
The lifesaving power of pneumonia and diarrhea vaccines for children

A new report explaining just how critical high coverage of pneumonia and diarrhea vaccines is for the achievement of global goals for child survival.

15 July 2024, 9:00-10:00ET

Co-hosted by the Childhood Vaccination Subgroup of the Child Health Taskforce



EVERY BREATH COUNTS



Why now?



Global achievement of the child survival Sustainable Development Goal (SDG) of 25 child deaths for every 1,000 babies born is within reach by 2030 if under-vaccinated populations of children can be reached with the most lifesaving vaccines.



As the world celebrates the 50th Anniversary of the Essential Programme for Immunization (EPI) and rallies to support replenishment of Gavi, the Vaccine Alliance, there is an unprecedented opportunity to demonstrate that it is #HumanlyPossible to protect all children with lifesaving vaccines.



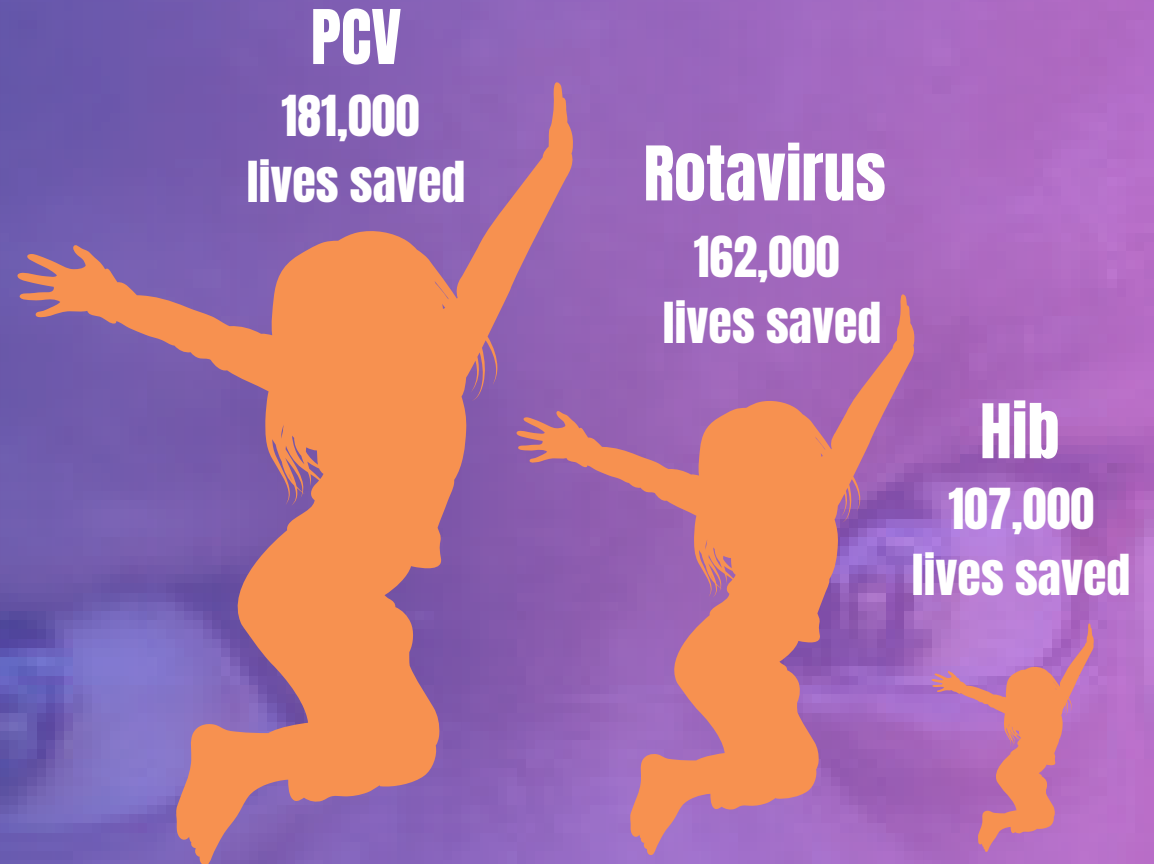
A growing body of evidence and tools is making it easier to increase the impact of vaccination on child survival, including WHO and UNICEF Estimates of National Immunization Coverage (WUENIC), Global Burden of Disease and IGME child mortality estimates, Vaccine Impact Modeling Consortium (VIMC) and Lives Saved Tool (LiST) projections on child lives saved by specific vaccines, VIEW-hub by IVAC data on national vaccination profiles, and more.



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450,000 child lives saved with pneumonia and diarrhea vaccines

- 450,000 child deaths prevented with 95% coverage of PCV, rotavirus, and Hib vaccines between 2025 and 2030 across 109 countries in Lives Saved Tool (LiST).
- PCV vaccine responsible for 181,000 child lives saved, rotavirus vaccine 162,000, and Hib vaccine 107,000.
- Pneumonia and diarrhea vaccines are so lifesaving because they are at relatively low coverage and target the two leading infectious child killers, which caused 842,000 deaths in 2021.
- Full coverage of PCV, rotavirus, Hib vaccines fast route to achieve child survival SDG as 450,000 additional deaths prevented represent one half of 900,000 additional deaths that need to be prevented to achieve goal.



Source: Lives Saved Tool (LiST)



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Most lives saved with pneumonia and diarrhea vaccines are in 20 countries

- Over 80% (390,000) of 450,000 child deaths prevented with 95% coverage of PCV, rotavirus, Hib vaccines 2025 - 2030 are in 20 countries - 12 in Africa, six in Asia, and two in the Middle East.
- PCV saves 158,000 child lives, rotavirus vaccine 144,000, Hib vaccine 89,000 across these 20 countries, of which 13 are eligible for Gavi support.
- Prioritizing full coverage of PCV, rotavirus, and Hib vaccines one of fastest routes to achieve child survival Sustainable Development Goal (SDG) in the 15 countries that are off-track.

*Gavi-eligible

~Countries off-track to achieve SDG 3.2 by reducing child deaths to at least 25 for every 1,000 births by 2030

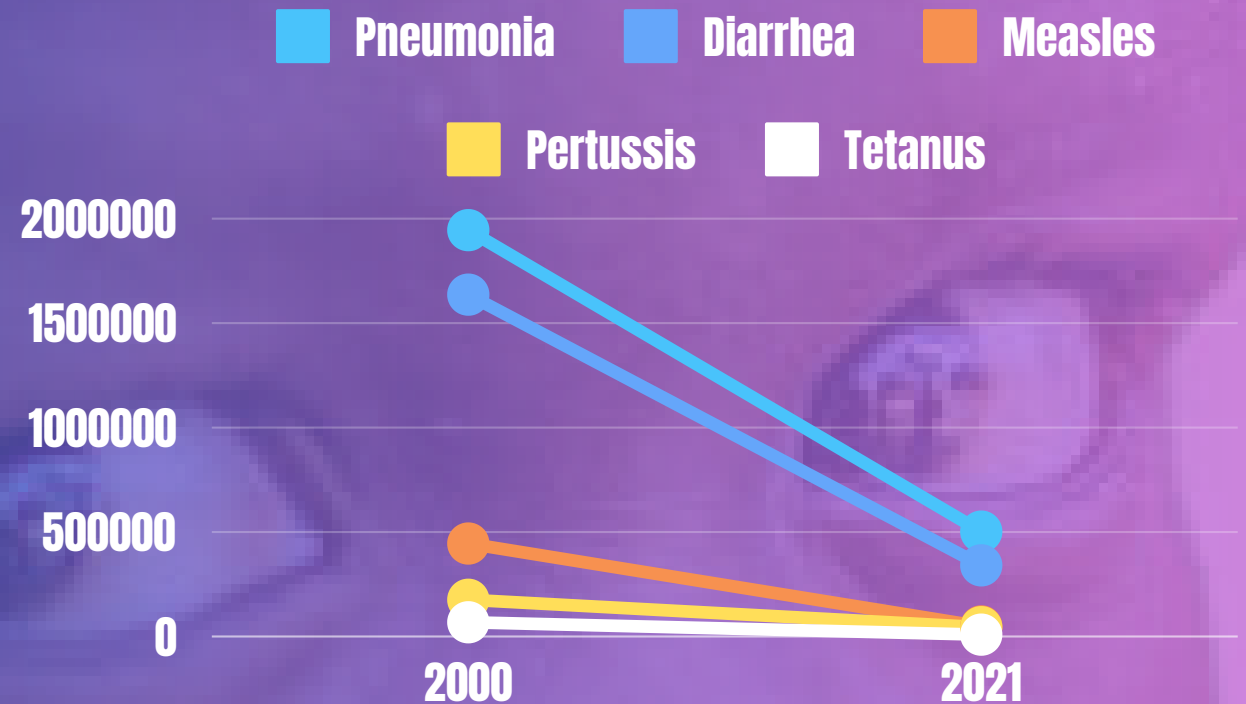
Country	PCV child lives saved 2025-2030	Rotavirus child lives saved 2025-2030	Hib child lives saved 2025-2030	Total
Nigeria*~	26,000	85,500	36,200	147,700
Somalia*~	21,500	7,000	11,200	39,700
Chad*~	22,500	6,900	5,700	35,100
Angola~	10,900	10,700	5,500	27,100
India	18,300	800	600	19,700
DR Congo*~	6,000	6,300	7,300	19,600
Guinea*~	10,300	2,800	4,700	17,800
Ethiopia*~	4,200	1,600	4,000	9,800
South Sudan*~	6,200	2,100	700	9,000
Indonesia	4,200	3,900	100	8,200
Philippines~	1,000	6,200	800	8,000
Egypt	7,200	600	0	7,800
Pakistan*~	3,800	1,400	2,000	7,200
CAR*~	1,500	1,400	2,800	5,700
Mali*~	2,300	1,300	1,900	5,500
Iraq	4,500	600	50	5,100
Madagascar*~	1,500	1,100	2,100	4,700
Viet Nam	3,300	1,400	15	4,700
Afghanistan*~	1,300	1,800	1,300	4,500
Niger*~	1,800	800	1,700	4,300
Total top 20	158,300	144,200	88,700	391,200
All LMICS in LiST (109)	181,300	159,900	106,700	447,900



Pneumonia and diarrhea vaccines target leading causes of child death

- Pneumonia and diarrhea leading infectious killers of children since 1990. Between 1990 and 2021 caused 75 million child deaths, 25% of all.
- In 2021, 842,000 children still dying from pneumonia and diarrhea - pneumonia 502,000 and diarrhea 340,000.
- Child pneumonia and diarrhea deaths fell by 65% and 70% since 2000, well below declines for measles (89%), tetanus (87%), and pertussis (75%).

Reductions in causes of death among children 0-4 years



Source: Global Burden of Disease 2021



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Most child pneumonia and diarrhea deaths occur in the post-neonatal period

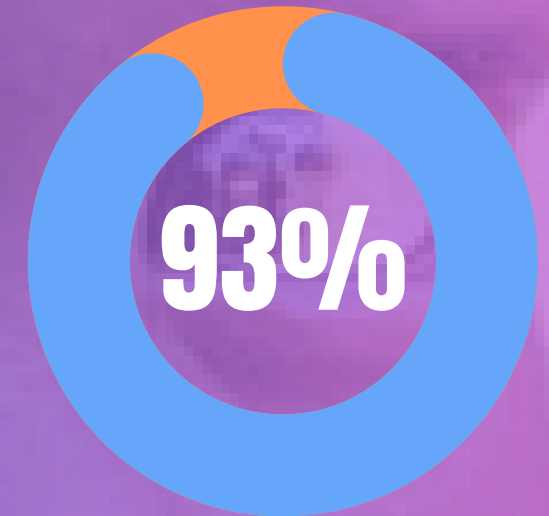
- Child pneumonia and diarrhea deaths concentrate in post-neonatal period with 70% of child pneumonia deaths and 93% of child diarrhea deaths among children aged 1 to 59 months.
- In 2021, 27% of 2.5 million post-neonatal child deaths caused by pneumonia and diarrhea.
- Greatest concentration of child pneumonia (26%) and diarrhea (30%) deaths among children aged 1 and 5 months.
- Pneumonia and diarrhea vaccines can have a major impact on reducing deaths in this age group as PCV, rotavirus, Hib vaccines given at 2, 4, and 6 months of age.

Concentration of child pneumonia and diarrhea deaths among children 1-59 months

PNEUMONIA
% 1-59 months



DIARRHEA
% 1-59 months



Source: Global Burden of Disease 2021



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Child pneumonia and diarrhea deaths cluster in Africa and South Asia

- **86% child pneumonia and diarrhea deaths occur in two regions - 60% in Sub-Saharan Africa and 26% in South Asia.**
- **Between 2000 and 2021, percentage of child pneumonia and diarrhea deaths in Sub-Saharan Africa increased from 45% to 60%, while fell in South Asia from 34% to 26%.**
- **East Asia and the Pacific, Latin America and the Caribbean, and the Middle East and North Africa also experienced declining proportions.**
- **Percent decline in child pneumonia and diarrhea deaths over period lowest in Sub-Saharan Africa (55%) and highest in East Asia and the Pacific (82%).**

Regions (World Bank)	Child pneumonia and diarrhea deaths 2000	Child pneumonia and diarrhea deaths 2021	Change 2000-2021	% Global burden 2000	% Global burden 2021
Sub-Saharan Africa	1,146,771	511,311	-55%	45%	60%
South Asia	885,771	220,163	-75%	34%	26%
East Asia and Pacific	319,933	57,791	-82%	12%	7%
Latin America and the Caribbean	87,125	20,480	-76%	3%	2%
Middle East and North Africa	73,659	17,624	-76%	3%	2%
Europe and Central Asia	52,981	13,774	-74%	2%	2%
North America	1,123	450	-60%	1%	1%

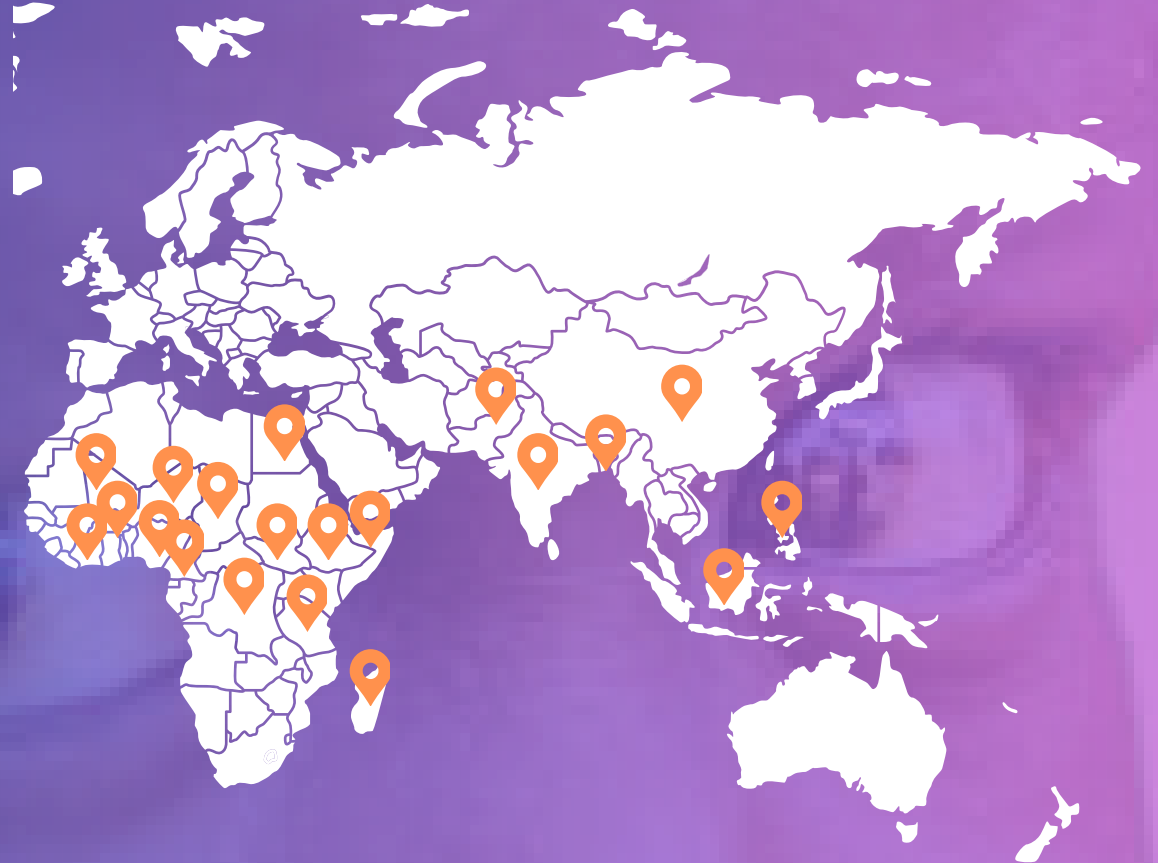
Source: Global Burden of Disease 2021



80% of child pneumonia and diarrhea deaths are concentrated in 20 countries

- Nigeria accounts for more child pneumonia and diarrhea deaths (198,000) than any other country, and is part of an eight-country west and central African cluster - all French-speaking.
- East Africa is home to five high-burden countries.
- In South Asia, child pneumonia and diarrhea deaths concentrate in India, Pakistan, and Bangladesh, and in East Asia and the Pacific across China, Indonesia, and the Philippines.
- Egypt is the only North African or Middle Eastern country losing 2,500+ children to pneumonia and diarrhea.

80% of child pneumonia and diarrhea deaths are in 20 countries



Source: Global Burden of Disease 2021

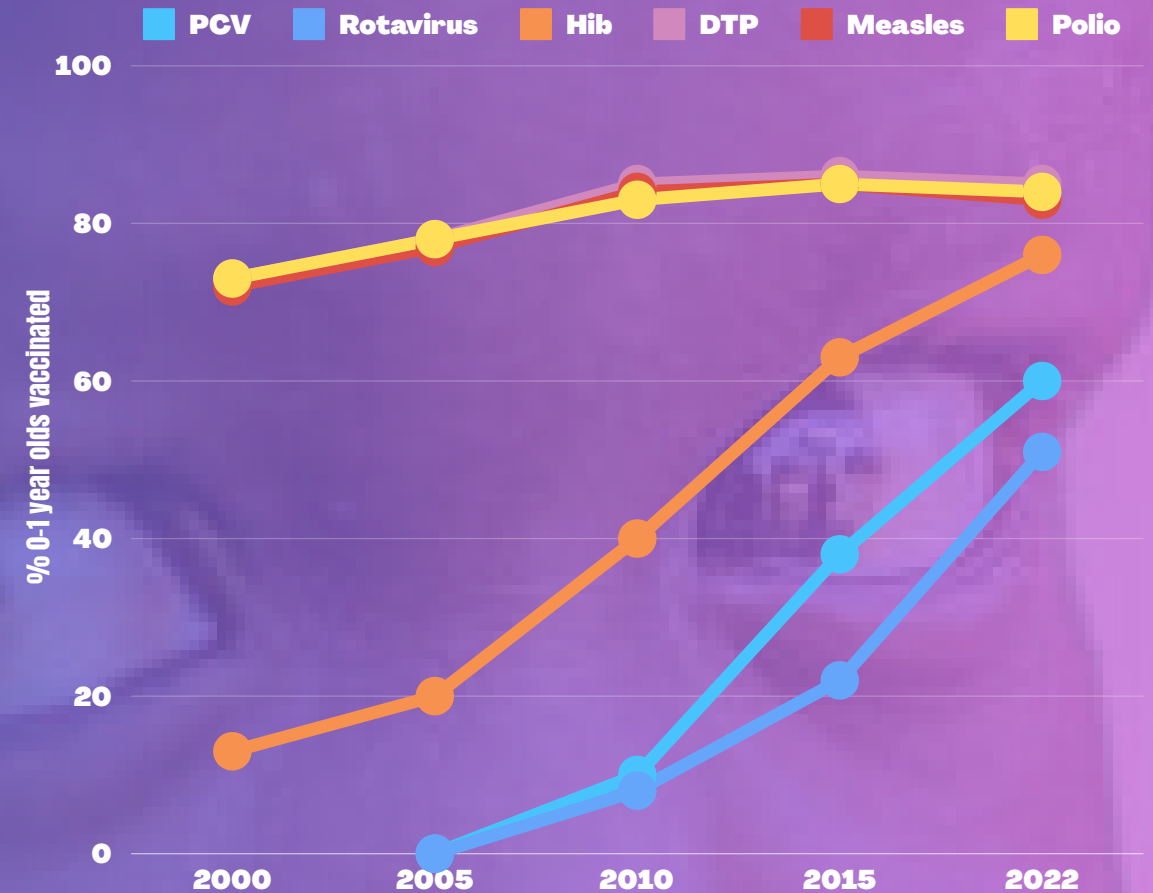


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Pneumonia and diarrhea vaccine coverage lags other childhood vaccines

- In 2022, 60% of 0 to 1 year olds were fully vaccinated with PCV, 51% with rotavirus vaccines, 76% with Hib vaccines, well below coverage rates for DTP (85%), polio (84%), and measles (83%) vaccines.
- Hib vaccine available in 1985 and by 2022, 193 of 194 countries had introduced; PCV available 2000 and by 2022, 166 of 194 countries had introduced; rotavirus vaccine available in 2006 and by 2022, 124 of 194 countries had introduced.
- Launch of Gavi, the Vaccine Alliance in 2002 accelerated coverage of pneumonia and diarrhea vaccines in low-income countries. By 2022, all 54 Gavi-eligible countries had introduced Hib vaccine, 47 PCV, and 42 rotavirus vaccine.

Lagging pneumonia and diarrhea vaccine coverage



Source: WHO and UNICEF 2022



EVERY BREATH COUNTS

No region has achieved all pneumonia and diarrhea vaccine targets

- Despite more than two decades of vaccine availability, coverage of pneumonia and diarrhea vaccines has not reached global target of 90% in any region.
- PCV coverage is especially low in Eastern Mediterranean, South-East Asia, and Western Pacific, driven by the lack of introduction in Egypt and China, and lower coverage in India and Indonesia.
- Rotavirus vaccine coverage is low in all regions except The Americas and Hib vaccine coverage very low in Western Pacific, as China has not yet introduced.
- Generally, regions with higher vaccine coverage experienced faster declines in child pneumonia and diarrhea deaths with exception of Western Pacific.

Region (WHO)	PCV coverage 2022	Hib vaccine coverage 2022	Rotavirus vaccine coverage 2022
Europe	82%	81%	30%
The Americas	74%	80%	70%
Africa	68%	72%	52%
Eastern Mediterranean	54%	82%	57%
South-East Asia	29%	82%	61%
Western Pacific	20%	29%	2%

Source: WHO and UNICEF 2022



Few countries have achieved pneumonia and diarrhea vaccine coverage targets

- None of the 20 countries where 80% of child pneumonia and diarrhea deaths concentrate has achieved all global vaccine coverage targets (>90%) for PCV, rotavirus, and Hib vaccines. Only 13 low- and middle-income countries have done so.*
- Of the 20 high-burden countries, two have achieved PCV target (Bangladesh and Burkina Faso) and one the rotavirus target (India). Four countries have achieved at least 90% coverage of Hib vaccines (Bangladesh, Burkina Faso, Egypt, India).
- Of great concern among the 20 high-burden countries are the seven yet to introduce one or more of these vaccines.

(*Burundi, Eritrea, Eswatini, Fiji, Ghana, Guyana, Kiribati, Morocco, Nicaragua, Niue, Palestine, Turmenistan)



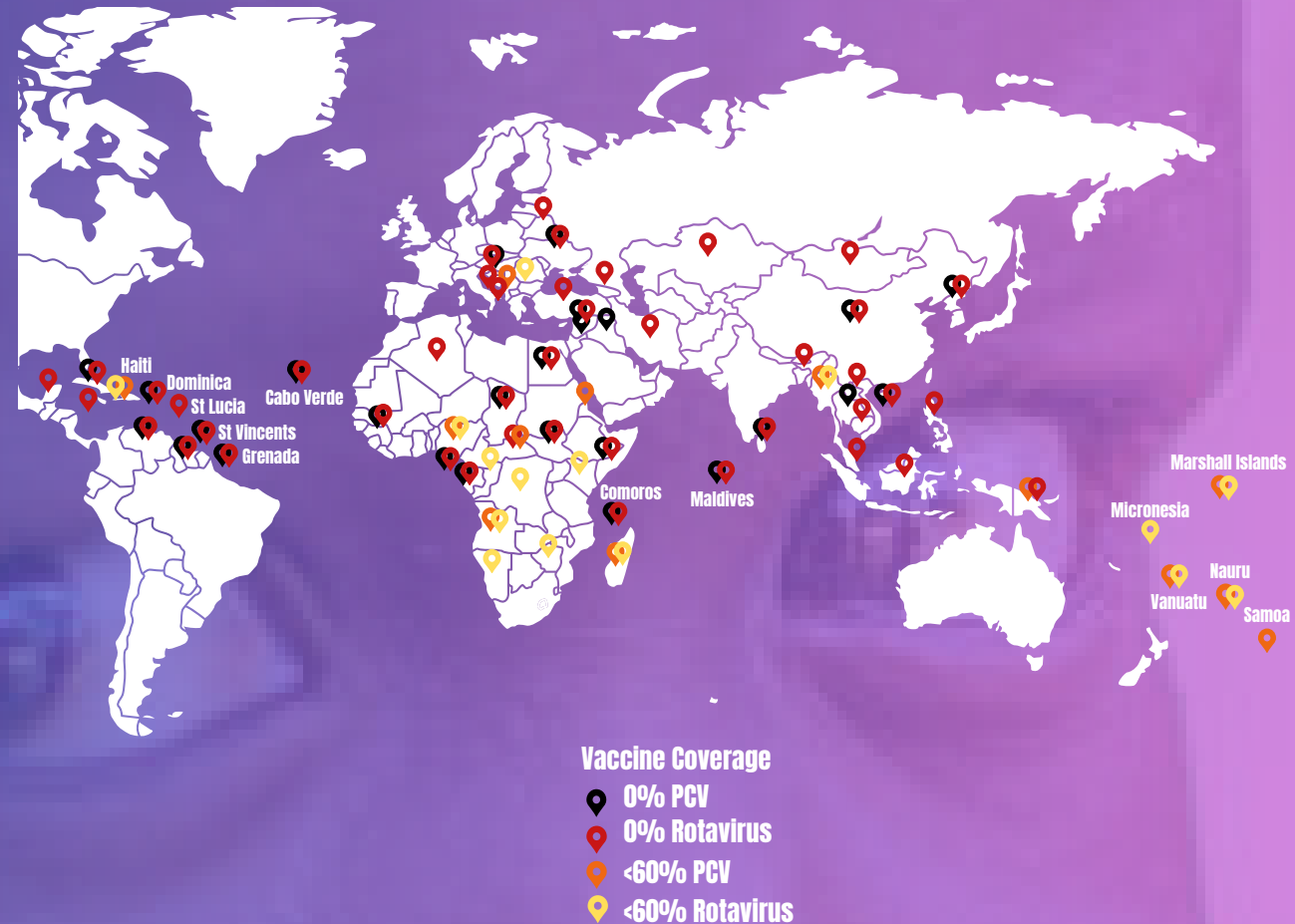
EVERY BREATH COUNTS

Country	PCV coverage 2022	Rotavirus vaccine coverage 2022	Hib vaccine coverage 2022
Nigeria	60%	12%	62%
India	66%	92%	93%
Pakistan	85%	88%	85%
Chad	0%	0%	60%
Ethiopia	61%	65%	65%
Niger	84%	86%	84%
Somalia	0%	0%	42%
Burkina Faso	91%	85%	91%
DR Congo	64%	59%	65%
Indonesia	6%	Introduced 2023	86%
Tanzania	83%	67%	88%
Madagascar	57%	53%	57%
Bangladesh	99%	0%	98%
South Sudan	0%	0%	73%
China	0%	0%	0%
Cameroon	67%	61%	68%
Côte d'Ivoire	61%	65%	76%
Mali	77%	70%	77%
Egypt	0%	0%	97%
Philippines	71%	0%	72%

Source: WHO and UNICEF 2022

65 countries have very low pneumonia and/or diarrhea vaccine coverage

- Hundreds of millions of children across 65 low- and middle-income countries are dangerously exposed to pneumonia and diarrhea due to no- or low-coverage of PCV and rotavirus vaccines.
- 24 countries do not offer PCV AND rotavirus vaccines including 8 Gavi-eligible (Guinea, Chad, Somalia, South Sudan, Comoros, Syria, Venezuela, North Korea).
- 23 countries do not offer PCV OR rotavirus vaccines, including 4 gavi-eligible (Bangladesh, Papua New Guinea, Central African Republic, LaoPDR).
- 18 countries either have BOTH PCV and rotavirus coverage rates below 60%, including 4 Gavi-eligible (Nigeria, Madagascar, Myanmar, Haiti), or ONE of the two vaccines below 60%.



Source: WHO and UNICEF 2022



EVERY BREATH COUNTS

3.7 million child lives have been saved by pneumonia and diarrhea vaccines

- 3.7 million child deaths prevented by PCV, rotavirus and Hib vaccines across 112 LMICs between 2000 and 2022 - underestimate as VIMC model includes 112 countries.
- Hib vaccine saved 2.3 million child lives, PCV 1.1 million, and rotavirus vaccine 250,000.
- In 20 countries home to 80% of all child pneumonia and diarrhea deaths, 2.4 million child deaths were averted - 700,000 by PCV, 135,000 by rotavirus vaccine, and 1.5 million by Hib vaccine.
- Lives saved were much lower than they would have been if Chad, Somalia, South Sudan, and Egypt had PCV and rotavirus vaccines, if Bangladesh and the Philippines had rotavirus vaccine, and if China had PCV, rotavirus, and Hib vaccines.

Location	PCV child lives saved 2000-2022	Rotavirus child lives saved 2000-2022	Hib child lives saved 2000-2022	Total
Nigeria	127,100	7,200	154,900	289,200
India	24,700	35,900	323,100	383,700
Pakistan	108,400	9,200	150,900	268,500
Chad	No vaccine	No vaccine	26,300	26,300
Ethiopia	93,500	20,400	147,300	354,700
Niger	39,900	16,100	76,800	132,800
Somalia	No vaccine	No vaccine	20,200	20,200
Burkina Faso	17,300	13,000	35,700	66,000
Democratic Republic Congo	95,500	1,000	149,000	245,500
Indonesia	3,500	125	35,600	39,230
Tanzania	40,100	7,400	59,200	106,700
Madagascar	16,900	6,700	26,700	50,300
Bangladesh	42,800	No vaccine	94,600	137,400
South Sudan	No vaccine	No vaccine	6,800	6,800
China	No vaccine	No vaccine	No vaccine	0
Cameroon	30,900	9,900	38,700	79,500
Côte d'Ivoire	11,200	4,300	20,800	36,300
Mali	28,200	3,500	42,800	74,500
Egypt	No vaccine	No vaccine	16,700	16,700
Philippines	8,000	No vaccine	18,300	26,300
20 High-Burden LMICs	688,000	134,700	1,537,900	2,360,600
112 LMICS	1,145,600	248,900	2,315,400	3,709,900

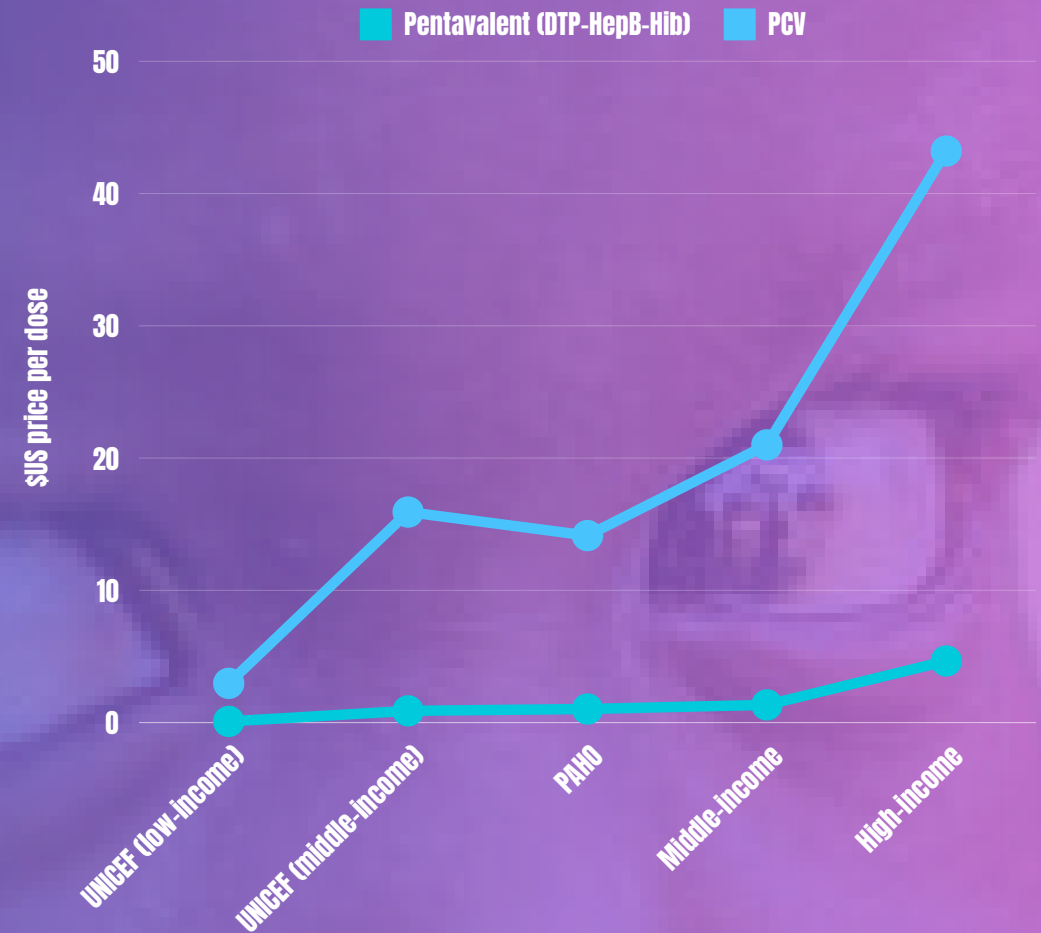
Source: Vaccine Impact Modelling Consortium (VIMC) 2019



Pneumococcal conjugate vaccine prices are too high and rising

- Lack of competition contributes to “very high” and rising prices for PCV, “limited access” in lower-income settings, and wide price gaps across countries, according to WHO.
- Pfizer and GSK dominate \$US7 billion global market for PCV - highest value market for any childhood vaccine. Pfizer’s PCV is used in 134 of 166 countries offering PCV - massive 80% country market share - including in 37 of 47 who are Gavi-supported. GSK’s PCV in 32 (20%) PCV countries; 15% of Gavi countries.
- Despite 2020 entry of 30% more affordable PCV from Serum Institute of India, only six countries using (India, LaoPDR, Kenya, Kyrgyzstan, Timor-Leste, and Uzbekistan), three Gavi eligible.
- 15-fold difference (\$US3 per dose and \$US43) between PCV prices for low- and high-income countries, with many middle-income countries paying extremely high prices.
- For middle- and high-income countries, PCV prices rose 43% between 2019 and 2021.

Wide gaps in PCV prices across countries



Source: WHO 2022

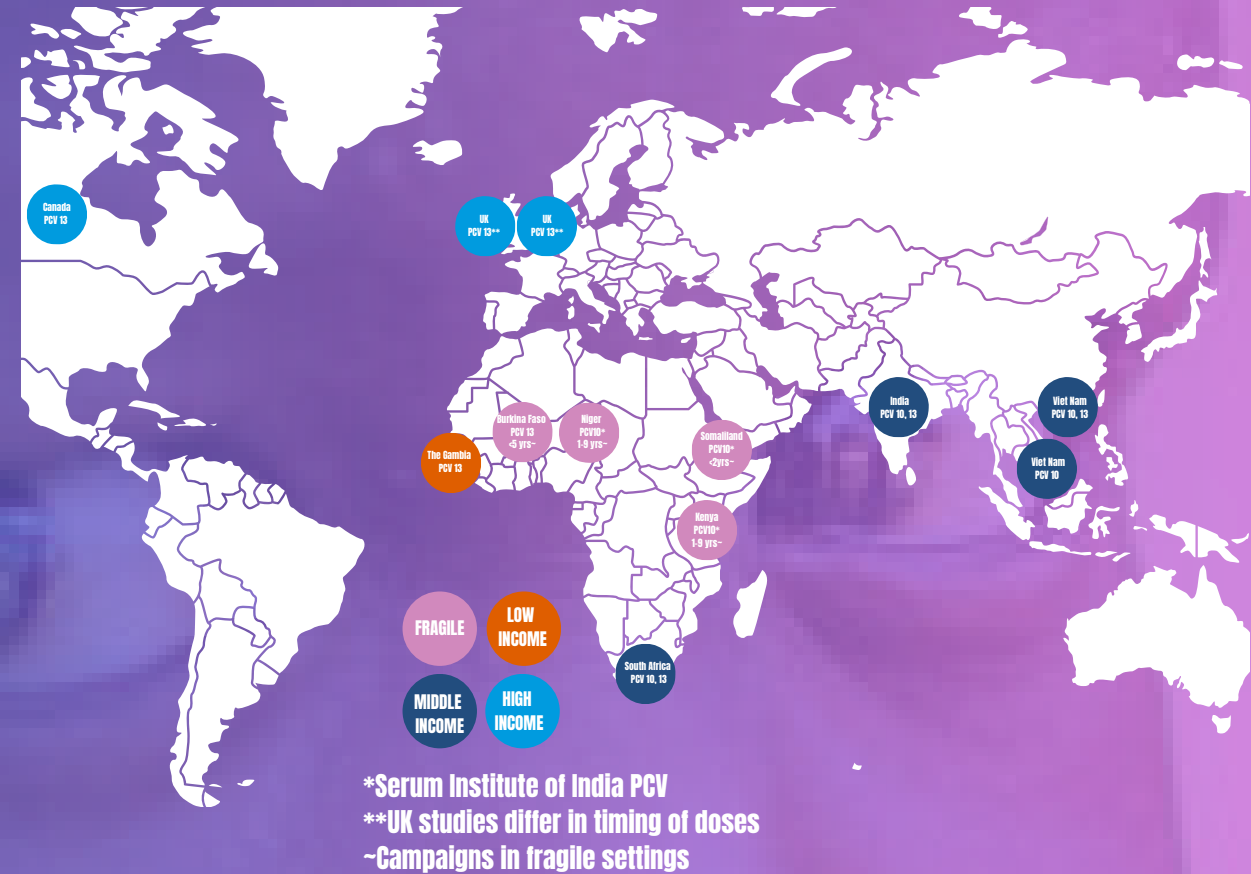


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Increasing the cost-effectiveness of pneumococcal vaccine programs

- Countries struggling to introduce PCV or maintain program costs can (1) reduce doses, (2) switch to lower-priced vaccine, and (3) bundle vaccine introductions.
- (1) An increasing number of studies report that two PCV doses instead of three do not compromise child health outcomes and can deliver substantial savings.
- (2) Countries can switch to a lower-priced PCV vaccine like India, Kyrgyzstan, Kenya, and Uzbekistan.
- (3) Countries can bundle PCV introduction with other vaccines to save on delivery costs. For example, Somalia, South Sudan, Guinea, and Chad are all planning to introduce PCV with rotavirus vaccines.
- Savings can be used to strengthen the vaccination system.

Reduced PCV dosing studies



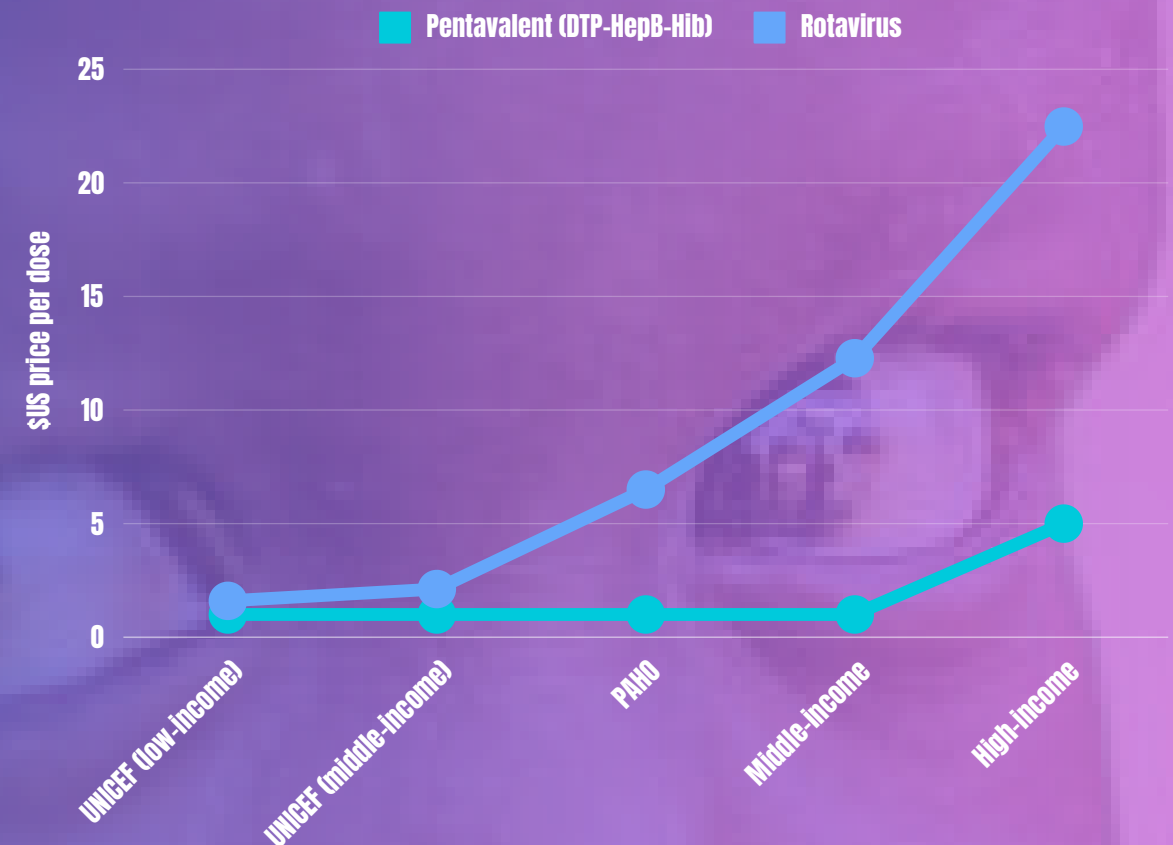
Source: Every Breath Counts 2024



Rotavirus vaccine prices are too high and rising

- Segmented markets and supply challenges constraining access to rotavirus vaccines, with only 58% of self-procuring middle-income countries offering them, according to WHO).
- GSK and Merck dominate \$US2 billion global market for rotavirus vaccines. GSK in 86 of 124 countries - 60% country market share. Merck's in 33 (27%). In contrast, Bharat Biotech's rotavirus vaccine in just 12 countries, and Serum Institute of India's in seven countries.
- Two-thirds (28) of 42 Gavi-supported countries offering rotavirus vaccine use GSK vaccine, while nine use Bharat Biotech vaccine, and eight Serum Institute of India's vaccine.
- 14-fold difference (\$US1.60 per dose and \$US22) between rotavirus vaccine prices for low- and high-income countries.
- For middle- and high-income countries, rotavirus vaccine prices rose by 55% between 2019 and 2021, faster than any other childhood vaccine.

Wide gaps in rotavirus vaccine prices across countries



Source: WHO 2022



EVERY BREATH COUNTS

The Call to Action for Fair Vaccine Prices

- Concerns that high and rising vaccine prices are preventing many middle-income countries from introducing PCV, rotavirus, and other vaccines led to global [Call to Action for Fair Vaccine Prices](#) from the World Society for Pediatric Infectious Diseases (WSPID).
- Call to Action argues that without PCV and rotavirus vaccine price reductions, 28 countries without PCV and the 68 countries without rotavirus vaccines will struggle to introduce them, and countries transitioning from Gavi support will not be able to sustain their programs, undermining achievement of 90% coverage targets and ultimately SDG for child survival.
- Call to Action asks governments and international organizations to, “urgently develop and implement a global plan to better address access and affordability challenges for all countries with limited resources.” To date, more than 500 organizations have signed on.

Stakeholder	Recommended Actions
Pharmaceutical Companies	• Commit to fair, equitable pricing strategies for vaccines, considering the socio-economic context of all countries with limited resources, and publish pricing by income status of countries.
	• Facilitate technology transfer and knowledge sharing to enable local production and/or fill and finish technology, and reduce dependence on imports.
Governments and international organizations	• Negotiate affordable pricing structures in regional blocs with national governments and pharmaceutical companies, promoting transparency and fair competition – and commit to publishing pricing by income status.
	• Explore alternative procurement strategies and promote regional co-operation, and support efforts like the Pan American Health Organization’s Revolving Fund to Access Vaccines and UNICEF’s Pacific Vaccine Independence Initiative.
	• Support technology transfer and capacity building initiatives to enhance local vaccine production such as the WHO-supported mRNA technology hub in South Africa.
Research and development funders	• Increase investments in research and development of vaccines, specifically targeting diseases prevalent in countries with limited resources.
	• Encourage partnerships between academic institutions, pharmaceutical companies, and international organisations to foster vaccine research and innovation and to improve affordability.
Global health initiatives	• Strengthen international collaborations to address vaccine inequity and include all countries with limited public health funds irrespective of World Bank income classifications.
	• Advocate for policies and mechanisms that promote equitable vaccine access.

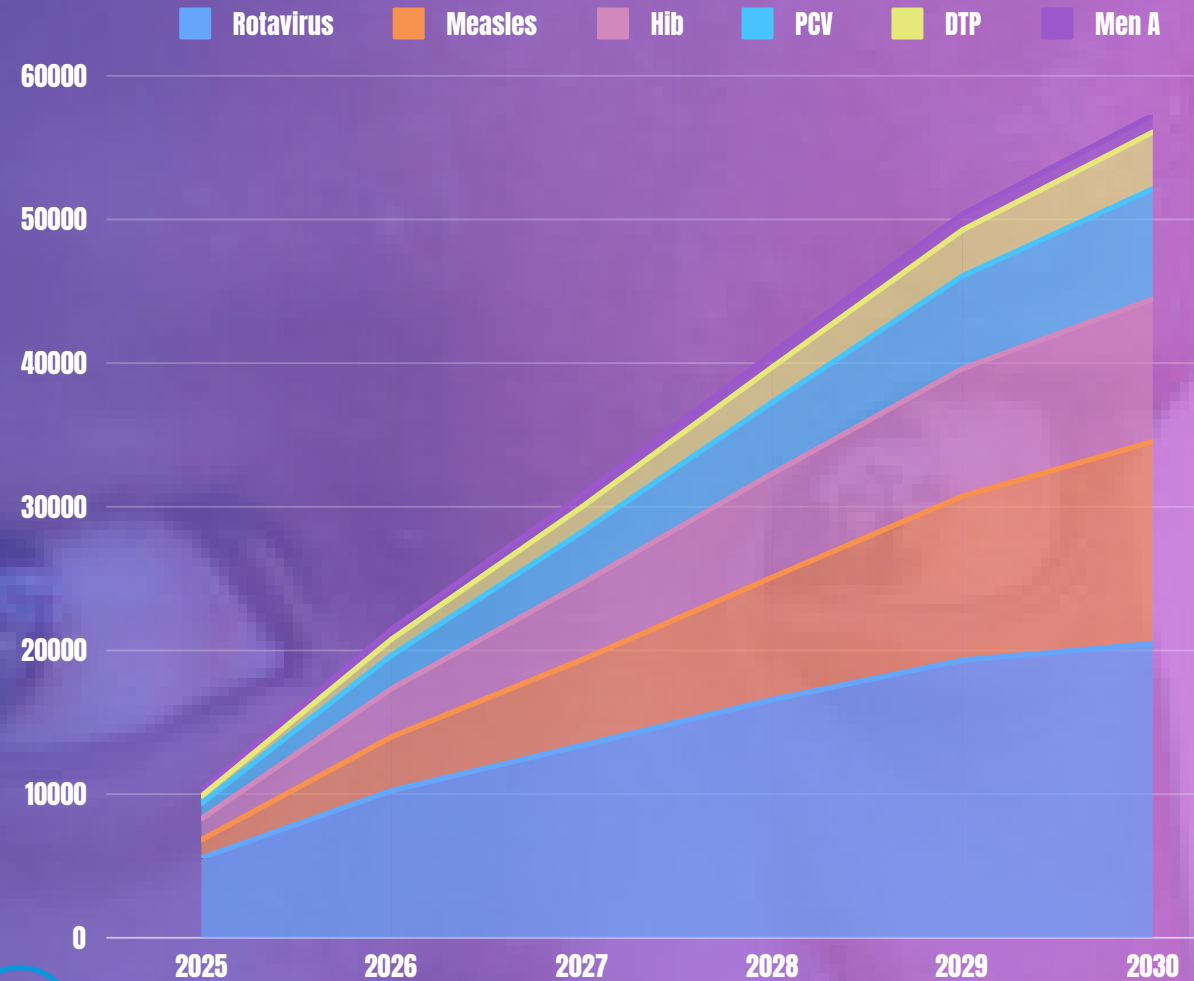
Source: WSPID 2023



The critical role of national vaccine prioritization

- With new vaccines coming (malaria, RSV, GBS), governments urgently need timely and quality data on each vaccine's potential impact on child deaths. See Nigeria example.
- Governments will also need access to the relative cost-effectiveness of introducing different vaccines and increasing coverage of existing vaccines, to allocate resources to maximize impact of vaccine programs on child survival goals.
- Governments will also need strong, independent National Immunization Technical Advisory Groups (NITAGs) to make vaccine decisions.
- Global vaccine agencies must ensure that mortality surveillance data, lives saved tools, and vaccine cost calculators are up to date, accessible, and easy to navigate.

Nigeria: child lives saved by vaccine coverage increases to >90%



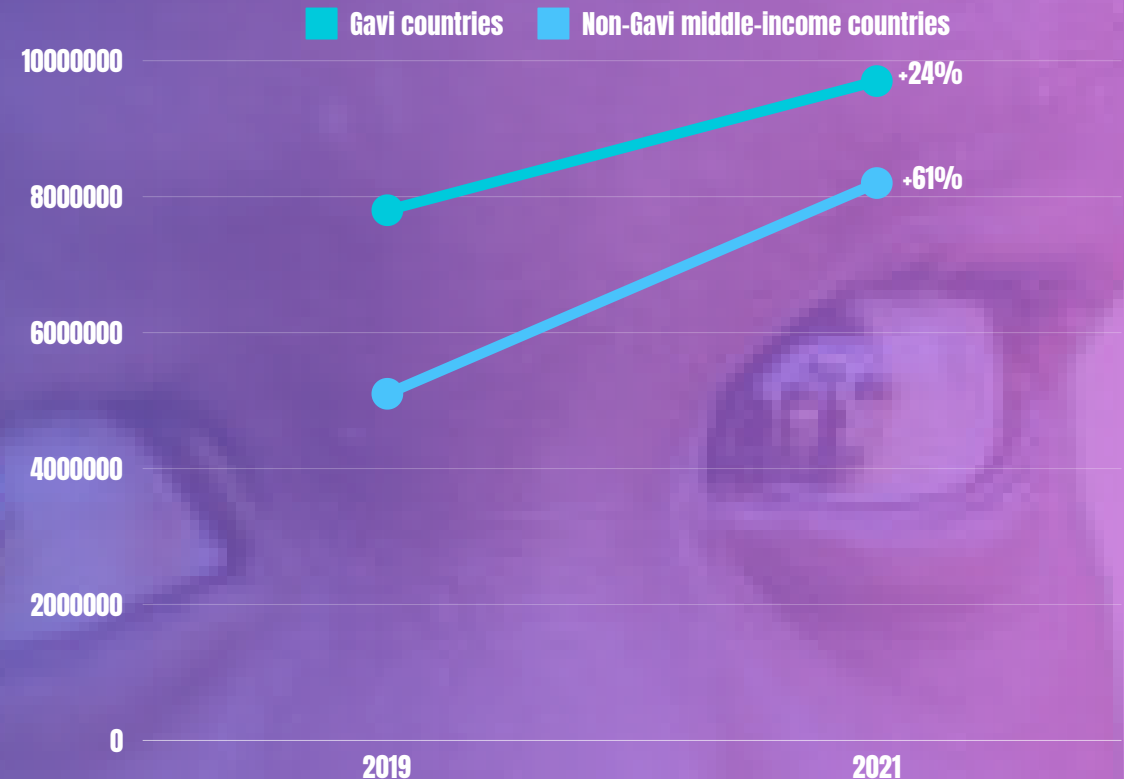
Source: Lives Saved Tool (LIST)



Pneumonia and diarrhea vaccines and Gavi 6.0

- Gavi 6.0 must prioritize >90% PCV, rotavirus, and Hib vaccine coverage by 2030 in Gavi-eligible countries, including those transitioning (Cameroon, Pakistan, Tanzania, Bangladesh, Kenya, and Nigeria).
- Gavi should also support full coverage in ineligible countries with large burdens of death (e.g., Angola, India, Indonesia, Egypt, and Philippines).
- Gavi must ensure that current and new zero-dose programs are also able to reach unvaccinated children in middle-income countries and include PCV, rotavirus, and Hib vaccines.
- Gavi should also support leveraging vaccine infrastructure to deliver other lifesaving interventions, especially nutrition supplements and treatments.

Number of zero-dose children rising sharply in non-Gavi countries



Source: Center for Global Development 2024

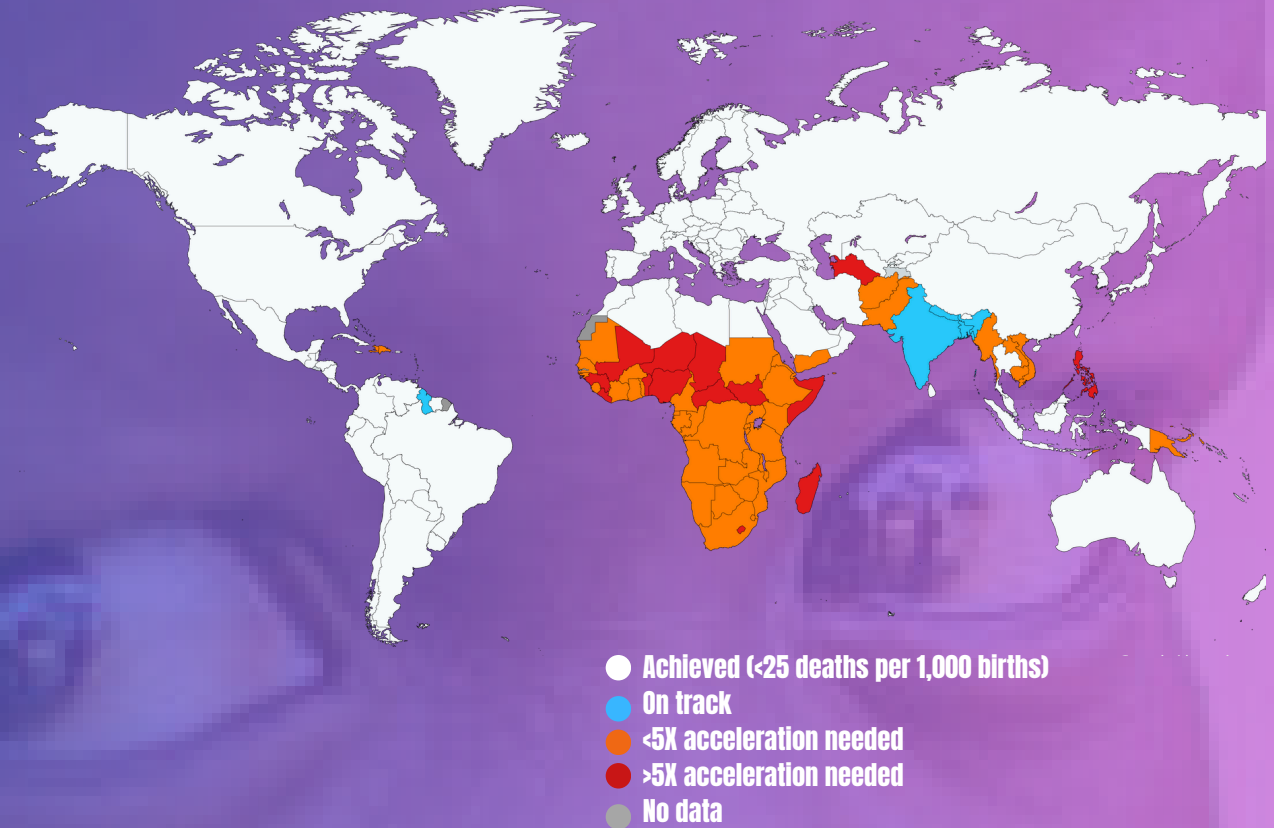


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Pneumonia and diarrhea vaccines and the SDGs

- Achieving child survival SDG means global child deaths must fall from 4.7 million in 2022 to 3.4 million by 2030, an average reduction of 150,000 additional child deaths each year and 900,000 additional between 2025 and 2030.
- Full coverage of PCV, rotavirus, and Hib vaccines can close half of this gap by preventing 450,000 child deaths.
- 32 off-track countries have no- or low-coverage (<70%) of PCV and/or rotavirus vaccines. This is where 90% coverage will help close SDG achievement gaps. 23 of these countries are eligible for Gavi support.
- Global health agencies and donors should prioritize increasing coverage of PCV, rotavirus, and Hib vaccines in all of the 32 low coverage, off-track countries as a top Child Survival Action strategy.

Projected Child Mortality Rates in 2030



Source: UN Inter-agency Group for Child Mortality Estimation 2023



Pneumonia and diarrhea vaccine agenda for action

To prevent 450,000 child deaths by 2030, national governments and their child survival partners, including industry, should collaborate closely to...

1

Increase global coverage of PCV, rotavirus, and Hib vaccines from 60%, 51%, and 76% to above 90% by 2030, with a special focus on countries with no- and low-coverage of either or both vaccines.

2

Reduce PCV and rotavirus vaccine program costs by helping countries switch to more affordable vaccines and/or reduce PCV dosing schedules, by expanding middle-income country access to Gavi/UNICEF prices, and by strengthening regional procurement mechanisms.

3

Support national vaccine prioritization exercises so governments can assess relative impact of existing and new vaccines and make investment decisions that maximize child lives saved, with special focus on the countries that are off-track to achieving SDG 3.2.

4

Strengthen national vaccine decision-making and implementation infrastructure, especially National Immunization Technical Groups (NITAG), Ministry of Health vaccination teams, national vaccination research institutions, and local/regional vaccine manufacturing industries.

5

Ensure Gavi highlights lives saved impact of increased PCV, rotavirus, and Hib vaccination, and supports introduction and >90% coverage in all Gavi-eligible countries by 2030, in addition to helping middle-income countries achieve high coverage of pneumonia- and diarrhea-fighting vaccines for children.



Essential Tools for Pneumonia and Diarrhea Vaccine Advocacy

CHAMPS
Mortality
Data

IA2030
Scorecard

Gavi,
the Vaccine
Alliance
(Gavi)

Child Health
Taskforce
Vaccine
Subgroup

Inter-agency
Child Mortality
Estimates
(IGME)

VIEWHub
by IVAC

Lives
Saved
Tool
(LIST)

WHO
Vaccines and
Immunization

Call to
Action for
Fair Vaccine
Prices
(WSPID)

Defeat DD
by PATH

Global
Burden of
Disease
(GBD)

WHO/UNICEF
Estimates of
National
Immunization
Coverage
(WUENIC)

Vaccine
Impact
Modelling
Consortium
(VIMC)

Immunization
Agenda 2030
(IA2030)

WHO Global
Vaccine
Market
Report

Every Breath
Counts
Coalition