



**PNEUMONIA & DIARRHEA
PROGRESS REPORT
2022**



CONTENTS

Executive Summary	2
Introduction	3
GAPPD Indicators	5
Key results & findings	5
How the scores are calculated	6
Progress summary	7
Overall GAPPD scores	8
Pneumonia GAPPD scores	9
Diarrhea GAPPD scores	10
Total GAPPD target scores	11
Country progress summary	12
Data & Methodology	13
Limitations	16
Additional resources	16
References	18
Acknowledgements and acronyms	19
Acknowledgements	20
Acronyms	



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 based on the WHO integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD).

KEY REPORT FINDINGS IN 2022



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



A CHILD UNDER 5
DIES OF PNEUMONIA
EVERY 43 SECONDS



Six of the 15 focus countries experienced decreases in immunization coverage, putting children at risk

15 HIGH-BURDEN FOCUS COUNTRIES



1,223,320

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



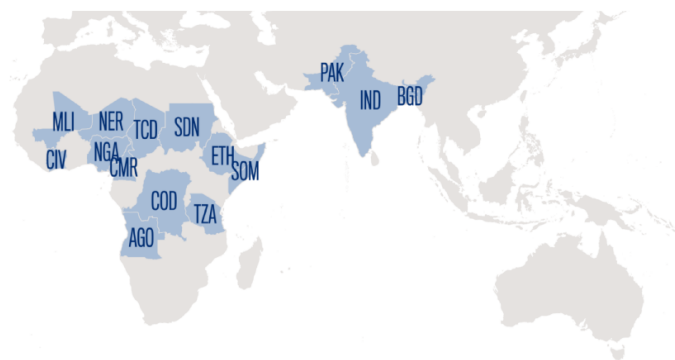
738,974

Number of children under 5 who die of pneumonia per year



484,346

Number of children under 5 who died of diarrhea per year



AGO - Angola	ETH - Ethiopia	PAK - Pakistan
BGD - Bangladesh	IND - India	SOM - Somalia
CMR - Cameroon	CIV - Ivory Coast	SDN - Sudan
TCD - Chad	MLJ - Mali	TZA - United Republic of Tanzania
COD - Democratic Republic of the Congo	NER - Niger	
	NGA - Nigeria	



INTRODUCTION

Pneumonia and diarrhea kill more young children worldwide than any other disease, claiming over 1.22 million lives each year.

Pneumonia and diarrhea are among the leading causes of child mortality worldwide, responsible for almost one in every four deaths of a child before the age of five. An estimated 1.22 million¹ young children lose their lives to pneumonia or diarrhea each year, equivalent to over 140 children dying every hour or 3,350 deaths each day.

Over 70% of under-5 deaths from pneumonia and diarrhea occur in just 15 countries. The children and families most impacted by these highly preventable illnesses are often the most vulnerable and marginalized—families without access to even the most basic health services due to poverty, armed conflict, and fragile health care systems. Every child, regardless of where they are born, has the right to live a healthy, full life. We already have the tools to save these lives. With sustained investments in simple, proven interventions such as vaccination, zinc, and oral rehydration solution (ORS), we can dramatically reduce the 739,000 deaths due to pneumonia and 484,000 deaths due to diarrhea each year.

Decades of progress in global child health are now threatened by “the largest sustained drop in childhood immunization in a generation.”² The COVID-19 pandemic has fueled the largest continued backslide in global vaccination coverage in three decades: 25 million children missed out on

basic vaccination services in 2021, the highest number since 2009³.

With over 1 million young children still dying from pneumonia and diarrhea each year, we are falling far short of reaching the Sustainable Development Goal (SDG) targets for preventable deaths of newborns and young children. We cannot allow decades of progress in child survival to stall out or backslide. If the SDGs are to be achieved, restoring and leveraging routine immunization is more important than ever.

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



These two infectious diseases are responsible for an estimated 23% of all deaths of children under five globally.

The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD)⁴ – launched by the World Health Organization (WHO) and UNICEF in 2009 and updated in 2013 – lays out a comprehensive package of interventions aimed to end preventable pneumonia and diarrhea child deaths by 2025.

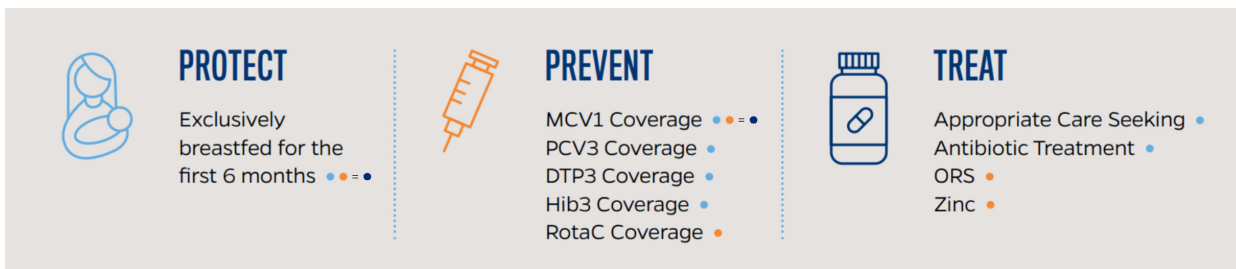
For over a decade, the International Vaccine Access Center at the Johns Hopkins Bloomberg School of Public Health has examined annual progress toward a subset of key GAPPD interventions in 15 countries with the highest total number of pneumonia and diarrhea deaths among children under five.

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 2025⁴. 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.

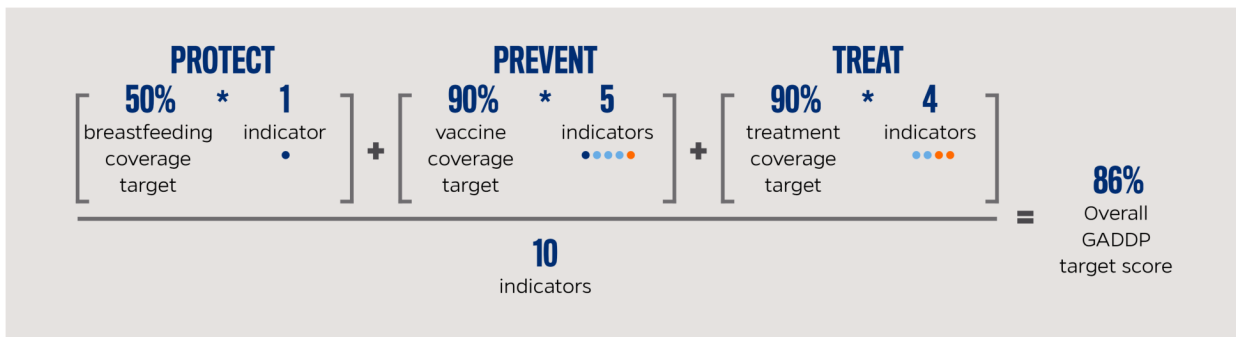
- The Pneumonia Score reflects the average of **7 pneumonia-specific indicators**
- The Diarrhea Score reflects the average of **5 diarrhea-specific indicators**
- Of the 10 indicators, **2 are effective against both diarrhea and pneumonia**



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 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%)				2022 Scores		
Rank	Country	Number of deaths	Number of deaths per 1,000 live births	% 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
					DTP3	MCV1	Hib3	PCV3	RotaC	Taken to an appropriate health care provider	Receiving antibiotics	ORS	Zinc			
1	Nigeria	321,596	43	29	56	59	56	52	0	40	23	40.0	31	39	45	32
2	India	146,558	6	58	85	89	85	25	83	69	25	61.0	30	61	62	64
3	Pakistan	76,553	13	47	83	81	83	83	87	71	46	37.0	12	63	71	53
4	Democratic Republic of the Congo	65,219	18	54	65	55	65	63	52	34	40	24.0	22	47	54	41
5	Ethiopia	45,436	13	59	65	54	65	61	65	30	27	30.0	33	49	52	48
6	Angola	28,784	22	37	45	36	41	34	36	49	N/A	43.0	0	36	40	30
7	Chad	28,621	43	16	58	55	58	0	0	18	18	17.0	20	26	32	22
8	Somalia	25,476	40	34	42	46	42	0	0	22	N/A	N/A	0	23	31	20
9	Niger	25,237	24	22	82	80	82	82	85	59	11	41.0	20	56	60	50
10	United Republic of Tanzania	24,870	12	58	81	76	81	80	77	55	61	45.0	18	63	70	55
11	Mali	24,465	30	40	77	70	77	77	70	35	18	21.0	15	50	56	43
12	Bangladesh	18,844	6	63	98	97	98	99	0	46	63	72.0	44	68	81	55
13	Cameroon	18,498	20	39	69	62	69	67	65	30	12	18.0	21	45	50	41
14	Sudan	18,431	14	55	84	81	84	85	84	48	N/A	20.0	15	62	73	51
15	Ivory Coast	16,586	18	23	76	68	76	57	58	44	30	16.0	18	47	53	37
MEDIAN				40	76	68	76	63	65	44	26	33.5	20	49	54	43

*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 49%, **same as last year**.

For 2022, Overall GAPPD scores ranged from 23% (**Somalia**) to 68% (**Bangladesh**).

This year, 4 countries experienced a decline in Overall GAPPD scores of greater than 1%, while 3 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 2021 and 2022.

Country	2021	2022	Difference
Mali	46	50	+4
India	59	61	+2
Chad	24	26	+2
United Republic of Tanzania	66	63	-2
Ethiopia	52	49	-3
Sudan	65	62	-3
Angola	40	36	-5



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 55%, **1% less than last year**.

For 2022, Pneumonia GAPPD scores ranged from 29% (**Chad**) to 81% (**Bangladesh**).

This year, 5 countries experienced a decline in Pneumonia GAPPD scores of greater than 1%, while 3 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 2021 and 2022.

Country	2021	2022	Difference
Mali	52	56	+5
Chad	29	32	+3
Pakistan	69	71	+2
Democratic Republic of the Congo	57	54	-3
Ethiopia	55	52	-3
United Republic of Tanzania	73	70	-3
Sudan	76	73	-4
Angola	47	40	-6



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 43%, **same as last year**.

For 2022, Diarrhea GAPPD scores ranged from 20% (**Chad**) to 60% (**India**).

This year, 4 countries experienced a decline in Diarrhea GAPPD scores of greater than 1%, while 4 countries experienced an improvement in Diarrhea GAPPD scores.

Increase and decrease in Diarrhea GAPPD score

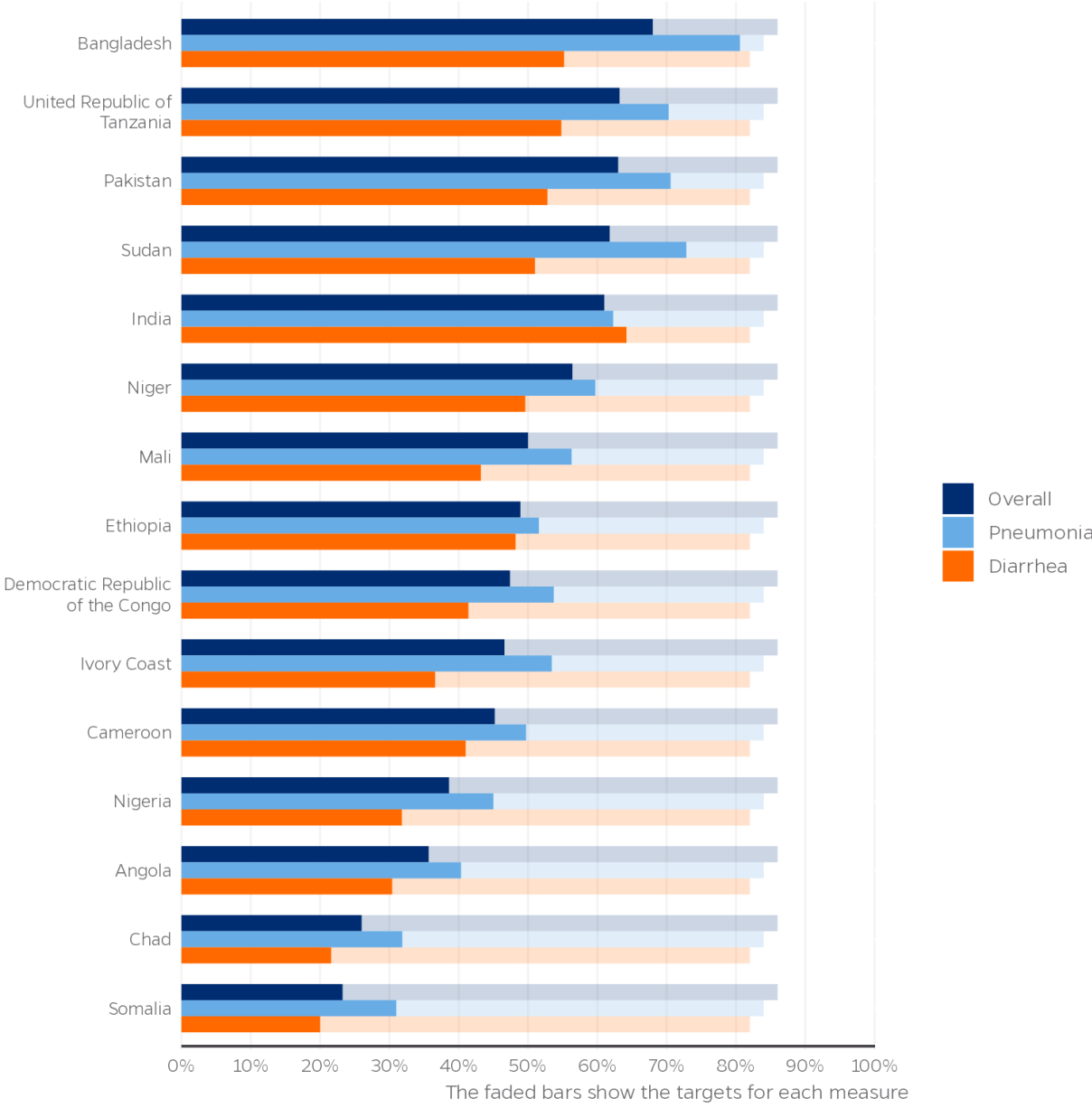
Countries listed experienced greater than 1 percentage point change in Diarrhea GAPPD score between 2021 and 2022.

Country	2021	2022	Difference
India	60	64	+4
Democratic Republic of the Congo	38	41	+4
Chad	20	22	+2
Mali	41	43	+2
Ethiopia	50	48	-2
Angola	33	30	-2
United Republic of Tanzania	57	55	-3
Sudan	54	51	-3



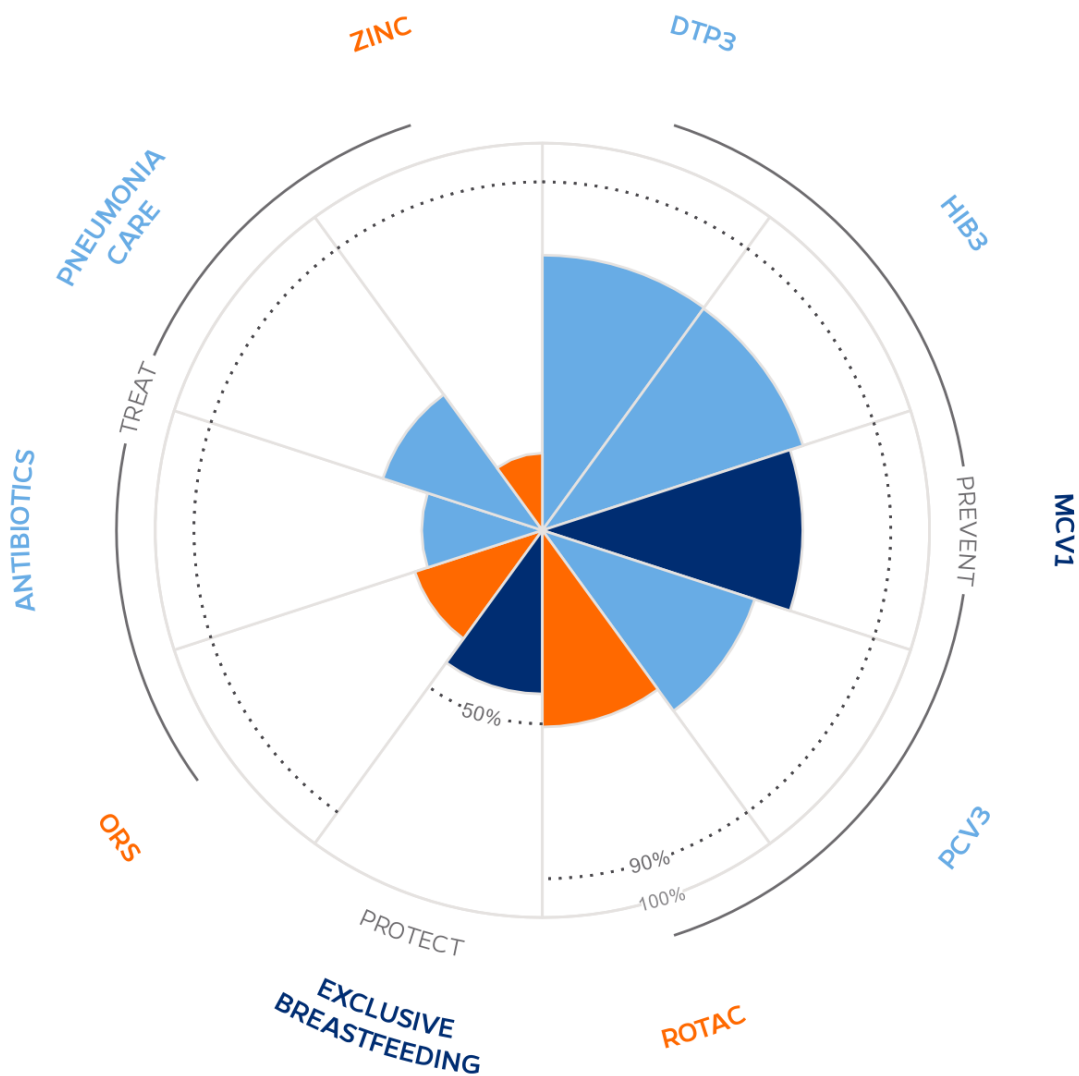
TOTAL GAPPD TARGET SCORES

None of the 15 countries met GAPPD targets.



Mean coverage by indicator

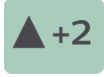


Zinc continues to lag far behind other GAPPD indicators.



The dotted lines show the targets for each measure

COUNTRY PROGRESS SUMMARY

From 2021 to 2022, 7 countries saw Overall GAPPD score changes of at least two percentage points.

Mali		Mali experienced increases across all immunization indicators, with PCV3 (77%) and RotaC (70%) now surpassing pre-pandemic coverage levels.
India		India continued to successfully improve coverage of PCV3 and RotaC and experienced a modest improvement in Overall GAPPD score this year.
Chad		Chad also experienced improvements in many immunization indicators, despite the pandemic. Key immunizations went up an average of 4%.
United Republic of Tanzania		United Republic of Tanzania experienced a decline in Overall GAPPD score due to reduced immunization coverage for all immunization indicators.
Ethiopia		Ethiopia also had a decline in Overall GAPPD score due to reduced immunization coverage of 5%-6% across all five immunization indicators.
Sudan		Sudan experienced a 3-point decline in Overall GAPPD score. All five immunization indicators experienced a decline, ranging from 5% to 8%.
Angola		Angola experienced sharp declines across immunization coverage indicators, with PCV3 declining the most dramatically by 19% in one year.



DATA & METHODOLOGY

IDENTIFYING THE HIGHEST BURDEN COUNTRIES

For this report, we analyze 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 are identified based on the latest data on pneumonia and diarrhea deaths, sourced from the WHO Maternal and Child Epidemiology Estimation (MCEE) group estimates⁵. The most recent publicly available estimates were published in 2022. 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.

GAPPD INDICATORS

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

Website

VIEW-hub is an online, interactive, map-based platform for visualizing data on vaccine use and impact. Find the most relevant and recent vaccine data, covering topics such as [Vaccine Introduction & Use](#), [Immunization Equity](#), [Vaccine Preventable Disease Burden](#), and [Immunization System Strength](#). It also includes country level summary data on the latest academic studies on [Vaccine Impact](#), as well as the [Economic Burden of Disease](#).

The Rota Council

Rotavirus Disease and Immunization: Series of Briefs

Six rotavirus-focused briefs cover epidemiology and disease burden, available vaccine products, the impact of vaccination, economic costs of rotavirus disease and the value of vaccines, safety, and introduction and coverage status.

Immunization Agenda 2030

IA2030 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.



Every Breath Counts

Pneumococcal Conjugate Vaccine (PCV) Scorecard

In a scorecard released in 2022, Every Breath Counts ranks the 40 countries that are home to 1.5 million (94 percent) of the 1.63 million child lives that could be saved with PCV coverage by 2030, according to the Vaccine Impact Modelling Consortium (VIMC).

Results for Development (R4D)

Market Report - Amoxicillin Dispersible Tablets Progress and Opportunities

This market brief aims to document progress seen over the past eight years since the WHO guidance was updated to recommend the use of amoxicillin DT for childhood pneumonia treatment. Importantly, the brief also highlights key remaining opportunities to unlock persistent barriers, and to transform access to this life-saving commodity.



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ACKNOWLEDGEMENTS AND ACRONYMS

The Pneumonia and Diarrhea Progress Report is prepared and published annually by the International Vaccine Access Center (IVAC) at the Johns Hopkins Bloomberg School of Public Health to mark World Pneumonia Day. This is the 14th edition of the progress report and the 15th year of World Pneumonia Day.

ACKNOWLEDGEMENTS

Data Visualization and Report Design - R for the Rest of Us

Photo Credits - Paromita Chatterjee

Suggested Citation - International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health. (2022). Pneumonia and Diarrhea Progress Report 2022.

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Report and web appendices can be found at 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

