

# Pneumonia & Diarrhea Progress Report 2018

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# FOREWORD

*This marks IVAC's ninth annual Pneumonia and Diarrhea Progress Report, and provides an opportunity to reflect on the progress made and the gaps that remain in pursuit of the GAPPD goal of ending preventable pneumonia and diarrhea child deaths.*

We have seen incredible progress in the fight against early childhood mortality since 2000. That year, 10 million children died before reaching their fifth birthday; by 2016, that number had fallen by more than 40%. While this reflects the hard work undertaken by the global community, progress has slowed and critical interventions remain out of reach for those who need them most. Despite global efforts, the leading killers remain the same. Pneumonia and diarrhea still claim more than 1.3 million child lives each year, roughly one in every four deaths in children under five in 2016—many are preventable.

This year's report highlights that progress in one area does not translate to equal progress overall; a comprehensive strategy is key. We see countries with high disease burden that surprisingly have exceptionally high immunization coverage rates, but substantially lag in breastfeeding and pneumonia and diarrhea treatment. In many countries covered in this report, despite the appearance of national-level progress, a deeper dive reveals that access substantially varies by geography and income status. Reaching these harder-to-reach, marginalized children is the only way we can actually reach our goals of ending preventable child deaths.

Key to effectively assessing progress and identifying ways to target our efforts and reach the most vulnerable is the availability of regularly collected, high-quality data. We have seen a global shift toward increased monitoring and evaluation and the use of data to inform programs and policies. This emergence of evidence-based decision-making and action is encouraging and a huge step in the right direction for global progress. We are now able to quantify the burden of child disease and estimate the potential impact of scaling up key interventions. WHO and UNICEF are now collecting and reporting countries' sub-national administrative data. These are all promising developments for our global aspiration to ensure equitable access to health services.

However, data collection challenges remain. Collecting high-quality data on a regular basis about interventions other than immunization continues to be an issue. Many demographic surveys are conducted only once every five years, leaving policy makers and program managers in the dark between phases. Data that is generated infrequently and often available only at the national level makes it virtually impossible for country programs and health systems to identify, target, and design interventions to quickly respond to challenges in access to health services—after all, you can't change what you can't measure.

Though we're moving in the right direction, it is not happening quickly enough for the most vulnerable children. To that end, the 2018 Pneumonia and Diarrhea Progress Report serves as a scorecard of the highest-burden countries, monitoring their progress on key pneumonia and diarrhea protection, prevention, and treatment interventions. It is our hope that policy makers and public health officials in these countries use this information to improve access to health services for their children, even the hardest to reach. Only with equitable access to—and delivery of—comprehensive pneumonia and diarrhea prevention and control programs will we stand a chance of ending preventable child deaths.



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Executive Director

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# EXECUTIVE SUMMARY

In 2016, 5.7 million children died before their fifth birthday. Of these children, nearly one in four died because of pneumonia or diarrhea. This disproportionately affects the children living in the 15 countries profiled in this report—though these countries are home to 55% of the world’s under-5 population, they account for nearly 70% of the global under-5 pneumonia and diarrhea deaths.

The 2018 Pneumonia and Diarrhea Progress Report reviews progress made by these 15 highest-burden countries on 10 key indicators identified in the integrated Global Action Plan for the Prevention of Pneumonia and Diarrhea (GAPPD). In doing so, we provide a snapshot of the global progress toward ending preventable pneumonia and diarrhea child deaths in the countries that contribute most to the global disease burden.

## 15 HIGHEST-BURDEN COUNTRIES

India	Ethiopia	China
Nigeria	Chad	Niger
Pakistan	Angola	Bangladesh
Democratic Republic of the Congo (DRC)	Somalia	Uganda
	Indonesia	Côte d'Ivoire
	Tanzania	

## METHODS

Each year, the International Vaccine Access Center analyzes data from WHO, UNICEF, and national surveys and scores countries on their progress towards targets for a subset of 10 interventions in GAPPD’s comprehensive approach to pneumonia and diarrhea prevention and control.

### Protect:

Exclusive breastfeeding

### Prevent:

DTP3, MCV1, Hib3, PCV3, RotaC

### Treat:

**Diarrhea:** ORS, Zinc

**Pneumonia:** Pneumonia care-seeking, Antibiotics

The availability of current data is critical for an accurate assessment of country performance on GAPPD indicators. This year’s report considers the available data sources with a new lens. Based on the year that data were collected, we created country-level and indicator-specific “Data Relevance Scores.” This score reflects how well the currently available coverage data may reflect the actual current coverage rates for the countries under evaluation. The fact that current year “Data Relevance Scores” are a fraction of what they would be if there were updated data for this

year for all indicators highlights the magnitude of the gaps in reliable data inputs. As a result, we highlight the need for more frequent monitoring and updating of key data to enable meaningful monitoring of progress on pneumonia and diarrhea interventions.

## KEY RESULTS & FINDINGS

The 15 countries highlighted in this year’s report are struggling to inch toward their GAPPD targets. Prevention indicators—immunization coverage for five key childhood vaccines—scored the highest and saw the most consistent performance for the majority of countries, while treatment indicators were the lowest performing measures. In comparing performance on pneumonia and diarrhea indicators, the median GAPPD pneumonia score was over 20 points greater than the median GAPPD score for diarrhea, at 59% and 36% respectively. This suggests that countries are doing better in providing pneumonia prevention and treatment than they are in implementing measures to prevent and treat diarrheal disease.

## FOCUS ON EQUITY

For the first time, in this year’s report, we evaluate data segmented by gender, wealth, maternal education, and residence to understand how those factors affect the coverage of four indicators for which data are available: pneumonia care-seeking, ORS, zinc supplementation, and exclusive breastfeeding. The analysis revealed inequities in most of the countries reviewed. This confirms that by considering only national-level aggregate data, we don’t appreciate areas of inequities in access to health interventions that exist in select areas, populations, and genders.

As the focus on equity is paramount to enable policy makers and advocates to help countries make meaningful improvements in GAPPD scores, this year’s report shines a spotlight on equity. We explore the sociodemographic factors that may affect a child’s ability to access and receive pneumonia and diarrhea interventions. This section also highlights small-scale interventions that have made improvements to address equity within local communities, as well as the need for continued research and development of local, context-based, targeted solutions aimed at improving health for all.

## CONCLUSION

While countries have made great strides in improving child health, additional changes are needed to further advance access to and uptake of key pneumonia and diarrhea interventions. Data integrity is key. Every effort must be made to develop and enhance systems to facilitate more frequent and consistent data collection and reporting, ideally with an eye toward uncovering pockets of inequities—stratified by key demographic factors, such as gender, income level, and maternal education. This in turn can serve to inform programs and policies so they are better targeted

to the underlying issues driving and holding inequalities in place. Donors must continue and scale-up investments to support the identification of the root causes of inequity, enabling development and implementation of targeted solutions. From there, we must adapt and scale-up effective interventions that prioritize at-risk and underserved populations.

Finally, the global community must create a comprehensive, integrated strategy that addresses the necessary system-level changes to support these highest-burden countries in their efforts to achieve GAPPD targets for all children.



**1/3 OF COUNTRIES**  
met the **50% exclusive breastfeeding target**  
(5 out of 15 countries)



**2 OF THE COUNTRIES**  
met the **90% coverage target** for at least  
4 vaccines



**NONE OF THE COUNTRIES**  
met the **90% coverage target**  
for a treatment indicator (care-seeking, antibiotics, ORS, zinc)



## STRATIFYING NATIONAL DATA REVEALS POCKETS OF INEQUITABLE ACCESS TO PREVENTION AND TREATMENT INTERVENTIONS

### GAPPD SCORES

**Highest** scoring countries:

- Tanzania
- Bangladesh

**Lowest** scoring countries:

- Somalia
- Chad
- Nigeria

**3 OUT OF 15**

**countries met targets for at least 2 GAPPD interventions**

**8 OUT OF 15**

**countries failed to meet the targets for any of the 10 GAPPD interventions**

### DATA RELEVANCE SCORES Data availability and timeliness

Countries with highest "Data Relevance Scores": **Nigeria, Tanzania**

Countries with lowest "Data Relevance Scores": **China, Somalia, Angola**

Indicators with highest "Data Relevance Scores": **Immunization coverage**

Indicators with lowest "Data Relevance Scores": **Antibiotics, Zinc**

# INTRODUCTION

In 2000, nearly 10 million children around the world died before reaching their fifth birthday [1]. Yet, despite significant progress made by the global community in reducing child mortality by over 40%, more than 5.7 million children under-5 still died worldwide in 2016. Two common, yet largely preventable diseases continue to claim more child lives than any others—pneumonia and diarrhea were responsible for nearly one in every four under-5 deaths in 2016 [2, 3].

In 2009 and 2013, the World Health Organization (WHO) and the United Nations International Children’s Emergency Fund (UNICEF) published the integrated Global Action Plan for Pneumonia and Diarrhea (GAPPD). This plan set forth an ambitious goal to end preventable pneumonia and diarrhea deaths by 2025 and outlined the core interventions critical to its success. While countries and the global community have come a long way from 2.9 million under-5 pneumonia and diarrhea deaths in 2000 to 1.3 million in 2016, the finish line remains stubbornly distant.

#### The specific GAPPD targets (by 2025) are:

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

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

Each year, the International Vaccine Access Center at Johns Hopkins Bloomberg School of Public Health reviews the progress toward GAPPD targets in the 15 countries with the highest number of pneumonia and diarrhea deaths among children under 5 years of age. These children bear a disproportionate burden of pneumonia and diarrhea. Despite the fact that these 15 countries are home to only 55% of the world’s under-5 population, they account for over 70% of the world’s under-5 pneumonia and diarrhea deaths. In this report, we update and review the pneumonia, diarrhea, and overall GAPPD scores for each of the 15 highest-burden countries based on their progress in implementing 10 key pneumonia and diarrhea interventions.

#### 15 countries featured in this year’s report are:

India	Ethiopia	China
Nigeria	Chad	Niger
Pakistan	Angola	Bangladesh
Democratic Republic of the Congo (DRC)	Somalia	Uganda
	Indonesia	Côte d’Ivoire
	Tanzania	

Substantial work remains to meet GAPPD targets. To truly reach the goal of ending preventable pneumonia or diarrhea deaths, countries must prioritize equity and sustainability. This means taking action to ensure that all children, especially the most vulnerable—those who are marginalized, high-risk, and hard to reach—not only have access to, but actually receive protection, prevention, and treatment interventions.

***This year, for the first time, this report stratifies data to identify where gaps in GAPPD intervention coverage disproportionately affect certain groups and highlight areas where targeted action may increase health equity and accelerate progress.***





**Methodology  
& Data  
Availability**

# METHODOLOGY & DATA AVAILABILITY

## IDENTIFYING HIGH-BURDEN COUNTRIES

Each year, the *Pneumonia and Diarrhea Progress Report* presents an analysis of coverage rates of 10 GAPPD interventions in the 15 countries with the highest number of pneumonia and diarrhea deaths among children under 5 years. Countries are identified based on publicly available data on pneumonia and diarrhea deaths in 2016, sourced from UNICEF’s global database: Pneumonia data—*Acute respiratory infection as a cause of death in children under 5* and Diarrhea data—*Diarrhea as a cause of death in children under 5*. These estimates were made available March 2018. The following are, in order, the 15 countries with the highest number of pneumonia and diarrhea child deaths: India, Nigeria, Pakistan, the Democratic Republic of Congo (DRC), Ethiopia, Chad, Angola, Somalia, Indonesia, Tanzania, China, Niger, Bangladesh, Uganda\*, and Côte d’Ivoire\*.

*\*Not included in last year’s progress report as they were not among the 15 highest-burden countries. Afghanistan and Sudan were included in last year’s progress report, but are not included this year because they were no longer among the 15 highest-burden countries in 2016.*



## GAPPD INTERVENTION SCORING

Three GAPPD scores are calculated—GAPPD Pneumonia score, GAPPD Diarrhea score, and a composite GAPPD score that includes both pneumonia and diarrhea. These scores reflect country progress towards achieving GAPPD coverage targets for select pneumonia and diarrhea interventions. The GAPPD framework outlines 19 key interventions aimed to protect against, prevent and treat pneumonia and diarrhea in children under 5. In this report, we assess 10 of these indicators.

**Data Sources:** We used publicly available data collected within the last 10 years to compile national coverage estimates for each of the 10 indicators (Table 1).

### Changes to the 15 highest-burden countries

While many of the 15 countries highlighted in this report—those with the most child pneumonia and diarrhea deaths—remain the same year to year, some countries drop off the list while others take their place for a number of reasons. Cause-of-death figures are reported to WHO annually, so the countries ranking among the top 15 for pneumonia and diarrhea deaths can fluctuate; this may reflect country progress (or regression) in improving access to key interventions. Additionally, each year the WHO Maternal and Child Epidemiology Estimation (MCEE) group updates and refines its methodology for determining cause-of-death estimates that re-establish the previous years’ estimates. As a result, country rankings may shift for the most recent and past years despite no actual changes in coverage of key interventions. Even with small changes in the number of deaths for a given cause, driven largely by refined methods, the ranking may move a country out of the top 15 highlighted here. The 2017 report included Afghanistan and Sudan, but, based on updated estimates, they are no longer in the top 15 for 2016, nor for 2015. Their burden estimates have not changed substantially, but the recalculated estimates for all countries have resulted in Uganda and Côte d’Ivoire moving to the top 15 while Afghanistan and Sudan are now ranked 16th and 17th, respectively, and thus excluded this year.

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	

**GAPPD sets forth 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

# METHODOLOGY & DATA AVAILABILITY

**Table 1: GAPPD indicators and their data sources**

Indicator	Source
<b>PROTECT</b>	
<b>Exclusive breastfeeding</b> 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)
<b>PREVENT</b>	
<b>DTP3</b> Percentage of children receiving the 3rd dose of diphtheria-tetanus-pertussis vaccine	WHO/UNICEF Estimates of National Immunization Coverage (WUENIC)
<b>MCV1</b> Percentage of children receiving the 1st dose of measles-containing vaccine	
<b>Hib3</b> Percentage of children receiving the 3rd dose of <i>Haemophilus influenzae</i> type b (Hib) vaccine	
<b>PCV3</b> Percentage of children receiving the 3rd dose of pneumococcal conjugate vaccine	
<b>RotaC</b> Percentage of children receiving the final dose of rotavirus vaccine	
<b>TREAT</b>	
<b>Care-seeking</b> 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, Pneumonia data: Child health coverage
<b>Antibiotics</b> Percentage of children under age 5 with symptoms of ARI who received antibiotics	USAID Demographic and Health Survey (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), 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)	UNICEF’s global database, Diarrhea data: Child health coverage
<b>Zinc</b> Percentage of children with diarrhea in the two weeks preceding the survey who received zinc supplements, for those born in the five years preceding the survey	

**Calculating the GAPPD target scores:** The GAPPD score is calculated by averaging the indicator-specific target scores of all 10 indicators identified in the GAPPD. The target for the five immunization indicators and the four treatment indicators is 90%, and the target for exclusive breastfeeding is 50%. The average of these 10 target scores equals a

GAPPD target score of 86%. The GAPPD Pneumonia target of 84% is calculated by averaging the targets of the seven pneumonia-specific indicators. The GAPPD Diarrhea target score of 82% is calculated by averaging the target scores of the five diarrhea-specific indicators.

**Equation**

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

# METHODOLOGY & DATA AVAILABILITY

**Calculating the country GAPPD scores:** GAPPD scores reflect the average of all relevant indicators for which coverage data is available within the last 10 years. A country's overall GAPPD score reflects all 10 indicators, the GAPPD Pneumonia score reflects the seven pneumonia-specific indicators, and the GAPPD Diarrhea score reflects the five diarrhea-specific indicators. If coverage was not reported for a particular indicator in a country, that data was classified as either 0% or missing.

## UNDERSTANDING AND INTERPRETING THE GAPPD SCORES

GAPPD scores help track country-level progress on access to interventions to protect against, prevent, and treat pneumonia and diarrhea.

Data for immunization coverage is collected and updated annually. Treatment and breastfeeding indicators are updated only every few years, when new national surveys are published. Therefore, while there may have been changes in real-life coverage, estimates reflecting those changes may not yet be available. If new data are not available, the last reported data collected within the previous 10 years are used for calculations.

This limitation underscores the importance of investing in regularly collected, high-quality data that enables accurate monitoring of key GAPPD interventions. This year, to better contextualize how well the data for each indicator might reflect current coverage, we've included an analysis on data availability. GAPPD scores for countries where more data are available may better reflect the country's performance against GAPPD targets.

In cases where a country has no available data for a particular indicator, that indicator is deemed as either "missing" or "0% coverage", depending on the indicator. In brief, no available data on immunization or zinc coverage are considered 0% coverage for that indicator, as we expect that this means either the vaccine has not been introduced, or that zinc coverage is very low and close to 0% coverage (explained below). No available data for the other four indicators is considered missing data and is excluded from the calculation of the score (unlike 0% coverage, which is included in the score's calculation). Somalia and China are examples of countries with missing indicators. As a result, scores might over- or underestimate the country's true progress.

**Immunization:** Every year, WHO and UNICEF jointly review Member States' national immunization coverage estimates and data, finalized survey reports, and data from published and grey literature to jointly estimate the most likely vaccine coverage levels for each country (i.e. WUENIC estimates). The annual WUENIC estimation process also includes a reanalysis of previous years' estimates to include data that was not

previously available, causing coverage estimates for prior years to be updated. In our report, we recalculate last year's GAPPD scores to incorporate the updated coverage data when comparing the current results to prior years' scores to ensure comparability. For example, the 2018 GAPPD report includes newly reported vaccine coverage rates for 2017, as well readjusted rates for 2016 and earlier. Changes in estimated coverage for prior years do not necessarily imply actual coverage increased or decreased for that year; they do reflect adjustments based on data that were made available within the last year.

A 0% for vaccine coverage indicates one of two scenarios—the country has not yet introduced the vaccine into its national immunization program as of 2017, or the country has introduced the vaccine but still reports a coverage of 0%. This second scenario occurs when, for example, a new vaccine introduction occurs late in the year or as a phased rollout.

**Care-seeking, antibiotic treatment, ORS treatment, exclusive breastfeeding:** Estimates for treatment and breastfeeding coverage are not updated annually. Thus, we used estimates from the latest year for which data were available within a 10-year period (2008-2018). "Missing" means that data were not reported within the last 10 years. The lack of data suggests only that the number is unknown, not necessarily that it is low; therefore, we do not include missing indicators when calculating the GAPPD scores.

**Zinc supplementation:** A 0% zinc supplementation coverage value means that a country either reported coverage of 0% or did not report a value for this indicator. If data were not reported, we assumed either that zinc was used at very low levels or not at all. Therefore, we defined missing data on zinc use as 0% zinc supplementation coverage when calculating the GAPPD scores.



# METHODOLOGY & DATA AVAILABILITY

## OVERVIEW OF DATA AVAILABILITY

This report aims to track the progress towards reducing pneumonia and diarrhea deaths in the highest-burden countries. Monitoring progress over time requires having data for key indicators collected, using consistent methods, and making these data available on an annual basis. Without this, insights about progress in countries cannot be drawn with reliability. Having a clear understanding of the timeliness, regularity, and accuracy of reported coverage is key to understanding the conclusions of this report. For some countries, the analysis here shows that the only component of the GAPPD score for this year's report that has been updated relative to last year's report is the immunization coverage. For those countries, it is not surprising that little progress is reported. We are unable to discern if little progress has been made in actual coverage, or whether there is simply little progress in reporting advances in coverage.

Table 2 lists the most recent year of reported coverage for each of the indicators across the 15 focus countries. These

are not the dates of publication of the data, but rather the year during which data was collected.

Among all indicators, immunization coverage data are most up to date and most regularly reported. WUENIC estimates of national immunization coverage are updated annually and published in July of the subsequent year (i.e. 2017 coverage is reported in July 2018).

Data for exclusive breastfeeding, care-seeking, antibiotic use, ORS, and zinc supplementation are drawn from national surveys conducted approximately every five years. The long interval between surveys that report on these interventions mean that analyses of progress are not truly quantifying annual changes. Compared with last year's report, updated protection and treatment indicator data from six countries—India, Nigeria, Angola, Ethiopia, Uganda, and Côte d'Ivoire—were available. These were published in a 2018 update to the UNICEF Child Health Database from surveys conducted within the last two to three years.

**Table 2: Year of available coverage data by country and indicator**

Country	PROTECT	PREVENT	TREAT			
	Exclusive breastfeeding	Immunization coverage	Pneumonia		Diarrhea	
			Care-seeking	Antibiotics	ORS	Zinc
India	<b>2015-16<sup>1</sup></b>	<b>2017<sup>2</sup></b>	<b>2015-16<sup>1</sup></b>	No data	<b>2015-16<sup>1</sup></b>	<b>2015-16<sup>1</sup></b>
Nigeria	<b>2016-17<sup>3</sup></b>	<b>2017<sup>2</sup></b>	<b>2016-17<sup>3</sup></b>	<b>2016-17<sup>3</sup></b>	<b>2016-17<sup>3</sup></b>	<b>2016-17<sup>3</sup></b>
Pakistan	2012-13 <sup>4</sup>	<b>2017<sup>2</sup></b>	2012-13 <sup>4</sup>	2012-13 <sup>4</sup>	2012-13 <sup>4</sup>	2012-13 <sup>4</sup>
DRC	2013-14 <sup>4</sup>	<b>2017<sup>2</sup></b>	2013-14 <sup>4</sup>	2013-14 <sup>4</sup>	2013-14 <sup>4</sup>	2013-14 <sup>4</sup>
Ethiopia	<b>2016<sup>4</sup></b>	<b>2017<sup>2</sup></b>	<b>2016<sup>4</sup></b>	2011 <sup>4</sup>	<b>2016<sup>4</sup></b>	<b>2016<sup>4</sup></b>
Chad	2014-15 <sup>4</sup>	<b>2017<sup>2</sup></b>	2014-15 <sup>4</sup>	2014-15 <sup>4</sup>	2014-15 <sup>4</sup>	2014-15 <sup>4</sup>
Angola	<b>2015-16<sup>4</sup></b>	<b>2017<sup>2</sup></b>	<b>2015-16<sup>4</sup></b>	No data	<b>2015-16<sup>4</sup></b>	No data
Somalia	2009 <sup>5</sup>	<b>2017<sup>2</sup></b>	No data	No data	No data	No data
Indonesia	2012 <sup>4</sup>	<b>2017<sup>2</sup></b>	2012 <sup>4</sup>	2012 <sup>4</sup>	2012 <sup>4</sup>	2012 <sup>4</sup>
Tanzania	2015-16 <sup>4</sup>	<b>2017<sup>2</sup></b>	2015-16 <sup>4</sup>	2015-16 <sup>4</sup>	2015-16 <sup>4</sup>	2015-16 <sup>4</sup>
China	<b>2013<sup>6</sup></b>	<b>2017<sup>2</sup></b> (Partial data)	No data	No data	No data	No data
Niger	2012 <sup>4</sup>	<b>2017<sup>2</sup></b>	2015 <sup>7</sup>	2012 <sup>7</sup>	<b>2015<sup>7</sup></b>	2012 <sup>4</sup>
Bangladesh	2014 <sup>4</sup>	<b>2017<sup>2</sup></b>	2014 <sup>4</sup>	2014 <sup>4</sup>	2014 <sup>4</sup>	2014 <sup>4</sup>
Uganda	<b>2016<sup>4</sup></b>	<b>2017<sup>2</sup></b>	<b>2016<sup>4</sup></b>	2011 <sup>4</sup>	<b>2016<sup>4</sup></b>	2011 <sup>4</sup>
Côte d'Ivoire	<b>2016<sup>3</sup></b>	<b>2017<sup>2</sup></b>	<b>2016<sup>3</sup></b>	2011-12 <sup>4</sup>	<b>2016<sup>3</sup></b>	<b>2016<sup>3</sup></b>

**Bold** items indicate data that was newly available for this year's report

1. National Family Health Survey (NFHS)  
 2. WHO/UNICEF Estimates of National Immunization Coverage (WUENIC)  
 3. Multiple Indicator Cluster Survey (MICS)  
 4. Demographic and Health Survey (DHS)

5. Nutrition and Health Surveillance System  
 6. National Micronutrient and Anthropometric Survey  
 7. Etude Nationale d'Evaluation d'Indicateurs Socio-Economiques et Démographiques

# METHODOLOGY & DATA AVAILABILITY

The data collected in national surveys can vary across countries; some surveys omit data on select indicators and are conducted infrequently. For example, recent surveys in Angola, Niger, and Uganda did not collect data on antibiotic use and zinc coverage. Although there were recent surveys in India, Ethiopia, and Côte d'Ivoire, data on antibiotic use were not reported. This makes accurate reporting of progress on antibiotic and zinc coverage nearly impossible and leaves open the question of whether countries are improving at delivering these services to children in need.

All data inputs to this year's GAPPD scores are not created equal. In Table 3, we apply a factor (ranging from -1 to 1) to each data point to reflect how recently that data was collected, resulting in country- and indicator-specific "Data Relevance Scores". A country with 2017 data on each of the ten variables would score 10. A country without data on any of the variables would score -10. Having contemporary data is only part of the aspiration. To actually monitor progress, we also need to have data updated on an annual basis.

These Data Relevance Scores will provide that insight as we compare scores for a country across years.

Each data relevance score aims to add another layer of scrutiny, based on the age of the data, to assess the current-day applicability and, hence, reliability of GAPPD scores to reflect the current coverage for each of the 15 countries highlighted in this report. This can help us contextualize and interpret the GAPPD scores as we aim to measure progress.

Later in this report, we examine the available data stratified by gender, residence, and wealth, to explore what might be missed by looking at national-level data alone. Although countries are moving in the direction of having new types of data available, progress is slow, and usefulness of the data becomes severely limited when the timeliness of collection and publication is not a priority.

**Table 3: Data Relevance Scores: Data timeliness and availability for 15 focus countries**

Country	PROTECT	PREVENT					TREAT				DATA RELEVANCE SCORE BY COUNTRY
	Breast-feeding	DTP3	MCV1	Hib3	PCV3	RotaC	Pneumonia		Diarrhea		
							Care-seeking	Anti-biotics	ORS	Zinc	
India	0.5	1	1	1	1	1	0.5	-1	0.5	0.5	6
Nigeria	0.5	1	1	1	1	1	0.5	0.5	0.5	0.5	7.5
Pakistan	0	1	1	1	1	1	0	0	0	0	5
DRC	0.25	1	1	1	1	1	0.25	0.25	0.25	0.25	6.25
Ethiopia	0.5	1	1	1	1	1	0.5	0	0.5	0.5	7
Chad	0.25	1	1	1	1	1	0.25	0.25	0.25	0.25	6.25
Angola	0.5	1	1	1	1	1	0.5	-1	0.5	-1	4.5
Somalia	0	1	1	1	1	1	-1	-1	-1	-1	1
Indonesia	0	1	1	1	1	1	0	0	0	0	5
Tanzania	0.5	1	1	1	1	1	0.5	0.5	0.5	0.5	7.5
China	0.25	1	1	-1	1	1	-1	-1	-1	-1	-0.75
Niger	0	1	1	1	1	1	0.5	0	0.5	0	6
Bangladesh	0.25	1	1	1	1	1	0.25	0.25	0.25	0.25	6.25
Uganda	0.5	1	1	1	1	1	0.5	0	0.5	0	6.5
Côte d'Ivoire	0.5	1	1	1	1	1	0.5	0	0.5	0.5	7
<b>DATA RELEVANCE SCORE BY INDICATOR</b>	3	10	10	8.67	10	10	1.83	-1.5	1.83	0.17	

Scoring weights are assigned based on the year of most recently available data.

Data from 2017 = 1 point; 2015–2016 = 0.5 points; 2013–2014 = 0.25 points; 2008–2012 = 0 points, no data = -1 point.



**Key**  
**Results &**  
**Findings**

# KEY RESULTS & FINDINGS

Each year, we calculate and compare GAPPD scores for the 15 countries with the highest-burden of pneumonia and diarrhea deaths in children. By doing so, we are able to track the global progress of **PROTECTING** children against pneumonia and diarrhea and **PREVENTING** and **TREATING** cases of pneumonia and diarrhea.

We use 10 key indicators to track progress. Exclusive breastfeeding **PROTECTS** children by making them healthier and less vulnerable to pneumonia and diarrhea. Vaccination against pertussis, measles, Hib, pneumococcus, and rotavirus **PREVENT** illness and death due to these pathogens that cause pneumonia and/or diarrhea, while access to appropriate healthcare providers, antibiotics, ORS, and zinc can **TREAT** pneumonia and diarrhea.

Preventing and treating pneumonia and diarrhea can have advantages beyond direct protection against disease and death. Preventing pneumonia and diarrhea through vaccination can prevent families from needing to access and pay for treatment, and in so doing protect poor families from the cycle of illness and poverty.

## PNEUMONIA AND DIARRHEA BURDEN

Globally, pneumonia and diarrhea cause 1.36 million deaths in children under 5 in 2016 [2, 3]. Over two-thirds of the global burden of pneumonia and diarrhea mortality occurs in just 15 countries. Despite significant reductions of disease in recent years with improvements in access to and use of health interventions, nearly half a million pneumonia and diarrhea deaths still occurred in two countries—India and Nigeria. We identified the 15 countries with the highest number of pneumonia and diarrhea deaths in children under five in 2016, based on the MCEE-WHO estimates released in 2018 (Table 4). The number of pneumonia and diarrhea deaths is driven by both the population of a country and by the rate of death in that country; for reference, we've included the pneumonia and diarrhea death rates in Table 4. For some countries the high number of deaths is largely a function of high mortality rates, while for others it is the large population size that is a major contributor to the magnitude of the death burden.

**Table 4: Countries with the highest burden of pneumonia and diarrhea child deaths**

Rank	Country	Number of Pneumonia and Diarrhea Deaths in Children Under 5 Years, 2016	Number of Pneumonia Deaths in Children Under 5 Years, 2016	Number of Diarrhea Deaths in Children Under 5 Years, 2016	Death Rates in Children Under 5 Years (per 1000 Live Births), 2016*	
					Pneumonia	Diarrhea
1	India	<b>260,990</b>	158,176	102,813	6.3	4.1
2	Nigeria	<b>215,306</b>	140,520	74,785	19.4	10.3
3	Pakistan	<b>99,644</b>	62,782	36,862	11.5	6.8
4	DRC	<b>82,017</b>	49,115	32,902	14.7	9.9
5	Ethiopia	<b>45,627</b>	30,733	14,894	9.4	4.6
6	Chad	<b>29,387</b>	18,724	10,664	29.9	17.0
7	Angola	<b>29,007</b>	16,983	12,023	14.1	10.0
8	Somalia	<b>28,162</b>	17,937	10,224	28.8	16.4
9	Indonesia	<b>27,582</b>	20,084	7,499	4.1	1.5
10	Tanzania	<b>27,065</b>	17,624	9,441	8.3	4.4
11	China	<b>25,830</b>	20,849	4,981	1.2	0.3
12	Niger	<b>24,405</b>	16,449	7,955	16.5	8.0
13	Bangladesh	<b>24,022</b>	16,960	7,062	5.5	2.3
14	Uganda	<b>21,575</b>	14,578	6,997	8.3	4.0
15	Côte d'Ivoire	<b>20,702</b>	13,336	7,367	15.3	8.4
	Top 15 countries	<b>961,319</b>	614,851	346,469		
	GLOBAL	<b>1,356,122</b>	878,829	477,293	6.3	3.4

\*Mortality rates are provided for reference but are not considered for rankings. Total deaths for pneumonia and diarrhea are used for ranking. Source: WHO and Maternal and Child Epidemiology Estimation Group (MCEE) estimates 2018

# KEY RESULTS & FINDINGS

**Table 5: Full dataset of GAPPD score indicators**

Countries with most under-5 pneumonia and diarrhea deaths		PROTECT	PREVENT					TREAT				2018 GAPPD Intervention Score		
		% Exclusive breastfeeding in first 6 months	Vaccine coverage (%)					% of children under 5 with suspected pneumonia		% of children under 5 with suspected diarrhea		Overall Target 86%	Pneumonia* Target 84%	Diarrhea* Target 82%
			DTP3	MCV1	Hib3	PCV3	RotaC	Taken to an appropriate health care provider	Receiving antibiotics	Receiving ORS	Receiving zinc supplements			
Global rank	Country	Target: 50%	Target: 90%					Target: 90%						
1	India	55	88	88	88	0	13	73	N/A	21	20	50	65	39
2	Nigeria	23	42	42	42	36	0	24	23	37	33	30	33	27
3	Pakistan	38	75	76	75	75	12	64	42	38	1	50	63	33
4	DRC	47	81	80	81	79	0	42	40	39	2	49	64	34
5	Ethiopia	57	73	65	73	68	80	31	7	30	33	52	53	53
6	Chad	0	41	37	41	0	0	26	30	20	1	20	25	12
7	Angola	37	52	42	52	59	58	49	N/A	43	N/A	44	49	36
8	Somalia	5	42	46	42	0	0	N/A	N/A	N/A	N/A	19	27	13
9	Indonesia	41	79	75	79	0	0	75	39	39	1	43	55	31
10	Tanzania	59	97	99	97	97	97	55	40	45	18	70	78	63
11	China	19	99	99	N/A <sup>1</sup>	0	0	N/A	N/A	N/A	N/A	36	54	29
12	Niger	23	81	78	81	80	84	59	11	41	10	55	59	47
13	Bangladesh	55	97	94	97	97	0	42	34	77	44	64	74	54
14	Uganda	65	85	80	85	81	0	80	47	47	2	57	75	39
15	Côte d'Ivoire	24	84	78	84	99	54	44	29	17	18	53	63	38
<b>Median across 15 high-burden countries</b>		<b>38</b>	<b>81</b>	<b>78</b>	<b>80</b>	<b>68</b>	<b>0</b>	<b>49</b>	<b>34</b>	<b>39</b>	<b>14</b>	<b>50</b>	<b>59</b>	<b>36</b>

\*GAPPD Pneumonia score is calculated by averaging coverage of the seven pneumonia-related interventions: DTP3, MCV1, Hib3, PCV3, children under 5 with suspected pneumonia taken to an appropriate healthcare provider, children under 5 with suspected pneumonia receiving antibiotics, and exclusive breastfeeding. GAPPD Diarrhea score is calculated by averaging the coverage of the five diarrhea-related interventions: MCV1, RotaC, children under 5 with diarrhea receiving ORS, children under 5 with diarrhea receiving zinc supplements, and exclusive breastfeeding.

Sources: WHO and Maternal and Child Epidemiology Estimation Group (MCEE) estimates 2018; UNICEF's global database, 2018; WHO/UNICEF Estimates of National Immunization Coverage (WUENIC), 2018; USAID Demographic and Health Survey (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), or equivalent (2011-2017)

1. Note on vaccine coverage in China: 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.

# KEY RESULTS & FINDINGS

## OVERALL GAPPD SCORES

GAPPD scores assess progress by countries in expanding access to and uptake of key pneumonia and diarrhea interventions. Comparing GAPPD scores between countries or over time can help inform programming and policymaking. All 15 highest-burden countries fell short of the overall GAPPD target of 86%, the average of the targets across the 10 interventions for pneumonia and diarrhea protection, prevention, and treatment (Table 5).

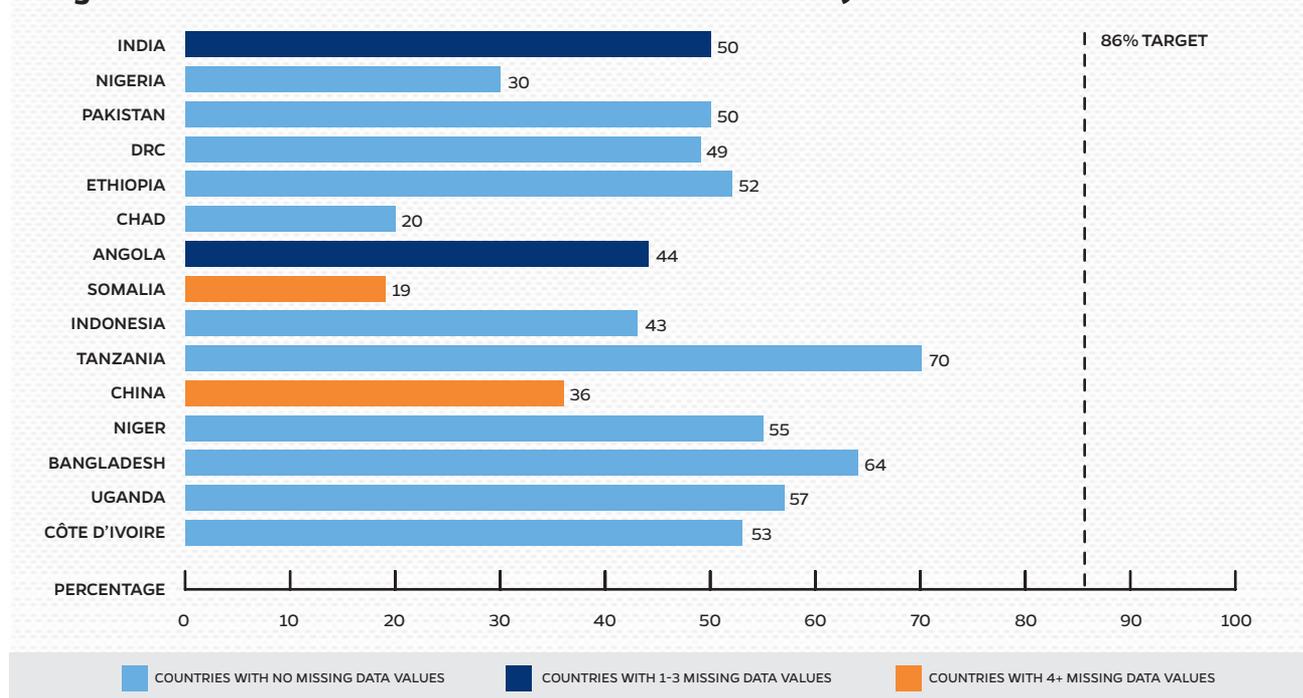
The 2018 overall GAPPD scores range from 19-70% (Figure 1). As in the 2017 Pneumonia and Diarrhea Progress Report, among the 15 countries with the greatest number of pneumonia and diarrhea deaths, Tanzania had the highest overall score and Somalia had the lowest. Four countries had scores that did not reach even half of the coverage target (i.e. below 43%): Somalia (19%), Chad (20%), Nigeria (30%), and China (36%). All four of these countries also had an overall GAPPD score below 43% last year.

Since last year, the median overall GAPPD score in the 15 highest-burden countries increased by only two percentage points, from 48% in 2017 to 50% in 2018.<sup>2</sup> Scores increased in seven countries—India, Nigeria, Pakistan, DRC, Ethiopia, Niger, and Tanzania—and decreased in Angola and China (range: -2% to +4%)<sup>3</sup>.

### Overall GAPPD scores in 15 high-burden countries

Target score: **86%**  
 Median: **50%**  
 Range: **19% – 70%**  
 Highest-scoring country: **Tanzania**  
 Lowest-scoring country: **Somalia**  
 Number of countries at or above target: **0**

**Figure 1. 2018 Overall GAPPD scores and data availability**



2. When new WUENIC estimates are released each year, prior year coverage estimates are also updated and may change from data used in previous years' Pneumonia & Diarrhea Progress Reports. We re-calculate prior years' scores to incorporate these updated WUENIC immunization coverage data. As such, prior year scores may have changed from what was noted in past reports; this may impact the difference from prior to current year GAPPD score.

3. Uganda and Côte d'Ivoire did not rank among the top 15 countries for pneumonia and diarrhea deaths in the previous burden data, and thus were not included in the 2017 report. No comparison to 2017 is available for these two countries. We compare only the 13 countries that were included in both the 2017 and 2018 reports.

# KEY RESULTS & FINDINGS

## PNEUMONIA AND DIARRHEA GAPPD SCORES

For all 15 countries, the GAPPD Pneumonia score was greater than or equal to the GAPPD Diarrhea score: the median GAPPD Pneumonia score was 59% and median GAPPD Diarrhea score was 36% (Figure 2). Tanzania topped the rankings with the highest GAPPD Pneumonia and GAPPD Diarrhea scores (78% and 63%, respectively); the lowest GAPPD scores were in Chad (25% and 12%, respectively). None of the 15 countries met the GAPPD Pneumonia target score of 84%, and three countries—Nigeria, Chad, and Somalia—had GAPPD Pneumonia scores below half the target score (42%).

### GAPPD Pneumonia scores in 15 high-burden countries

Target score: **84%**  
 Median: **59%**  
 Range: **25% - 78%**  
 Highest-scoring country: **Tanzania**  
 Lowest-scoring country: **Chad**  
 Number of countries at or above target: **0**

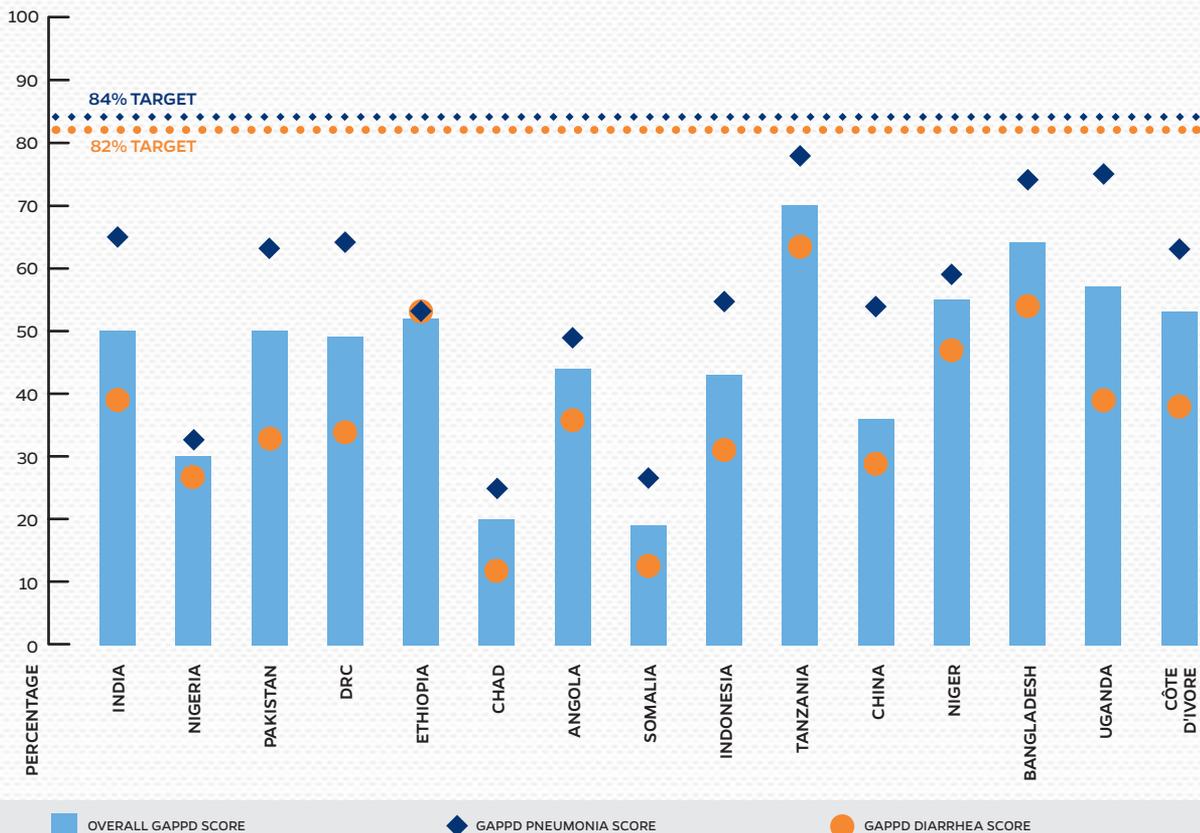
### GAPPD Diarrhea scores in 15 high-burden countries

Target score: **82%**  
 Median: **36%**  
 Range: **12% - 63%**  
 Highest-scoring country: **Tanzania**  
 Lowest-scoring country: **Chad**  
 Number of countries at or above target: **0**

Similarly, no countries met the GAPPD Diarrhea target of 82%, and only four countries had GAPPD Diarrhea scores that met or exceeded 41%—Ethiopia, Tanzania, Niger, and Bangladesh—just half of the GAPPD Diarrhea target score. Of the 150 total GAPPD indicators (10 indicators for 15 countries), only 17 indicators had measures above the target score.

The low diarrhea indicator scores are largely due to low zinc coverage in children with diarrhea. For countries not reporting zinc data, we assumed zinc coverage was not measured because it was likely used at very low levels or not used at all and therefore assigned it 0% coverage. Fewer countries have introduced rotavirus vaccines than have introduced PCV, which further contributes to lower diarrheal scores.

**Figure 2: 2018 GAPPD Pneumonia and GAPPD Diarrhea scores**



# KEY RESULTS & FINDINGS

## PROTECT

### Exclusive breastfeeding

Exclusive breastfeeding helps protect children against both pneumonia and diarrhea. Across the 15 countries, the median breastfeeding coverage was 38%. Five countries met the GAPPD breastfeeding target of 50%: Uganda (65%), Tanzania (59%), Ethiopia (57%), India (55%), and Bangladesh (55%) (Figure 3). More countries met the GAPPD target for breastfeeding than any other indicator. Six countries had breastfeeding coverage below half the threshold (25%): Chad (0%), Somalia (5%), China (19%), Nigeria (23%), Niger (23%), and Côte d'Ivoire (24%). All countries had data available from the past 10 years.

#### Exclusive breastfeeding in 15 high-burden countries

Target score: **50%**

Median: **38%**

Range: **0% - 65%**

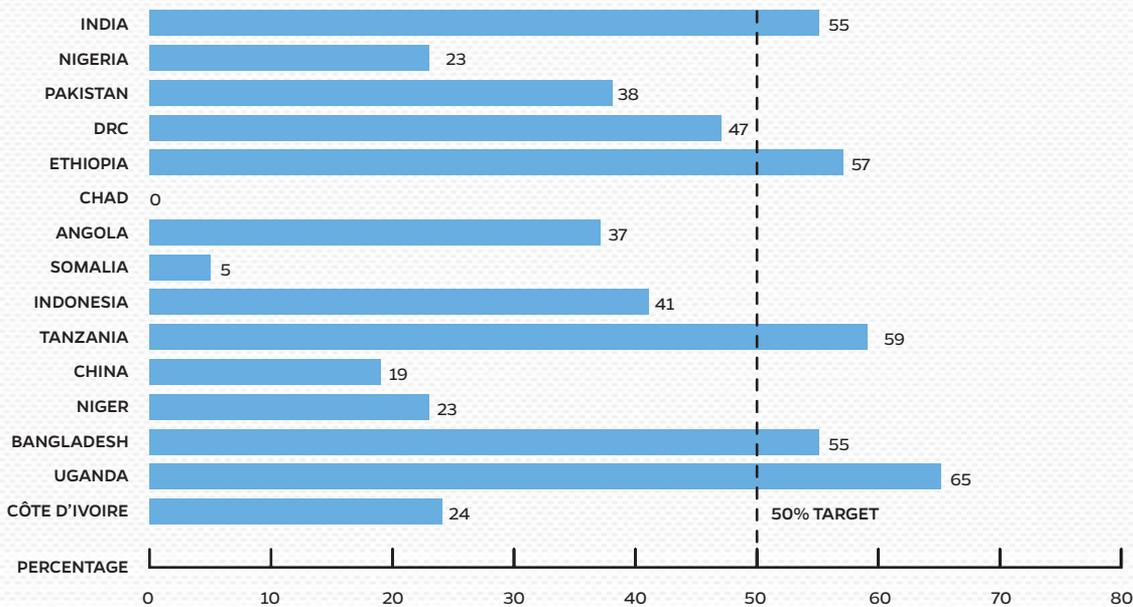
Highest-scoring country: **Uganda**

Lowest-scoring country: **Chad**

Number of countries at or above target: **5**



**Figure 3: Exclusive Breastfeeding Coverage in the First 6 Months of Life**



Source: UNICEF's global database, 2018

# KEY RESULTS & FINDINGS

## PREVENT

The highest and most consistent levels of immunization coverage were seen in Tanzania and Bangladesh, where coverage for all introduced vaccines exceeded the GAPPD target of 90% (in Bangladesh, all vaccines but rotavirus vaccine had been introduced) (Figure 4). Immunization coverage was at or below half the 90% target for all five vaccines in Chad, Nigeria, and Somalia (except MCV1, which was 46%).

### DTP3 coverage

DTP3 coverage had the highest median coverage value of any of the 10 GAPPD indicators, scoring at 81%. Over half of the focus countries have DTP3 coverage above 80%, with three countries meeting the indicator target of 90%: China (99%), Tanzania (97%), and Bangladesh (97%). Three countries had DTP3 coverage below 45%, half of the target value: Chad (41%), Nigeria (42%), and Somalia (42%).

#### DTP3 coverage in 15 high-burden countries

Target score: **90%**  
Median: **81%**  
Range: **41% – 99%**  
Highest-scoring country: **China**  
Lowest-scoring country: **Chad**  
Number of countries at or above target: **3**

### MCV1 coverage

The median value of MCV3 coverage was 78%. MCV1 coverage exceeded the 90% target in three countries—Tanzania (99%), China (99%), and Bangladesh (94%)—and six countries have MCV1 coverage at or above 80%. MCV1 coverage was below half the target in three countries: Chad (37%), Nigeria (42%), and Angola (42%).

#### MCV1 coverage in 15 high-burden countries

Target score: **90%**  
Median: **78%**  
Range: **37% – 99%**  
Highest-scoring country: **Tanzania, China**  
Lowest-scoring country: **Chad**  
Number of countries at or above target: **3**

### Hib3 coverage

Because DTP and Hib vaccines are delivered together via pentavalent vaccination, identical coverage rates for these two vaccines are seen in nearly all the countries. Of the 15

high-burden countries, all but China have introduced the pentavalent vaccine, accounting for the difference between the two coverage rates. After DTP3, Hib3 had the highest median coverage across the countries (80%). Data were not available for China, which has private market coverage for Hib vaccine, but has not introduced the vaccine into its national immunization program. See country coverage data in DTP3 section above.

#### Hib3 coverage in 15 high-burden countries

Target score: **90%**  
Median: **80%**  
Range: **41% – 97%**  
Highest-scoring country: **Tanzania, Bangladesh**  
Lowest-scoring country: **Chad**  
Number of countries at or above target: **2**

### PCV3 coverage

As of 2017, four countries have not introduced PCV—Chad, Somalia, Indonesia, and China. India initiated a phased national introduction in May 2017, but no child had yet received the third dose, given at 9 months of age in 2017; thus, the estimated PCV3 coverage is 0%. Of the 11 countries where PCV has been introduced, the median coverage is 79%. Three countries had coverage above the 90% target: Côte d'Ivoire (99%), Tanzania (97%), and Bangladesh (97%). Interestingly, PCV3 coverage in Côte d'Ivoire was estimated to be 15 percentage points higher than its DTP3 coverage. A similar but not as substantial difference in coverage between PCV and DTP3 was also noted in Angola. Aside from India, of the countries that had introduced PCV, Nigeria was the only country to have PCV3 coverage below half the target, with 33% coverage.

#### PCV3 coverage in 15 high-burden countries

Target score: **90%**  
Median\*: **79%**  
Range: **0% – 99%**  
Highest-scoring country: **Côte d'Ivoire**  
Number of countries that have not introduced PCV3: **4**  
Number of countries at or above target: **3**

\*Of countries that have introduced the vaccine

### RotaC coverage

As of 2017, rotavirus vaccine had not been introduced in eight of the 15 focus countries: Nigeria, DRC, Chad, Somalia, Indonesia, China, Bangladesh, and Uganda. Of the seven countries where rotavirus vaccine has been introduced, the median coverage of complete rotavirus vaccine is

# KEY RESULTS & FINDINGS

58%. Tanzania was the only country to meet or exceed the target level, with 97% coverage. Among countries that had introduced the vaccine as of 2017, the lowest coverage levels were in Pakistan (12%) and India (13%), both of which had recently started phased national rollouts that had not yet reached all states or provinces. Côte d'Ivoire, with an estimated 54% coverage level, introduced the vaccine in March 2017.

## RotaC coverage in 15 high-burden countries

Target score: **90%**

Median\*: **58%**

Range: **0% - 97%**

Highest-scoring country: **Tanzania**

Number of countries that have not introduced RotaC: **8**

Number of countries at or above target: **1**

\*Of countries that have introduced the vaccine

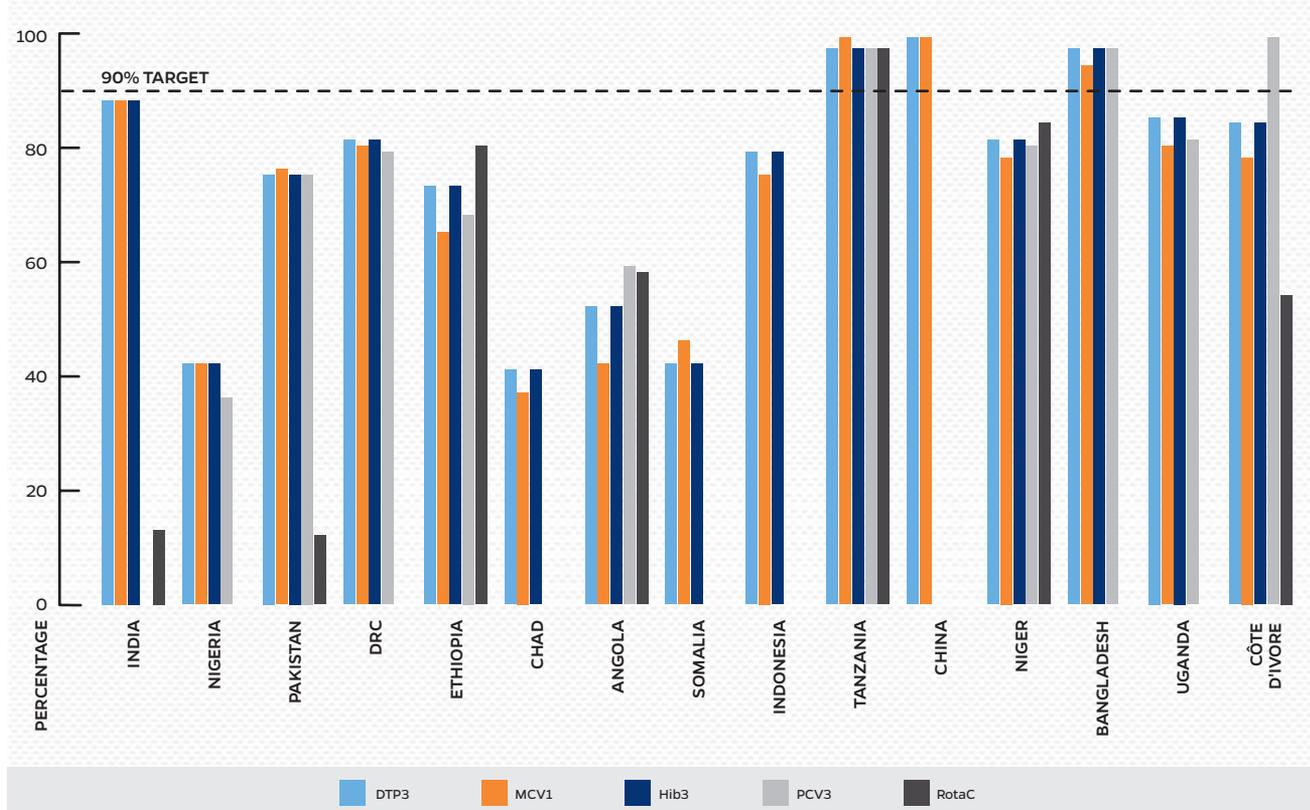
**Table 6: PCV and rotavirus vaccine introductions**

	2017 Introductions	2018 Introductions
<b>PCV</b>	India (Phased)	India (Phased), Indonesia (Pilot)
<b>Rotavirus vaccine</b>	Côte d'Ivoire, India (Phased), Pakistan (Phased)	Afghanistan, India (Phased), Pakistan, Uganda

## Vaccine introductions

As of 2017, four of the 15 countries either had not introduced PCV into their national immunization programs or have estimated the national coverage at 0% implying the start of roll-out in 2017 (Table 6). Eight of the 15 countries had not introduced rotavirus vaccine as of 2017.

**Figure 4: Immunization coverage: DTP3, MCV1, Hib3, PCV3, RotaC**



Coverage is measured among children 12-24 months of age.<sup>4</sup> This table shows coverage of the 3rd dose of diphtheria/pertussis/tetanus vaccine (DTP3), pneumococcal conjugate vaccine (PCV3), and Hib vaccine (Hib3); the 1st dose of measles-containing vaccine (MCV1); and completion of the rotavirus vaccine series (RotaC). Source: WHO/UNICEF Estimates of National Immunization Coverage (WUENIC), 2018

4. WHO and UNICEF estimates of national infant immunization coverage: methods and processes. <http://www.who.int/bulletin/volumes/87/7/08-053819/en/>

# KEY RESULTS & FINDINGS

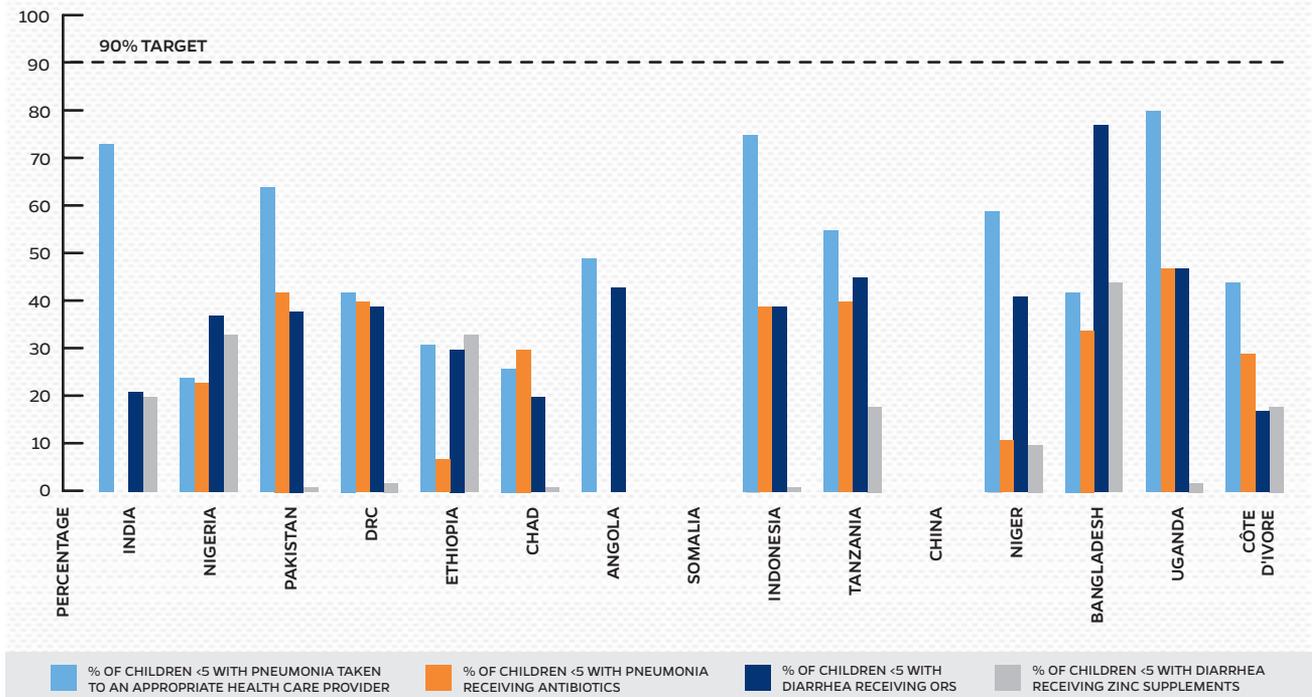


## TREAT

No country reached the target of 90% coverage for any of the four treatment indicators (Figure 5). For children with symptoms of pneumonia, the likelihood of receiving care by an appropriate healthcare provider was greater than the likelihood of receiving antibiotics. For children with diarrhea, receiving ORS was more common than receiving zinc supplements. In fact, only three countries (Bangladesh, Ethiopia, and Nigeria) had zinc coverage that even exceeded 30%. Uganda was the only country to have three treatment scores exceeding half of the target value: children under five with acute respiratory infection taken to a health facility (80%) and given antibiotics (47%) and children under five with diarrhea given ORS (47%). Six countries had only one indicator with coverage above 45%, indicating low access to treatment.

Data availability is an issue for the four treatment indicators. Four countries lacked data on antibiotic use, three lacked data on zinc, two lacked data on care-seeking, and two were without data for ORS. No treatment indicator data were available for Somalia or China.

**Figure 5: Pneumonia and Diarrhea treatment coverage:**  
Care-seeking, Antibiotics, ORS, Zinc



Source: UNICEF's global database, 2018; USAID Demographic and Health Survey (DHS), UNICEF Multiple Indicator Cluster Surveys (MICS), or equivalent (2011-2017)

# KEY RESULTS & FINDINGS

## Pneumonia treatment

**Care-seeking:** Of all treatment indicators, countries performed the best on “taken to an appropriate healthcare provider,” with a median coverage of 49%. No countries met the target of 90% but seven countries had coverage above half the target: Uganda (80%), Indonesia (75%), India (73%), Pakistan (64%), Niger (59%), Tanzania (55%), and Angola (49%). The lowest coverage was reported for Nigeria (24%). Data were not available for Somalia or China.

### Pneumonia Treatment — Access to care in 15 high-burden countries

Target score: **90%**

Median: **49%**

Range: **24% - 80%**

Highest-scoring country: **Uganda**

Lowest-scoring country: **Nigeria**

Number of countries at or above target: **0**

Number of countries with missing data: **2**

**Antibiotic treatment:** The median antibiotic coverage was 34%, and all countries were low-performing on this indicator. Only Uganda exceeded half the antibiotic coverage target, with an estimated 47% coverage. Data were not available for India, Angola, Somalia, or China. Of the countries with available data, the lowest coverage was recorded in Ethiopia (7%). Data were not available for four countries: India, Angola, China, and Somalia. Data were not available in the most recent survey for Ethiopia, Niger, Uganda and Côte d'Ivoire, but were available in a survey conducted within the last 10 years.

### Pneumonia Treatment — Receiving antibiotics in 15 high-burden countries

Target score: **90%**

Median: **34%**

Range: **7% - 47%**

Highest-scoring country: **Uganda**

Lowest-scoring country: **Ethiopia**

Number of countries at or above target: **0**

Number of countries with missing data: **4**

## Diarrhea treatment

**ORS treatment:** The median coverage rate of ORS was 39%; all countries' scores were below the 90% target. Only three countries reached half the target: Bangladesh (77%), Uganda (47%), and Tanzania (45%). The lowest ORS coverage was recorded in Côte d'Ivoire (17%), with coverage in India and Chad a few percentage points higher. Data were not available for Somalia or China.

### Diarrhea Treatment — Receiving ORS in 15 high-burden countries

Target score: **90%**

Median: **39%**

Range: **17% - 77%**

Highest-scoring country: **Bangladesh**

Lowest-scoring country: **Côte d'Ivoire**

Number of countries at or above target: **0**

Number of countries with missing data: **2**

**Zinc supplementation:** Of the 10 indicators, zinc supplementation had the lowest coverage levels, ranging from 1% to 44% in the countries with zinc data. Across the 12 countries with zinc data, the median coverage was 14%. The highest rates were seen in Bangladesh (44%), Nigeria (33%), and Ethiopia (33%). Data were not available for Angola, Somalia, or China. Where data was available, coverage was below 5% in five countries: Pakistan (1%), Chad (1%), Indonesia (1%), DRC (2%), and Uganda (2%). Data were not available in the most recent survey but was available in a survey in the last 10 years for Niger and Uganda.

### Diarrhea Treatment — Receiving zinc in 15 high-burden countries

Target score: **90%**

Median: **14%**

Range: **1% - 44%**

Highest-scoring country: **Bangladesh**

Lowest-scoring country: **Pakistan, Chad, Indonesia**

Number of countries at or above target: **0**

Number of countries with missing data: **3**



# KEY RESULTS & FINDINGS

## CHANGES IN OVERALL GAPPD SCORES

From 2017 to 2018, overall GAPPD scores increased in seven countries but all increases were very small (range 1-4%)—Ethiopia (+4), Pakistan (+2), Nigeria (+2), India (+1), DRC (+1), Tanzania (+1), and Niger (+1)—and scores decreased in China (-2) and Angola (-1). Uganda and Côte d'Ivoire did not rank among the 15 countries with the highest pneumonia and diarrhea deaths in the 2017 report, so comparisons are not available. Uganda was last included in the report in 2014, when its overall GAPPD score was 47; its score of 57 this year shows an increase of 10 points over the past four years.

Across the 13 countries included in both 2017 and 2018 reports, GAPPD Pneumonia scores were higher than GAPPD Diarrhea scores. Four countries (DRC, Ethiopia, Tanzania, and Niger) saw one-point increases in their GAPPD Pneumonia scores and four countries saw declines: Angola (-5), Nigeria (-3), China (-2), and India (-1). GAPPD Diarrhea scores increased in six countries—Nigeria (+8), Ethiopia (+8), Pakistan (+3), Tanzania (+2), India (+1), and DRC (+1)—and decreased in China (-2), Angola (-1), and Bangladesh (-1). Availability of zinc coverage data is a key driver of GAPPD Diarrhea score increases. Zinc supplementation data was missing for several countries, giving them 0% coverage values for that indicator in the 2017 report; zinc coverage data is now available in a number of countries, and is included in scores for 2018.

**India:** India's overall GAPPD score increased by one point, however, this aggregate score masks the drivers of change—both positive and negative—in the individual GAPPD indicators. Coverage for Hib and rotavirus vaccines increased by 8 and 9 percentage points. Zinc coverage was recorded as 20%. Although this appears to be an improvement and impacts the country's GAPPD scores, data were unavailable last year and do not necessarily reflect a 20 percentage point increase in coverage. In contrast, the other treatment indicators decreased: ORS coverage (-13 percentage points), exclusive breastfeeding (-10), and access to pneumonia care (-4).

**Nigeria:** The modest increase in Nigeria's overall GAPPD score was offset by large decreases in intervention coverage for the two pneumonia treatment indicators, care-seeking and antibiotics coverage, which decreased by 11 and 14 percentage points, respectively. The main positive driver of change was zinc coverage, which increased by 31 percentage points. Exclusive breastfeeding and ORS coverage increased by 6 and 3 percentage points, respectively. The conflicting decrease in GAPPD Pneumonia score (-3 points) and increase in GAPPD Diarrhea score (+8) show that progress has varied widely in Nigeria.

**Pakistan:** The increases in Pakistan's overall GAPPD score (+2 points) and GAPPD Diarrhea score (+3 points) are almost entirely driven by the increase in rotavirus vaccine coverage (+12 percentage points).



# KEY RESULTS & FINDINGS

**DRC:** The one-point increases in DRC's three GAPPD scores are driven by small increases (+1 to 3 percentage points) in vaccine coverage for four vaccines.

**Ethiopia:** The increases in Ethiopia's overall GAPPD score and GAPPD Diarrhea score were driven mainly by the availability of data on zinc coverage, which was reported as 33% in 2016. These data do not necessarily show an actual increase in coverage, as zinc coverage had not previously been reported and we therefore do not have a comparison. There were also increases in exclusive breastfeeding (+5 percentage points) and ORS coverage (+3).

**Chad:** There were no changes in any of the GAPPD scores in Chad. The immunization coverage did not change for any of the vaccines, and the treatment and breastfeeding data were not updated.

**Angola:** For the first time, Angola had coverage data on access to pneumonia care and breastfeeding. The decreases in its overall score and GAPPD Pneumonia and GAPPD Diarrhea scores were driven partly by small decreases in immunization coverage for four vaccines (-1 to 3 percentage points) and partly due to this new data.

**Somalia:** There were no changes in any of Somalia's GAPPD scores. The data for all four treatment indicators remained unavailable, as data on these four indicators have not been recorded in the past 10 years. The immunization coverage did not change for any of the vaccines, and the treatment and breastfeeding data were not updated.

**Indonesia:** There were no substantial changes in the immunization coverage and no updates to the treatment and breastfeeding data.

**Tanzania:** The small increases in all three of Tanzania's GAPPD scores were driven largely by an increase in MCV1 coverage (+9 percentage points).

**China:** The decreases in China's GAPPD scores were driven entirely by a decrease in exclusive breastfeeding (-9 percentage points).

**Niger:** The overall GAPPD score increase in Niger was driven by small increases in coverage for all vaccines (+1 to 4 percentage points). These increases in vaccine coverage countered the small decrease in ORS coverage, as no change was seen in the GAPPD Diarrhea score.



**Bangladesh:** The small decrease in Bangladesh's GAPPD Diarrhea score was driven by the minor decrease in zinc coverage (-5 percentage points).

**Uganda:** Since the last time Uganda was included in this report in 2014, its overall GAPPD score increased by 10 points. Comparing the 2018 scores to the 2014 scores, the GAPPD Pneumonia score increased by 14 points and the GAPPD Diarrhea score increased by one point. The increase in overall GAPPD score and GAPPD Pneumonia score was driven mostly by the introduction and high coverage of PCV (81% coverage in 2017). Over the past four years, DTP3 and Hib3 coverage both increased by 7 percentage points.

**Côte d'Ivoire:** Because Côte d'Ivoire hasn't been included in previous Pneumonia and Diarrhea Progress Reports, we're unable to ascertain changes in GAPPD scores. Comparing the available treatment and breastfeeding data from 2016 to the previous data from 2011, increases for zinc coverage (+18 percentage points), exclusive breastfeeding (+12), and care-seeking (+6), show overall progress. Comparing the immunization data between 2017 and 2016, rotavirus vaccine was introduced and showed an increase from 0% coverage to 54%.

# KEY RESULTS & FINDINGS

## STRATIFYING THE DATA: TAKING A CLOSER LOOK AT THE TREATMENT AND PROTECTION DATA IN 15 HIGH-BURDEN COUNTRIES

This year, for the first time, when publishing its Child Health Coverage data, UNICEF published national results broken down by sociodemographic factors, such as: gender, geography (urban/rural), wealth, and maternal education (for exclusive breastfeeding and zinc coverage). By looking at coverage data for exclusive breastfeeding, access to pneumonia care, ORS, and zinc, we gain insight into which approaches and interventions are most inequitably distributed. The data also highlight the countries in which national coverage estimates poorly reflect intervention coverage among sub-populations within the country. By understanding these data, policy makers and program planners can focus efforts to understand the factors driving these inequities, better design interventions targeted to these communities, and direct resources more appropriately, all with the goal of improving the equity in health service delivery.

### **Exclusive Breastfeeding**

In most of the 12 countries with equity data on exclusive breastfeeding status we see little variability across the equity predictors assessed by the surveys with a notable exception, Nigeria, described below. Previous studies have found that, unlike other child health interventions, breastfeeding coverage tends to be higher among children from lower-income families than higher ones; as a result, breastfeeding coverage inequities are often less apparent in lower-income, high-burden settings [4–8]. Additionally, among the indicators assessed in this report, breastfeeding is unique in that it is not dependent on a child’s access to health services, another potential driver of the relatively equitable coverage of breastfeeding. This highlights the critical role of access to health centers, practitioners, and programs—and how lack of access rather than demand may be a key determinant of inequalities in these 12 highest-burden countries with available data.



# KEY RESULTS & FINDINGS

In Nigeria, exclusive breastfeeding coverage is 11 percentage points higher in urban areas than rural (31% vs. 20%). Somewhat surprisingly, exclusive breastfeeding in the wealthiest quintile in Nigeria was reported to be over twice that of the poorest quintile (35% vs. 16%). As with zinc coverage we see a relationship between maternal education and breastfeeding coverage in Nigeria, and also in Angola.

Missing data: Côte d'Ivoire, Somalia, China

## Pneumonia care-seeking

Based on available data, clear geographic and wealth inequities exist in pneumonia care-seeking in the 15 high-burden countries. In six of the 11 focus countries where data were available, urban children were brought for care at higher rates (at least 13% higher) than children living in rural areas (Pakistan, Ethiopia, Chad, Angola, Tanzania, and Bangladesh). There was nearly a two-fold difference in urban vs. rural coverage in the countries with the highest coverage disparities—Ethiopia (59% vs. 29%), Angola (60% vs. 32%), and Chad (40% vs. 22%).

No country had higher coverage in the poorest quintile compared to the wealthiest. Coverage in the wealthiest quintiles was at least 10 percentage points higher than in the poorest in six of the nine countries with available data. Pneumonia care-seeking in the wealthiest group in Chad was nearly 3 times higher than in the poorest group (44% vs. 16%). Tanzania has the highest GAPPD scores and high care-seeking coverage compared to the other countries in the analysis. In spite of this, in Tanzania coverage was twice as high in the wealthiest group than the poorest (75% vs. 37%), accounting for the largest coverage gap (38 percentage points) of any of the countries we analyzed. This highlights that national coverage estimates, even when relatively high, can mask sub-national inequities in access to care.

A positive finding was that coverage of pneumonia care-seeking does not seem to differ by gender, at least in the 11 countries with data.

Missing data: Somalia, China, Niger, Côte d'Ivoire (only had data on gender), India (only had data on urban/rural), Angola (missing data on wealth quintiles)

## ORS

In four of the 12 countries with available data, ORS coverage was reported to be between 10 and 20 percentage points higher in urban areas as compared to rural areas: Nigeria, Ethiopia, Chad, and Angola.

Coverage gaps by a family's wealth were also found; ORS coverage was over 10 percentage points higher in the wealthiest quintile compared to the poorest in six of the 11 countries with data. In Chad, Nigeria, Angola, and Côte d'Ivoire, coverage was in the range of two times higher in the wealthiest group compared to the poorest quintiles. This



provides evidence that even access to inexpensive treatments like ORS remains a major issue in many countries.

Although there was not a prevailing pattern of gender disparity in ORS coverage, in three countries—Pakistan, Indonesia, and Bangladesh—ORS coverage was marginally higher (seven to eight percentage points) in boys than in girls.

Missing data: Somalia, China, Niger, India (only had data on urban/rural)

## Zinc

An assessment of inequities in zinc coverage is made difficult because of how low the zinc coverage is at the national level. It is small comfort that such low levels leave little room for disparities to have yet developed. Zinc coverage was below 20% in more than half of the countries, and below 2% in five countries where data are available. Notwithstanding the lack of implementation, the available data do not suggest there is a substantial inequity in zinc coverage due to geography, wealth quintile, gender, or maternal education.

In countries with higher overall coverage, we saw some evidence of inequity. In Ethiopia, zinc coverage was 20 percentage points higher in urban than rural areas (51% vs. 31%) and, similarly, 20 percentage points higher in the wealthiest than the poorest quintile (49% vs. 29%). Of note, even children in this wealthiest quintile had a 50:50 chance of being treated with zinc at the time of a diarrheal illness. Maternal education did not appear to determine zinc coverage levels, except in Nigeria. Wealth also appeared to be related to zinc coverage in Nigeria: coverage is 13 percentage points higher in the wealthiest quintile than the poorest (39% vs. 26%).

Missing data: Somalia, China, Angola, India (only had data on gender)



**Spotlight  
on equitable  
immunization  
coverage**

# SPOTLIGHT ON EQUITABLE IMMUNIZATION COVERAGE

## NATIONAL PROGRESS DOESN'T NECESSARILY MEAN PROGRESS WHERE IT'S NEEDED MOST.

Each year, we review national-level data to assess whether strategies to reduce pneumonia and diarrhea are being effectively implemented in the countries where they are needed most. While this provides a snapshot of the progress made and steps taken to reduce disease, national data alone may, in fact, lull us into a false sense of security—it can cover up disparities that exist below the surface.

This year's approach enabled us to go a step further to examine specific population-level data collected in surveys, as recently published in UNICEF's child health database. Assessing the role that poverty, maternal education, gender, and geography play in access to and uptake of key pneumonia and diarrhea interventions can inform the design and strategies for programs and policies to reach targeted populations most vulnerable to severe disease and most often missed by traditional health services.

Our priority, as a global community, should be to identify pockets of persistent disease and measure progress and gaps in access to protection, prevention, and treatment in those settings. These pockets—regions or communities with a disproportionately high concentration of disease—are often found in areas and among populations where key risk factors exist [9]. For pneumonia and diarrhea, these include poverty, living in urban slums or rural areas, and low maternal education [10–13]. Poorer children and those who are harder to reach often have lower access to and uptake of health services like pneumonia care and antibiotic and ORS treatment, placing them at even greater risk of serious outcomes.

## SPOTLIGHT ON IMMUNIZATION

National data provide a measure of the scale and direction of countries' progress toward fulfilling their commitment to reducing the burden of vaccine-preventable diseases, but national data alone are not sufficient to inform programs and policies that target disparities and address the areas of greatest risk. While some sub-group data on key interventions are available, immunization data falls short. Unfortunately, although the annually-published WUENIC immunization coverage estimates provide both a single, national-level estimate for each country, as well as administrative sub-national data for many countries, there is no readily-available breakdown in the coverage rates by gender, wealth quintile, or geography that would enable comparison within and between countries. This lack of detail makes it difficult to assess whether immunization coverage lags among certain groups or regions, and if it is reaching the most vulnerable, hard-to-reach children. It prevents the vaccine community from evaluating the effectiveness of local efforts to increase immunization access and uptake

in the most vulnerable groups. To substantially impact the approach to tackling pneumonia and diarrhea, and child health as a whole, we need to ensure sub-national and key risk factors coverage data are available.

Countries and global partners have established immunization targets, often aiming for 90% coverage as outlined in GAPPD and assessed in this report. These immunization targets are set for and usually measured through national coverage rates, allowing public health officials to assess progress toward broad, high-level goals and make the case for program activities. However, they generally do not consider whether segments of the population are falling behind or are left out completely—further, establishing a 90% coverage target effectively acknowledges that immunization programs will still fail to reach 10% of children. Whether these 10% are the same children who lack access to other services and are at greater risk of serious health outcomes is of critical concern [14]. Countries need to evaluate and develop strategies to address these inequities in access to prevention and treatment.

## ADDRESSING DISPARITIES: QUALITY SUBNATIONAL AND RISK GROUP COVERAGE DATA ARE NEEDED

Populations with lower immunization coverage face a disproportionately higher risk of vaccine-preventable diseases both because of low vaccination rates and because these are the same communities with higher rates of non-immunization risk factors. In order to address the problem, we must first *define* and *measure* coverage gaps. This year, for only the second time ever, WHO has collected and reported sub-national immunization coverage data along with the standard national data from 141 member countries [15]. Although these data have their limitations (e.g., coverage estimates may exceed 100% in districts lacking a good sense of their target population [16]), they do serve as an indicator of where to delve deeper—identifying districts making progress to see what works and, perhaps more importantly, identifying districts lagging behind to better understand where a focused effort is required. **By bolstering the use of district-level data, countries can provide targeted investments and ensure program accountability at all levels to address persistent issues.**

Although the subnational, district-level data do not themselves provide evidence on the role of distance in vaccine coverage, other data have shown that children living **farther from health facilities** are less likely to be immunized than children living closer to facilities. In Tanzania, children living at least 5 kilometers away from a health facility had

# SPOTLIGHT ON EQUITABLE IMMUNIZATION COVERAGE

an 84% higher risk of missing the third dose of DTP and a 48% higher risk of missing the first dose of measles-containing vaccine than children closer to a health facility [17]. Strategies should consider how to mitigate the impact of distance on children at risk. If children living farther away from a health facility are reached by immunization services, it provides an opportunity to reach them with other health services or education. Improving the accessibility of health services may also help reduce the impact of other diseases beyond pneumonia and diarrhea.

Disparities also occur between urban and rural areas. Globally, coverage of the third dose of DTP is 8% **higher among urban children compared to children raised in a rural environment [18]**. We also see evidence that **children living in slum conditions are less likely to be immunized** and have a greater risk of infectious diseases than those in other urban areas [11]. In India, one study found that although full immunization coverage in one state was reported at 70% in 2014, less than half of children in a poor, urban area within that state were fully immunized [12]. A similar relationship was seen in Niger, where children living in slums were 2.5 times less likely to be immunized than children living in other urban areas (35% immunization coverage in slums vs. 86% in non-slums) [11].

## INEQUITIES WITHIN COMMUNITIES

National-level data can also mask coverage disparities due to sociodemographic factors. At the global and national level, differences in vaccine coverage between girls and boys are not evident in the data. Yet, in some communities **deep-rooted gender inequalities exist** and manifest as

lower vaccine coverage in girls compared to boys. A recent WHO report using national data shows consistently equal national coverage in boys and girls across a variety of countries—including eight of the countries covered in this 2018 Pneumonia & Diarrhea Progress Report [19]. However, when looking more closely at the community-level, studies have found vaccine coverage inequities between boys and girls [12, 20, 21].

Across India there is lower vaccine coverage among female children in rural areas and in poor, urban areas [22]. Improvements to full immunization coverage in India have not succeeded in closing the gender gap in coverage, as only 78 females were fully immunized for every 100 males fully immunized in poor areas of Delhi [12]. In a rural part of Bangladesh, poverty had a stronger negative effect on the likelihood of girls being fully immunized than it did for boys. In other words, girls from households in this area that were below the poverty line were 11% less likely to be fully immunized than boys from households below the poverty line [21]. In general, countries with high levels of gender inequality have lower levels of immunization coverage [20, 23]. In both Ethiopia and Pakistan, researchers found **maternal empowerment and autonomy** (i.e. a mother's involvement in decision-making regarding the family and healthcare) to be predictive of their children's immunization coverage [24, 25].

In many places, differences in **maternal education** and **household wealth level** have perhaps the most notable impact on DTP3 coverage [20]. Across 45 low- and middle-income countries, coverage of the third dose of DTP is 26% higher among children born to mothers with some secondary education compared to mothers with no education and 15% higher among children in the highest compared to lowest wealth quintile [18].

Recent studies in India [22] and in Southeast Nigeria [26], DRC, Ethiopia, and Pakistan [27] have shown entrenched vaccine coverage inequalities within countries according to family income. It is clear that these **wealth inequities impact immunization coverage** as increases in immunization rates occur more slowly among poor children compared to children from wealthier families [14].

## WHAT WORKS IN COMMUNITIES TO EQUALIZE AND IMPROVE COVERAGE

Evidence is slowly growing around **effective community-driven strategies** to address multi-dimensional inequities. For example, work from Somalia and India shows us that Child Health Days and Immunization Weeks can have a significantly greater effect on improving coverage in hard-to-reach, rural areas compared to more geographically accessible communities [29, 30]. Scale-up of the Reaching Every District (RED) approach is an effective strategy to



# SPOTLIGHT ON EQUITABLE IMMUNIZATION COVERAGE

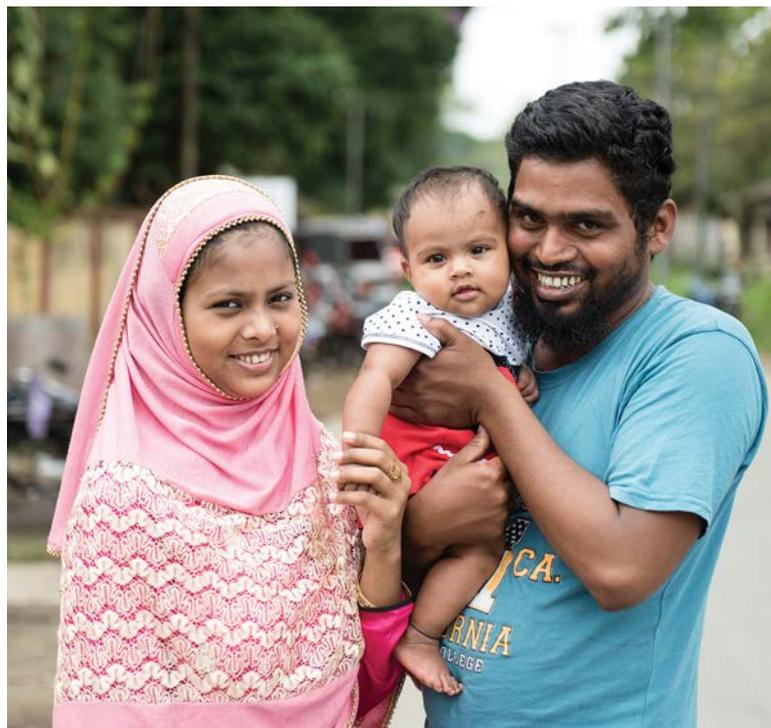
## **What happens when we don't protect the poorest children?**

Poorer children are less likely to be protected against diseases but are also less likely to be able to access treatment for the diseases that they are not protected against. This traps them in a **cycle of poverty and poor health**—a cycle that becomes more difficult to escape with each case of vaccine preventable disease and its associated costs to the family. Diseases like pneumonia can push families into poverty. Researchers modeling the economic impact of immunization in 41 low- and middle-income countries found that administering Hib and PCV vaccines can together prevent over 1.25 million cases of poverty over 15 years, by avoiding the need for families to pay for expensive medical care [28]. Forty percent of the poverty avoided would be in the poorest 20% of the population [28]. Similarly, in Ghana, researchers suggest that immunization would eliminate the childhood mortality risk associated with living in poverty [9]. Although promising, we know that the poorest children don't receive these vaccines as often as wealthier children, so without focused efforts, the poorest children will remain at a higher risk of disease, death, and poverty. If we are to make real progress in preventing and controlling disease and increasing immunization rates, community-level data can serve as a powerful tool to hold public health programs accountable for targeted solutions to close coverage gaps.

improve vaccine coverage at the sub-national level [31]. Strategies employed in Bangladesh—such as providing families with mobile phone reminders, lengthening immunization sessions to accommodate working mothers, and the use of community support groups to encourage and remind mothers of immunization visits—were all found to be effective at increasing coverage in hard-to-reach populations [32, 33]. India's National Health Mission introduced a multi-strategy community intervention, with activities such as reimbursing travel to health facilities and developing groups of community health activists, aimed at reducing gender inequality, as an approach to improve health equity. This approach successfully closed the gender gap from a baseline of nearly 6% higher full immunization coverage in boys to an almost indistinguishable difference between boys and girls [34].

## **THE WAY FORWARD**

Equity in immunization coverage is driven by a number of factors, including sociocultural influences like gender equality and poverty and cross-cutting factors like



education. We must continue to identify local solutions that work to address the nuanced, cultural factors that created a society that continues to marginalize certain groups. A one-size-fits-all approach will fail to account for context-specific demographics or characteristics, widening the gap between marginalized groups and the rest of the population and amplifying the negative effects of inequities.

Addressing immunization coverage disparities can help reduce pneumonia and diarrhea burden and make important contributions in development, poverty reduction, and health systems strengthening. Though some successful small-scale interventions have been developed, we must continue to accurately assess the root causes that drive inequities, then work to deliver programs specifically designed to target those groups. But doing so will require widespread political support and financial commitment. We've seen success in innovative solutions and community-driven programs that have worked to chip away at the inequalities that drive coverage gaps, and recent research has quantified factors like gender inequality and multidimensional poverty, an encouraging development. It's imperative that we continue to generate and use this evidence to direct interventions focused at reducing—and eliminating—these inequities and ensuring all children have the opportunity for a healthy, productive life.



## **Conclusion & Recommendations**

# CONCLUSION & RECOMMENDATIONS

This marks our ninth year reporting GAPPD scores for the countries with the highest pneumonia and diarrhea burden. We have made progress in that time, but this year's report shows that forward motion has slowed substantially. Global targets elude us, driven by persistent inequities in these and other countries around the world.

To truly see the change for which we strive, we must delve into what is happening in the sometimes forgotten corners of the world—the populations that are remote, impoverished, or left behind by insufficient will. There is no quick fix or single, simple solution. Addressing the inequities that exist will demand greater levels of funding, strong political commitment and accountability, and a coordinated global effort that prioritizes the most vulnerable. This is crucial not only for pneumonia and diarrhea, but to establish a primary healthcare system that addresses the needs of vulnerable populations.

Before we can set this in motion, we need better data—reliable, regularly collected measurements that will allow us to identify the problems and monitor progress with a closer eye to target our efforts. High-quality data enables countries to strategically allocate resources and prioritize the areas of greatest need. While we can measure progress by a reduction in the number of deaths, better monitoring shines a light on the places and people that will benefit most from increased awareness and education and improved access to life-saving prevention and treatment.

Better national data is one step in the right direction, but is insufficient to see the disparities hidden below the surface. Even high-performing countries can have substantially unequal access to interventions among key groups, and these differences can be striking:

- Tanzania scored highest on pneumonia score and overall GAPPD score among the 15 countries with the greatest number of pneumonia and diarrhea deaths this year and frequently tops the performance rankings on our annual report of these high-burden countries. However, access to care for pneumonia in Tanzania was twice as high in the wealthiest quintile as in the poorest, a 38-point gap—this was the largest pneumonia care-seeking coverage gap by wealth quintile of any country we evaluated.
- Nigeria, home to more under-5 diarrhea deaths than almost any other country, has access to ORS that differs by nearly 20 points between children in urban and rural areas. Fewer than one in three children in rural areas have access to this diarrhea treatment which is not only inexpensive and highly effective, but also easy to store, deliver, and administer. The prospect is even worse for poor children, with just one in four receiving ORS for diarrhea.
- Pakistan, too, faces disparities in access to care for pneumonia that exceed 20 points depending on whether families are rich or poor.

Living in poverty or in rural areas is often linked to lower access to health interventions than in wealthier, urban communities—although there are significant disparities within these groups as well, particularly for those living in urban slums. Children in marginalized parts of countries are often the same children who are already undernourished, further complicating any bout of pneumonia or diarrhea and perpetuating the cycle of malnutrition and illness.

While we highlight the health implications of these determinants, marginalized children and their families face many other struggles. Families whose children have been hospitalized for pneumonia and diarrhea are at risk of falling into poverty due to medical expenses—for families already living on the edge of poverty, this can be devastating [28, 35]. Scaling up access to interventions like immunization can help prevent millions of cases of medical impoverishment [36]. When parents have to miss work to care for a sick child, this can mean the difference between providing food that day or not—many families face these challenges, and the effects can impact the entire community [37, 38]. Access to effective preventive care—like immunization—can also improve the chance that children will stay in school longer and grow up to become more productive adults [39].



# CONCLUSION & RECOMMENDATIONS

**As the global community rolls out plans to further tackle the leading causes of child illness and death in the next decade, now is the time to emphasize the importance of reaching children and communities who have been left out.**

Prioritizing these oft-missed populations will pay off many times over, and will demand that we tailor our funding and programmatic strategies to communities and regions, rather than take a one-size-fits-all, national-focused approach. This may require new research to determine what works best for these communities and ensure that this approach is implemented. All stakeholders—donors, manufacturers, civil society, government at all levels, and researchers—must

be committed to finding and funding solutions. We need multi-disciplinary collaboration to implement programs and policies, and hold each other accountable for outcomes. We need to make a focused effort to tackle child health equity with every program and system designed to ensure we address socioeconomic well-being, education, and development, prioritizing the communities and populations where disparities prevail.

The persistent global burden of child pneumonia and diarrhea is a symptom of a broader problem: health systems fall woefully short of ensuring the most vulnerable communities and families have sufficient access to prevention and treatment. It's high time we get to the core of this problem by effectively identifying and addressing disparities, and strengthening systems to provide a foundation of equitable healthcare for all.



## Where do we go from here?



### “WE CAN’T FIX WHAT WE CAN’T MEASURE”

- **Governments**, with **donor** and **partner** support, need to **improve the quality and frequency of data** collection and reporting
- Data must include **key equity indicators**—providing insight into **key populations and risk factors**—and report at the sub-national level to inform targeted programs and policies.



### EQUITY: TARGETING THE PLACES OF GREATEST NEED

- Country and local governments, suppliers, civil society, and other global community partners must **develop and scale-up effective interventions to address disparities** in access to protection, prevention, and treatment.
- We need to **prioritize reaching underserved communities and populations**, first identifying the determinants of inequity and then delivering product and programmatic changes that target those factors.



### NEED FOR CONTINUED FUNDING

- We need to **continue investing** to identify and deliver evidence-based interventions—vaccines, treatment, and programs to ensure that children get a good start in life. Without sustained investment, we risk losing the gains we’ve made in improving the health and lives of children.



### INTEGRATION IS KEY

- To tackle health equity challenges, we need a **comprehensive, integrated strategy** that considers issues like poverty and education and does not shy away from system-level changes that improve supply chains and product suitability and reduce missed opportunities.

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# ACRONYMS & ABBREVIATIONS

**ARI** — Acute respiratory infection

**DHS** — Demographic and Health Survey

**DRC** — Democratic Republic of the Congo

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

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

**Hib** — *Haemophilus influenzae* type B

**IVAC** — International Vaccine Access Center

**MCEE** — WHO/UNICEF Maternal and Child Epidemiology Estimation Group

**MCV** — Measles-containing vaccine

**MICS** — Multiple Indicator Cluster Survey

**NIP** — National Immunization Program

**NFHS** — National Family Health Survey

**ORS** — Oral rehydration salts

**PCV** — Pneumococcal conjugate vaccine

**RED** — Reaching Every District

**RotaC** — Rotavirus vaccine final dose

**UNICEF** — United Nations International Children's Emergency Fund

**USAID** — United States Agency for International Development

**WHO** — World Health Organization

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



# ACKNOWLEDGEMENTS

*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 ninth edition of the progress report and the 10th year of World Pneumonia Day.*

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### Suggested Citation

International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health. (2018). Pneumonia and Diarrhea Progress Report 2018.

**We gratefully recognize the following organizations and individuals for their valuable contributions to the 2018 edition of the Pneumonia and Diarrhea Progress Report (in alphabetical order):**

- The Bill & Melinda Gates Foundation
- UNICEF
- WHO

## More Resources



View-Hub (Vaccine Information and Epidemiology Window):  
<http://view-hub.org/>



VoICE (The Value of Immunization Compendium of Evidence):  
<https://immunizationevidence.org/>



ROTA Council Advocacy Toolkit:  
<http://rotacouncil.org/resources/advocacy-toolkit/>

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