

2019
Pneumonia
& Diarrhea
Progress
Report Card



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**INTERNATIONAL
VACCINE ACCESS
CENTER**

INTRODUCTION

In 2017, over 5.4 million children died before reaching their fifth birthday¹. Pneumonia and diarrhea are responsible for nearly one in every four deaths among children under 5, accounting for more than 1.2 million young lives lost in 2017 alone¹. While countries and global partners have made tremendous progress in lowering the burden of these two serious diseases, reducing under-5 pneumonia and diarrhea deaths by more than half since 2000, we can save many more lives with the tools and solutions available today. Tackling pneumonia and diarrhea in high burden countries is critical to meeting the Sustainable Development Goal (SDG) target of ending preventable newborn and child deaths by 2030.

GAPPD goals:

Pneumonia: ≤ 3 under-5 deaths per 1000 live births by 2025

Diarrhea: ≤ 1 under-5 death per 1000 live births by 2025

The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD) lays out a comprehensive package of interventions aiming to end preventable pneumonia and diarrhea child deaths by 2025².

In this report, the International Vaccine Access Center (IVAC) provides pneumonia, diarrhea, and overall GAPPD scores for each of the 15 countries with the highest number of pneumonia and diarrhea deaths among children under 5 years of age.

THE 23 COUNTRIES INCLUDED IN THE 2019 REPORT TOGETHER WERE HOME TO NEARLY 950,000 UNDER-5 PNEUMONIA AND DIARRHEA DEATHS IN 2017, MORE THAN 75% OF THE GLOBAL TOTAL.

This report—which marks IVAC’s 10th annual Pneumonia and Diarrhea Progress Report—also spotlights the 15 countries with the highest pneumonia and diarrhea mortality rates. While several new, smaller countries with high levels of mortality but lower overall numbers of deaths are highlighted in these pages, there are a number of large countries on both lists, indicating places where pneumonia and diarrhea play a particularly critical role in child health.

High number of under-5 pneumonia/diarrhea deaths:

Bangladesh	Ethiopia	Pakistan
China	India	Tanzania
DRC	Indonesia	

High number of under-5 pneumonia/diarrhea deaths and high under-5 pneumonia/diarrhea mortality rate:

Angola	Mali	Somalia
Chad	Niger	
Côte d’Ivoire	Nigeria	

High under-5 pneumonia/diarrhea mortality:

Benin	Guinea	South Sudan
Cameroon	Haiti	
Central Africa Republic	Mauritania	
	Sierra Leone	

METHODS

Each year, we identify the 15 countries with the highest number of under-5 pneumonia and diarrhea deaths based on publicly available data for 2017, the most recent year available¹. This year, we have also included the 15 countries with the highest under-5 pneumonia and diarrhea deaths per 1,000 live births for 2017¹. These two sets of countries are presented and scored separately, although seven countries appear on both lists.

We analyze publicly available WHO, UNICEF, and national survey data collected within the last 10 years to score countries on their progress towards targets for **10 key GAPPD interventions (see page 10 for definitions):**

Protect:

Exclusive breastfeeding

Prevent:

DTP3, MCV1, Hib3, PCV3, RotaC

Treat:

Diarrhea: ORS, Zinc

Pneumonia: Pneumonia care-seeking, Antibiotics

For each country, we calculate three scores:

- Overall GAPPD Score: the average of indicator-specific scores for all 10 interventions
- GAPPD Pneumonia Score: the average of scores for the 7 pneumonia-specific interventions
- GAPPD Diarrhea Score: the average of scores for the 5 diarrhea-specific interventions

The GAPPD target for the five immunization indicators and the four treatment indicators is 90%; for exclusive breastfeeding, the target is 50%². Meeting or exceeding an overall GAPPD score of 86% suggests a country is on track to implementing and scaling up GAPPD interventions. Targets for GAPPD Pneumonia and GAPPD Diarrhea scores are 84% and 82%, respectively.

7 Pneumonia-specific indicators	5 Diarrhea-specific indicators
Exclusive Breastfeeding	
MCV1 Coverage	
DTP3 Coverage	RotaC Coverage
Hib3 Coverage	ORS
PCV3 Coverage	Zinc
Appropriate Care Seeking	
Antibiotic Treatment	

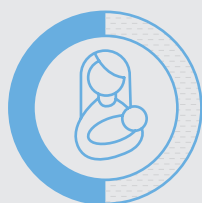
A Detailed Methodology web appendix including data sources for each country and indicator, as well as score calculation and interpretation, is available at <https://www.jhsph.edu/ivac/resources/pdpr/>.

Equation

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

GAPPD ESTABLISHED THE FOLLOWING COVERAGE TARGETS FOR ITS RECOMMENDED INTERVENTIONS, WHICH COUNTRIES SHOULD STRIVE TO ACHIEVE:

PROTECT



50%

coverage of exclusive breastfeeding for the child's first six months of life

PREVENT



90%

coverage for each of the following vaccines: pertussis, measles, Hib, pneumococcal conjugate, and rotavirus vaccines

TREAT



90%

treatment coverage for children with suspected pneumonia, including care by an appropriate health care provider and antibiotics



90%

treatment coverage for children with diarrhea, including treatment with ORS and zinc supplements

SCORES

Global rank	Country	Under-5 pneumonia and diarrhea burden (2017) ¹		PROTECT	PREVENT				
		Number of deaths	Number of deaths per 1,000 live births	% Exclusive breastfeeding in first 6 months <small>3-5, 8, 9, 19-23</small>	Vaccine coverage (%) ⁶				
				Target: 50%	DTP3	MCV1	Hib3	PCV3	RotaC
					Target: 90%				
GAPPD scores for the 15 countries with the highest									
1	India	233,240	9.3	55	89	90	89	6	35
2	Nigeria	208,439	28.4	29*	57	65	57	57	0
3	Pakistan	90,398	16.6	47	75	76	75	79	58
4	DRC	64,170	18.9	47	81	80	81	81	0
5	Ethiopia	44,692	13.6	57	72	61	72	67	79
6	Chad	27,496	43.1	0	41	37	41	0	0
7	Indonesia	27,422	5.6	52*	79	75	79	8	0
8	Angola	25,609	20.8	37	59	50	59	67	65
9	Tanzania	25,367	11.7	59	98	99	98	98	98
10	Somalia	25,158	39.5	5	42	46	42	0	0
11	China	24,254	1.5	19	99	99	N/A†	0	0
12	Mali	21,353	27.3	37	71	70	71	68	55
13	Bangladesh	21,166	6.9	55	98	97	98	97	0
14	Niger	20,048	19.4	23	79	77	79	79	79
15	Côte d'Ivoire	18,651	21.0	23	82	71	82	81	59
Median				37	79	75	77	67	35
GAPPD scores for the 15 countries with the highest									
1	Chad	27,496	43.1	0	41	37	41	0	0
2	Somalia	25,158	39.5	5	42	46	42	0	0
3	Central African Republic	5,013	30.1	33	47	49	47	47	0
4	Nigeria	208,439	28.4	29*	57	65	57	57	0
5	Mali	21,353	27.3	37	71	70	71	68	55
6	South Sudan	12,207	27.3	45	49	51	49	0	0
7	Sierra Leone	6,234	23.9	47	90	80	90	90	92
8	Guinea	10,441	23.1	33*	45	48	45	0	0
9	Benin	9,130	22.3	41	76	71	76	73	0
10	Haiti	5,614	21.5	40	64	69	64	1	58
11	Côte d'Ivoire	18,651	21.0	23	82	71	82	81	59
12	Angola	25,609	20.8	37	59	50	59	67	65
13	Cameroon	17,268	20.0	40*	79	71	79	79	78
14	Niger	20,048	19.4	23	79	77	79	79	79
15	Mauritania	2,838	19.0	41	81	78	81	77	76
Median				37	64	69	64	67	55

N/A: Data is unavailable or not reported

*Data in Tables 1 and 2 may differ from that reported in WHO, UNICEF, or national survey sources. Differences of 1-2 percentage points is often due to rounding differences across sources. At the time of report development, new national surveys (e.g. Demographic Health Surveys [DHS], Multiple Indicator Cluster Surveys [MICS]) for some countries were published since the UNICEF Child Health Coverage database was last updated in November 2018. To ensure we are using the most recent data available, in these cases—countries with surveys published since November 2018 but not yet reflected in the UNICEF database—we have pulled treatment and protection intervention coverage from the newly published surveys. These are marked with a *. Thus, data for these countries may differ from what is available in UNICEF and analyzed in other reports. Details on data sources, score calculation, and score interpretation—including 0% scores and missing data—is available online at <https://www.jhsph.edu/ivac/resources/pdpr>.

TREAT				2019 Scores		
% of children under 5 with suspected pneumonia		% of children under 5 with suspected diarrhea		Overall	Pneumonia*	Diarrhea*
Taken to an appropriate health care provider 3-5, 8, 9, 19-23	Receiving antibiotics‡ 3,5,7, 8, 10-17, 21,24-29	Receiving ORS 3-5, 8, 15, 19-23	Receiving zinc supplements 3-5, 8, 15, 18-23			
Target: 90%				Target: 86%	Target: 84%	Target: 82%

number of under-5 pneumonia and diarrhea deaths

78*	N/A	51	20	56	67	50
73*	23*	40*	31*	43	52	33
84*	46*	37*	13*	59	69	46
42	40*	39	2	49	65	34
31	7	30	33	51	52	52
26	30*	20	1	20	25	12
92*	34*	36*	37*	49	60	40
49	N/A	43	0	48	54	39
55	61*	45	18	73	81	64
N/A	N/A	N/A	0	19	27	13
N/A	N/A	N/A	0	36	54	29
23	18*	21	9	44	51	38
42	34*	77	44	64	74	55
59	11*	41	10	54	58	46
44	29*	17	18	51	59	38
49	30	39	18	49	58	39

st under-5 pneumonia and diarrhea mortality rate

26	30	20	1	20	25	12
N/A	N/A	N/A	0	19	27	13
30	31	16	0	30	41	20
73*	23	40*	31*	43	52	33
23	18	21	9	44	51	38
48	33	39	3	32	39	27
74*	28*	78*	50*	72	71	69
83*	N/A	55*	26*	37	42	32
46*	16	22*	17*	44	57	30
37*	46	39*	6*	42	46	42
44	29	17	18	51	59	38
49	N/A	43	0	48	54	39
59*	41	18*	21*	56	64	45
59	11	41	41	54	58	46
34	14	25	23	53	58	49
47	28	32	17	44	52	38

†China has not yet introduced Hib, rotavirus, or pneumococcal vaccines into its national immunization program (NIP); as such, WUENIC estimates indicate 0% coverage for these three vaccines. Hib and rotavirus vaccines are available through the private market. While relatively high private market coverage for Hib vaccine and low coverage for rotavirus vaccine has been reported in some settings, vaccine coverage levels are not well-documented in the private sector. In past reports, because some evidence suggests that private market Hib3 coverage may exceed 50% in some parts of China even though the vaccine has not yet been introduced into the NIP—as opposed to private market coverage for other non-NIP vaccines, for which data is either unavailable or is limited and reflects low coverage—we classified Hib3 coverage as “missing” (noted in the data tables as “private market coverage”). We have applied the same approach this year. China’s Hib3 coverage is classified as “missing,” and therefore not included in the numerator or denominator for this year’s scores.

‡ Some experts recommend excluding the antibiotics coverage indicator; we include it this year for consistency with past reports. More information is available in the web appendix at <https://www.jhsph.edu/ivac/resources/pdpr>

KEY RESULTS & FINDINGS

PROGRESS SUMMARY



JUST 5 COUNTRIES

met the **50% target** for exclusive breastfeeding



1 COUNTRY

met the **90% coverage target** for all five vaccines; 2 countries met the 90% coverage target for at least four vaccines



ONLY 1 COUNTRY

met the **90% coverage target** for any of the four treatment indicators

OVERALL GAPPD SCORES

All 23 countries fell short of the overall GAPPD score target of 86%. Seven countries fell below half the overall GAPPD score target (43%). Scores ranged from 19-73% among countries with the highest number of deaths and from 19-72% among countries with the highest mortality rates. Tanzania (73%) and Sierra Leone (72%) had the highest overall GAPPD scores; Somalia (19%) had the lowest overall GAPPD score.

As in past years, immunization coverage—the most frequently updated data included in the report—was generally the highest among the indicators. Treatment coverage, particularly zinc supplements for diarrhea, continues to lag behind.

Of note, Sierra Leone ranks seventh highest by pneumonia and diarrhea mortality rate. However, the country has achieved immunization coverage of 90% or higher for four of five vaccines and has relatively high coverage for most other interventions, attaining an overall GAPPD score of 71%. However, in 2017 it was still home to an under-5 pneumonia and diarrhea mortality rate of nearly 24 deaths per 1,000 live births. Understanding the drivers of this high mortality rate despite relatively high intervention coverage may help better target efforts to reduce disease burden.

GAPPD PNEUMONIA SCORES

No countries met the GAPPD Pneumonia score target of 84%. Median scores for both the countries with the highest number of deaths (58%) as well as those with the highest mortality rates (52%) exceeded half the target GAPPD pneumonia score. Four countries fell short of reaching half the target score (42%)—Central African Republic, Chad, Somalia, and South Sudan.

Scores ranged from 25-81% among countries with the highest number of deaths, and from 25-71% among those with the highest mortality rates. Tanzania (81%) and Sierra Leone (71%) had the highest GAPPD Pneumonia scores, with Tanzania falling just short of the 84% target. Chad (25%) had the lowest score among the 23 countries.

GAPPD DIARRHEA SCORES

All countries also fell short of the GAPPD Diarrhea score target of 82%, and median scores for both the countries with the highest number of deaths (39%) as well as those with the highest mortality rates (38%) were below half the target GAPPD diarrhea score (41%). Just 10 countries exceeded half the target score (41%)—Bangladesh (55%), Cameroon (45%), Ethiopia (52%), Haiti (42%), India (50%), Mauritania (49%), Niger (46%), Pakistan (46%), Sierra Leone (69%), and Tanzania (64%).

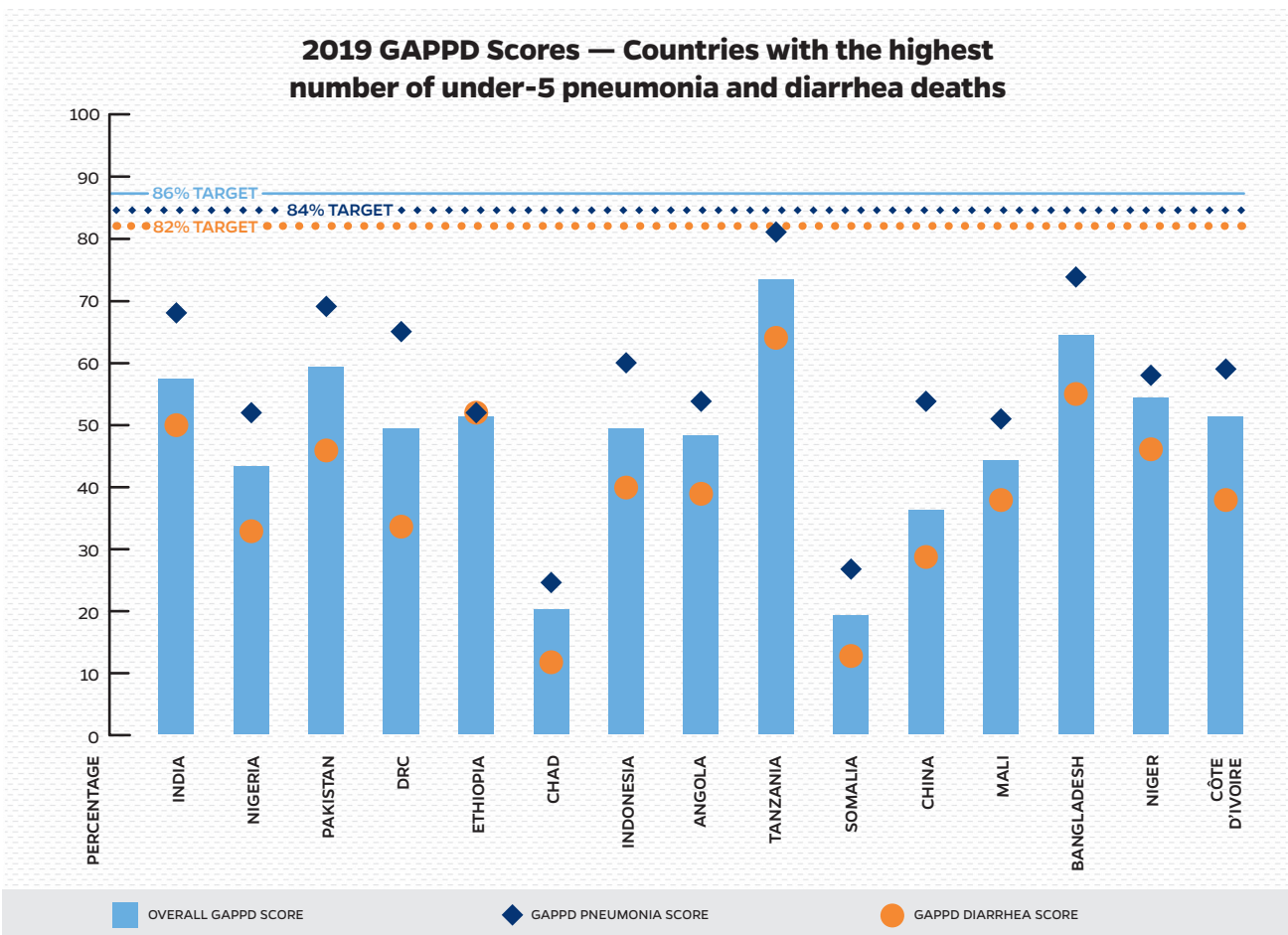
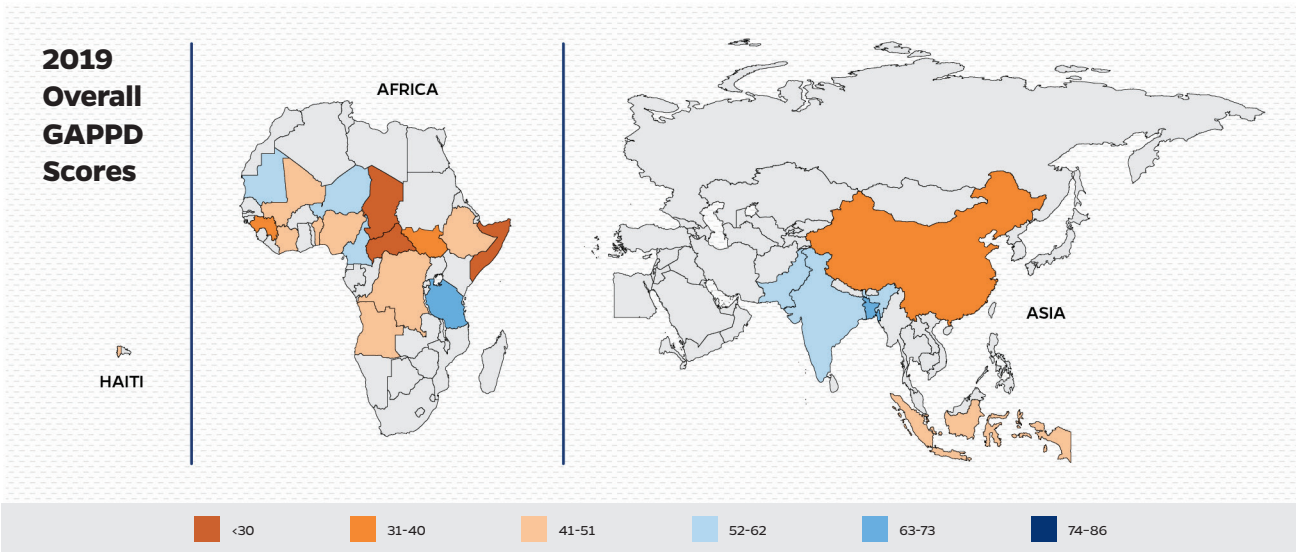
Scores ranged from 12-64% among countries with the highest number of deaths, and from 12-69% among those with the highest mortality rates. Sierra Leone (69%) and Tanzania (64%) had the highest GAPPD Diarrhea scores, and Chad (12%) had the lowest score among the 23 countries.

PROGRESS IN OVERALL GAPPD SCORE

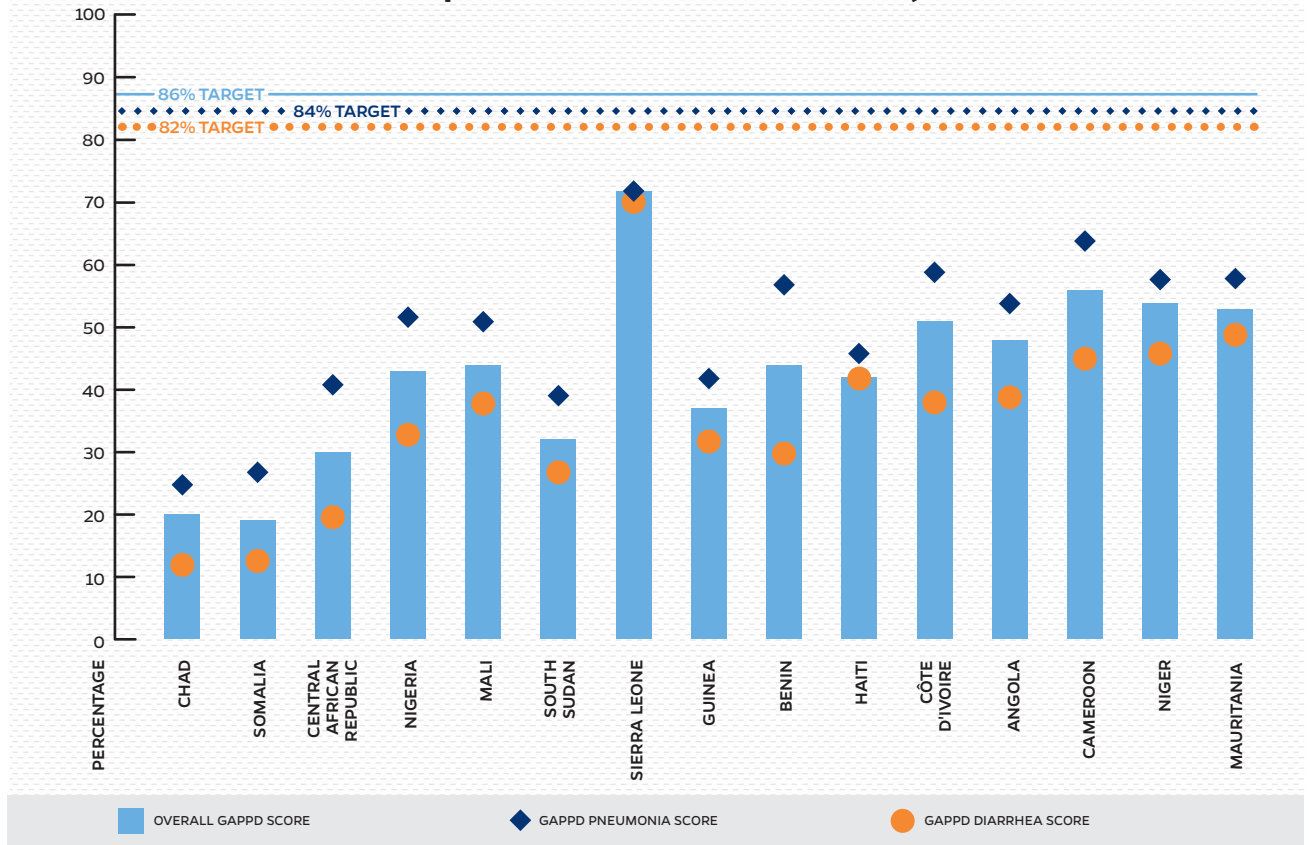
From 2018 to 2019, seven countries saw overall GAPPD score changes of more than one percentage point.

- **Pakistan:** Pakistan had the largest overall GAPPD score change, a nine percentage point increase. Its GAPPD Diarrhea and Pneumonia scores also rose, by 13 and five points respectively. This was largely driven by large increases in RotaC coverage as the country scaled up to national coverage and pneumonia care-seeking, as well as smaller increases in breastfeeding, antibiotics for pneumonia, and zinc for diarrhea.
- **Nigeria:** The five percentage point increase in Nigeria's overall GAPPD score was largely due to a seven-point increase in its GAPPD Pneumonia score, driven by a substantial increase in pneumonia care-seeking.
- **Indonesia:** Indonesia saw a five percentage point increase in overall GAPPD score, with GAPPD Diarrhea and Pneumonia score improvements of seven and three points, respectively. This was driven by increases in zinc for diarrhea, pneumonia care-seeking, and PCV3 coverage. Indonesia did, however, see its coverage for antibiotics and ORS decrease.

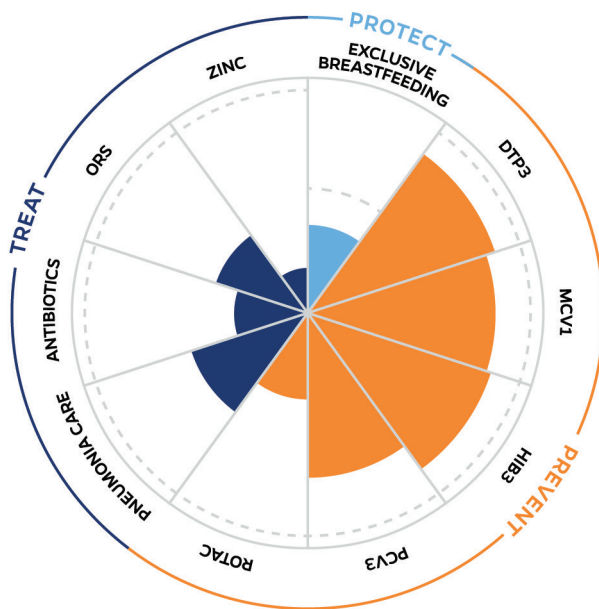
- **Angola:** With rising immunization coverage, Angola's overall GAPPD score increased by four percentage points; its GAPPD Diarrhea and Pneumonia scores increased by five and three points, respectively. However, national immunization coverage still falls well short of targets, ranging from 50% (MCV1) to 67% (PCV3) for the five vaccines included in this analysis.
- **India:** Improvements in immunization coverage as ongoing phased national rollouts of rotavirus and pneumococcal conjugate vaccines continue also helped India's overall GAPPD and GAPPD Diarrhea scores improve by three and four points, respectively.
- **Côte d'Ivoire:** Increasing RotaC coverage helped raise Côte d'Ivoire's GAPPD Diarrhea score by four percentage points, improving its overall GAPPD score by two points.
- **Niger:** Just one country saw a substantial decrease (more than one percentage point) in overall GAPPD score from last year's analysis. Niger's overall GAPPD score fell by three points due to decreasing immunization coverage across all five vaccines included. Its current coverage ranges from 77% (MCV1) to 79% (DTP3, Hib3, PCV3, and RotaC).



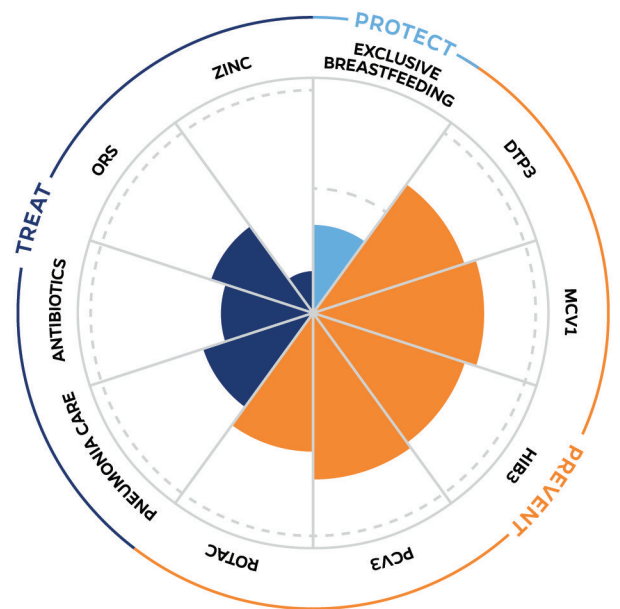
2019 GAPPD Scores — Countries with the highest under-5 pneumonia and diarrhea mortality rate



Median coverage by indicator: Progress towards GAPPD targets*



Countries with the highest number of deaths



Countries with the highest mortality rates

* Dashed lines indicate target coverage levels for each indicator (50% for exclusive breastfeeding and 90% for all other indicators)

CONCLUSIONS & RECOMMENDATIONS

The 2019 Pneumonia and Diarrhea Progress Report Card features the 23 countries facing the highest burden of child pneumonia and diarrhea mortality—in absolute number, rate or, in several cases, both. Tracking their progress in implementing, scaling-up, and ensuring equitable access to key child health interventions is critical, particularly as countries approach the 2025 target date for GAPPD interventions.

Country-led efforts—supported by global, regional, and national partners—to reach global targets and end preventable child pneumonia and diarrhea deaths is a work in progress.

- Global targets remain well out of reach in many countries, and while national coverage may be improving, inequities persist at the sub-national level.
- Immunization coverage continues to exceed other interventions in most countries, but newer vaccines like PCV and rotavirus vaccine have yet to be introduced or scaled up in several of the countries where they are needed most—half of the 15 countries with the highest pneumonia and diarrhea mortality rate report 0% RotaC coverage and five report PCV3 coverage of 1% or less. Several countries in this report have plans to introduce or scale up these vaccines in the coming years, but sustainability will be crucial as they transition out of Gavi eligibility.
- Coverage of breastfeeding and treatment for pneumonia and diarrhea continues to lag behind immunization coverage, and data are updated far less frequently, making actual progress difficult to track.

Fragile states are particularly vulnerable to missing the GAPPD targets for pneumonia and diarrhea mortality reductions, and this lagging pace has been obscured by larger countries facing lower mortality rates but greater numbers of deaths. The countries with the highest pneumonia and diarrhea mortality rate were also those with the lowest overall GAPPD scores—these countries are being left behind.

Progress continues slowly, and only a few of the 23 countries seem poised to approach the GAPPD targets by 2025. In countries where progress has been made, ensuring equitable access to interventions and sustainability—through program and policy commitments as well as financing—are critical next steps to avoid stagnation or, worse, a backward slide in the coming years.

There is a short, urgent window to act. Drastic action spurred by increased investment and smart, sustainable strategies will be vital to close the gaps and accelerate progress in the countries falling behind. We must do more to support country-led efforts—particularly to reach the most vulnerable children, prepare for evolving health system challenges, and plan for sustainable child health programs.



RENEWED FOCUS ON THE PLACES AT RISK OF BEING LEFT BEHIND

Countries with the highest pneumonia and diarrhea mortality face competing priorities and weakened health systems due to fragility, conflict, outbreaks, or natural disasters. Ensuring access to routine services will require a renewed commitment and unique solutions to sustain coverage. To do this, we need better data and a focus on addressing complex and critical sub-national challenges.



PRIORITIZING SUSTAINABILITY AND CONTINUED INVESTMENT

Continued investment is critical to identify and deliver evidence-based interventions. We must also support and enable countries to develop and implement sustainable program, policy, and financial strategies to ensure children have a healthy start. Data gaps hinder efforts to measure progress and target both investment and interventions.



AN INTEGRATED APPROACH

The siloed public health programs of the past may hold us back from closing the gap on child pneumonia and diarrhea. We need to radically change our approach to reduce missed opportunities, link interventions, and refine products, programs, and systems to meet the needs of the most vulnerable.

IMPROVING DATA QUALITY AND FREQUENCY REMAINS CRITICALLY IMPORTANT

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ACRONYMS

- DHS** — Demographic and 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/UNICEF Maternal and Child Epidemiology Estimation Group
- MCV** — Measles-containing vaccine
- MCV1** — First dose of measles-containing vaccine (MCV)
- MICS** — Multiple Indicator Cluster Survey
- NIP** — National Immunization Program
- NFHS** — National Family Health Survey
- ORS** — Oral rehydration salts
- PCV** — Pneumococcal conjugate vaccine
- PCV3** — Third dose of pneumococcal conjugate vaccine (PCV)
- RotaC** — Final dose of rotavirus vaccine (complete course)
- SDG** — Sustainable Development Goals
- WHO** — World Health Organization
- WUENIC** — WHO/UNICEF Estimates of National Immunization Coverage

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