



# Pneumonia & Diarrhea Progress Report 2023

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# EXECUTIVE SUMMARY

**PNEUMONIA AND DIARRHEA ARE RESPONSIBLE FOR 1 IN 4 DEATHS OF CHILDREN UNDER 5**

Each year, IVAC's Pneumonia and Diarrhea Progress Report tracks 10 key indicators in the 15 countries with the highest mortality burden of pneumonia and diarrhea in children under age 5. These 10 indicators are evaluated and summarized into an overall score. This year's report finds signs of recovery from the impacts of the COVID-19 pandemic. Overall scores improved in four focus countries since the 2022 report.

 **1.22 MILLION**

Number of children under 5 who die of pneumonia and diarrhea per year



Over 70% of all pneumonia and diarrhea deaths in children under 5 occur in just 15 focus countries

 **484,000**

Number of children under 5 who die of diarrhea per year

 **739,000**

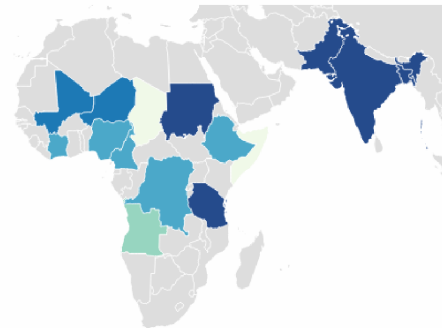
Number of children under 5 who die of pneumonia per year



**A CHILD UNDER 5 DIES OF PNEUMONIA EVERY 43 SECONDS**

## 15 HIGH-BURDEN FOCUS COUNTRIES

2022 GAPPD Score



Rank	Country	Under-5 Pneumonia & Diarrhea Deaths	Deaths Per 1,000 Live Births	GAPPD Score 2022	GAPPD Score Change
1	Nigeria	321,596	43	45	4
2	India	146,558	6	68	8
3	Pakistan	76,553	13	64	1
4	DRC	65,219	18	48	1
5	Ethiopia	45,436	13	49	0
6	Angola	28,784	22	37	1
7	Chad	28,621	43	27	1
8	Somalia	25,476	40	23	0
9	Niger	25,237	24	56	-1
10	Tanzania	24,870	12	65	2
11	Mali	24,465	30	51	1
12	Bangladesh	18,844	6	68	0
13	Cameroon	18,498	20	47	2
14	Sudan	18,431	14	62	0
15	Côte d'Ivoire	16,586	18	48	1



# INTRODUCTION

*Despite significant progress toward recovery from the COVID-19 pandemic, childhood pneumonia and diarrhea continue to claim the lives of more children under five than any other infectious diseases.*

While global health systems have shown promising signs of recovery, this progress remains uneven, with millions of children left without access to basic services. Pneumonia and diarrhea remain leading killers of young children worldwide, responsible for nearly 1.22 million under-five deaths annually. These two infectious diseases account for approximately 23% of global under-five mortality.

Routine immunization is a cornerstone of primary health care and is essential to reducing the burden of vaccine-preventable pneumonia and diarrhea. The latest data on global immunization coverage shows promising signs of recovery, with an estimated 4 million more children receiving life-saving vaccination in 2022 compared to 2021<sup>1</sup>. However, 95% of these gains occurred in just eight countries: India, Indonesia, Myanmar, Philippines, Brazil, Mexico, Pakistan, and Tanzania.

Although great progress continues to be made, the burden of pneumonia and diarrhea continues to be deeply inequitable, with over 70% of under-five mortality concentrated in just 15 countries. If we are to leave no child behind, regardless of where they are born, we must call for consistent,

focused prioritization of children living in settings where conflict and poverty threaten already fragile health systems. Restoring and strengthening routine immunization systems is critical to get back on track toward achieving the Sustainable Development Goal targets for ending preventable newborn and child deaths.

Rank	Country	Under-5 Pneumonia & Diarrhea Deaths	Deaths per 1,000 Live Births
1	Nigeria	321,596	43
2	India	146,558	6
3	Pakistan	76,553	13
4	Democratic Republic of the Congo	65,219	18
5	Ethiopia	45,436	13
6	Angola	28,784	22
7	Chad	28,621	43
8	Somalia	25,476	40
9	Niger	25,237	24
10	United Republic of Tanzania	24,870	12
11	Mali	24,465	30
12	Bangladesh	18,844	6
13	Cameroon	18,498	20
14	Sudan	18,431	14
15	Ivory Coast	16,586	18





*With a child under five dying of pneumonia every 43 seconds, we continue to fall short of global targets.*

“We have seen incredible progress against preventable childhood deaths over the past decades, but disruptions to health systems and stagnated immunization coverage rates continue to threaten the health and safety of the most vulnerable children,” says IVAC Executive Director Dr. William Moss. “We cannot allow persistent gaps in basic child health services to continue – the global health community must mobilize to prevent the resurgence of preventable diseases like pneumonia, diarrhea, and measles.”

In 2013, the Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD)<sup>2</sup> identified an integrated framework of key interventions proven to effectively protect, prevent, and treat childhood pneumonia and diarrhea. In the 10 years since, under-five pneumonia and diarrhea deaths have fallen by 57% from 2.89 million deaths in 2000<sup>3</sup>, but this progress still falls short of the GAPPD goal of less than three childhood pneumonia deaths and fewer than two diarrhea deaths for every 1,000 births in all countries by 2025.

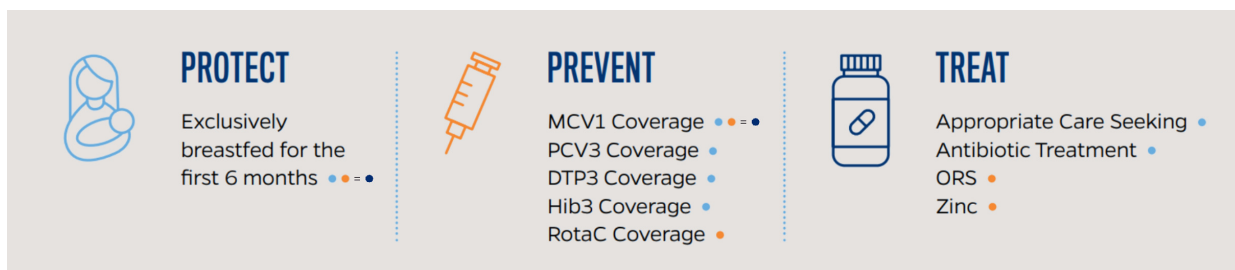
Since 2011, the International Vaccine Access Center at the Johns Hopkins Bloomberg School of Public Health has analyzed annual progress for 10 key GAPPD interventions in the 15 countries with the highest burden of under-five deaths from pneumonia and diarrhea.

## GAPPD INDICATORS

In 2009 and 2013, the WHO and UNICEF published GAPPD, a bold call to action with the goal of achieving a global 75% reduction in incidence of severe pneumonia and diarrhea in children under 5 by 2025.<sup>4</sup> GAPPD outlines a set of core interventions to successfully prevent, protect, and treat children who are at risk of serious illness or death due to these two diseases.

A country’s Overall GAPPD score reflects the average of all 10 indicators.

- The Pneumonia Score reflects the mean of **7 pneumonia-specific indicators**
- The Diarrhea Score reflects the mean of **5 diarrhea-specific indicators**
- Of the 10 indicators, **2 are effective against both diarrhea and pneumonia**

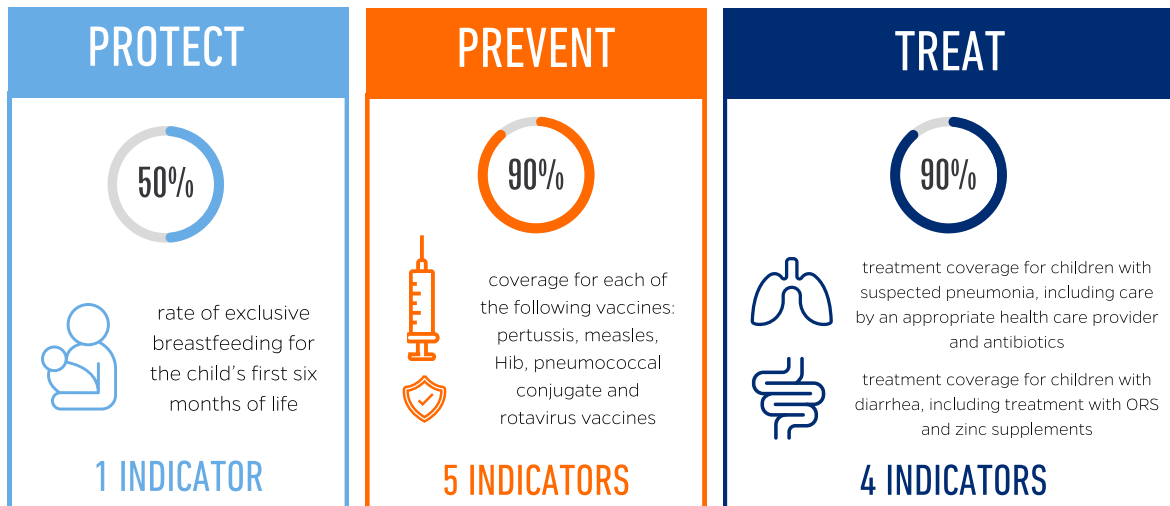


# KEY RESULTS & FINDINGS

## HOW THE SCORES ARE CALCULATED

Each year we calculate and compare GAPPD scores based upon 10 key indicators to track global progress toward GAPPD targets. Exclusive breastfeeding **PROTECTS** children by making them healthier and less vulnerable to pneumonia and diarrhea. Vaccination against pertussis, measles, Hib, pneumococcus, and rotavirus **PREVENTS** illness and death due to these pathogens that cause pneumonia and/or diarrhea, while access to appropriate health care providers, antibiotics, ORS, and zinc are key interventions to **TREAT** pneumonia and diarrhea.

### GAPPD COVERAGE TARGETS



$$\left[ \begin{array}{c} \text{PROTECT} \\ 50\% * 1 \\ \text{breastfeeding coverage target} \end{array} \right] + \left[ \begin{array}{c} \text{PREVENT} \\ 90\% * 5 \\ \text{vaccine coverage target} \end{array} \right] + \left[ \begin{array}{c} \text{TREAT} \\ 90\% * 4 \\ \text{treatment coverage target} \end{array} \right] = 86\% \text{ Overall GAPPD target score}$$



## GAPPD scores for the 15 countries with the highest number of under-5 pneumonia and diarrhea deaths

Countries with most under-5 pneumonia & diarrhea deaths		Under-5 pneumonia & diarrhea burden		Protect (Target = 50%)	Prevent (Target = 90%)					Treat (Target = 90%)				2023 Scores		
				% exclusive BF* in first 6 months	Vaccine coverage (%)					% of children under 5 with suspected pneumonia		% of children under 5 with diarrhea receiving		Overall	Pneumonia	Diarrhea
Rank	Country	Number of deaths	Number of deaths per 1,000 live births		DTP3	MCV1	Hib3	PCV3	Rotac	Taken to an appropriate health care provider	Receiving antibiotics	ORS	Zinc			
1	Nigeria	321,596	43	29	62	60	62	60	12	40	50	40	31	45	52	34
2	India	146,558	6	64	93	95	93	66	92	56	25	61	31	68	70	69
3	Pakistan	76,553	13	47	85	82	85	85	88	71	46	37	13	64	72	53
4	Democratic Republic of the Congo	65,219	18	54	65	56	65	64	59	34	39	24	22	48	54	43
5	Ethiopia	45,436	13	59	65	56	65	61	65	30	21	30	33	49	51	49
6	Angola	28,784	22	37	42	37	42	24	37	49	56	43	0	37	41	31
7	Chad	28,621	43	16	60	56	60	0	0	18	18	17	21	27	33	22
8	Somalia	25,476	40	34	42	46	42	0	0	23	N/A	N/A	0	23	31	20
9	Niger	25,237	24	26	84	65	84	84	86	59	8	41	20	56	59	48
10	United Republic of Tanzania	24,870	12	58	88	86	88	83	67	55	61	45	18	65	74	55
11	Mali	24,465	30	48	77	70	77	77	70	35	24	21	15	51	58	45
12	Bangladesh	18,844	6	63	98	97	98	99	0	46	63	72	44	68	81	55
13	Cameroon	18,498	20	39	68	65	68	67	61	30	31	18	21	47	53	41
14	Sudan	18,431	14	55	84	81	84	85	84	48	59	20	15	62	71	51
15	Ivory Coast	16,586	18	34	76	65	76	61	65	44	19	17	18	48	54	40
<b>MEDIAN</b>				<b>47</b>	<b>76</b>	<b>65</b>	<b>76</b>	<b>66</b>	<b>65</b>	<b>44</b>	<b>35</b>	<b>34</b>	<b>20</b>	<b>49</b>	<b>54</b>	<b>45</b>

\*BF = Breastfeeding

Equal or above target score

N/A = Data is unavailable or not reported



# PROGRESS SUMMARY

## OVERALL GAPPD SCORES

This year, all 15 countries failed to reach the Overall GAPPD score target of 86%. The mean Overall GAPPD score across all 15 countries was 50%, **1% more than last year**.

For 2023, Overall GAPPD scores ranged from 23% (**Somalia**) to 68% (**Bangladesh** and **India**).

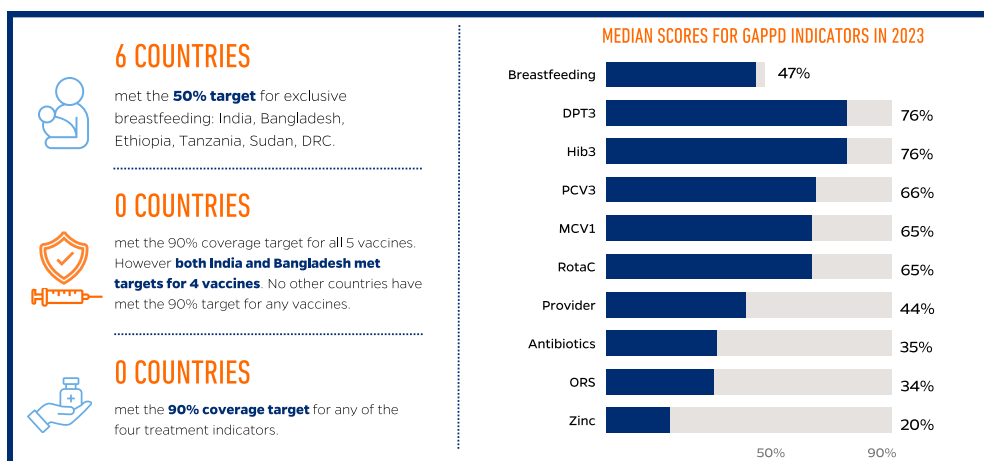
This year, no country experienced a decline in Overall GAPPD scores of greater than 1%, while 4 countries experienced an improvement in Overall GAPPD score.

## Increase and decrease in Overall GAPPD score

Countries listed experienced greater than 1 percentage point change in Overall GAPPD score between 2022 and 2023.

Country	2022	2023	Difference
India	60	68	+8
Nigeria	41	45	+4
United Republic of Tanzania	63	65	+2
Cameroon	45	47	+2

## GAPPD PROGRESS SUMMARY





## PNEUMONIA GAPPD SCORES

This year, all 15 countries failed to meet the Pneumonia GAPPD score target of 84%. The mean Pneumonia GAPPD score across all 15 countries was 57%, **2% more than last year**.

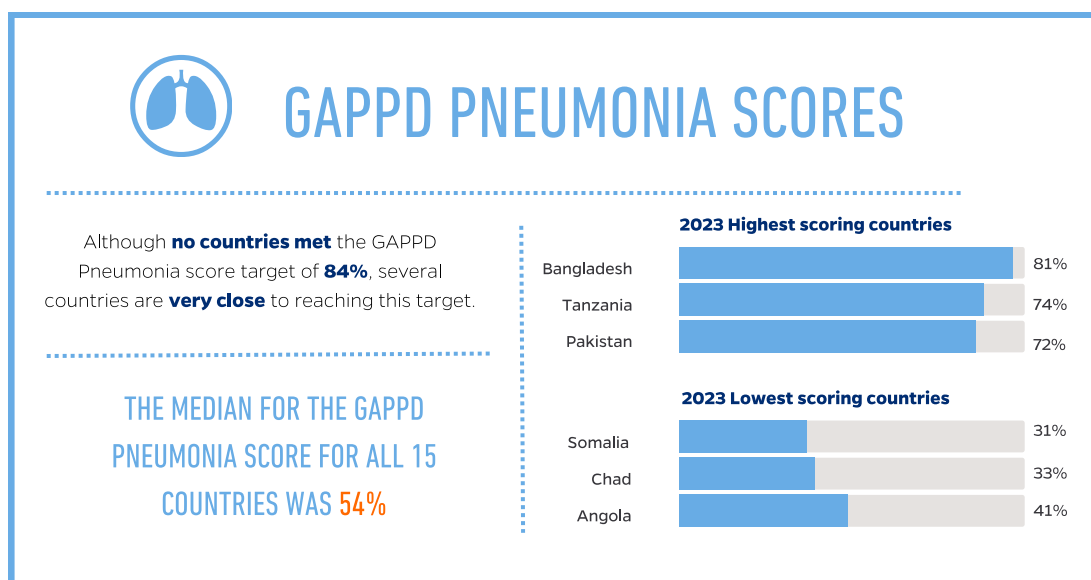
For 2023, Pneumonia GAPPD scores ranged from 31% (**Somalia**) to 81% (**Bangladesh**).

This year, 1 country experienced a decline in Pneumonia GAPPD scores of greater than 1%, while 5 countries experienced an improvement in Pneumonia GAPPD score.

### Increase and decrease in Pneumonia GAPPD score

Countries listed experienced greater than 1 percentage point change in Pneumonia GAPPD score between 2022 and 2023.

Country	2022	2023	Difference
India	60	70	+10
Nigeria	48	52	+4
United Republic of Tanzania	70	74	+4
Cameroon	50	53	+3
Mali	56	58	+2
Sudan	73	71	-2



## DIARRHEA GAPPD SCORES

This year, all 15 countries failed to meet the Diarrhea GAPPD score target of 82%. The mean Diarrhea GAPPD score across all 15 countries was 44%, **1% more than last year**.

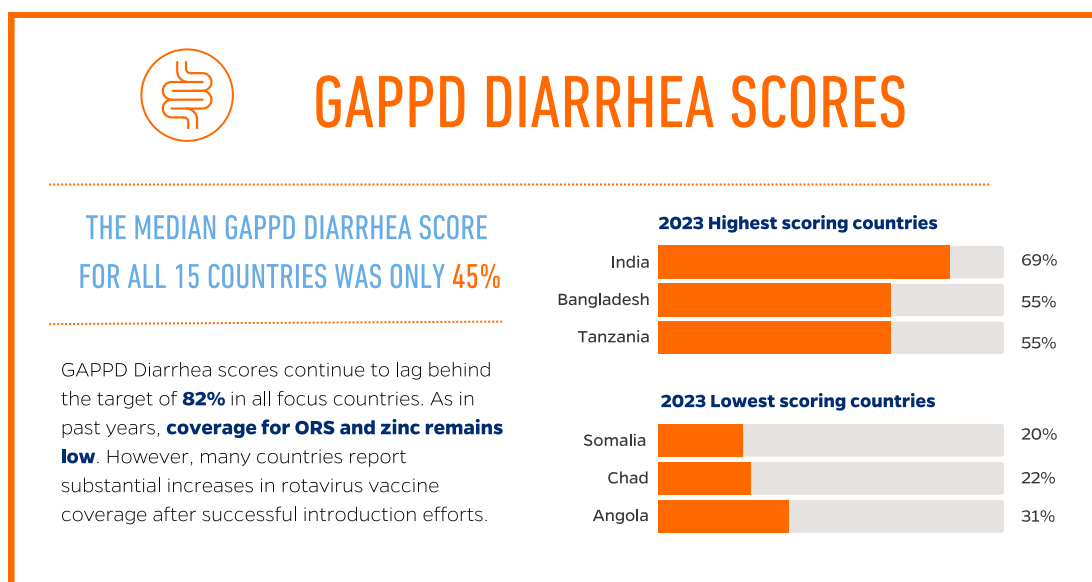
For 2023, Diarrhea GAPPD scores ranged from 20% (**Somalia**) to 69% (**India**).

This year, 1 country experienced a decline in Diarrhea GAPPD scores of greater than 1%, while 5 countries experienced an improvement in Diarrhea GAPPD scores.

### Increase and decrease in Diarrhea GAPPD score

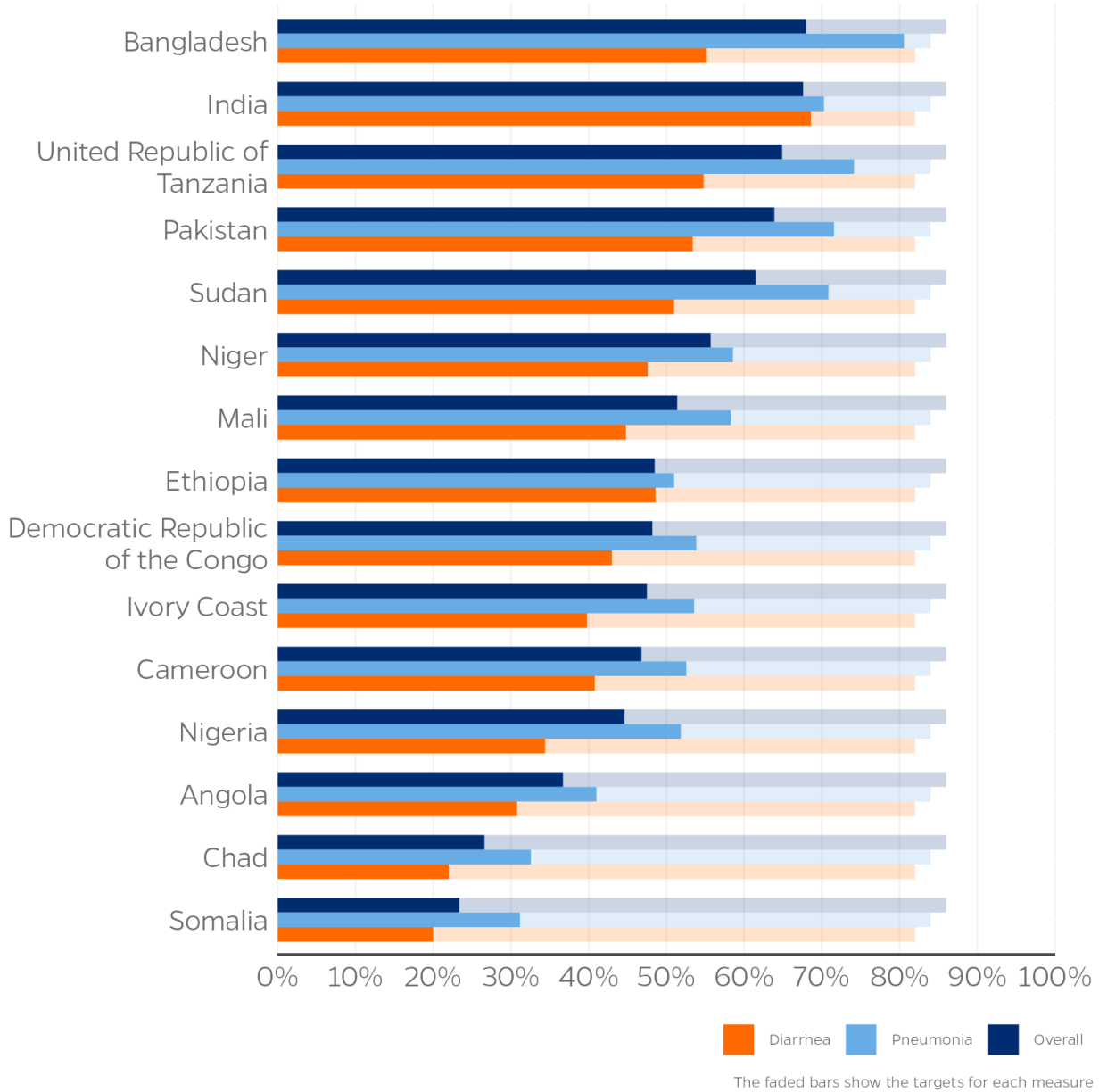
Countries listed experienced greater than 1 percentage point change in Diarrhea GAPPD score between 2022 and 2023.

Country	2022	2023	Difference
India	64	69	+4
Ivory Coast	37	40	+3
Nigeria	32	34	+2
Democratic Republic of the Congo	41	43	+2
Mali	43	45	+2
Niger	50	48	-2



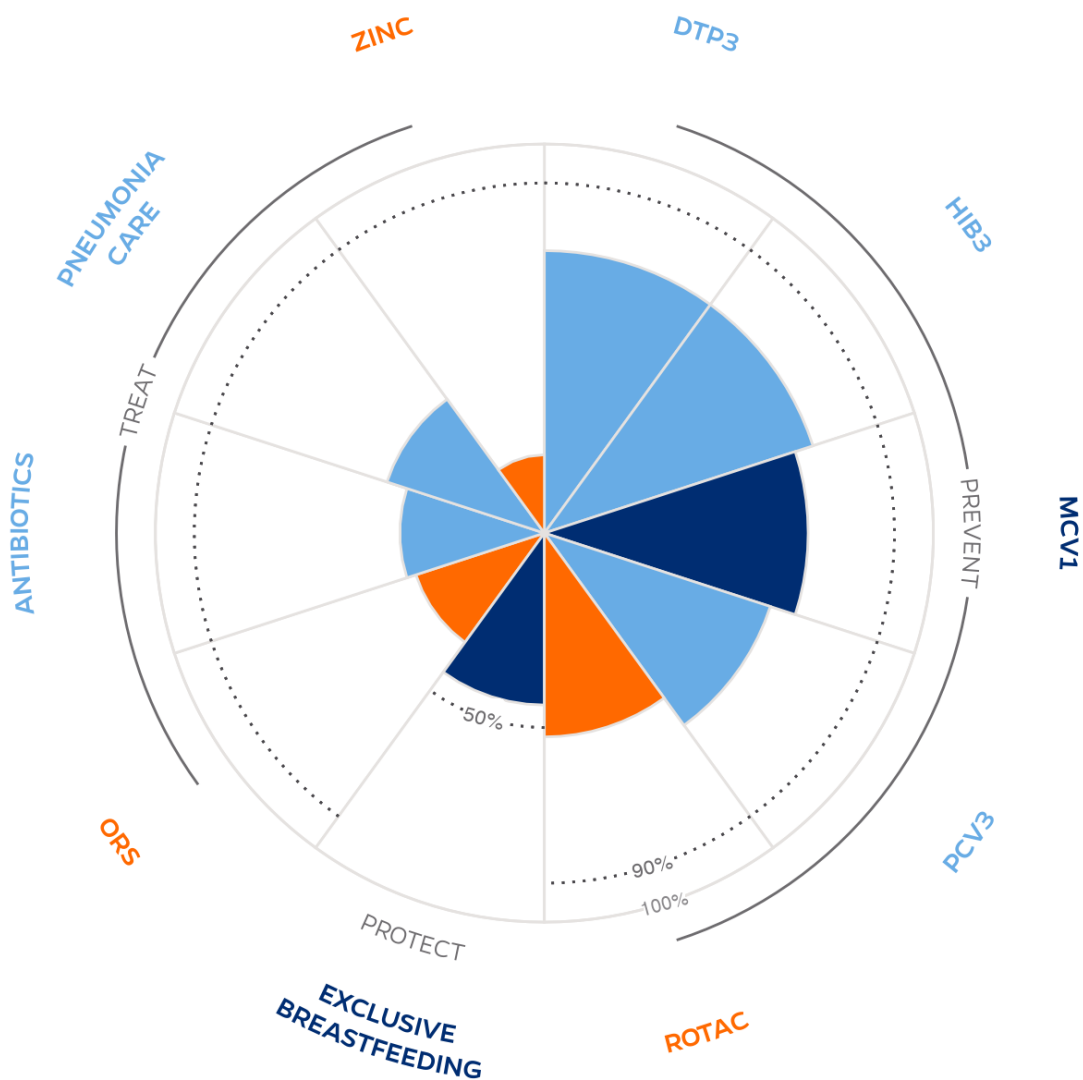
# TOTAL GAPPD TARGET SCORES

None of the 15 countries met GAPPD targets in 2023.



## Mean coverage by indicator



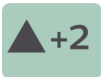

Zinc continues to lag far behind other GAPPD indicators.



The dotted lines show the targets for each measure

# COUNTRY PROGRESS SUMMARY

*From 2022 to 2023, 4 countries saw Overall GAPPD scores increase at least two percentage points.*

India		India had the largest increase in Overall GAPPD score of any focus country due to significant improvements across all immunization indicators, particularly a 41 percentage point increase in PCV3 coverage.
Nigeria		Nigeria's recent introduction of rotavirus vaccine led to a jump of 12 percentage points in coverage. It's estimated that over the next decade, introduction of rotavirus vaccine could prevent over 100,000 child deaths in Nigeria.
United Republic of Tanzania		United Republic of Tanzania continued to successfully increase coverage between 3-7 percentage points across all pneumonia-preventing vaccines. However, there was a drop of 10 percentage points in rotavirus vaccine coverage.
Cameroon		Cameroon reported increased coverage of MCV1 and new survey data showed large increases in access to antibiotics for treatment of ARI compared to 2022.



# DATA & METHODOLOGY

## IDENTIFYING THE HIGHEST BURDEN COUNTRIES

For this report, we analyzed the progress of 10 GAPPD indicators in the 15 countries with the highest total number of pneumonia and diarrhea deaths among children under 5 years.

These 15 high-burden countries were identified based on the latest data on pneumonia and diarrhea deaths, sourced from the WHO Maternal and Child Epidemiology Estimation (MCEE) group estimates<sup>3</sup>. The most recent publicly available estimates were published in 2022 and include data through 2019. The list of the 15 high-burden countries can shift from year to year as new data is made available. Therefore, countries included in our list of high burden countries may change either due to country progress that results in fewer under-5 pneumonia and diarrhea deaths or adjustments to the methodology used to estimate mortality.

A dataset of the 10 GAPPD indicators used in this report is now available for 196 countries and is accessible on the [VIEW-hub](#) data visualization platform.

## GAPPD INDICATORS

The main data sources for data for this report come from WHO and UNICEF data repositories on global child health<sup>4-7</sup>. The most recently available data were used to compile the national coverage estimates for each of the 10 GAPPD indicators tracked in the report. We used data collected within the last 10 years to compile national coverage estimates for each of the 10 indicators. Three key target scores are calculated by averaging the GAPPD coverage target scores for these 10 indicators: a GAPPD Pneumonia score, GAPPD Diarrhea score, and an Overall GAPPD score that includes both pneumonia and diarrhea indicators. These scores can be used to track country progress towards achieving GAPPD coverage targets based upon this selection of proven pneumonia and diarrhea interventions.





## Data sources for 10 GAPPD indicators

Indicator	Definition	Source
<b>PROTECT</b>		
<b>Exclusive breastfeeding</b>	Percentage of infants 0-5 months of age who are fed exclusively with breast milk	<a href="#">UNICEF's global database, Infant and Young Child Feeding: Exclusive Breastfeeding (&lt;6 months)</a> .
<b>PREVENT</b>		
<b>DTP3</b>	3rd dose of diphtheria-tetanus-pertussis (DTP) vaccine	<a href="#">WHO/UNICEF Estimates of National Immunization Coverage (WUENIC)</a> .
<b>MCV1</b>	1st dose of measles-containing vaccine	
<b>Hib3</b>	3rd dose of Haemophilus influenzae type b (HIB) vaccine	
<b>PCV3</b>	3rd dose of pneumococcal conjugate vaccine (PCV)	
<b>RotaC</b>	Final dose of rotavirus vaccine (complete course)	
<b>TREAT</b>		
<b>Pneumonia care-seeking</b>	Percentage of children born in the five years preceding the survey with acute respiratory infection (ARI) taken to a health facility	<a href="#">UNICEF's global database, Child health coverage: Pneumonia data</a>
<b>Antibiotics</b>	Percentage of children under the age of 5 with symptoms of ARI who received antibiotics	<a href="#">USAID Demographic and Health Survey (DHS)</a> .
		<a href="#">UNICEF Multiple Indicator Cluster Surveys (MICS)</a> .
		or equivalent
<b>ORS</b>	Percentage of children under 5 years old with diarrhea receiving oral rehydration salts (ORS packets or pre-packaged ORS fluids)	<a href="#">UNICEF's global database, Child health coverage: Diarrhoeal disease</a>
<b>Zinc</b>	Percentage of children born in the five years preceding the survey with diarrhea in the two weeks preceding the survey who received zinc supplements	



# LIMITATIONS

## Data availability

Not all indicators are available for each country for each year. While the data for some indicators are updated annually, as with the WUENIC immunization coverage, other data sources may only be updated once every few years when new national surveys are published. In cases where a country has no available data for a particular indicator, that indicator is recorded as either “missing” or “0% coverage,” depending on the indicator.

While actual changes in the availability and provision of these key interventions may have occurred in a given year, estimates reflecting these changes may not yet be recorded or available. In the event that new data are not collected, the last reported data point within the last 10 years is used for calculations. Thus, GAPPD scores for countries where more data are available may better reflect trends toward GAPPD targets. This limitation underscores the importance of regularly collected, high-quality data that enables accurate monitoring of key GAPPD interventions.

## Antibiotics

Concerns have been raised about the validity of antibiotics for suspected pneumonia as an indicator and recommend excluding this indicator in analyses of pneumonia treatment coverage.

Learn more: [A prospective validation study in South-West Nigeria on caregiver report of childhood pneumonia and antibiotic treatment using Demographic and Health Survey \(DHS\) and Multiple Indicator Cluster Survey \(MICS\) questions.](#)

## Oxygen

The availability of oxygen is not currently a standard health system indicator, despite oxygen’s classification as an essential medicine by the WHO. Indicators for tracking country-level progress for oxygen coverage have not been included this year but may be incorporated in the future.

Read more here: [Good data is critical to equitably improve oxygen access](#)



# ADDITIONAL RESOURCES

## [VIEW-Hub](#)

VIEW-hub is an open-access data visualization tool from IVAC that provides updated data on global vaccine introduction, use, coverage, access, impact, and disease burden for nine vaccines: the [pneumococcal conjugate vaccine](#), the [rotavirus vaccine](#), the [\*Haemophilus influenzae\* type b vaccine](#), the [inactivated polio vaccine](#), the [human papillomavirus vaccine](#), the [typhoid vaccine](#), the [measles-containing vaccine \(second-dose\)](#), the [measles-rubella vaccine](#), and [vaccines for COVID-19](#).

## [Immunization Agenda 2030 Scorecard](#)

The Immunization Agenda 2030 (IA2030) scorecard is a publicly available interactive tool displaying data that enables stakeholders at all levels—global, regional and country—to monitor the status of each indicator in the IA2030 Framework for Action. The scorecard supports coordinated operational planning, ownership and accountability, and communication and advocacy.

## [Second Global Forum on Childhood Pneumonia](#)

The 2nd Global Forum on Childhood Pneumonia built on the momentum for action generated by the first Global Forum, and the political attention COVID-19 has focused on respiratory health, to accelerate the specific government actions needed to reduce child pneumonia deaths. These include full coverage of the pneumonia-fighting vaccines (e.g., PCV, pertussis, Hib, and measles), reductions in wasting, improvements in air quality, as well as rapid access to diagnosis and treatment with antibiotics and oxygen, especially as part of strong primary health care.

## [Estimating the impact of new vaccine introduction in Chad, Guinea, Somalia, and South Sudan](#)

This analysis emphasizes the life-saving benefits of including PCV and rotavirus vaccines in the immunization schedules of four key countries. By implementing this strategy in Chad, Guinea, Somalia, and South Sudan, an estimated 67,500 lives could be saved, and around 2.6 million cases of pneumococcal pneumonia, meningitis, and rotavirus-related diarrhea in children under five could be prevented from 2024 to 2030.



## **The Big Catch-Up: An Essential Immunization Recovery Plan for 2023 and Beyond**

The backsliding of immunization coverage during the COVID-19 pandemic, combined with delayed catch-up efforts has resulted in a large and growing immunity gap for millions of children. The Essential Immunization Recovery Plan sets out a path to getting immunization back on track, framed by three key approaches – Catch-Up, Restore and Strengthen. This document serves as the joint strategic description of this coordinated effort by WHO, UNICEF, and Gavi, the Vaccine Alliance, along with the Immunization Agenda 2030 (IA2030) Partnership, to support countries to plan and implement intensified efforts to bolster immunization programmes in 2023 and beyond.

## **The State of the World's Children 2023 Report**

The world is facing a red alert for children's health: Routine vaccination coverage dropped sharply during the COVID-19 pandemic. UNICEF's latest report, The State of the World's Children 2023: For every child, vaccination, explores the reasons behind this red alert and the steps we as a global community must take to make sure that no child is left behind.



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**Report and web appendices can be found at [jhsphe.edu/ivac/resources/pdpr](http://jhsphe.edu/ivac/resources/pdpr)**





## ACRONYMS

**DHS** - Demographic & Health Survey

**DRC** - Democratic Republic of Congo

**DTP** - Diphtheria-tetanus-pertussis vaccine

**DTP3** - Third dose of diphtheria-tetanus-pertussis (DTP) vaccine

**GAPPD** - The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea

**Hib** - Haemophilus influenzae type B

**Hib3** - Third dose of Haemophilus influenzae type b (Hib) vaccine

**IVAC** - International Vaccine Access Center

**MCEE** - WHO Maternal and Child Epidemiology Estimation Group

**MCV** - Measles-containing vaccine

**MICS** - Multiple Indicator Cluster Survey

**NFHS** - National Family Health Survey

**ORS** - Oral rehydration salts

**PCV** - Pneumococcal conjugate vaccine

**PCV3** - Third dose of pneumococcal conjugate vaccine (PCV)

**RotaC** - Rotavirus vaccine final dose

**SDG** - Sustainable Development Goals

**WHO** - World Health Organization

**WUENIC** - WHO/UNICEF Estimates of National Immunization Coverage

