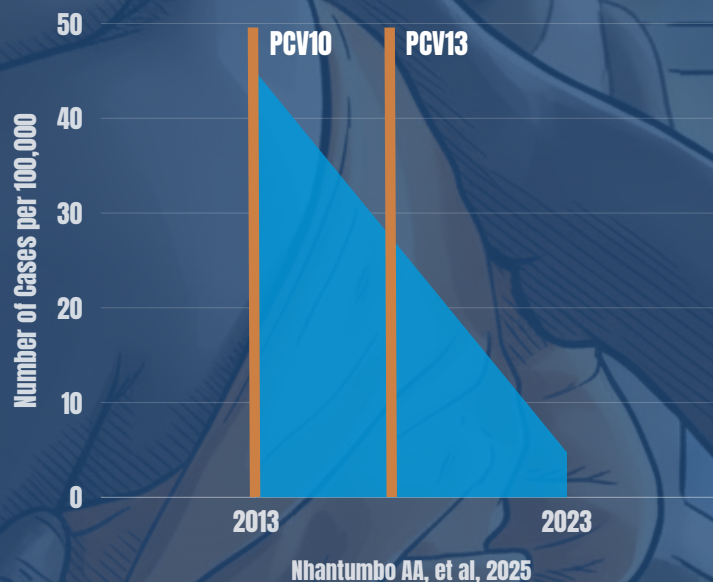
5. New Evidence of Other Benefits

Beyond preventing pneumococcal disease and death, high coverage with PCVs generates important secondary benefits, including fewer disabilities from meningitis (hearing loss, brain injury, learning difficulties, seizures, vision problems, etc.), fewer outpatient and inpatient visits for infectious (e.g., TB, HIV) and chronic lung conditions (e.g., COPD), and fewer unnecessary antibiotic prescriptions, which help slow the emergence and spread of antimicrobial resistance (AMR).

Recent research in Mozambique found that PCV introduction substantially reduced pneumococcal meningitis in children under five, from 44.7 cases per 100,000 in 2013 to 4.6 per 100,000 in 2023, a 90% drop.

PCVs also provide benefits to patients with chronic lung disease. A recent study of adults with COPD, found pneumococcal vaccination reduced exacerbations and hospitalizations and improved long-term survival in these high-risk, older adults.

Pneumococcal Meningitis Cases (0-4 yrs), Mozambique



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Other studies have reported greater reductions in AMR with higher-valent PCVs in Canada, and have used models to estimate dramatic reductions in antibiotic prescriptions and resistant infections compared to lower-valent PCVs.

A recent US study predicted higher-valent PCVs would also deliver healthcare cost savings—especially for children with chronic or immunocompromising conditions.

Takeaway

Beyond preventing pneumococcal infections and deaths, PCVs provide secondary health and economic benefits. PCVs can reduce long-term neurological or developmental complications from meningitis, protect adults with chronic lung conditions, and help to slow antimicrobial resistance.



What is AMR?

When germs evolve so antibiotics no longer work, infections become harder to treat and more dangerous. This antimicrobial resistance (AMR) directly caused 1.1 million deaths globally in 2021.

Aside from their obvious health benefits, all of these effects also lower healthcare expenditures for governments and out-of-pocket costs for families.

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What Now?

With powerful vaccines targeting leading bacterial (PCV) and viral (RSV) causes of pneumonia in children and adults, it has never been easier for governments to prevent respiratory infections. Those that invest in pneumococcal disease control now will reap significant health and economic benefits in the decades to come.

The landscape of pneumonia control is changing rapidly. New, higher-valency pneumococcal vaccines offer the potential to prevent a greater share of disease, while simplified dosing schedules—such as PCV 1+1—can lower costs without reducing health impact.

If these savings are used to introduce new vaccines with significant impact (e.g., RSV), there could be more lives saved without additional spending. This means that countries could significantly improve child survival, even in the face of fiscal constraints.

Looking ahead, countries face a window of opportunity to strengthen pneumonia control by reassessing vaccine choices, optimizing dosing schedules, and prioritizing a portfolio of vaccines with the greatest lifesaving potential.

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Important Information

- [Global NITAG Network, Vaccine Prioritization and Portfolio Optimization \(VPOP\) toolkit, January 2026](#)
- [WHO Position Paper: Pneumococcal conjugate vaccines in infants and children aged <5 years, September 2025](#)
- [SAGE Report: Pneumococcal conjugate vaccine reduced dosing schedule: a systematic review and meta-analysis, March 2025](#)
- [WHO Vaccine Evidence Compendium: PCV, December 2025](#)
- [Invasive pneumococcal disease 3 years after introduction of a reduced 1 + 1 infant 13-valent pneumococcal conjugate vaccine immunisation schedule in England, Lancet Infectious Diseases, May 2024](#)
- [WHO Considerations for Pneumococcal Conjugate Vaccine \(PCV\) Product Choice, September 2021](#)
- [WHO Considerations for pneumococcal vaccination in older adults, June 2021](#)

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