IMMUNIZATION
AGENDA 2030

# IA2030
# GLOBAL PROGRESS
# REPORT 2024

# PREFACE

This Global Progress Report summarizes IA2030 indicator data for 2023. It has been developed by members of the IA2030 Monitoring and Evaluation Working Group on behalf of the IA2030 Coordination Group.

The Report provides an overview of progress towards 2030 targets. It is intended to inform global and regional decision-making, highlighting whether IA2030 Impact Goal indicators are on- or off-track.

The IA2030 Global Progress Report is a successor to the IA2030 Technical Progress Report. A draft version was reviewed by the WHO Strategic Advisory Group of Experts on Immunization (SAGE) in October 2024. This final version has been revised in light of discussions at SAGE and with the addition of some new information, such as modelled estimates of measles cases and deaths in 2023.

The data suggest that the world is not on course to meet most of the immunization targets set for 2030. The COVID-19 pandemic was undoubtedly a setback early in the decade but is unlikely to be the only cause of the limited progress made to date, which undoubtedly also reflects deep-seated systemic issues. Of note, while there were signs of a recovery in 2022, this was not sustained in 2023.

Trends over recent years have been markedly different across countries, even between those of similar income levels. Multiple factors beyond income affect coverage in individual countries, highlighting the need to consider challenges and barriers to progress at an individual country and more local level.

Although the picture is disappointing overall, there were some positive developments in 2023 relating to individual vaccines and to individual countries. Even now, 2030 targets are still within reach. However, this will require determined efforts in all countries, backed up by tailored global and regional support, to strengthen immunization systems so that they reach and retain more infants, adolescents and adults.

## THE MEMBERS OF THE MONITORING AND EVALUATION WORKING GROUP

*Any opinions expressed in this report are those of the co-authors in an individual capacity and do not necessarily reflect those of WHO or the CDC.

# CONTENTS

# 01
# EXECUTIVE SUMMARY

The Immunization Agenda 2030 (IA2030), the global immunization strategy for 2021–2030, includes a set of indicators for monitoring progress towards the IA2030 vision of a world where everyone, everywhere, at every age, fully benefits from vaccines for good health and wellbeing. Data for 2023 indicate that **limited progress globally is being made towards 2030 targets, and a major acceleration will be required to achieve these targets.**

Overall, global vaccination coverage has been stagnating, leading to a growing number of unvaccinated and under-vaccinated children, and a marked increase in vaccine-preventable disease outbreaks, particularly of measles.

## OF THE MOST NOTABLE IA2030 IMPACT GOAL INDICATORS IN 2023:

- The estimated number of **future deaths averted** by immunization rose slightly to 4.19 million, but this was 9.3% under the 2023 target, which will translate to an **additional 430,000 future deaths** from vaccine-preventable diseases.

- The number of **large or disruptive outbreaks** increased significantly, particularly of measles.

- After a substantial drop from a pandemic era peak in 2021, the number of **zero-dose children** (defined as those not receiving any DTP doses) **rose to 14.5 million** from 13.9 million in 2022, indicating lack of progress in engaging more children in immunization programmes.

- While the total number of new vaccine introductions so far this decade is on pace to reach the 2030 target, the annual number of **new vaccine introductions** in low- and middle-income countries **fell to 36** in 2023 from 57 in 2022. This number will need to be maintained for the 2030 target to be met.

- Global **DTP3 coverage**[1], a key indicator of immunization programme reach, was **unchanged at 84%.**

- Global coverage of **MCV2**, **PCV3** and **HPV** (human papillomavirus) vaccine increased, due to new introductions and increasing coverage in countries with newly introduced programmes. This marks progress in expansion of immunization beyond the first year of life.

[1] DTP3: third dose of diphtheria, tetanus and pertussis vaccine; MCV2: measles-containing vaccine second dose; PCV3: pneumococcal conjugate vaccine third dose.

# REGIONAL PROGRESS

There were some promising trends in **regional vaccination coverage** across the life-course. Bright spots included increases in DTP3 coverage in the WHO African Region and the Region of the Americas, with coverage in the latter now significantly above the 2019 baseline. However, DTP3 coverage fell in three of six WHO regions (the Eastern Mediterranean, South-East Asian and Western Pacific Regions).

In addition, over the past two years, substantial increases have been seen in global coverage of PCV, driven mainly by the WHO South-East Asian Region, and HPV vaccine, coverage of which increased by more than 15% in the WHO African Region. Globally, HPV vaccine coverage remains low but has shown encouraging increases in both 2022 and 2023, although coverage is less than 10% in three out of six WHO regions.

# REDUCING INEQUITIES

Immunization coverage is typically lower in low- and middle-income countries than in high-income countries. Some progress has been achieved in closing equity gaps between countries, thanks in particular to progress in Gavi-eligible countries. In **Gavi-eligible countries**, coverage of PCV3, HPV and measles-containing vaccine second dose (MCV2) all increased while DTP3 coverage was unchanged. Countries that have **transitioned out of Gavi support** recorded increases in PCV3 and HPV coverage but small declines in DTP3 and MCV2 coverage. In **middle-income countries** that have never been eligible for Gavi support, DTP3 and MCV2 coverage is close to that seen in high-income countries, but PCV3 and HPV coverage is far lower (and below that seen in low-income countries), due primarily to delays in vaccine introduction. Overall, for most vaccines, coverage gaps between different country income categories remain significant.

Within countries, some minor progress was seen in 2023 in the closing of equity gaps, with small increases in average coverage seen in the 20% of districts with the lowest coverage. However, average coverage in the lowest-performing districts is still lower than in baseline year 2019.

# OUTLOOK

**Most IA2030 indicators are off-track to achieve 2030 targets.** While the COVID-19 pandemic undoubtedly undermined immunization programmes, the initial post-pandemic recovery seen in 2022 has not been sustained. Regionally, there were some encouraging signs of progress in the WHO African Region and the Region of the Americas, and increasing coverage has been seen for some vaccines, particularly PCV3 and HPV. However, overall, the world is falling well short of the challenging targets it has set itself.

Countries themselves face multiple challenges, including economic uncertainty, conflict, and the growing impacts of climate change. Immunization programmes face competing priorities for investment, inside and outside of the health sector. However, investment in immunization as part of integrated primary healthcare systems is one of the most effective ways to protect the health of populations, can generate a massive return on investment, and provides a foundation for future prosperity and health security.

Despite the stagnation seen in 2023, **2030 targets remain attainable** – but they will require a sharp acceleration, with global, regional and sub-regional partners working closely with countries to identify and address their challenges, and to build high-performing and sustainable immunization programmes that equitably deliver vaccines to their populations.

Preliminary DTP1 data from the first half of 2024 suggest a small uptick in the number of doses delivered compared with 2023. Whether this translates to an increase in coverage will be clear when WUENIC estimates for 2024 are released in July 2025.

# 02
# INTRODUCTION

The Immunization Agenda 2030 (IA2030) is the global immunization strategy for the decade 2021–2030. It sets out a vision whereby everyone, everywhere, at every age fully benefits from vaccines for good health and wellbeing.

To track progress, IA2030's Framework for Action includes a comprehensive monitoring and evaluation (M&E) framework. This includes three **Impact Goals** derived from the IA2030 vision statement, progress towards which is tracked by seven Impact Goal indicators:

# IA2030 IMPACT GOALS AND 2030 TARGETS

| IA2030 Impact Goals | Targets |
|---|---|
| **01** **Reduce mortality and morbidity from vaccine-preventable diseases for everyone throughout the life course** | **1.1** **50 million** future deaths averted globally |
| | **1.2** **All countries** achieve VPD control, elimination and eradication targets |
| | **1.3** All selected VPDs have a **declining trend** in the number of large or disruptive outbreaks |
| **02** **Leave no one behind, by increasing equitable access and use of new and existing vaccines** | **2.1** **50% reduction** in the number of zero-dose children |
| | **2.2** **500 vaccine introductions** in low- and middle-income countries |
| **03** **Ensure good health and well-being for everyone by strengthening immunization within primary health care and contributing to universal health coverage and sustainable development** | **3.1** **90% global coverage** for DTP3, MCV2, PCV3 and HPVc |
| | **3.2** Improve **Universal Health Coverage** |

The IA2030 M&E framework also includes multiple indicators linked to IA2030's **seven strategic priorities**. Specific numerical targets have not been set for strategic priority indicators at the global level, as it is more useful for regions and countries to set their own targets, but progress is monitored by IA2030 Working Groups.

Regions have developed **regional strategies and frameworks** aligned with the global IA2030 strategy. These are associated with regional M&E frameworks, providing the basis for data use to inform regional decision-making.
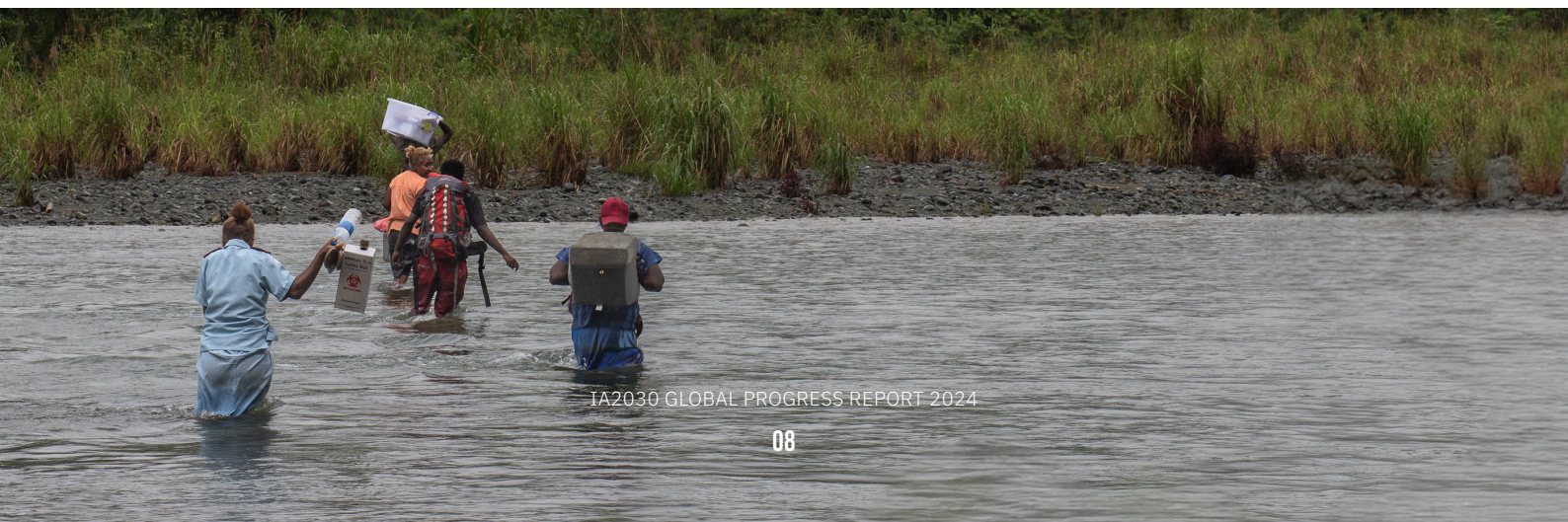
## Progress to date

2024 marked the 50th anniversary of the launch of the **Expanded Programme on Immunization (EPI)** initiative, designed to facilitate access to a suite of essential WHO-recommended vaccines. Now generally known as the Essential Programme on Immunization, the EPI initiative has saved an estimated 154 million lives since 1974 and has made a major contribution to the decline in child mortality seen over the past five decades, particularly in Africa.[2]

However, the launch of IA2030 coincided with the start of the **COVID-19 pandemic**. The pandemic itself, and the efforts made to control it, have had a deep impact on immunization and other health services, leading to a significant drop in key immunization indicators. Recovery since the pandemic has been slow and uneven.

The decline in immunization coverage during the pandemic years contributed to the build-up of large numbers of unvaccinated and under-vaccinated children at risk of multiple vaccine-preventable diseases. As a result, the world has seen a surge in **vaccine-preventable disease outbreaks**, including measles, diphtheria and circulating vaccine-derived poliovirus (cVDPV).

In response to post-pandemic challenges, global partners launched the **Big Catch-Up** initiative in 2023, through which countries could apply for Gavi funding to reach children missed during recent years. The Big Catch-Up initiative has three aims:

- **Catch-up**: Reach children who missed out on vaccination during the pandemic years.

- **Restore**: Return vaccination coverage to at least the levels seen in 2019.

- **Strengthen**: Build the capacity of immunization programmes within primary healthcare systems, to reduce the numbers of children in future birth cohorts who miss out on vaccination and resume the upwards trajectory required to reach IA2030 goals.

The first Big Catch-Up activities began in countries in 2024 and will continue through 2025.

Immunization programmes face other significant challenges. Many countries are facing **economic difficulties** that are affecting their ability to sustain and expand their health systems, including immunization. An increasing number of countries are affected by **social unrest and conflict**, which can lead to the destruction of healthcare infrastructure, loss of health workers and reduced access to communities. **Climate change** is driving changes in infectious disease epidemiology and increasing the risk of extreme weather events that disrupt service provision and people's ability to access services. In many settings, immunization workers face challenges with declining confidence in vaccines.

More positively, **new vaccines** continue to be developed, with 2024 seeing the first routine implementation of malaria vaccination beyond countries in the pilot roll-out programme. A highly effective vaccine for respiratory syncytial virus (RSV), a major cause of pneumonia in young children in low- and middle-income countries, is now also available.

## Immunization data reporting

The global IA2030 monitoring and evaluation framework includes a set of indicators for tracking progress towards 2030 goals. Most of the data relating to these indicators is collected annually from countries using the **electronic Joint Reporting Form (eJRF)**. These data are reviewed and quality-assured within WHO and by countries before being publicly released jointly by WHO and UNICEF (WUENIC data release).

Data for other indicators are collated from a wide range of other sources and verified in dialogue with technical focal points within WHO, UNICEF and other partner organizations. Data analyses and visualizations are also discussed with WHO and UNICEF Regional Offices before publication in the Global Progress Report.

Most data in the Global Progress Report are also made available in an interactive form through the online IA2030 Scorecard. The Scorecard also provides the latest year's data from individual countries.

To aid analysis, criteria have been established for each Impact Goal indicator to determine whether the world is **on- or off-track** to achieve 2030 targets. For simplicity, these criteria are mostly based on assumptions such as linear progress towards 2030 targets, so should be interpreted with caution. Nevertheless, they provide a high-level indication of progress to date.

A **"trend assessment"** (trend-positive or trend-negative) adds granularity by showing whether the year-on-year change has brought each indicator closer to or further away from the trajectory required to achieve 2030 targets.

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[2] Shattock AJ, Johnson HC, Sim SY et al. Contribution of vaccination to improved survival and health: modelling 50 years of the Expanded Programme on Immunization. Lancet. 2024;403(10441):2307-2316. doi: 10.1016/S0140-6736(24)00850-X.

# 03

# IA2030
# IMPACT GOAL
# INDICATORS

TABLE 1
**IA2030 impact goal indicators**

| Impact Goal | Indicator | 2030 target | 2023 Progress towards 2030 target* |
|---|---|---|---|
| **01 PREVENT DISEASE** | **1.1** Number of future deaths averted through immunization† | **50 million** future deaths averted by immunization in 2021-2030 | **OFF-TRACK** 4.19 million future deaths averted in 2023, 9.3% below 2023 target |
| | **1.2** Number and proportion of countries achieving regional or global VPD control, elimination, and eradication targets | **All countries** achieve targets Eradication target for polio (WPV) and elimination targets for measles, rubella, and maternal and neonatal tetanus (MNT). | **OFF-TRACK** 80 countries have achieved all eradication and elimination targets |
| | **1.3** Number of large or disruptive VPD outbreaks | **Declining trend** in the annual number of large or disruptive VPD outbreaks | **OFF-TRACK** 109 large or disruptive outbreaks in 2023, a 43% increase over baseline |
| **02 PROMOTE EQUITY** | **2.1** Number of zero-dose children | **50%** reduction in number of zero-dose children | **OFF-TRACK** 14.5 million zero-dose children, 33% more than the 2023 target |
| | **2.2** Introduction of new or under-utilized vaccines in low- and middle-income countries | **500** vaccine introductions | **ON-TRACK** 258 introductions since 2021, exceeding the 2023 target by 108 |
| **03 BUILD STRONG IMMUNIZATION PROGRAMMES** | **3.1** Vaccination coverage across the life-course | **90% coverage** of full course for selected vaccines | **OFF-TRACK** 2023 coverage target hit for PCV3 but not DTP3, MCV2 or HPVc |
| | **3.2** UHC Service Coverage Index (SCI) | Universal Health Coverage **increase** in all countries, regions and globally | **ON-TRACK** 71 countries reported an increase in UHC-SCI score in 2021, 52 more than 2021 target |

* Annual targets are mostly based on simplistic assumptions, such as linear progress from baseline to 2030, so should be seen as approximate milestones providing an indication of progress to date.

† Estimates exclude deaths averted due to COVID-19 vaccination. Annual target for deaths averted is modelled based on annual coverage targets.

# IMPACT GOAL 1.1
## Future deaths averted through immunization

### WHAT IS THE INDICATOR?

Estimated number of deaths that will be averted by vaccination against 14 pathogens if IA2030 introduction and coverage targets are achieved.

### WHAT DOES IT TELL US?

The number of **lives saved** by vaccines during the period of IA2030 (2021-2030) and the number of **avoidable deaths** that will occur as a result of the failure to reach IA2030 targets.

### 2030 TARGET

50 million deaths averted over the IA2030 decade. This is the estimated number of deaths that will be averted if all IA2030 coverage and introduction targets are met.

**2023 summary:**

- **4.19 million future deaths were averted by vaccination against 14 key pathogens in 2023.**

- **Three-quarters of these deaths averted were due to prevention of measles, hepatitis B and pertussis infections.**

- **The number of future deaths averted by vaccination in 2023 was 9.3% lower than initially targeted, which will lead to an additional 430,000 future deaths from vaccine-preventable diseases that could have been avoided.**

According to initial modelling, an estimated 50 million deaths will be averted due to vaccines administered between 2021 and 2030 against 14 pathogens, if IA2030 targets are met each year. This figure has been recalculated based on 2023 coverage and introductions to date, as well as updated population estimates (Figure 1).

The latest modelling suggests that an estimated 4.19 million future deaths have been averted by vaccination against

14 key pathogens in 2023, a slight increase on 2022 but still below the 2019 baseline. The largest proportion of future deaths averted is due to prevention of measles (38.9%), hepatitis B (26.9%) and pertussis (11.2%). The area in which the greatest number of lives saved by vaccination was the WHO African Region, which also saw an increase in the number of deaths averted in 2023 compared to 2022 (Figure 2).

The number of deaths averted in 2023 was 9.3% lower than initially targeted, driven primarily by fewer introductions and lower than anticipated coverage for human papillomavirus (HPV), measles, meningitis A, yellow fever and hepatitis B vaccines (Figure 3). Missing the IA2030 target for 2023 will lead to an estimated additional 430,000 future premature deaths from the 14 vaccine-preventable diseases included in the analysis.

Figures do not include deaths averted by COVID-19 or malaria vaccination. The analysis also does not consider the multiple other benefits of vaccination, including prevention of disease and disability. Future analyses will include a wider range of vaccine-preventable diseases.

FIGURE 1

**Estimated future deaths averted by vaccination against 14 pathogens in a given year**
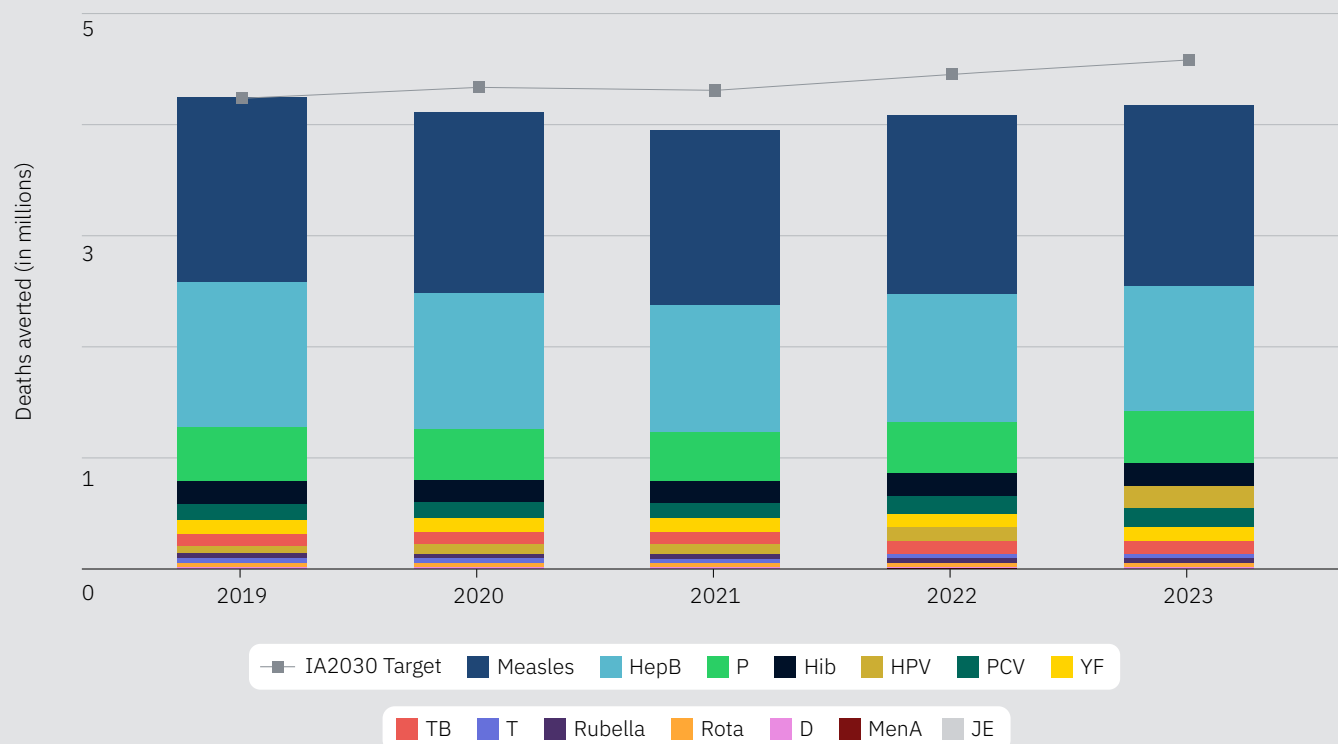


**Note:** Numbers are derived from modelling based on actual coverage and IA2030 targets. D: diphtheria; HepB: hepatitis B virus; Hib: Haemophilus influenzae type b; HPV: human papillomavirus; JE: Japanese encephalitis; MenA: *Neisseria meningitidis* serogroup A; P: pertussis; PCV: *Streptococcus pneumoniae*; Rota: rotavirus; T: tetanus; TB: tuberculosis (BCG); YF: yellow fever.

FIGURE 2

**Estimated future deaths averted by vaccination against 14 pathogens in a given year broken down by WHO region**
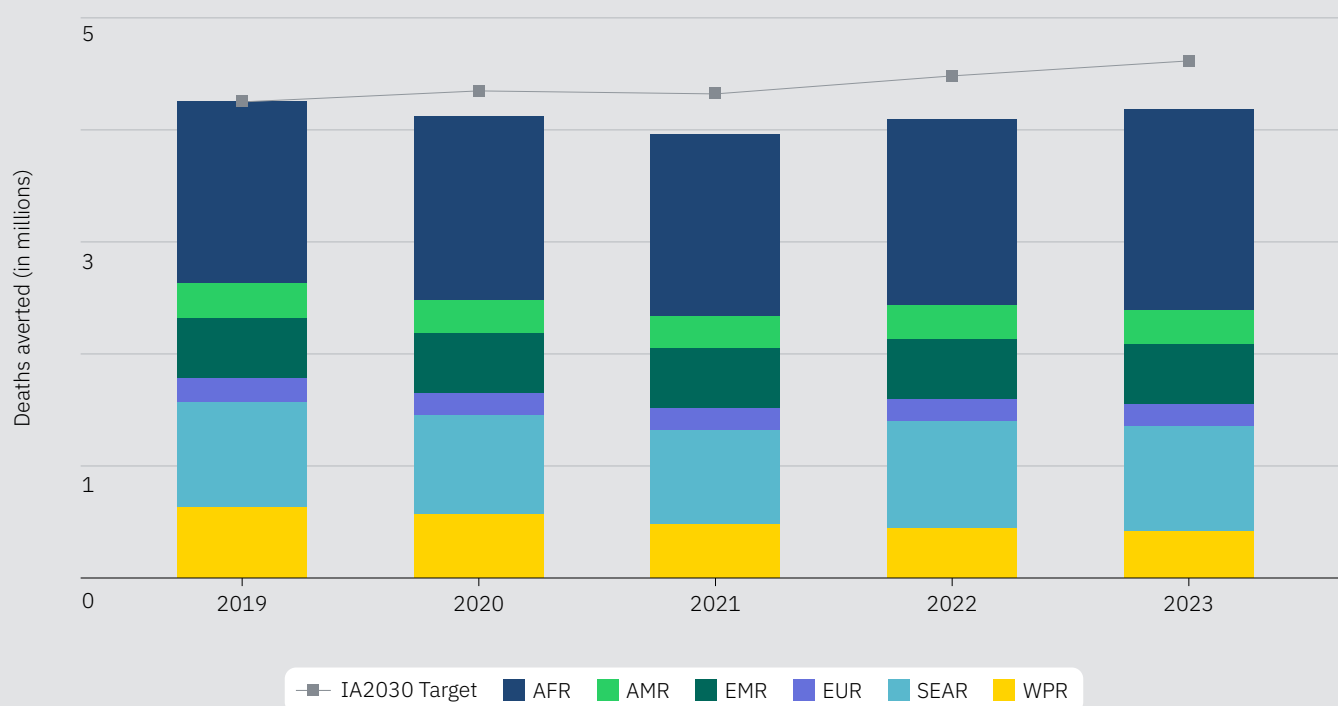


**Note:** AFR: African Region; AMR: Region of the Americas; EMR: Eastern Mediterranean Region; EUR: European Region; SEAR: South-East Asia Region; WPR: Western Pacific Region.

FIGURE 3

## Estimated future deaths averted by vaccination against 14 pathogens in a given year broken down by WHO region and pathogen



**AFR**

**AMR**

**EMR**

**EUR**

**SEAR**

**WPR**

Deaths averted (in millions)

Legend: IA2030 Target · Measles · HepB · P · Hib · HPV · PCV · YF · TB · T · Rubella · Rota · D · MenA · JE

**Note:** Numbers are derived from modelling based on actual coverage and IA2030 targets. D: diphtheria; HepB: hepatitis B virus; Hib: Haemophilus influenzae type b; HPV: human papillomavirus; JE: Japanese encephalitis; MenA: *Neisseria meningitidis* serogroup A; P: pertussis; PCV: *Streptococcus pneumoniae*; Rota: rotavirus; T: tetanus; TB: tuberculosis (BCG); YF: yellow fever.
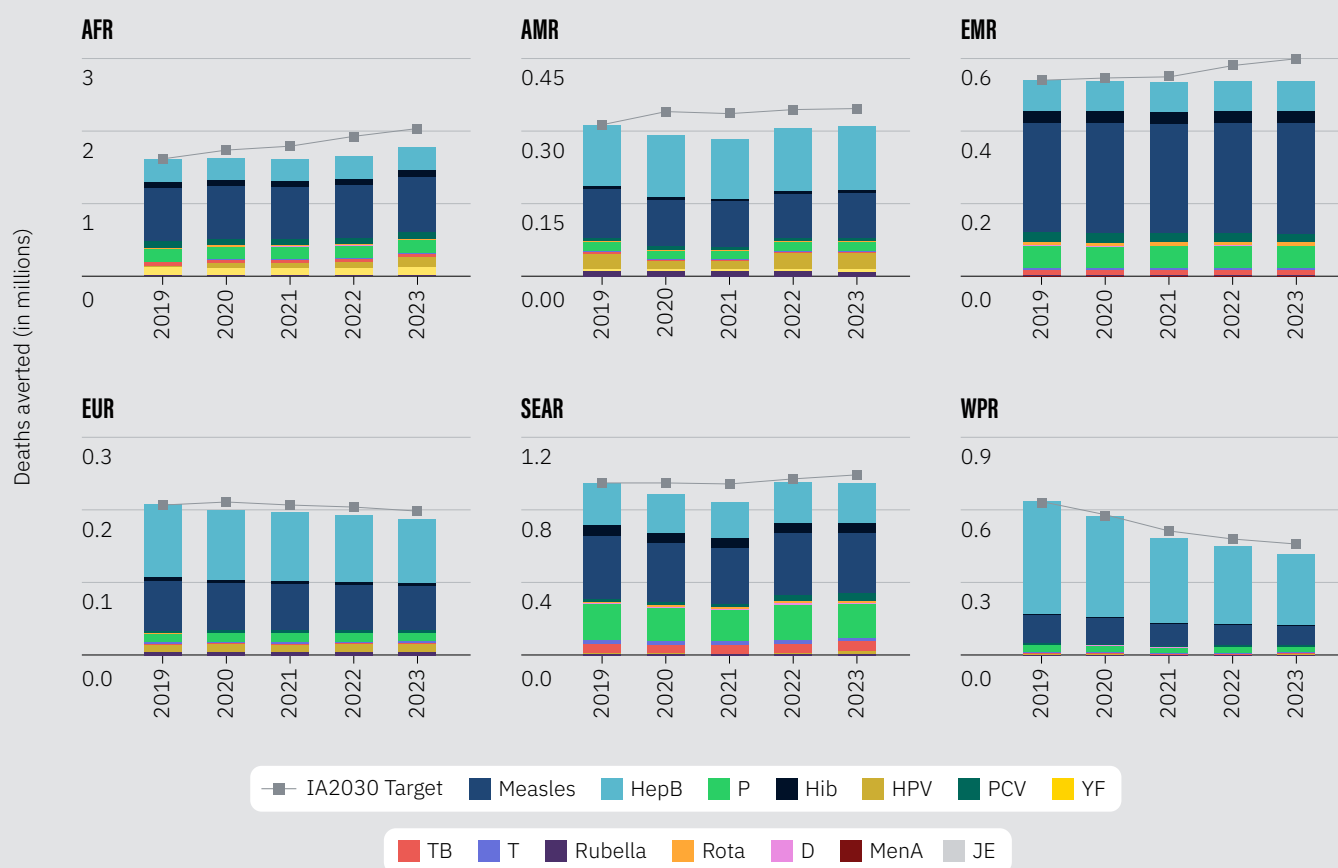
# IMPACT GOAL 1.2
## Vaccine-preventable disease control and eradication

**WHAT IS THE INDICATOR?**
Number and percentage of countries meeting vaccine-preventable disease control, elimination and eradication criteria.

**WHAT DOES IT TELL US?**
How countries are faring in the control, elimination and eradication of key vaccine-preventable diseases.

**2030 TARGET**
All global and regional elimination and eradication goals achieved.

### 2023 summary (Figures 4, 5):

- **Wild poliovirus remains endemic in two countries (Afghanistan and Pakistan).**

- **No updated figures are available for measles and rubella elimination in 2023 as decisions have not yet been communicated by all Regional Verification Commissions (RVCs).**

- **One additional country (Mali) achieved maternal and neonatal tetanus elimination in 2023, bringing the total number to 183 and leaving 11 countries yet to achieve elimination**.

**Polio**: Wild poliovirus remains endemic in two countries (Afghanistan and Pakistan). In 2023, six cases of type 1 wild poliovirus were detected in Afghanistan and six cases in Pakistan (compared with two and 20, respectively, in 2022). Moreover, 62 wild poliovirus type 1 isolates were detected from other sources (such as environmental samples) in Afghanistan and 127 in Pakistan. The endemic countries have continued to report cases of wild poliovirus (23 in Afghanistan and 48 in Pakistan by 14 November 2024).

**Measles and rubella**: At the country level, the evaluation of progress towards measles and rubella elimination is based on reports submitted by National Verification Committees (NVCs), which are evaluated by Regional Verification Commissions (RVCs). In 2022, 83 countries (43%) had been verified for measles elimination and 99 (51%) for rubella elimination. RVCs met from September through December 2024 to review 2023 data but not all have communicated their conclusions yet.

Following the 2024 RVC meeting in the WHO Western Pacific Region, the number of countries with verified measles and rubella elimination status was unchanged. After the 2024 RVC meeting in the WHO South-East Asia Region, one country (Sri Lanka) lost its measles elimination status.

In November 2024, it was announced that measles and rubella elimination in Brazil had been reverified by the Measles and Rubella Elimination Regional Monitoring and Re-Verification Commission[3]. Following reverification of Venezuela for measles elimination in 2023, Brazil was the last remaining country in the WHO Region of the Americas yet to be reverified. With reverification of Brazil, in 2024 the region therefore regained its status as a region free of endemic measles.

**Maternal and neonatal tetanus**: Following the validation of five northern regions in 2023, Mali has been validated for maternal and neonatal tetanus elimination, meaning 11 countries have yet to eliminate the disease. All countries in the WHO Region of the Americas and the WHO European and South-East Asian Regions have achieved maternal and neonatal tetanus elimination.

Progress continues to be made. Guinea was validated for elimination in June 2024 and four of the six zones in Nigeria have been validated. Sindh Province in Pakistan was validated in December 2024. Pre-validation assessments in the southern governorates of Yemen and South Sudan were postponed to 2024.

**Hepatitis B**: Regional control goals for hepatitis B have been set by all six WHO regions. Hepatitis B prevalence criteria for elimination and target dates for control vary by region, as does the process for validating control goals. All regions except the WHO South-East Asia Region have active verification committees. Data on hepatitis B control will be included in future Global Progress Reports.

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[3] https://www.paho.org/en/news/12-11-2024-paho-re-verifies-brazil-measles-free-country

FIGURE 4

**Status of eradication and elimination targets for wild poliovirus, measles, rubella, and maternal and neonatal tetanus in 2023, showing country counts and percentage of countries achieving target**
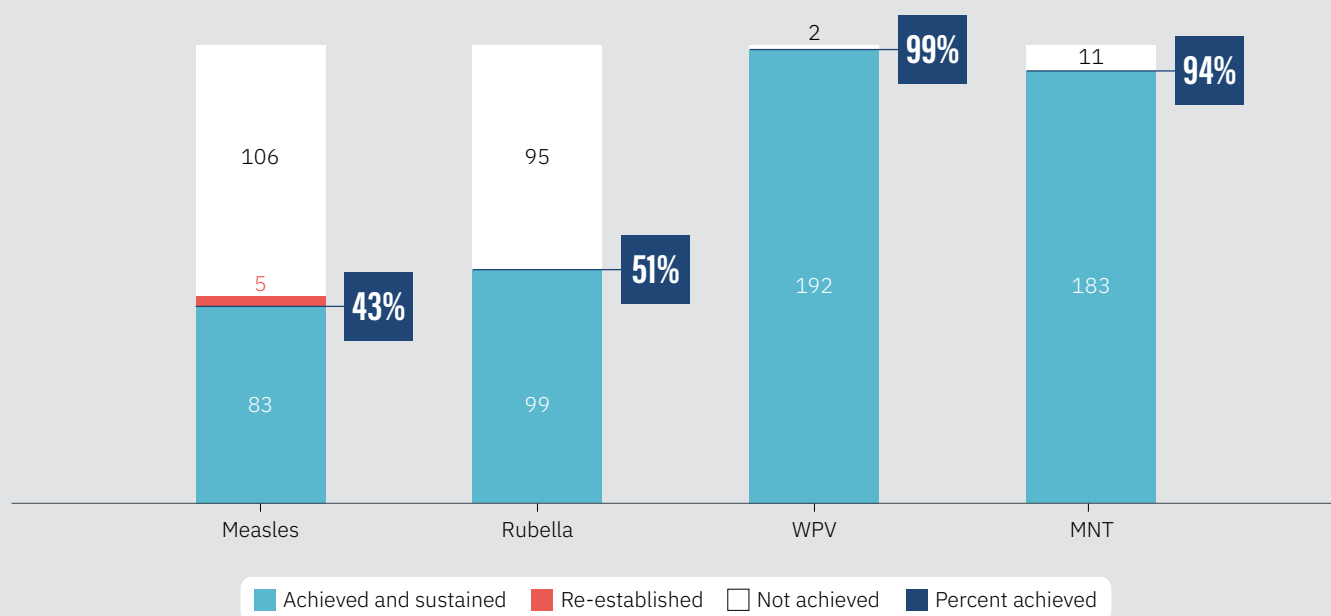


**Note:** Measles and rubella figures reflect the situation in 2022.

FIGURE 5

**Count and percentage of countries by WHO region that have achieved eradication or elimination of wild poliovirus, measles, rubella, and maternal and neonatal tetanus in 2023[4]**

| WHO Region | Eradication | Elimination | | |
|---|---|---|---|---|
| | **WPV** | **Measles*** | **Rubella*** | **MNT** |
| **AFR**<br>47 countries | 47<br>100% | 0<br>0% | 0<br>0% | 42<br>89% |
| **AMR**<br>35 countries | 35<br>100% | 34<br>97% | 35<br>100% | 35<br>100% |
| **EMR**<br>21 countries | 19<br>90% | 4<br>19% | 4<br>19% | 16<br>76% |
| **EUR**<br>53 countries | 53<br>100% | 34<br>64% | 50<br>94% | 53<br>100% |
| **SEAR**<br>11 countries | 11<br>100% | 5<br>45% | 5<br>45% | 11<br>100% |
| **WPR**<br>27 countries | 27<br>100% | 6<br>22% | 5<br>19% | 26<br>96% |

**Regional status**  ■ Achieved  ■ Not achieved

*For measles and rubella, status relates to 2022 data. With reverification of Brazil in November 2024, the Region of the Americas (AMRO) has achieved regional elimination of measles.

[4] In the WHO Western Pacific Region, Pacific Island countries and areas are verified as one group for measles and rubella elimination, so regional verification is targeting 17 countries and country groups.

# IMPACT GOAL 1.3
## Large or disruptive vaccine-preventable disease outbreaks

### WHAT IS THE INDICATOR?

Number of countries experiencing large or disruptive outbreaks of key vaccine-preventable diseases[5,6].

### WHAT DOES IT TELL US?

How well countries are preventing and containing infectious disease outbreaks through vaccination (and other interventions).

### 2030 TARGET

A declining trend in the number of large or disruptive outbreaks.

### 2023 summary:

- **Compared with 2022, an increased number of large or disruptive outbreaks were seen in 2023 for measles, circulating vaccine-derived poliovirus (cVDPV), cholera, meningococcal disease and yellow fever.**

- **For wild poliovirus, the number of outbreaks fell by one as the outbreak affecting Malawi and Mozambique in 2021 and 2022 was declared closed.**

- **The increases reflect inadequate routine immunization coverage and delayed and low-coverage supplementary immunization campaigns, which have created substantial immunity gaps in populations.**

Prevention of vaccine-preventable disease outbreaks is dependent on consistently high vaccine coverage across populations, backed up by preventive campaigns when necessary. In addition, rapid and effective outbreak detection and response, including vaccination and other measures, are needed to prevent small-scale outbreaks from becoming large or disruptive.

The number of countries experiencing large or disruptive **measles outbreaks** rose by 54% in 2023 compared to 2022, from 37 outbreaks to 57 (Figures 6, 7). Increases were also seen for **polio (cVDPV), cholera, meningococcal**

**disease and yellow fever**. The number of countries affected by wild poliovirus returned to the 2019 baseline figure of two. No new large or disruptive vaccine-preventable Ebola virus disease outbreaks have been reported for three consecutive years since 2021.

- **Measles:** Large or disruptive **measles outbreaks** primarily affected the WHO African, Eastern Mediterranean and South-East Asia Regions (outbreaks in 26, 13 and four countries, respectively). The European Region experienced outbreaks in 10 countries, nine more than in 2022.

- These patterns indicate that multiple countries are facing challenges in achieving adequate population immunity for measles. This is due to weak immunization and primary healthcare systems and barriers to the implementation of high-quality campaigns to fill the consequent immunity gaps. Global policy favouring high campaign coverage over timeliness may also be having an impact.

- An estimated 10,341,000 measles cases occurred in 2023, a 20% increase over 2022[7]. The estimated number of measles deaths fell by 8% to 107,500 in 2023, mainly because more cases occurred in countries with a lower risk of death. Even so, in 2023 nearly 300 people, mostly children, died every day from a disease that is readily preventable by vaccination.

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[5] Definitions of "large or disruptive" differ by disease.

[6] For three infections (meningococcal disease, yellow fever and Ebola virus disease) counts are based on outbreaks rather than countries.

[7] Minta AA, Ferrari M, Antoni S et al. Progress Toward Measles Elimination - Worldwide, 2000-2023. MMWR Morb Mortal Wkly Rep. 2024;73(45):1036-1042. doi: 10.15585/mmwr.mm7345a4.

FIGURE 6

**Number of countries experiencing large or disruptive outbreaks between baseline (2018–2020 average, except for measles, which is based on a 2011–2020 average) and in 2021, 2022 and 2023 for reported vaccine-preventable diseases**
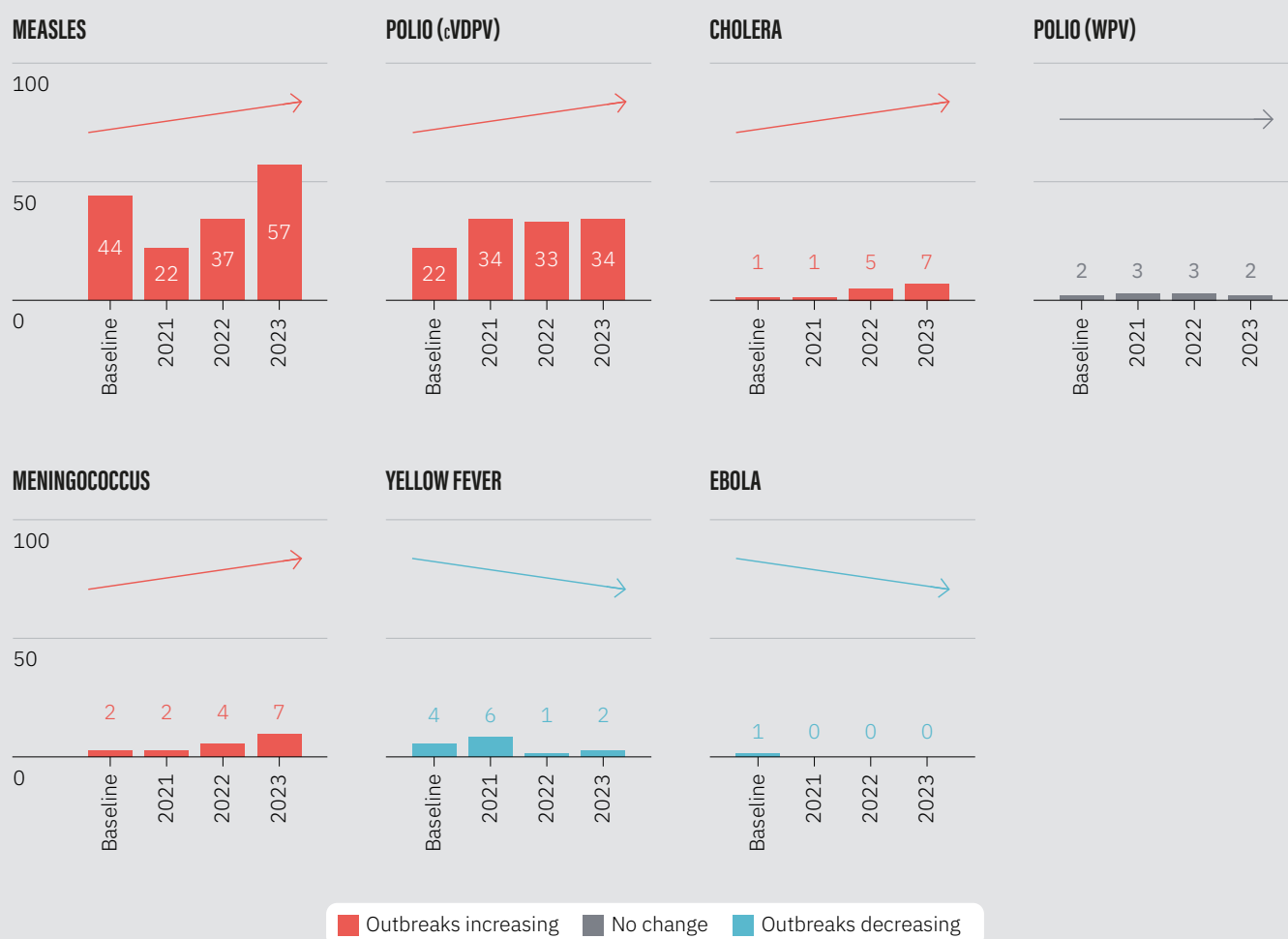


**Note:** Orange bars indicate progress is off-track to meet 2030 targets; blue bars indicate progress is on-track. For measles, cVDPV, wild poliovirus and cholera, outbreak count is based on the number of countries affected. For meningococcal disease, yellow fever and Ebola virus disease, the count is based on individual outbreak numbers.

- **Cholera**: Countries in the African Region (Ethiopia, Malawi, Mozambique, Zimbabwe), the Region of the Americas (Haiti) and Eastern Mediterranean Region (Afghanistan, Syria) were all affected by large or disruptive **cholera outbreaks** in 2023. The reasons for the increase compared to 2022 and baseline are multifactorial and include the growing impact of extreme weather events due to climate change.

- Use of **oral cholera vaccine (OCV)**, in conjunction with water, sanitation and hygiene interventions, helped to prevent some cholera outbreaks from becoming large or disruptive. However, vaccine supply constraints limited the overall impact of OCV, particularly its preventive deployment outside outbreak contexts.

- **Meningococcal disease**: Large or disruptive **meningococcal disease outbreaks** were seen in the African meningitis belt. Seven outbreaks (two in Niger and five in Nigeria) occurred in 2023, compared with four in 2022. No cases of meningococcal A disease have been detected in the meningitis belt since 2017 due to widespread use of meningococcal A conjugate vaccine. However, outbreaks caused by other meningococcal serogroups continue to occur[8].

[8] As multivalent meningococcal vaccines are available for outbreak response in the African meningitis belt and elsewhere, all meningococcal outbreaks regardless of serogroup are measured by this indicator.

- **Poliovirus**: Wild poliovirus continued to affect two endemic countries (Afghanistan and Pakistan) in the Eastern Mediterranean Region. No cases were detected in any other country in 2023.

- **cVDPV outbreaks** (types 1 and 2) affected every region in 2023 except the Region of the Americas and the Western Pacific Region, with the African Region particularly affected (27 outbreaks). The data underscore the continuing importance of achieving high IPV coverage, including in challenging geographies.

- **Ebola virus disease**: No vaccine-preventable large or disruptive **Ebola virus disease outbreaks** occurred during 2021–2023. All the 2022 outbreaks caused by *Orthoebolavirus zairense*, for which WHO-prequalified vaccines are available, were contained before reaching the threshold to be considered large or disruptive, thanks to prompt detection and comprehensive multifaceted responses[9].

- **Yellow fever**: In 2023, two large or disruptive **yellow fever outbreaks** occurred in the African Region – one in Cameroon and one in Central African Republic. Increasing population immunity, particularly due to the implementation of the Eliminating Yellow Fever

Epidemics (EYE) strategy and associated preventive yellow fever routine immunization and campaigns in the Region of the Americas, has helped to reduce the risk of such large or disruptive outbreaks, even as sporadic cases and small outbreaks have continued to appear.

- However, since 2020 a resurgence of yellow fever outbreaks has been seen in some countries with a history of preventive mass vaccination campaigns, where routine immunization has not been able to sustain the gains from the campaigns and/or vulnerable, migrant and hard-to-reach populations were missed by the campaigns. This underscores the need for urgent action to close immunity gaps in these countries via targeted vaccination interventions, while efforts to strengthen routine immunization continue[10].

A surge in outbreaks through 2022 and 2023 underscores the need for urgent action to quash current outbreaks and build population immunity to prevent their recurrence. There is an urgent need to reduce the number of people at risk through strengthening of routine immunization and timely campaign strategies. Effective outbreak detection and response is also essential to contain outbreaks before they become large or disruptive, highlighting the need for timely and accurate surveillance and monitoring.

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[9] Although a large and disruptive outbreak of Sudan virus disease (caused by *Orthoebolavirus sudanense*) occurred in Uganda in 2022, it is not included in IA2030 reporting because there is no prequalified vaccine for this virus.

[10] Global yellow fever update, 2023. WER9935-eng-fre.pdf (who.int)

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FIGURE 7

**Number of large or disruptive outbreaks by region in 2023 and direction of multiyear trend (comparison with baseline)**

| WHO Region | Cholera | Ebola | Measles | Meningococcus | Polio (cVDPV) | Polio (WPV) | Yellow Fever |
|---|---|---|---|---|---|---|---|
| AFR | 4 | 0 | 26 | 7 | 27 | 0 | 2 |
| AMR | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| EMR | 2 | 0 | 13 | 0 | 4 | 2 | 0 |
| EUR | 0 | 0 | 11 | 0 | 2 | 0 | 0 |
| SEAR | 0 | 0 | 4 | 0 | 1 | 0 | 0 |
| WPR | 0 | 0 | 3 | 0 | 0 | 0 | 0 |
| **Global** | **7** | **0** | **57** | **7** | **34** | **2** | **2** |

Trend directionality:  ■ Worsening or outbreaks increasing  ■ Improving or outbreaks decreasing  ■ No change

# IMPACT GOAL 2.1
## Numbers of zero-dose children

### WHAT IS THE INDICATOR?

The number of children under one year of age who did not receive DTP1.

### WHAT DOES IT TELL US?

How many children have been missed completely by immunization services.

### 2030 TARGET

6.4 million (50% reduction from baseline)

**2023 summary:**

- **The number of zero-dose children globally increased in 2023, following a decrease in 2022.**

- **The WHO African Region has the greatest numbers of zero-dose children, although numbers were lower than in 2022**.

The estimated numbers of zero-dose children globally increased by 0.6 million in 2023, from 13.9 million in 2022 to 14.5 million. This is down from a pandemic high of 17.7 million in 2021 but is still higher than the 12.8 million in baseline year 2019 (Figure 8).

FIGURE 8

**Trends in the numbers of zero-dose children (in millions) by WHO region**
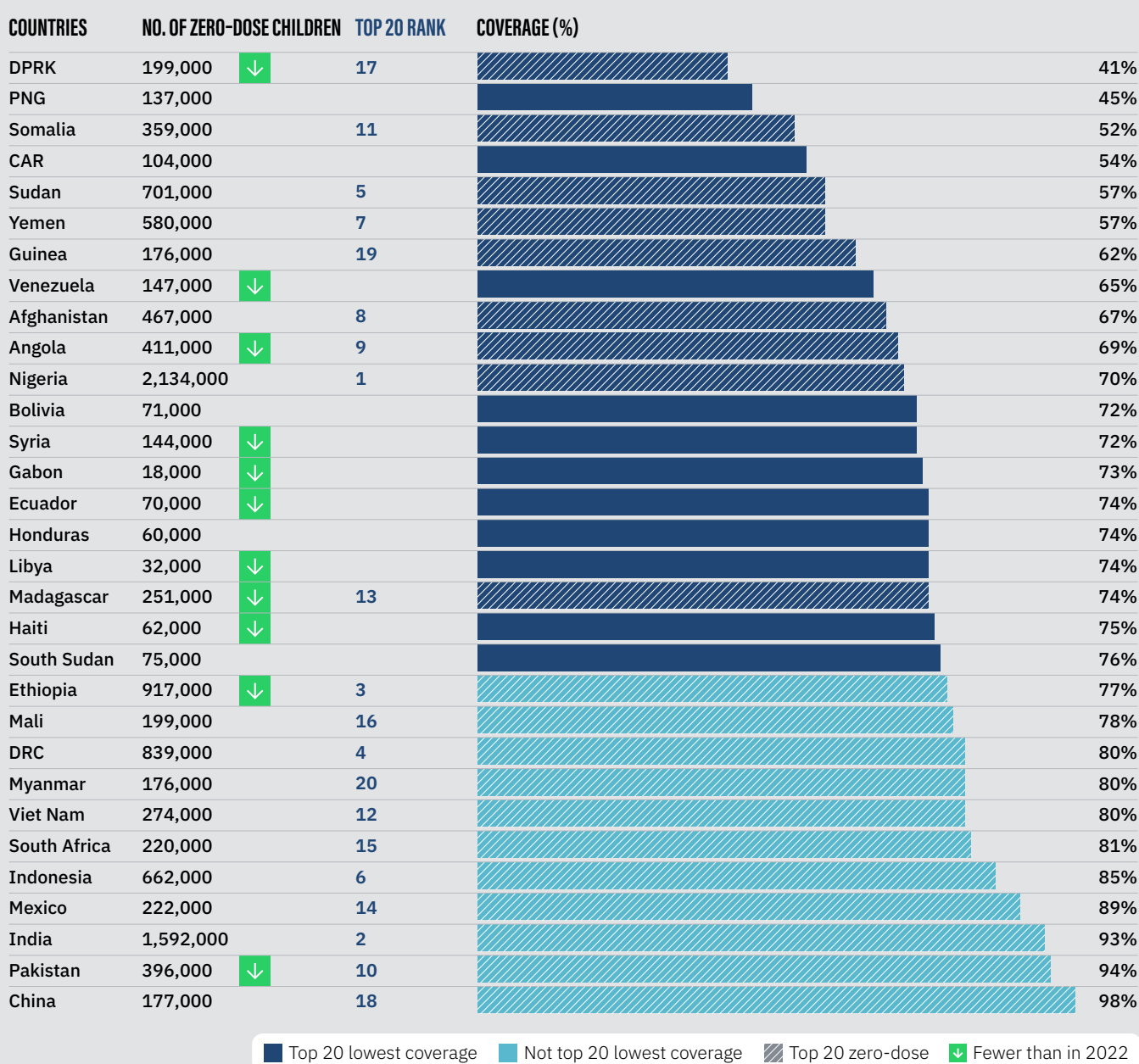


IA2030 GLOBAL PROGRESS REPORT 2024
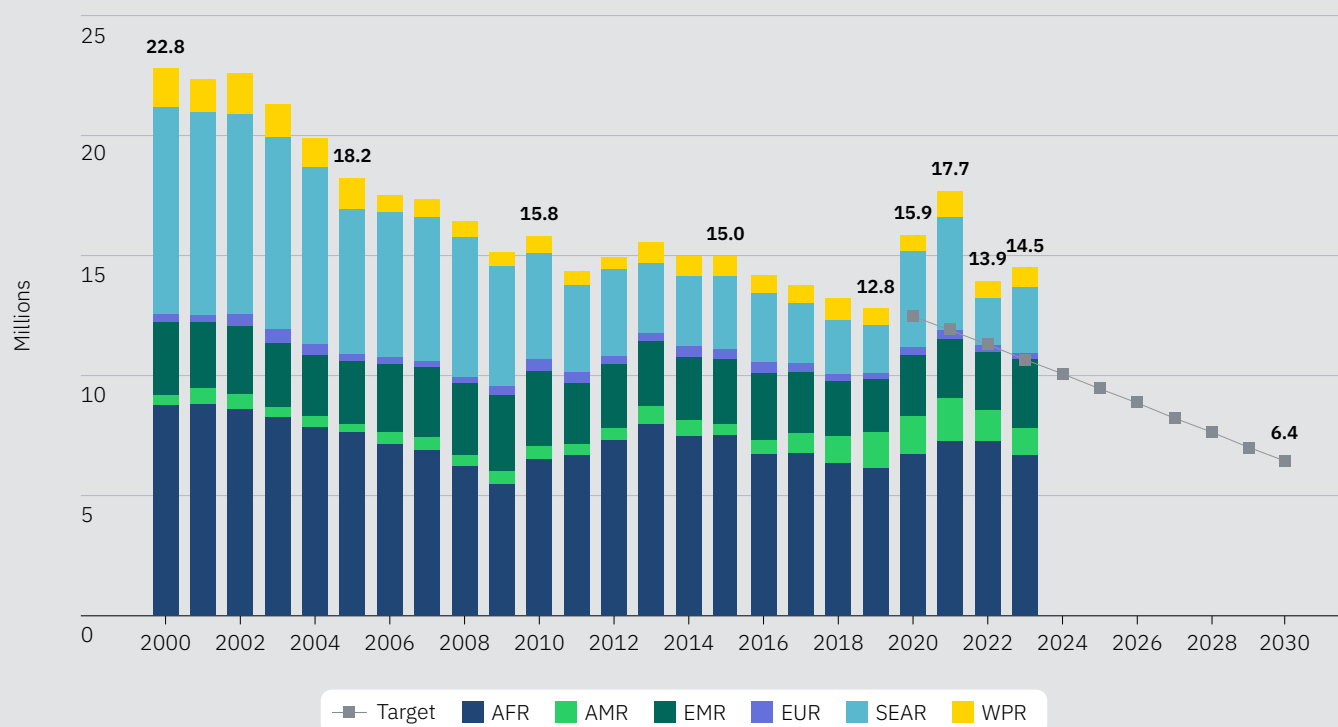
An escalation of conflict in the WHO Eastern Mediterranean Region likely contributed to a notable increase in the numbers of zero-dose children. The South-East Asian Region also reported more zero-dose children than in 2022, possibly because the number of zero-dose children in 2022 was underestimated because catch-up vaccinations of older children were counted as infant vaccinations.

Numbers of zero-dose children fell in both the African Region and the Region of the Americas in 2023 (despite an increase in the size of the birth cohort in the former).

**Location of zero-dose children, by country**: Figure 9 identifies the countries with the highest proportion of zero-dose children (lowest DTP1 coverage) and those with the highest absolute numbers of zero-dose children. Countries with large populations may appear in the list of 20 countries with the greatest numbers of zero-dose children despite having relatively high DTP1 coverage.

## FIGURE 9
### Countries ranked according to DTP1 coverage and absolute number of zero-dose children in 2023

| COUNTRIES | NO. OF ZERO-DOSE CHILDREN | | TOP 20 RANK | COVERAGE (%) |
|---|---|---|---|---|
| DPRK | 199,000 | ↓ | 17 | 41% |
| PNG | 137,000 | | | 45% |
| Somalia | 359,000 | | 11 | 52% |
| CAR | 104,000 | | | 54% |
| Sudan | 701,000 | | 5 | 57% |
| Yemen | 580,000 | | 7 | 57% |
| Guinea | 176,000 | | 19 | 62% |
| Venezuela | 147,000 | ↓ | | 65% |
| Afghanistan | 467,000 | | 8 | 67% |
| Angola | 411,000 | ↓ | 9 | 69% |
| Nigeria | 2,134,000 | | 1 | 70% |
| Bolivia | 71,000 | | | 72% |
| Syria | 144,000 | ↓ | | 72% |
| Gabon | 18,000 | ↓ | | 73% |
| Ecuador | 70,000 | ↓ | | 74% |
| Honduras | 60,000 | | | 74% |
| Libya | 32,000 | ↓ | | 74% |
| Madagascar | 251,000 | ↓ | 13 | 74% |
| Haiti | 62,000 | ↓ | | 75% |
| South Sudan | 75,000 | | | 76% |
| Ethiopia | 917,000 | ↓ | 3 | 77% |
| Mali | 199,000 | | 16 | 78% |
| DRC | 839,000 | | 4 | 80% |
| Myanmar | 176,000 | | 20 | 80% |
| Viet Nam | 274,000 | | 12 | 80% |
| South Africa | 220,000 | | 15 | 81% |
| Indonesia | 662,000 | | 6 | 85% |
| Mexico | 222,000 | | 14 | 89% |
| India | 1,592,000 | | 2 | 93% |
| Pakistan | 396,000 | ↓ | 10 | 94% |
| China | 177,000 | | 18 | 98% |

■ Top 20 lowest coverage  ■ Not top 20 lowest coverage  ▨ Top 20 zero-dose  ↓ Fewer than in 2022

**Note:** DPRK: Democratic People's Republic of Korea; CAR: Central African Republic; DRC: Democratic Republic of the Congo; PNG: Papua New Guinea.

# IMPACT GOAL 2.2
## New vaccine introductions

### WHAT IS THE INDICATOR?

The number of new or under-utilized vaccines introduced in low- and middle-income countries

### WHAT DOES IT TELL US?

Country progress in introducing WHO-recommended vaccines into their national schedules.

### 2030 TARGET
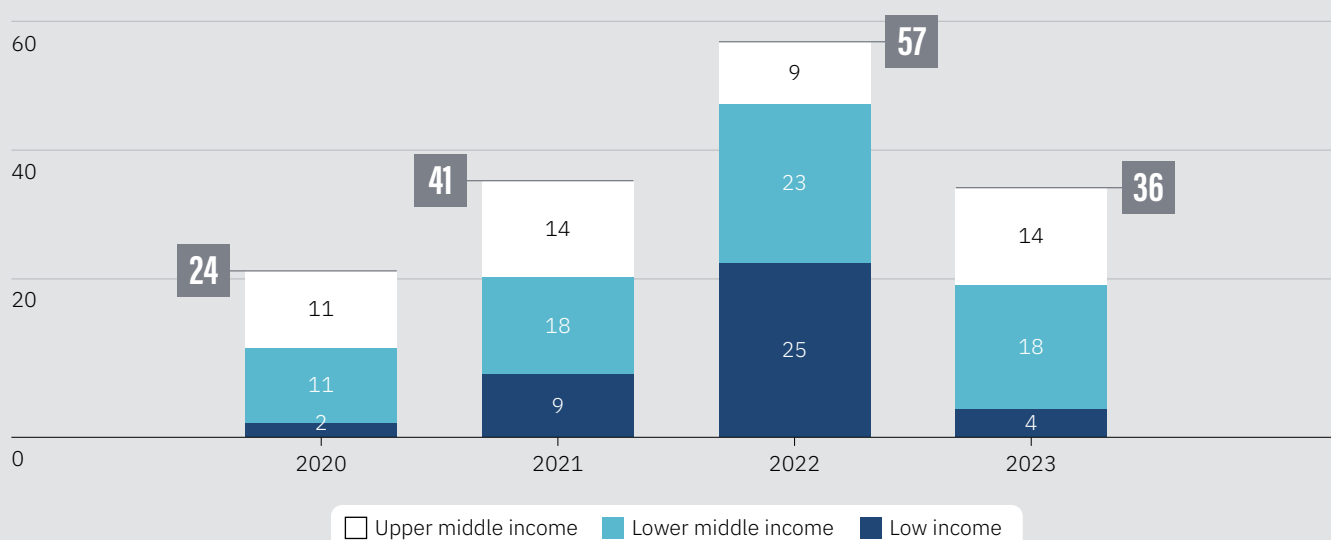
500 introductions in low- and middle-income countries

## 2023 summary:

- **The number of new vaccine introductions in low- and middle-income countries is more than halfway to the 2030 target of 500 introductions, reaching a cumulative total of 258 in 2023.**

- **Although this indicator is on-track, this reflects the high number of COVID-19 vaccine introductions in 2021.**

- **The number of new introductions was lower in 2023 than in 2022, particularly in low-income countries (Figure 10).**

- **A total of 36 new vaccines were introduced in 2023. This number needs to be sustained in order for the 2030 target to be met.**

- **Key barriers to vaccine introductions include cost and programmatic capacity**.

The 2030 target for new introductions (500) was based on an assessment of the number of WHO-recommended vaccines, including COVID-19 vaccine, yet to be introduced by low- and middle-income countries. Only universally recommended vaccines are counted, so the total number does not include introduction of vaccines recommended for use in only a subset of countries (e.g. malaria vaccine).

FIGURE 10

**Number of vaccine introductions in low- and middle-income countries 2020–2023 (excluding COVID-19 vaccine introductions)**



Legend: Upper middle income | Lower middle income | Low income

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The largest numbers of introductions in low- and middle-income countries in 2023 were of inactivated poliovirus vaccine second dose (IPV2) and human papillomavirus (HPV) vaccine (Figure 11).

Reporting changes: DTP booster doses are now reported separately, and national typhoid vaccine introductions are now included. Introductions of malaria and dengue vaccines will be included in future reports.

**Number of vaccine introductions in 2020–2023 in low- and middle-income countries, by vaccine type (including or excluding COVID-19 introductions)**
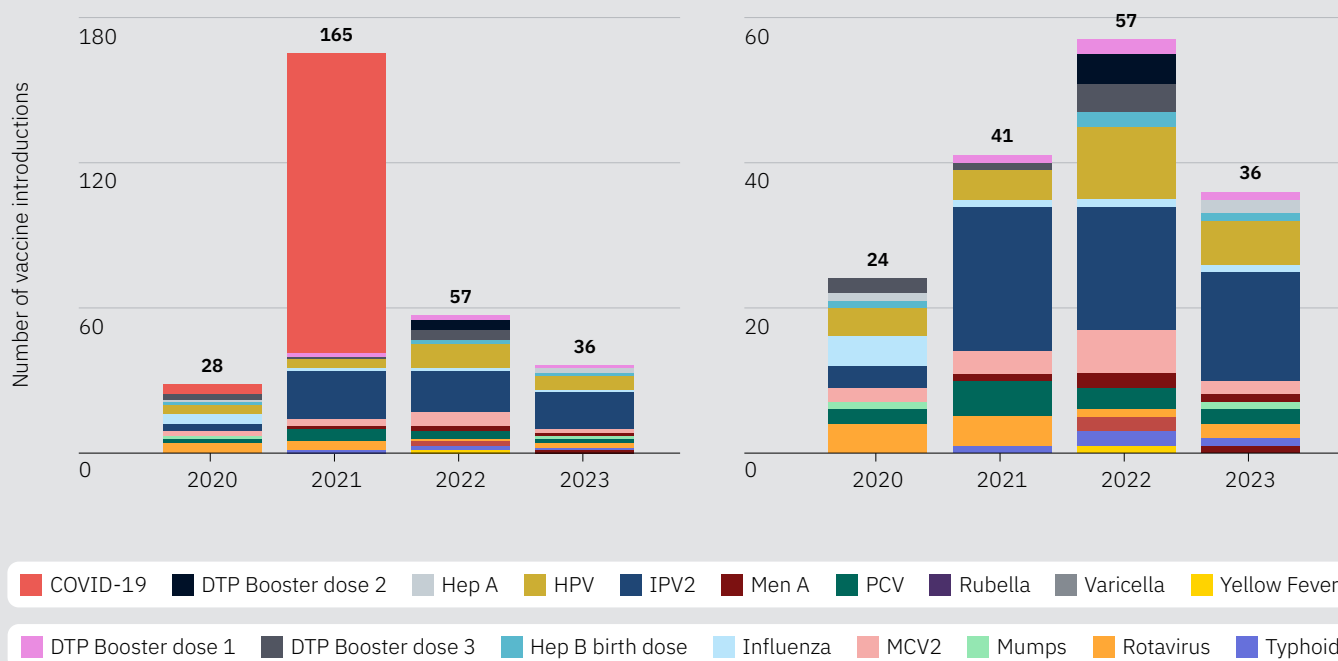


**Note:** Cook Islands and Niue are excluded as they are not classified by the World Bank. Venezuela is temporarily unclassified by the World Bank, but is considered as upper middle income based on 2019 classification.

**Number of remaining vaccine introductions in low- and middle-income countries**
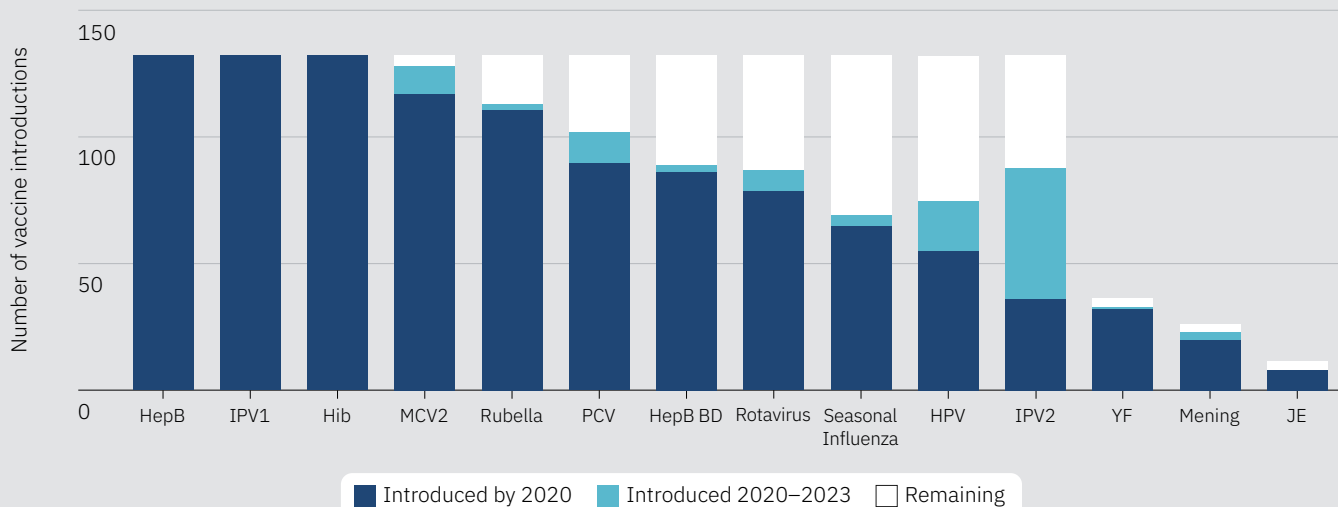


**Note:** Yellow fever vaccine (YFV), meningococcal vaccine and Japanese encephalitis (JE) vaccine are recommended in a subset of countries, based on disease epidemiology.

# IMPACT GOAL 3.1
## Vaccination coverage across the life course

### WHAT IS THE INDICATOR?

Coverage of four vaccines given at different ages – DTP3, MCV2, PCV3, HPVc

### WHAT DOES IT TELL US?

This indicator provides insight into the extension of vaccination to a wider range of age groups beyond the first year of life, through the second year of life and into adolescence.

### 2030 TARGET

90% average global coverage for all four vaccines.

**2023 summary:**

- **Globally, no significant increase in DTP3 and MCV2 coverage was seen in 2023.**

- **Global coverage of PCV3 and HPV vaccine is increasing rapidly, due to new introductions and increasing**

**coverage, although HPV vaccine coverage remains low overall (Figure 13).**

- **Encouraging progress is being made in the WHO African Region and in Gavi-eligible countries (Figure 14).**

FIGURE 13

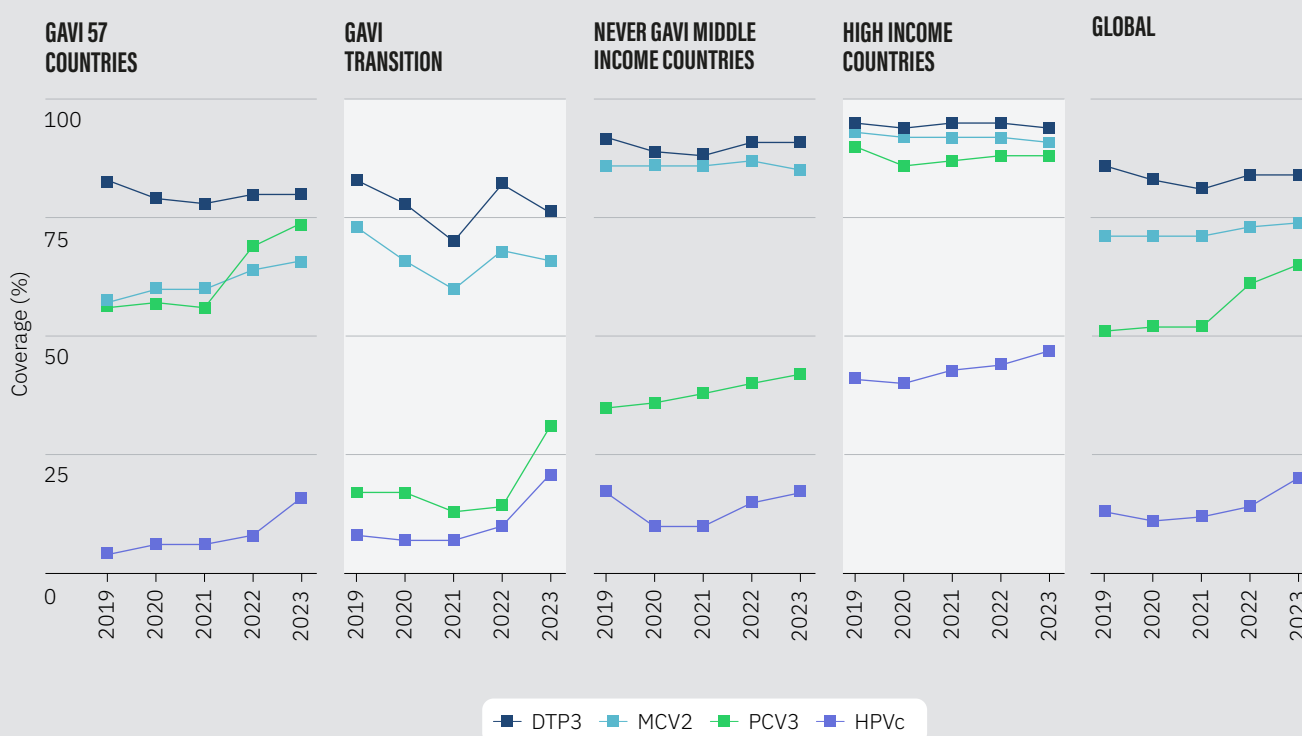**DTP3, MCV2, PCV3 and HPVc vaccine coverage globally and by WHO region**
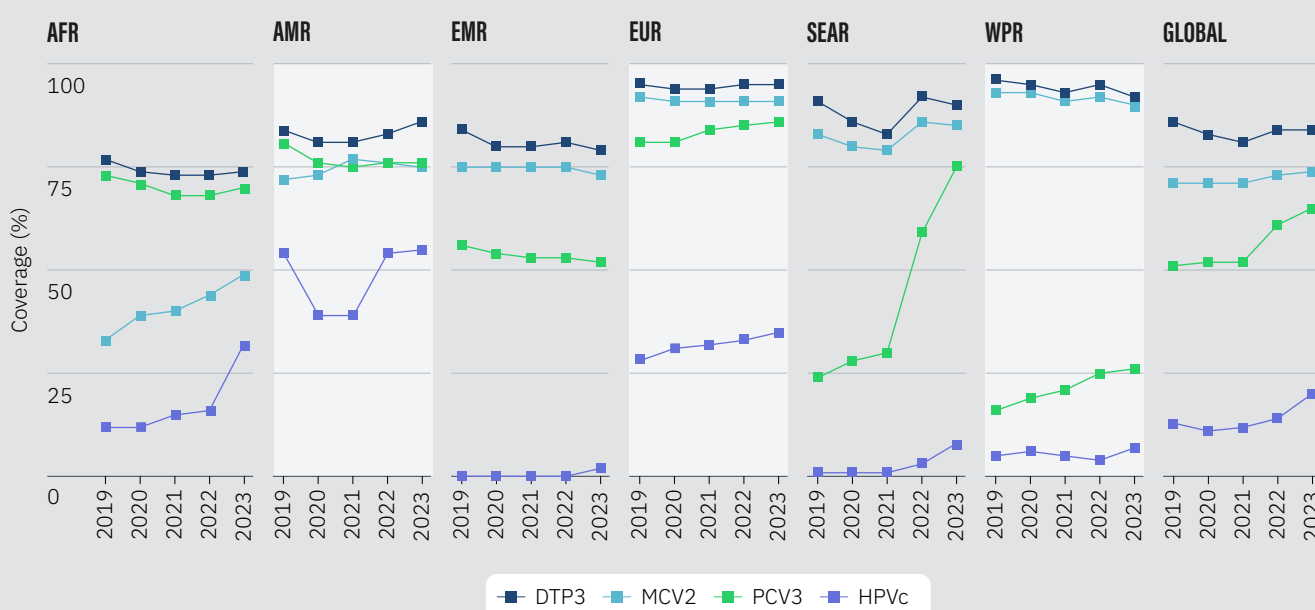


**Note:** HPVc: Full-course HPV vaccination, either one dose or two doses according to national schedules.

Apart from DTP3, coverage is increasing in Gavi-eligible countries and is close to the global average for the four vaccines (Figure 14). Increasing PCV3 and HPV coverage is seen in Gavi-transitioned countries, but MCV2 and DTP3 coverage declined in these countries in 2023 and is below 2019 baseline levels.

Middle-income countries that have never been eligible for Gavi support show DTP3 and MCV2 coverage broadly comparable to that seen in high-income countries. However, HPV and PCV3 coverage is markedly lower than in high-income countries (and, for PCV3, much lower than in Gavi-eligible countries). This likely reflects limited introductions in non-Gavi-eligible middle-income countries.

**DTP3, MCV2, PCV3 and HPVc vaccine coverage globally and by country income group**



**Note:** HPVc: Full-course HPV vaccination, either one dose or two doses according to national schedules.

**PCV3 coverage** is increasing, mostly because of its roll-out in two countries with large populations, India and Indonesia. In the 157 countries where PCV3 has been introduced, coverage has reached 83%, close to global DTP3 coverage.

**HPV vaccination**[11] is lagging the other coverage indicators, but the trend is positive, with increased coverage in the African and European Regions, and solid recovery in the Region of the Americas. Although increasing, coverage rates remain very low (<10%) in the Eastern Mediterranean, South-East Asian, and Western Pacific Regions. The lower coverage compared with PCV3 reflects a smaller number of introductions (129 countries) and lower average coverage in countries that have introduced HPV vaccination (54%). Given the surge of introductions following the policy shift to

single-dose vaccination, global HPV vaccine coverage should continue to rise.

The reach of HPV vaccine programmes varies markedly by region. Although only around 50% of girls in the African Region have access to HPV vaccine through national immunization programmes, 76% of these girls are actually reached. Access is very high in the Region of the Americas (>90%) and 71% of eligible girls are reached. In other regions, fewer girls have access to HPV vaccine and a smaller proportion of those eligible are reached (ranging from 26% in the WHO Western Pacific Region to 61% in the European and South-East Asian Regions).

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[11] IG3.1 tracks coverage of the full course of HPV vaccination, either one dose or two doses dependent on national schedules.

# IMPACT GOAL 3.2
## Universal health coverage

### WHAT IS THE INDICATOR?

Population-weighted global universal health coverage (UHC) Service Coverage Index (SCI) score, as estimated by WHO. The SCI score provides a measure of average coverage across a basket of 14 tracer indicators of health service coverage.

### WHAT DOES IT TELL US?

The extent of progress towards universal health coverage at country, regional and global levels.

### 2030 TARGET

An increased SCI score in all countries, regions and globally.

### 2023 summary:

- **This indicator is updated every two years. No new data are available for 2023.**

- **In 2021, 71 countries had achieved an increase in SCI score. However, 68 countries experienced a decline in SCI score.**

# 04

# STRATEGIC PRIORITY INDICATORS

The **15 global strategic priority objectives indicators** (Table 2) are designed to track performance at all levels (country, regional and global), to help identify potential root causes of success and failure in relation to IA2030 impact goals, so that actions for improvement can be recommended. At the global level, baseline is assessed but no targets are set, due to wide regional and country variations. Regions and countries are encouraged to assess their baseline for each indicator and set their own targets for these indicators to track progress, based on guidance provided in Annex 1 to the IA2030 Framework for Action.

TABLE 2
**Strategic Priority (SP) indicators, baseline and 2023 data\***

| Strategic Priority | Indicator | 2023 data |
|---|---|---|
| **01**<br>**IMMUNIZATION PROGRAMMES FOR PRIMARY HEALTH CARE AND UNIVERSAL HEALTH COVERAGE** | **1.1** Number of countries with a National Immunization Technical Advisory Group (NITAG) meeting six functionality criteria | **131**<br>2019 baseline: 113 |
| | **1.2** Density of physicians, nurses and midwives per 10,000 population | **55.7**<br>health workers per 10,000 population‡<br>(Physicians: 16.3; nurses/midwives: 39.4)<br>2019 baseline: 56.4 (17.4 physicians and 39 nurses/midwives) |
| | **1.3** Percentage of countries achieving the non-measles/non-rubella discard rate of ≥2/100,000 persons and the non-polio acute flaccid paralysis rate of >1/100,000 population aged less than 15 years per year† | **39%**<br>(countries meeting thresholds for the two surveillance indicators) |
| | **1.4** Proportion of countries with district-level stockouts | **31%**<br>(61 out of 194 countries)<br>2019 baseline: 40% |
| | **1.6** Proportion of countries with at least one documented (with reporting form and/or line-listed) individual serious adverse event following immunization (AEFI) case safety report per million total population | **38%**<br>(92 out of 194 countries)<br>2019 baseline: 28% (54 out of 194) |

| Strategic Priority | Indicator | 2023 data |
|---|---|---|
| **02 COMMITMENT & DEMAND** | **2.1** Proportion of countries with legislation in place that is supportive of immunization as a public good | **63%** (123 out of 194 countries) |
| | **2.2** Proportion of countries that have implemented behavioural or social strategies (i.e., demand generation strategies) to address under-vaccination | **58%** (113 out of 194 countries) |
| **03 COVERAGE & EQUITY** | **3.1** DTP3, MCV1, and MCV2 coverage in the 20% of districts with lowest coverage (mean across countries) | **70%** DTP3, **71%** MCV1, **59%** MCV2 2019 baseline: 74% DTP3, 72% MCV1, 64% MCV2 |
| **04 LIFE COURSE & INTEGRATION** | **4.1** Breadth of protection (mean coverage for all WHO-recommended vaccine antigens) | **74%** 2019 baseline: 71% |
| **05 OUTBREAKS & EMERGENCIES** | **5.1** Proportion of polio, measles, meningococcus, yellow fever, cholera, cVDPV and Ebola outbreaks with timely detection and response | **24%** (10 out of 42 outbreaks) average 2018-2020 baseline: 28% |
| **06 SUPPLY & SUSTAINABILITY** | **6.1** Health of vaccine markets, disaggregated by vaccine antigens and country typology | **5/12** vaccine markets categorized as healthy |
| | **6.2** Proportion of countries whose domestic government and donor expenditure on primary health care increased or remained stable | Minimal data available from countries |
| | **6.3** Proportion of low- and middle-income countries whose share of national immunization schedule vaccine expenditure funded by domestic government resources increased or remained stable¶ | **84%** (38 out of 56 countries, 2021 to 2022) 2018-2019 baseline: 84% (38 out of 56) |
| **07 RESEARCH & INNOVATION** | **7.1** Proportion of countries with an immunization research agenda | Indicator discontinued. |
| | **7.2** Progress towards global research and development targets | Indicator under development. |

\* Table only includes SP objectives for which global indicators have been specified.
†Interim indicator.
‡2022 data.
¶Estimate excludes domestic expenditure on COVID-19 vaccination.

# SP 1.1
## Leadership, management, coordination

Number of countries with a National Immunization Technical Advisory Group (NITAG) meeting six functionality criteria

This indicator was originally specified as the proportion of countries with evidence of adopted mechanism for monitoring, evaluation and action at national and subnational levels. This proved difficult for countries to report against. An indicator relating to National Immunization Technical Advisory Groups (NITAGs) has been included as an alternative SP5.1 indicator.

**2023 summary:**

- **The number of countries with a NITAG was unchanged at 170 (88%) in 2023, while the number of countries with functional NITAGs increased to 131, the highest ever recorded.**
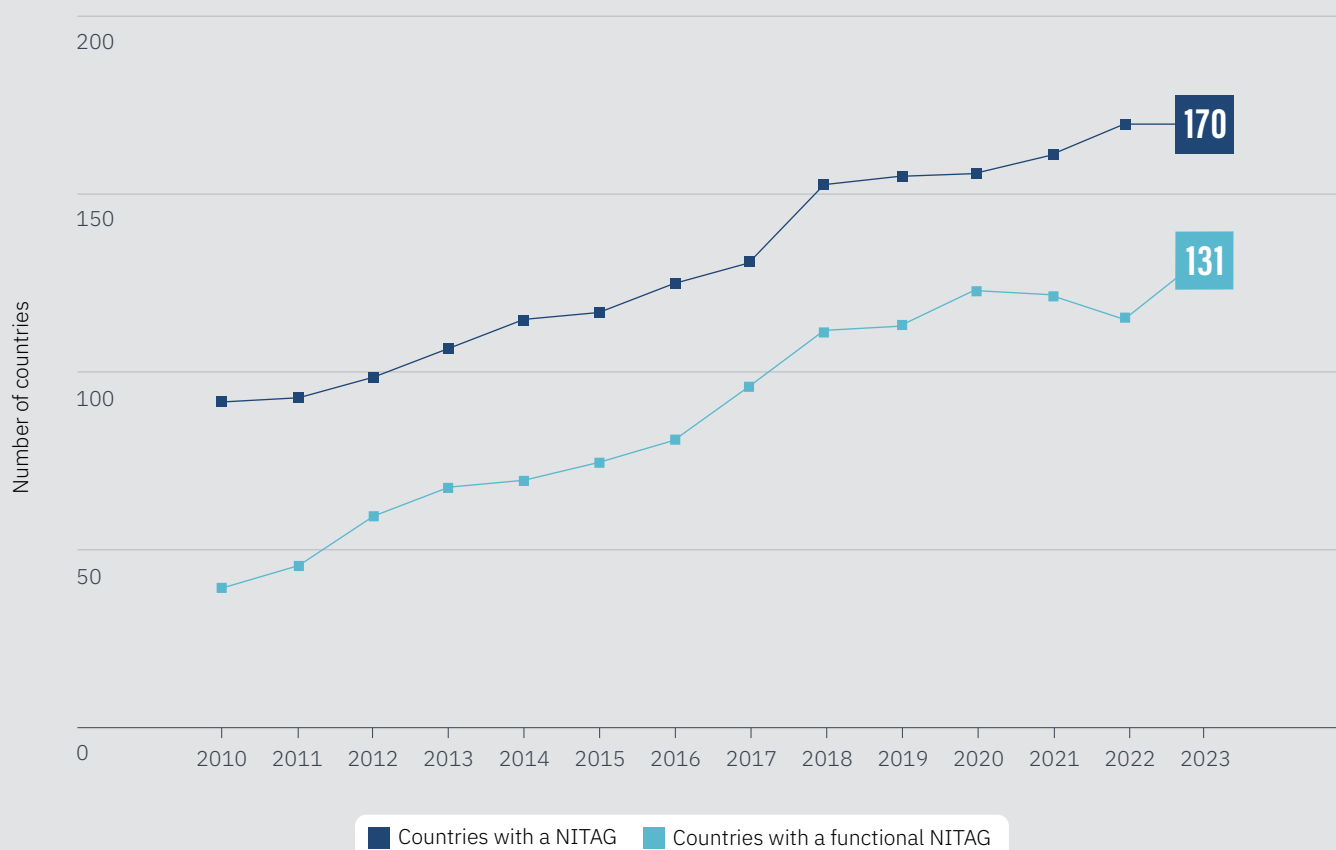
- **The proportion of countries with a functional NITAG increased in all WHO regions except the Western Pacific Region.**

- **In all regions except the Western Pacific Region, a high proportion of NITAGs issued recommendations in 2023 that were adopted by ministries of health.**

The number of countries reporting the existence of a NITAG was unchanged in 2023 compared with 2022, but efforts to strengthen them led to an increase in the number of functional NITAGs (meeting six functionality criteria[12] ; Figure 15).

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[12] These criteria cover the existence of formal terms of reference, having a legislative or administrative basis, breadth of expertise represented, frequency of meeting, distribution of documentation in advance of meeting, and declarations of conflicts of interest.

FIGURE 15

**Number of countries reporting existence of a NITAG and a functional NITAG between 2010 and 2023**

The WHO South-East Asia Region had the highest proportion of countries with functional NITAGs in 2023 (91%; Figure 16). The numbers of functional NITAGs have been steadily increasing in the WHO African and Eastern Mediterranean Regions. The number of countries with functional NITAGs declined during the COVID-19 pandemic in the Region of the Americas and the European Region but began to recover in 2023. The Western Pacific Region is still lagging, with only 22% of countries having functional NITAGs in 2023, in part due to challenges in establishing functional NITAGs in Pacific Island countries.

**Proportion of countries with a functional NITAG by WHO region and year**
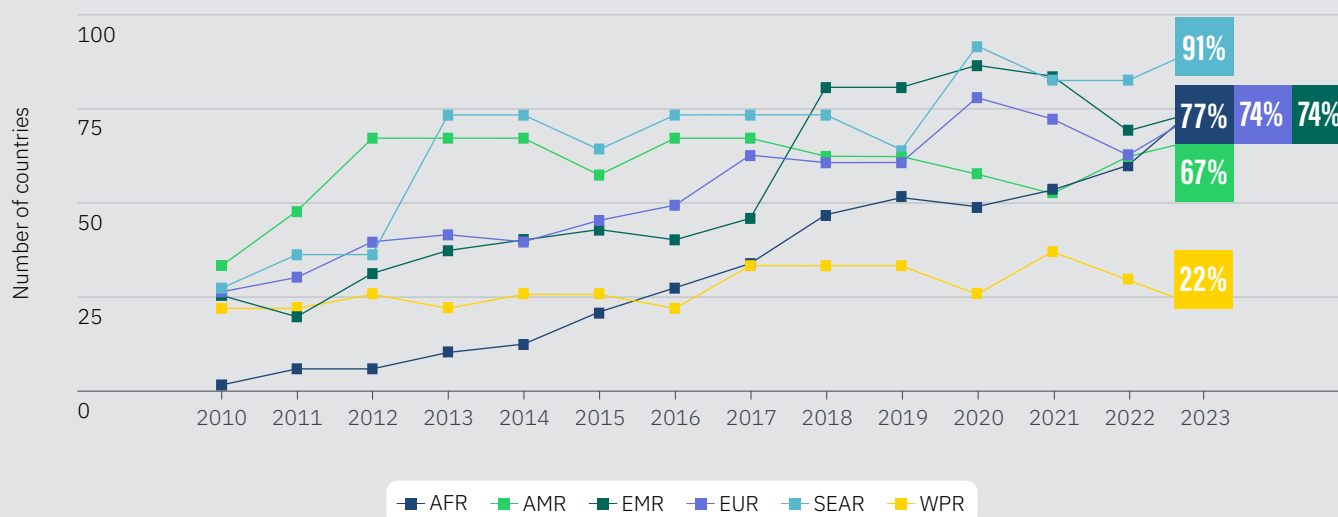


**NITAG output indicators** track whether NITAGs are issuing recommendations and whether these are adopted by country decision-makers. NITAGs in all countries in the South-East Asia Region issued recommendations in 2023 and recommendations were adopted in all countries (Figure 17). In most other regions, a high proportion of NITAGs have issued recommendations and had recommendations acted upon, showing a good linkage between NITAGs and national immunization decision-makers. The exception is the Western Pacific Region, where NITAGs in only 60% of countries issued recommendations in 2023.

**Proportion of countries in 2023 in which a NITAG: (1) issued a recommendation and (2) had a NITAG recommendation adopted by a ministry of health, by WHO region**



■ NITAG issued at least one recommendation   ⫽ At least one of the NITAG recommendations was adopted by Ministry of Health
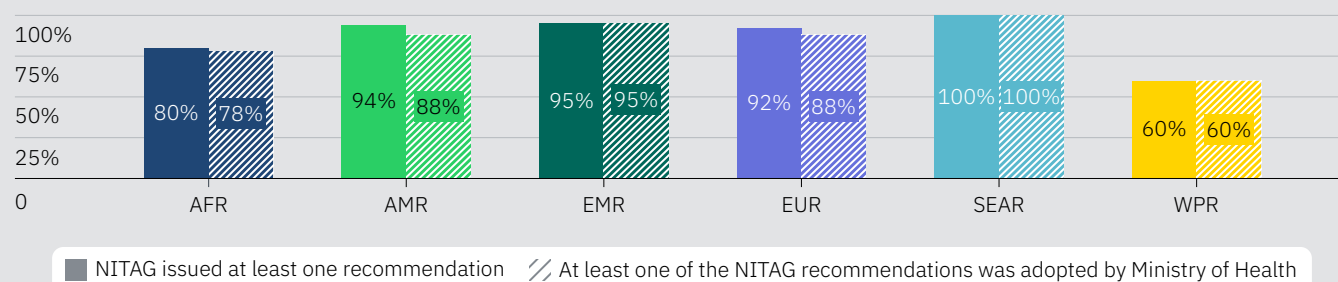
**Note:** Only includes countries with NITAGs

# SP 1.2
## Health workforce

Density of medical doctors, nursing and midwifery personnel per 10,000 population

**2023 summary:**

- **In 2022, the density of physicians per 10,000 population was 16.3 (2019 baseline: 17.4) and the density of nurses and midwives was 39.4 (2019 baseline: 39).**

- **Major global inequities exist in healthcare worker numbers. The highest densities of medical doctors, nursing and midwifery personnel are in the European Region followed by the Region of the Americas, while the African Region has the lowest health worker density.**

Since 2006, the size of the global health workforce has increased significantly globally, with the estimated numbers of medical doctors, nursing and midwifery personnel reaching 43 million in 2022. The density of medical doctors, nursing and midwifery personnel has increased by 47% globally, from 37.9 per 10 000 population in 2006 to 55.7 in 2023 (Table 3). However, WHO regions with the highest burden of disease continue to have the lowest densities of health workers (Figures 18, 19).

TABLE 3

**Change in health workforce density per 10,000 population by occupation and by WHO region from 2006 to 2023**

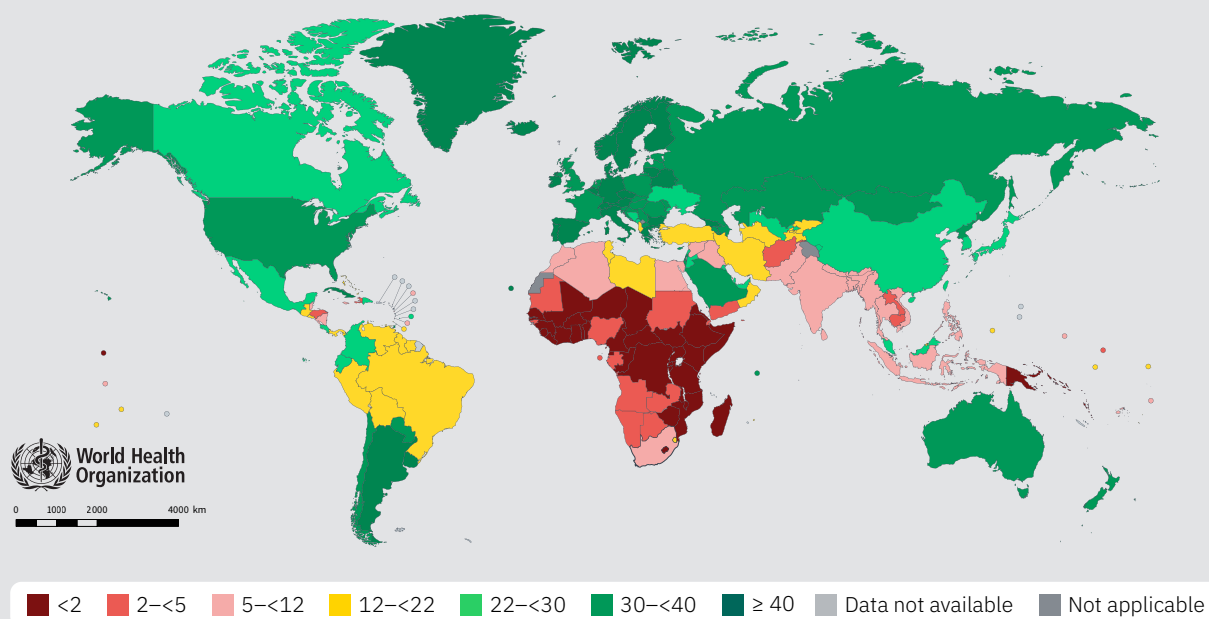| WHO region | Medical doctors | | | Nursing and midwifery personnel | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Year of data release | | | Year of data release | | |
| | 2006[a] | 2012[b] | 2023[c] | 2006[ad] | 2012[b] | 2023[c] |
| African Region | 2.1 | 2.3 | 2.9 | 9.3 | 10.2 | 12.9 |
| Region of the Americas | 19.4 | 23.0 | 24.5 | 48.8 | 73.7 | 82.1 |
| South-East Asia Region | 5.2 | 4.6 | 7.7 | 8.1 | 11.7 | 20.4 |
| European Region | 32.0 | 33.5 | 36.6 | 74.3 | 85.7 | 83.4 |
| Eastern Mediterranean Region | 7.4 | 8.4 | 11.2 | 11.1 | 15.8 | 16.5 |
| Western Pacific Region | 11.0 | 16.4 | 20.9 | 17.0 | 33.1 | 40.0 |
| **Global** | **12.3** | **13.8** | **16.3** | **25.6** | **35.0** | **39.4** |

**Note:** Estimated densities of the SDG 3.c.1 occupations per 10 000 population for 2006, 2012 and 2023. Numbers should be compared with caution as estimates are based on the latest available data at the time of data release.

**Sources:** [a]World health statistics 2007; [b]World health statistics 2013; [c]NHWA data platform, December 2023 update[13]; [d]includes only nurses.

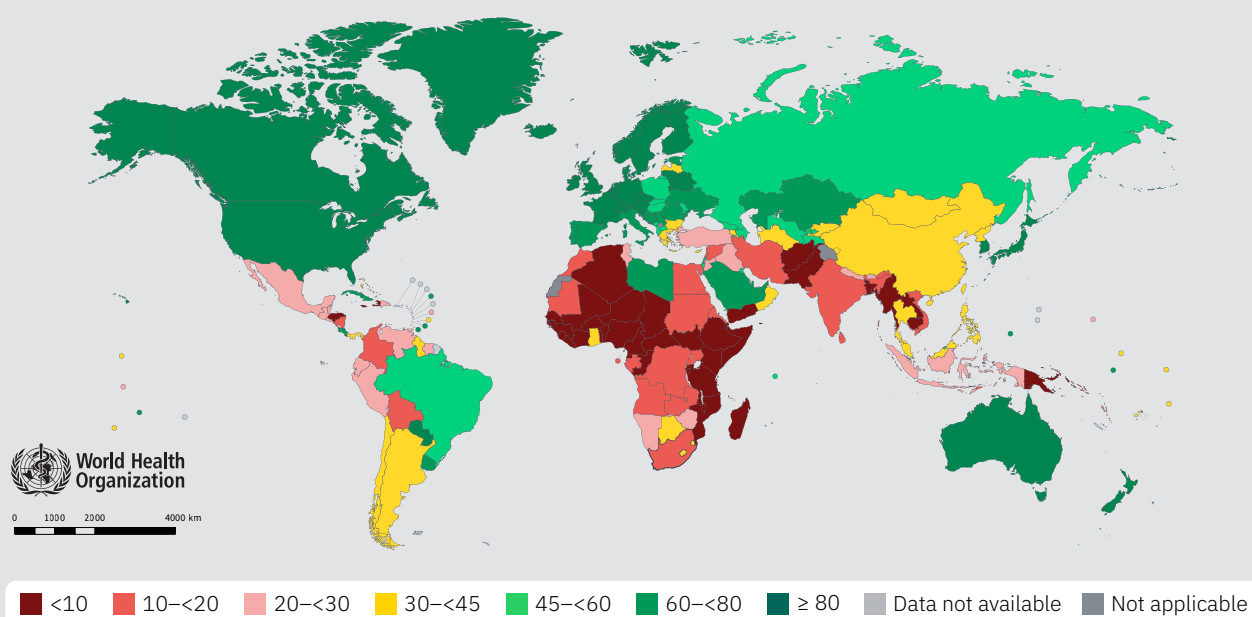[13] World Health Organization. (2023). National health workforce accounts: a handbook, 2nd ed. World Health Organization. https://iris.who.int/handle/10665/374320.

## FIGURE 18
**Density of medical doctors per 10,000 population (2014–2022).**



Legend: <2 | 2–<5 | 5–<12 | 12–<22 | 22–<30 | 30–<40 | ≥ 40 | Data not available | Not applicable

**Source:** NHWA data platform, December 2023 update.

## FIGURE 19
**Density of nursing and midwifery personnel per 10,000 population (2014–2022)**



Legend: <10 | 10–<20 | 20–<30 | 30–<45 | 45–<60 | 60–<80 | ≥ 80 | Data not available | Not applicable

**Source:** NHWA data platform, December 2023 update.

The data highlight stark regional inequities. The country with the highest density of medical doctors (in the Region of the Americas) has 470 times the number of doctors per capita than the country (in the African Region) with the lowest density. Similarly, there is more than a 270-fold difference between countries with the lowest and highest densities of nursing and midwifery personnel.

# SP 1.3
## Comprehensive vaccine-preventable disease surveillance

Percentage of countries achieving the non-measles/non-rubella discard rate of ≥2/100,000 persons and the non-polio acute flaccid paralysis rate of >1/100,000 population aged less than 15 years per year

A suitable indicator of comprehensive vaccine-preventable disease surveillance has yet to be identified. An interim composite indicator has been developed based on well-established surveillance indicators. However, these do not necessarily provide an indication of the overall maturity level of national surveillance systems, and data were not available for almost a third of countries.

### 2023 summary:

- **The indicator tracked in 2023 is based on non-polio acute flaccid paralysis (NP-AFP) case detection rate and annual non-measles, non-rubella (NMNR) case detection rates.**

- **For 2023, surveillance systems were classified as acceptable in 75 countries (39%), requiring attention in 39 countries (20%), and needing improvement in 17 countries (9%).**

It has not proven feasible to gather data from countries relating to the original IA2030 SP1.3 indicator, the proportion of countries with 90% on-time reporting from 90% of districts for suspected cases of all priority vaccine-preventable diseases included in nationwide surveillance (including reporting of zero cases). Many countries could not provide data on timeliness of reporting, and regions and countries could see minimal value in this timeliness of reporting indicator in terms of programmatic action.
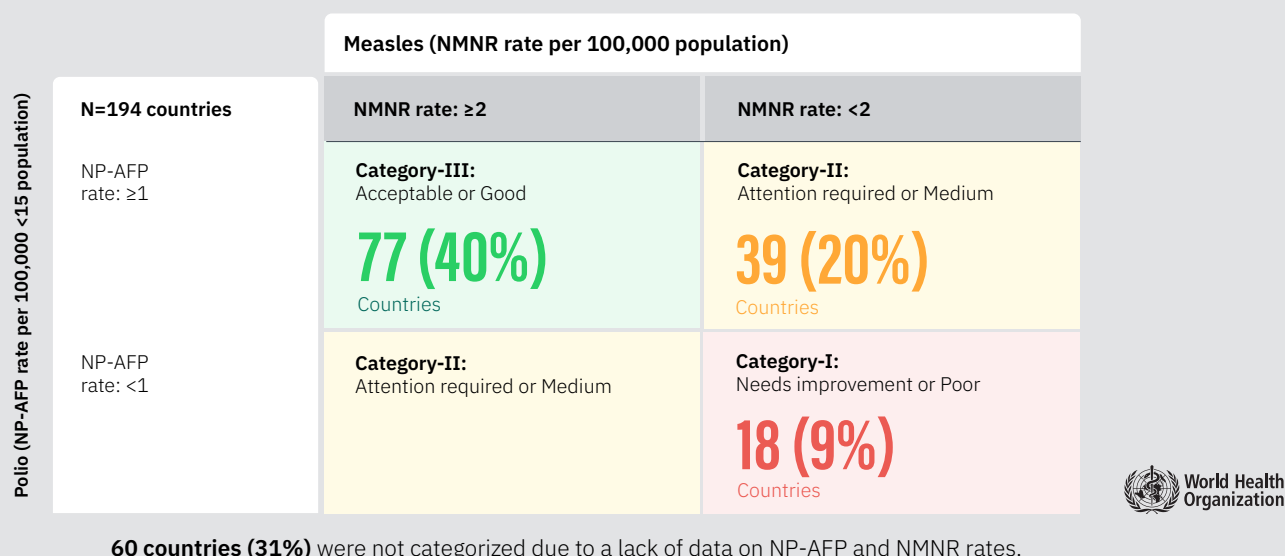
The IA2030 Disease-Specific Initiative Working Group has explored possible alternatives to assess the quality of surveillance systems. Acute flaccid paralysis (AFP) surveillance for polio and measles/rubella surveillance are the two most widespread population-based surveillance systems across most regions. Both have cardinal indicators of surveillance sensitivity with targets (annual non-polio AFP (NP-AFP) case detection rate of ≥1 per 100,000 in the under-15 population and annual non-measles, non-rubella (NMNR) case detection rate of ≥2 per 100,000 population). If a country is achieving both targets, its surveillance performance is deemed to be **"acceptable"** (category III). If it is achieving the target on one indicator but not the other, its surveillance performance is classified as **"requiring attention"** (category II). If it is not reaching the target on either, its surveillance performance is rated as **"needing improvement"** (category I).

Globally, 75 countries (39%) had acceptable-quality (category III) surveillance systems, while 39 countries (20%) had category II systems (Figure 20). These category II countries require attention to improve at least one of their surveillance systems. The other 17 countries (9%) were classed as category I. A further 63 countries (32%) could not be categorized because of lack of data from countries.

FIGURE 20

**Vaccine-preventable disease surveillance quality measurement and categorization of countries based on NP-AFP and NMNR surveillance**

| | Measles (NMNR rate per 100,000 population) | |
|---|---|---|
| **N=194 countries** | **NMNR rate: ≥2** | **NMNR rate: <2** |
| NP-AFP rate: ≥1 | Category-III: Acceptable or Good<br><br>**77 (40%)**<br>Countries | Category-II: Attention required or Medium<br><br>**39 (20%)**<br>Countries |
| NP-AFP rate: <1 | Category-II: Attention required or Medium | Category-I: Needs improvement or Poor<br><br>**18 (9%)**<br>Countries |

Polio (NP-AFP rate per 100,000 <15 population)

World Health Organization

**60 countries (31%)** were not categorized due to a lack of data on NP-AFP and NMNR rates.

Most category III countries were in the African (34 countries) and Eastern Mediterranean (17 countries) Regions (Figure 21). These two regions and the South-East Asian Region had no category I countries. However, data were not available for many countries in the Region of the Americas and the European and Western Pacific Regions.

FIGURE 21

**Regional-level VPD surveillance quality measurement and categorization of countries based on NP-AFP and NMNR surveillance**

| WHO Region | Category I | Category II | Category III | No Category | Total |
|---|---|---|---|---|---|
| AFR | | 9 | 34 | 4 | 47 |
| AMR | 5 | 8 | 7 | 15 | 35 |
| EMR | | 4 | 17 | | 21 |
| EUR | 10 | 7 | 6 | 30 | 53 |
| SEAR | | 5 | 6 | | 11 |
| WPR | 3 | 6 | 7 | 11 | 27 |
| **Total** | **18** | **39** | **77** | **60** | **194** |

# SP 1.4
## Supply chain

Proportion of countries with district-level stockouts

**2023 summary:**

- **Globally, the proportion of countries that reported district-level stockouts of any vaccine decreased by 5% in 2023, from 36% in 2022 to 31%, and is 9% lower than in baseline year 2019.**

- **The proportion of countries reporting district-level stockouts varied from 6% in the European Region to 60% in the African Region.**

Vaccine stockouts at health facilities can lead to interruptions in immunization services and missed opportunities for vaccination. Therefore, monitoring vaccine stocks and ensuring an adequate supply of quality vaccines at the service delivery level is crucial. Because of challenges in obtaining facility-level data from countries, reporting is focusing on district-level stockouts.

The WHO South-East Asia and Western Pacific Regions have experienced an increase in the number of countries reporting district-level stockouts (Figure 22). By contrast, the number of countries reporting stockouts in the other four WHO Regions generally decreased in 2023 compared to 2022. Notably, the WHO Eastern Mediterranean Region reported a significantly lower number of stockouts compared to the average over the past two years. Fewer countries in the African Region reported district-level stockouts in 2023 compared with 2022, but the number remains high (60% of countries).

FIGURE 22

**Proportion of countries reporting district-level stockouts, 2018–2023.**
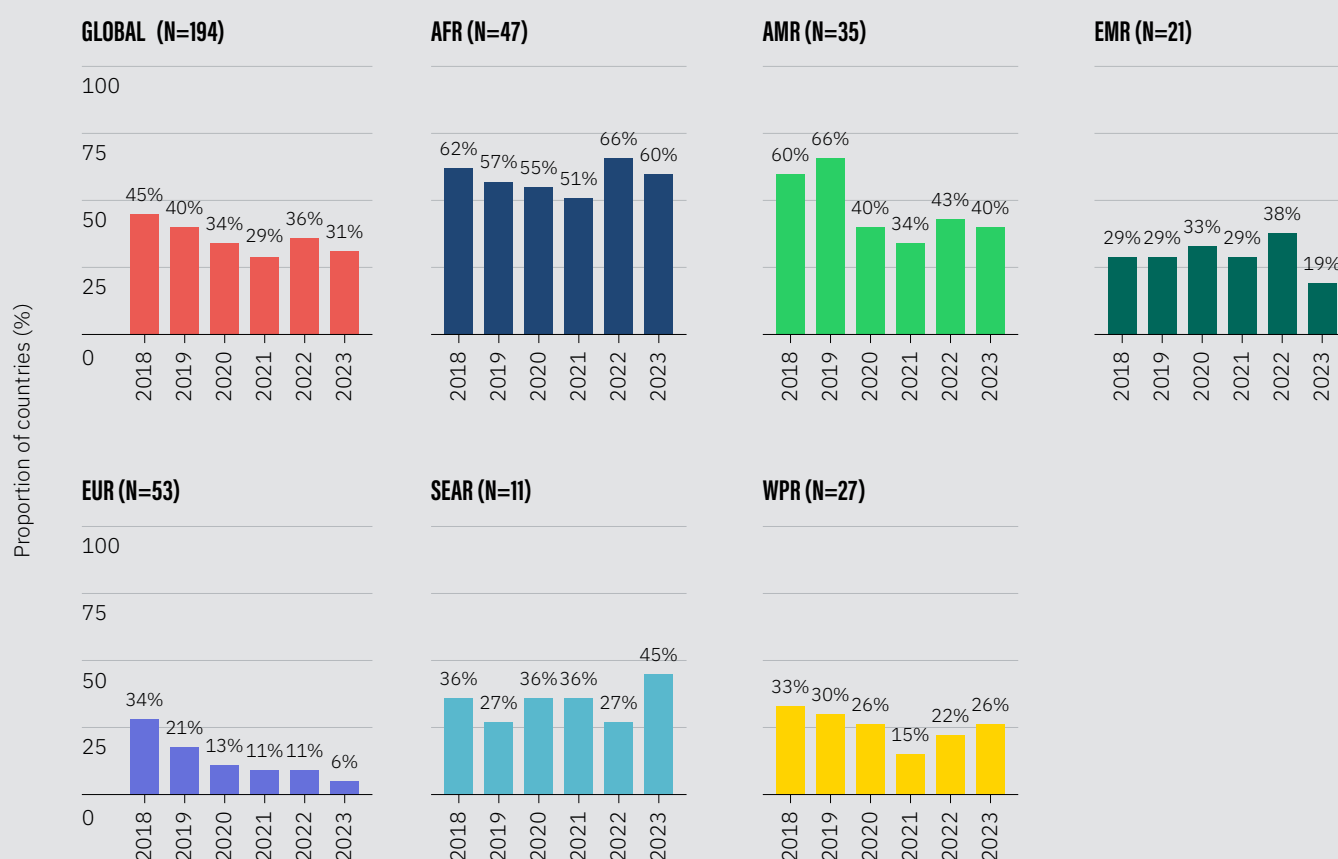
Using MCV- and DTP-containing vaccines as tracers, most countries cited delays in vaccine procurement, funding delays and difficulties sourcing vaccines as the main reasons for vaccine stockouts in 2023. In addition, some countries attributed stockouts to stock management or distribution problems, inaccurate forecasting, cold chain issues and delays in national regulatory authority (NRA) lot release.

Despite technological advancements, many countries continue to rely on paper-based and offline stock management systems; 142 of 194 countries (73%) reported having a system in place to monitor vaccine availability at the health-facility level (Figure 23) but 60% of these countries are still using paper-based systems and 13% have electronic offline systems. This poses significant challenges in consolidating data and accurately reporting facility-level stock availability. As a result, this indicator will continue to be monitored at the district level until most countries have robust stock information management systems that enable automated monitoring and reporting of supply availability.

FIGURE 23

**Proportion of countries with systems in place to measure vaccine availability at the service delivery level, 2021– 2023**

# SP 1.6
## Vaccine safety reporting

Proportion of countries with at least one documented individual serious adverse event following immunization (AEFI) case safety report per million total population.

**2023 summary:**

▪ **In recent years, there has been a notable decrease in the reporting of serious adverse events following immunization (AEFI) to the WHO global database (VigiBase), from 57% of countries in 2021 to 38% in 2023, across all WHO regions.**

▪ **Countries are facing technical, logistical and administrative challenges in data sharing, which are compounded by the creation of local or regional databases and have negatively impacted global AEFI reporting and data sharing.**

▪ **Countries must invest in strengthening their vaccine safety surveillance systems by enhancing data-sharing mechanisms, encouraging healthcare providers to report AEFI, and leveraging WHO-supported tools or suitable alternatives for detailed case-based data analysis and sharing of data with national and global stakeholders.**

Although vaccines are extremely safe, some adverse events following immunization (AEFI) will inevitably occur. It is essential that serious AEFI are investigated and reported so that the safety of vaccines can be continually monitored. As well as managing national vaccine safety monitoring systems, countries should also report serious AEFI to the WHO global database (VigiBase).

The Global Advisory Committee on Vaccine Safety (GACVS) has adopted a baseline standard of reporting of at least one documented serious AEFI per million population into VigiBase. The GACVS and WHO have been advocating for the transition to case-based data sharing and strengthening of AEFI surveillance systems in countries to better detect and respond to vaccine safety signals. WHO has also recommended the sharing of AEFI data between stakeholders within a country to support the "one country – one AEFI data" concept.

There has been a steady decline in the number of countries reporting serious AEFI into VigiBase over the past three years, from 57% in 2021 to 47% in 2022 and 38% in 2023. As outlined in Figure 24, this trend has been observed across all WHO regions.

The significant reduction in COVID-19 vaccinations, the shifting focus of immunization programmes to routine immunization and reporter fatigue over the last three years have impacted the frequency and emphasis on AEFI reporting in countries. In addition, countries continue to face data-sharing challenges as they transition from aggregate data to case-based data sharing, including the use of interoperable electronic data management systems, which pose technical and logistical challenges. New stringent data-sharing regulations in some countries and the development of stand-alone local or regional databases have impacted the global reporting of AEFI cases. Furthermore, reallocation of resources, including human resources, to other post-pandemic priorities may also have contributed to the declining AEFI reporting rates.

This decline could have significant implications for global and national immunization programmes, potentially affecting the ability to detect safety signals. A decline in AEFI reporting may mean that policymakers and programme managers lack the critical information needed for informed decision-making and response planning, potentially reducing public trust in vaccination programmes if safety monitoring is perceived as inadequate. This issue is of particular importance given the planned vaccine introductions in several low- and middle-income countries by new vaccine manufacturers using novel vaccine manufacturing technologies.

Countries need to strengthen their vaccine safety surveillance systems by enhancing data-sharing mechanisms as they transition from aggregate to case-based data sharing at all levels (sub-national, national and global). Surveillance infrastructure needs to be improved by investing in the capacity of AEFI surveillance systems to collect, analyse and respond using detailed case-based data. There is also a need to promote the importance of AEFI reporting among healthcare providers and to provide training on accurately documenting and sharing case-based data.

The WHO can assist countries by encouraging full utilization of their membership of the WHO Programme for International Drug Monitoring (WHO PIDM), including the use of electronic tools, and by updating national policies to analyse and share key anonymized data for national and global health benefits.

In addition, embedding vaccine safety surveillance within a national regulatory framework can provide the necessary support and ownership to sustain vigilance functions as a mandated regulatory deliverable. The WHO regulatory benchmarking process, which uses the Global Benchmarking Tool (GBT) to assess regulatory systems for medical products (including vaccines), can be used to assess the maturity level of vaccine safety surveillance programmes and inform the design of tailored strategic institutional development plans (IDPs).

FIGURE 24

**Proportion of countries in each WHO region reporting AEFI to the global WHO database, VigiBase, 2021–2023.**
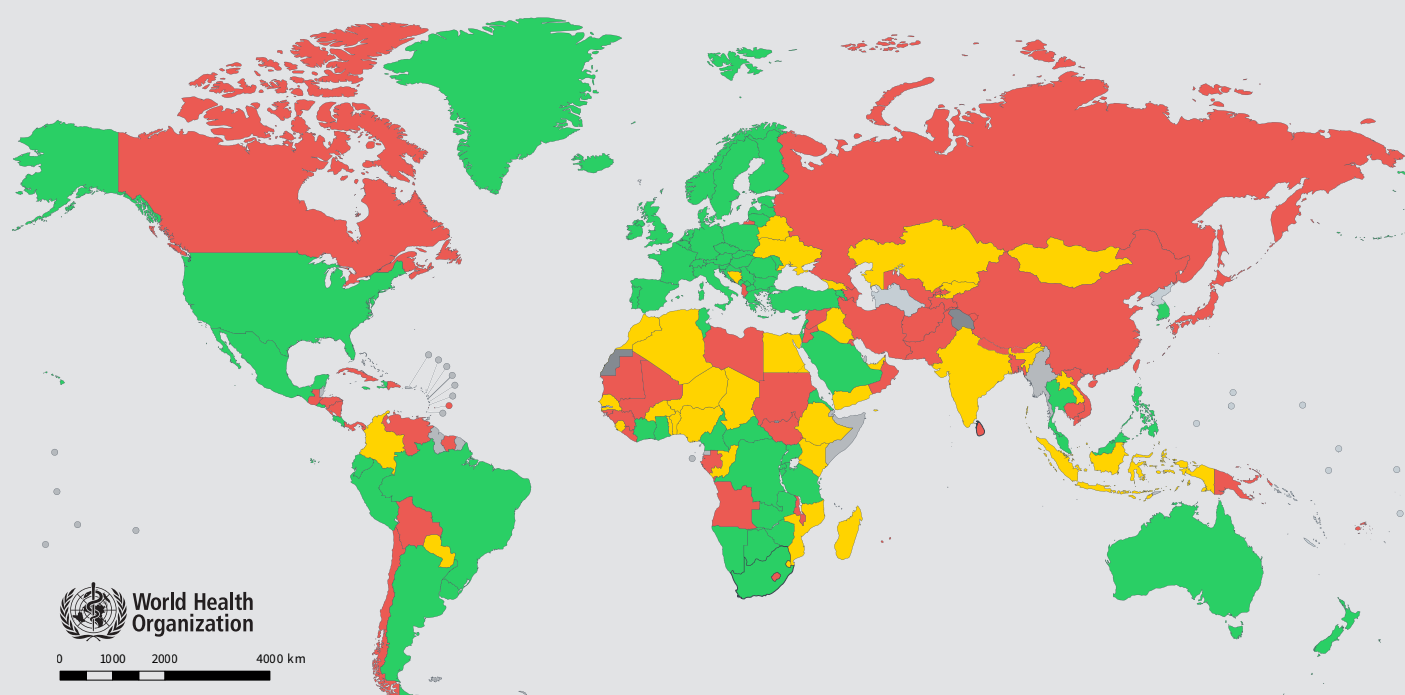


GLOBAL (N=194)
- 2021: 57%
- 2022: 47%
- 2023: 38%

AFR (N=47)
- 2021: 60%
- 2022: 47%
- 2023: 32%

AMR (N=35)
- 2021: 49%
- 2022: 40%
- 2023: 29%

EMR (N=21)
- 2021: 52%
- 2022: 29%
- 2023: 14%

EUR (N=53)
- 2021: 81%
- 2022: 77%
- 2023: 72%

SEAR (N=11)
- 2021: 27%
- 2022: 9%
- 2023: 9%

WPR (N=27)
- 2021: 33%
- 2022: 30%
- 2023: 22%

Proportion of countries (%)
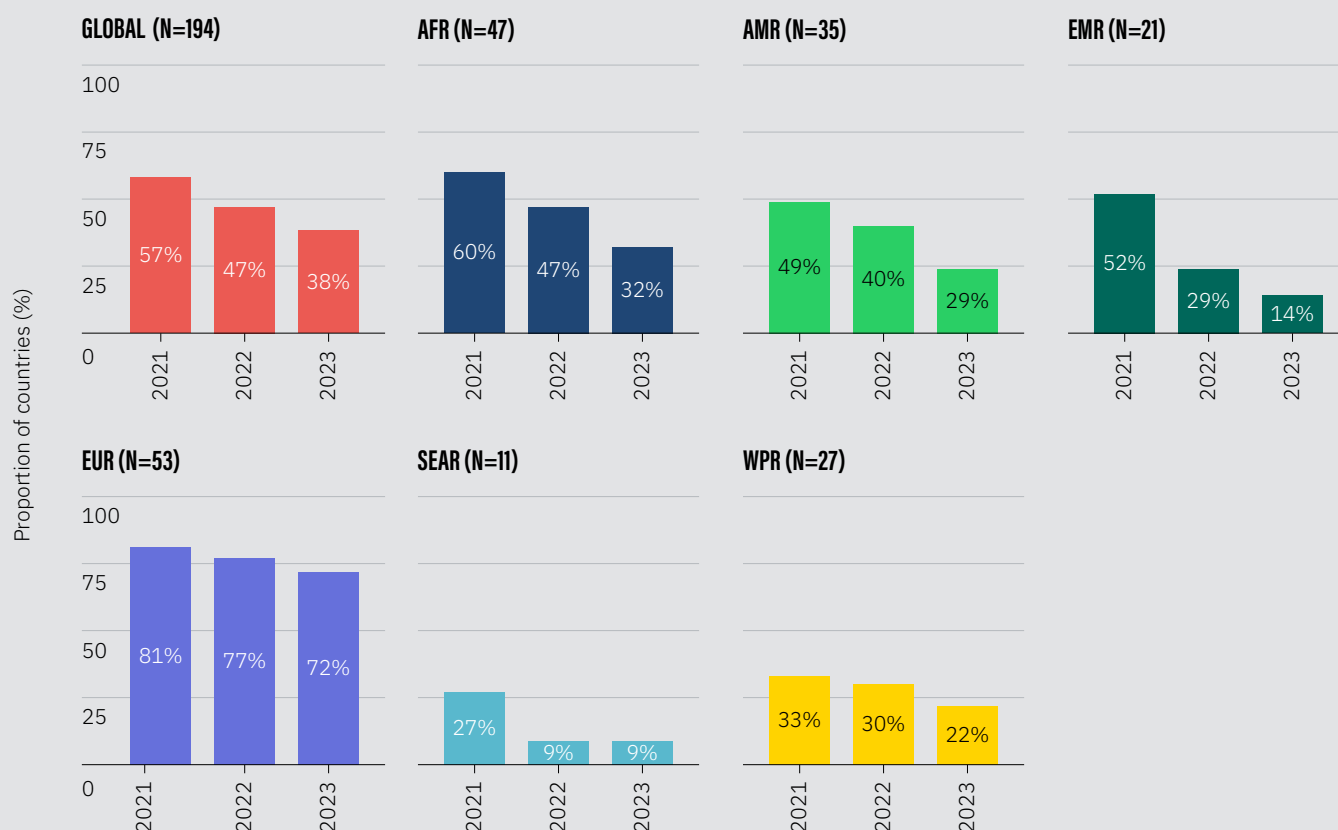
FIGURE 25

**Reporting of AEFI to VigiBase in 2023.**

WHO member countries reporting serious AEFI cases into Vigibase per million total population in 2023



**World Health Organization**

| 0 | 1000 | 2000 | | 4000 km |

Legend: 0 (red) | <1 (yellow) | ≥1 (green) | Data not available (light grey) | Not applicable (dark grey)

Donut chart:
- 73 (38%) — green
- 68 (35%) — red
- 34 (18%) — yellow
- 19 (10%) — grey

Bar chart (by region):

| Region | ≥1 | <1 | 0 | Not applicable | Total |
|--------|----|----|----|------|-------|
| AFR | 15 | 17 | 13 | 2 | 47 |
| AMR | 10 | — | 22 | — | 35 |
| EMR | 3 | 5 | 13 | — | 21 |
| EUR | 39 | 6 | 6 | 3 | 53 |
| SEAR | — | — | 7 | — | 11 |
| WPR | 6 | 2 | 7 | 12 | 27 |
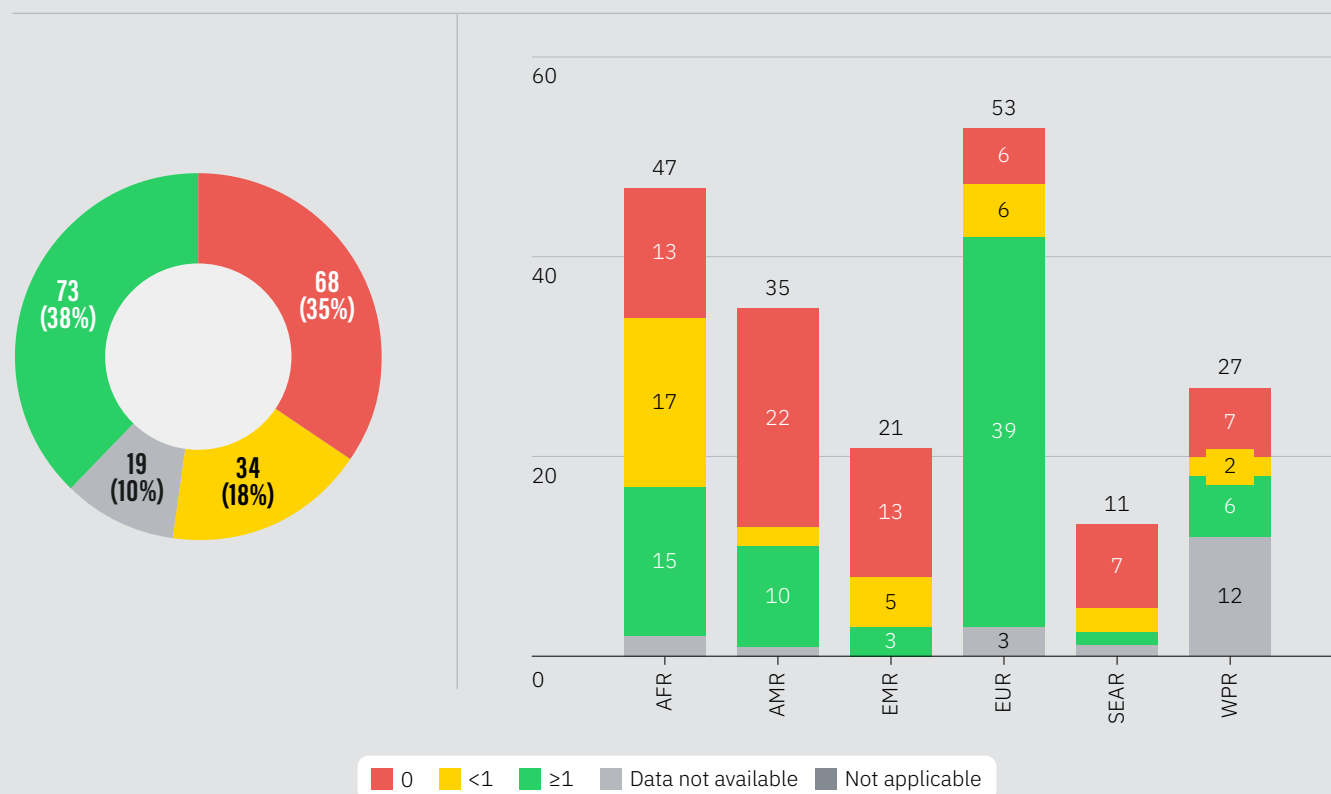
**Note:** The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of WHO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

**Source:** Vigibase, Map Production: GIS center for Health, DNA/DDI, Map Creation Date: 14 July 2024, Data Accessed on: 30 June 2024

# SP 2.1
## Commitment

Proportion of countries with legislation in place that is supportive of immunization as a public good

**2023 summary:**

- **The number of countries reporting having legislation in place that is supportive of immunization as a public good rose slightly in 2023, from 115 countries (61%) in 2022 to 123 countries (63%).**

- **Findings vary by WHO region, and low- and lower-middle income countries are less likely to report existence of legislation supportive of immunization as a public good.**

The number of countries reporting having legislation in place that is supportive of immunization as a public good has been steadily rising (Figure 26), from 107 countries (55%) in 2021 to 123 countries in 2023 (63%). The rise in part reflects an increase in reporting for this indicator (183 countries in 2023 compared to 175 in 2022 and 160 in 2021).

Findings varied across WHO regions, with the highest proportion consistently reported in the European Region, followed by the Eastern Mediterranean Region, and the lowest proportion in the South-East Asian Region across all years. When data are broken down by World Bank income classification, low- and lower-middle income countries are less likely to report existence of legislation supportive of immunization as a public good.

Although the number of countries reporting the existence of supportive legislation continues to increase, there remains a continuing need to promote further strengthening of political commitment to immunization.

## FIGURE 26

**Proportion of countries reporting that legislation is in place which is supportive of immunization as a public good**



Proportion of countries (%)

**2021**

GLOBAL: Global 55%

WHO REGION: AFR 43%, AMR 57%, EMR 57%, EUR 75%, SEAR 27%, WPR 44%

INCOME STATUS: High Income 61%, Upper Middle Income 59%, Lower Middle Income 48%, Low Income 46%

DTP3 COVERAGE: <70% 50%, 70-85% 57%, >85% 56%

**2022**

GLOBAL: Global 61%

WHO REGION: AFR 45%, AMR 69%, EMR 71%, EUR 77%, SEAR 36%, WPR 48%

INCOME STATUS: High Income 66%, Upper Middle Income 72%, Lower Middle Income 48%, Low Income 50%

DTP3 COVERAGE: <70% 54%, 70-85% 60%, >85% 63%

**2023**

GLOBAL: Global 63%

WHO REGION: AFR 47%, AMR 69%, EMR 71%, EUR 83%, SEAR 36%, WPR 52%

INCOME STATUS: High Income 71%, Upper Middle Income 72%, Lower Middle Income 50%, Low Income 54%

DTP3 COVERAGE: <70% 65%, 70-85% 54%, >85% 67%

Legend: Legislation in place | Legislation not in place | No data/Not relevant/No response

**Source:** Cook Islands and Niue are excluded as they are not classified by the World Bank. Venezuela is temporarily unclassified by the World Bank, but is considered upper middle income based on 2019 classification.

# SP 2.2
## Demand

Proportion of countries that have implemented behavioural or social strategies
(i.e. demand-generation strategies) to address under-vaccination

**2023 summary:**

- **In 2023, 113 countries (58%) reported having implemented behavioural or social strategies to address under-vaccination, compared with 90 countries (46%) in 2022.**

- **Findings varied across WHO regions in 2023, with the highest proportion being seen in the South-East Asian and African Regions, and the lowest proportion in the European and Western Pacific Regions.**

A comprehensive range of behavioural or social strategies are required to achieve high uptake. Strategies should be informed by local data to support effective implementation and evaluation of interventions – especially in settings with low uptake or in association with new vaccine introductions – as well as meaningful engagement of community representatives and civil society to bring important local knowledge into planning processes and demonstrate the benefit of the "people-centred" principle at the heart of IA2030.

The increase in use of behavioural or social strategies from 2022 to 2023 was seen in all regions except the South-East Asia and Western Pacific Regions and in all

groups of countries categorized by World Bank income status (Figure 27). Low-income and lower middle-income countries were more likely to have implemented behavioural and social strategies.

The increase from 2022 to 2023 could reflect factors such as shifting operational priorities, available resourcing, political commitment to address demand-related barriers, and coordinated advocacy and technical support from partners.

Behavioural or social strategies that countries reported applying in 2023 included community engagement (52% of countries), digital or social listening (45%), behaviourally informed interventions (40%), public communications (57%), service quality interventions (46%), and interventions to build capacity among healthcare workers (56%).

In 2023, 39% of countries reported having carried out an assessment of reasons for under-vaccination (2022: 29%), and 56% of these countries included measures of behavioural and social drivers in the assessment (2022: 59%). Opportunities exist to analyse reported data based on reasons for under-vaccination, to promote greater use of behavioural or social strategies by countries, and to assess the effectiveness of these strategies.

FIGURE 27

## Proportion of countries having implemented behavioural or social strategies



**GLOBAL** · **WHO REGION** · **INCOME STATUS** · **DTP3 COVERAGE**

**2021**
- Global: 69%
- AFR: 83%, AMR: 71%, EMR: 76%, EUR: 55%, SEAR: 91%, WPR: 56%
- High Income: 53%, Upper Middle Income: 67%, Lower Middle Income: 86%, Low Income: 85%
- <70%: 89%, 70-85%: 57%, >85%: 61%

**2022**
- Global: 46%
- AFR: 62%, AMR: 63%, EMR: 33%, EUR: (25%), SEAR: 82%, WPR: 44%
- High Income: 29%, Upper Middle Income: 50%, Lower Middle Income: 58%, Low Income: 62%
- <70%: 65%, 70-85%: 57%, >85%: 38%

**2023**
- Global: 58%
- AFR: 72%, AMR: 69%, EMR: 57%, EUR: 45%, SEAR: 73%, WPR: 41%
- High Income: 44%, Upper Middle Income: 61%, Lower Middle Income: 68%, Low Income: 73%
- <70%: 70%, 70-85%: 67%, >85%: 53%

Proportion of countries (%)

Legend:
- Implemented strategies
- Did not implement strategies
- No data/Not relevant/No response

**Note:** Cook Islands and Niue are excluded as they are not classified by World Bank. Venezuela is temporarily unclassified by the World Bank, but is considered upper middle income based on 2019 classification.

# SP 3.2
## Equity

DTP3, MCV1 and MCV2 coverage in the 20% of districts with the lowest coverage (mean across countries)

**2023 summary:**

- **Globally, equity gaps within countries fell slightly in 2023 compared to 2022 for all three antigens, although coverage in the 20% of districts with the lowest coverage remained lower than in baseline year 2019.**

This indicator aims to assess disparities in coverage within countries, by comparing coverage at the district level for three key vaccines in the 20% of districts with the lowest coverage and the national average. A smaller difference in coverage between the lowest quintile and the national average represents more equitable vaccination coverage.

Encouraging improvements in coverage across the lowest quintile of districts were seen across all DTP3, MCV1 and MCV2 vaccines in 2023 compared to 2022 (Figure 28). These coverage improvements reversed a multi-year downward trend in coverage for the lowest quintile and reflect a minor but positive change to the equity gap in vaccination coverage between the highest and lowest performing districts.

FIGURE 28

**Average DTP3, MCV1 and MCV2 district-level coverage for lowest and highest district quintiles and national WUENIC estimates**



DTP3

MCV1

MCV2

Coverage (%)

- Average coverage of the 20% highest-performing districts
- Average coverage of the 20% lowest-performing districts
- WUENIC estimates
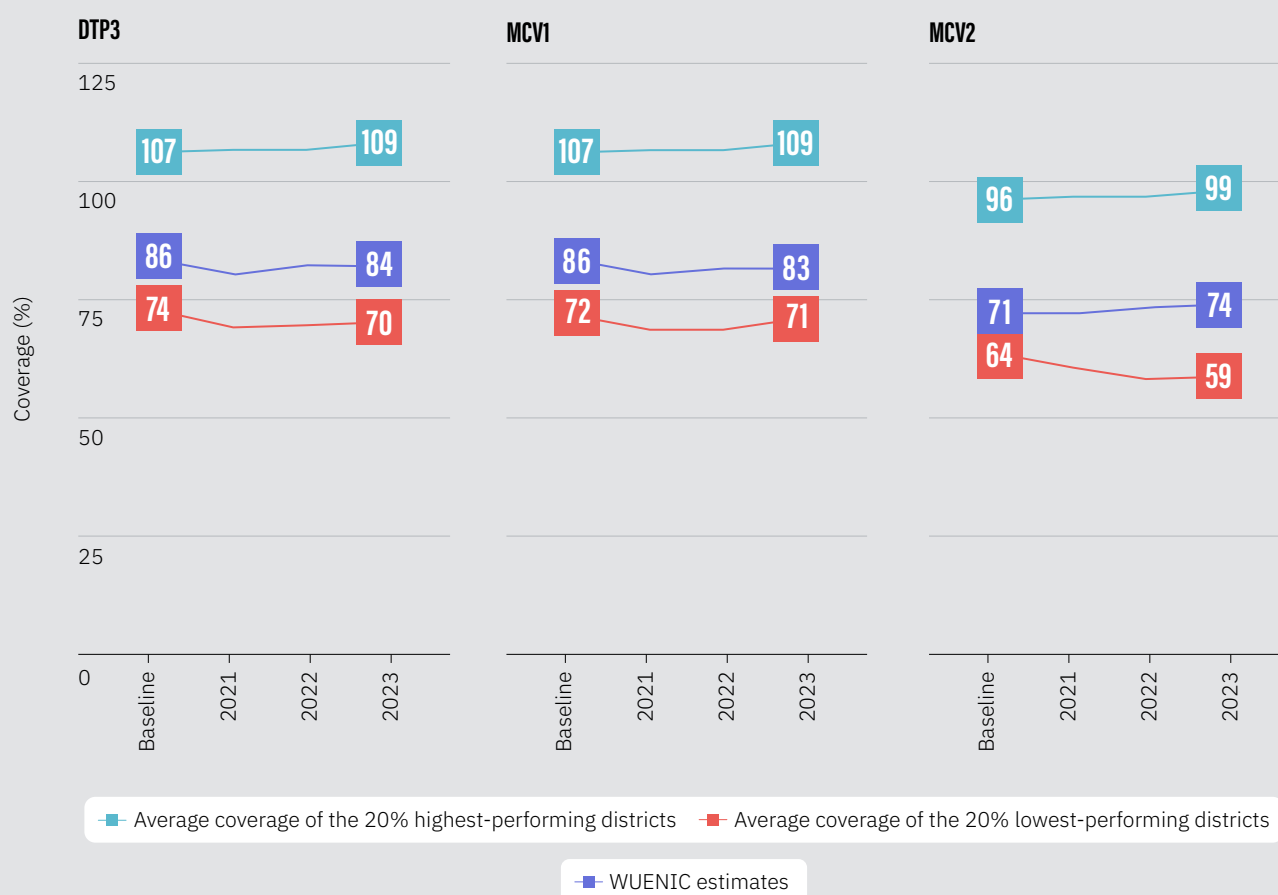
# SP 4.1
## Life course – breadth of protection

Mean coverage for a set of WHO-recommended vaccine antigens

**2023 summary:**

- **Breadth-of-protection coverage continued to increase in 2023, from 72% in 2022 to 74%.**

- **The biggest increases in coverage were seen in the WHO African Region and Region of the Americas.**

- **An increase in HPV coverage made a substantial contribution to the 2023 increase in breadth-of-protection coverage.**

Breadth of protection is a cross-sectional programme performance indicator, defined as the average global coverage achieved for a set of globally recommended antigens used at different ages.

Since 2000, breadth-of-protection coverage has increased steadily, driven primarily by new vaccine introductions, reaching 71% in 2019. This positive trend was interrupted in 2020 and 2021, but the positive trend in coverage returned in 2022 and 2023, with coverage reaching 74% in 2023 (Figure 29). In 2023, substantial coverage increases were seen for HPV, pneumococcal and rotavirus vaccines, contributing to the overall coverage increase for the breadth of protection.

Regionally, the African Region and Region of the Americas saw the biggest increases in coverage in 2023 (Figure 30). Breadth-of-protection coverage declined slightly in the WHO Eastern Mediterranean and Western Pacific Regions.

FIGURE 29

**Trends in breadth-of-protection indicators 2000–2023 by antigen**
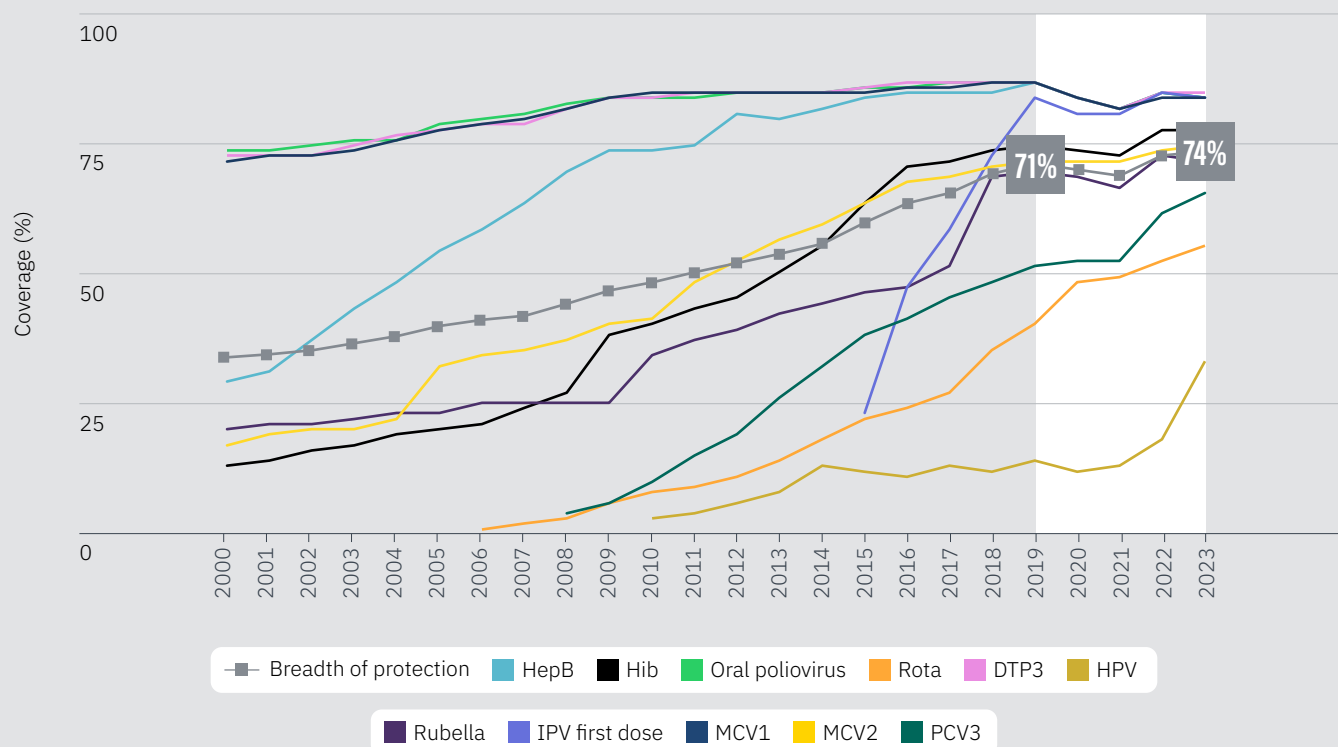


**Note:** HPVc: Full-course HPV vaccination, either one dose or two doses according to national schedules.

FIGURE 30

**Trends in breadth-of-protection average coverage 2000–2023 by WHO region**
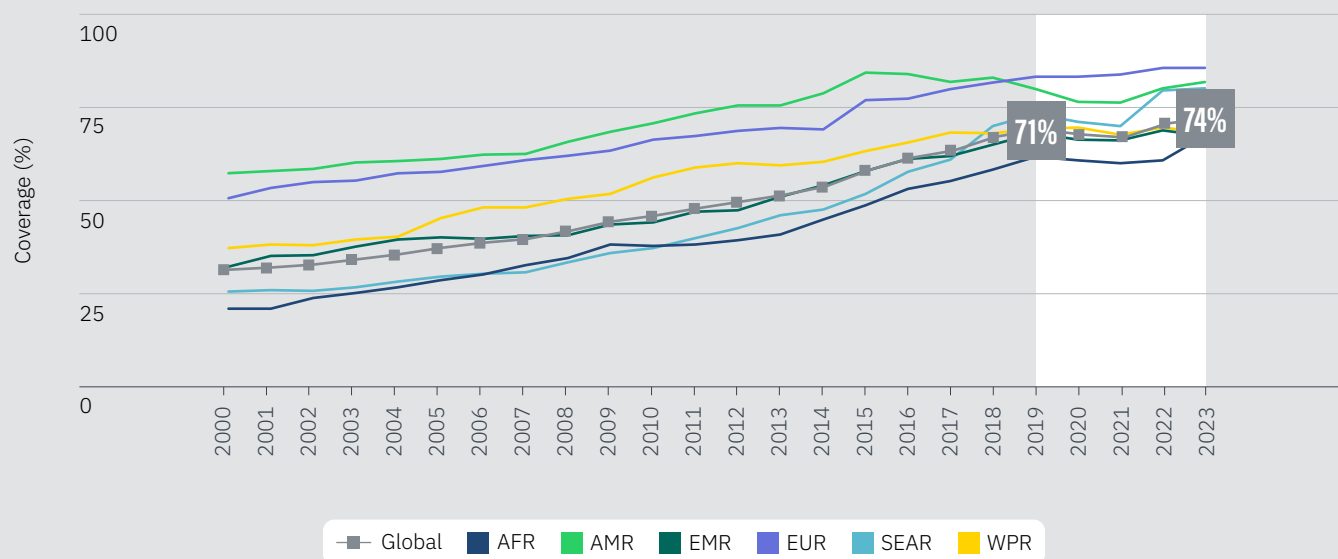


FIGURE 31

**Global coverage of vaccines included in the breadth-of-protection indicator 2000–2023**
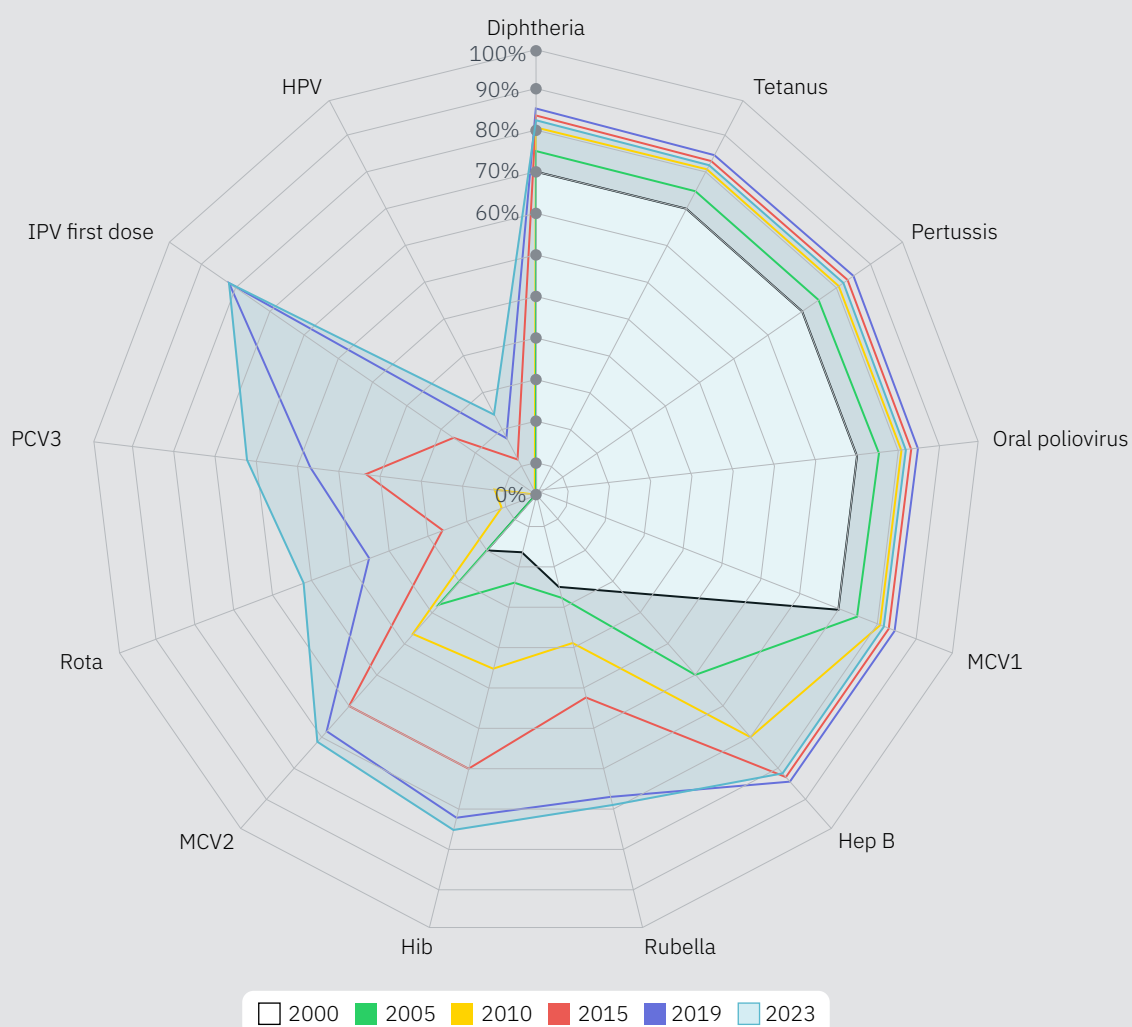
# SP 5.1
## International outbreak responses

Proportion of polio, measles, meningococcus, yellow fever, cholera and Ebola outbreaks with timely detection and response

**TREND-POSITIVE**

**2023 summary:**

- **The number of vaccine-preventable disease outbreaks generating an international response fell to 43 in 2023 compared to 66 in 2022, largely due to a decline in responses to polio (cVDPV) and measles outbreaks.**

- **Fewer than one in five responses met timeliness criteria in 2021, 2022 or 2023. Although the proportion of timely responses was higher in 2023, only 10 responses met such criteria in 2023.**

- **Factors contributing to delayed responses included difficulties in transporting samples to national laboratories, lack of immediately available financial resources, slow administrative processes, shipment delays and countries' competing priorities.**

There were 43 vaccine-preventable disease outbreaks in 2023 where the resulting vaccination campaigns received vaccines, funding or other support from international organizations, a decrease from 66 such outbreaks in 2022 and 79 at baseline (2018–2020 average) (Figure 32). Approximately one in five of such outbreak responses

met timeliness criteria in 2021, 2022 and 2023[14]. The reasons for slow responses included delays in laboratory confirmation and data validation by authorities, inefficient internal procedures, and countries' competing priorities[15].

**Measles**: In 2023, two out of the six outbreak response campaigns (33%) met timeliness criteria (Figure 33), compared with 20% (two out of 10 responses) in 2022 and 29% at baseline.

**Yellow fever**: Timeliness criteria were met for two out of four outbreak responses (50%), compared with 0% in 2022 and 25% at baseline. The two timely reactive vaccinations were carried out in Guinea, while the two delayed campaigns were in Niger and the Central African Republic.

In Niger, delays in submission of requests to the International Coordinating Group on Vaccine Provision (ICG) occurred at multiple levels due to difficulties in transporting samples from remote detection sites to the national laboratory, lack of immediately available financial resources and slow administrative processes in conducting investigations. In the Central African Republic, cases have been reported in hard-to-reach areas and in conflict zones.

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[14] This indicator focuses on outbreaks accompanied by an international response, so numbers do not correspond to the numbers of large or disruptive outbreaks (indicator IG1.3), many of which will have started in 2022 and reached a large or disruptive threshold in 2023.

[15] This report includes data on cVDPV responses for the first time. Hence data are not directly comparable with those included in previous IA2030 reports.

FIGURE 32

**Number of outbreaks requiring a vaccination campaign response by disease, and number of outbreaks where timely response criteria were met.**
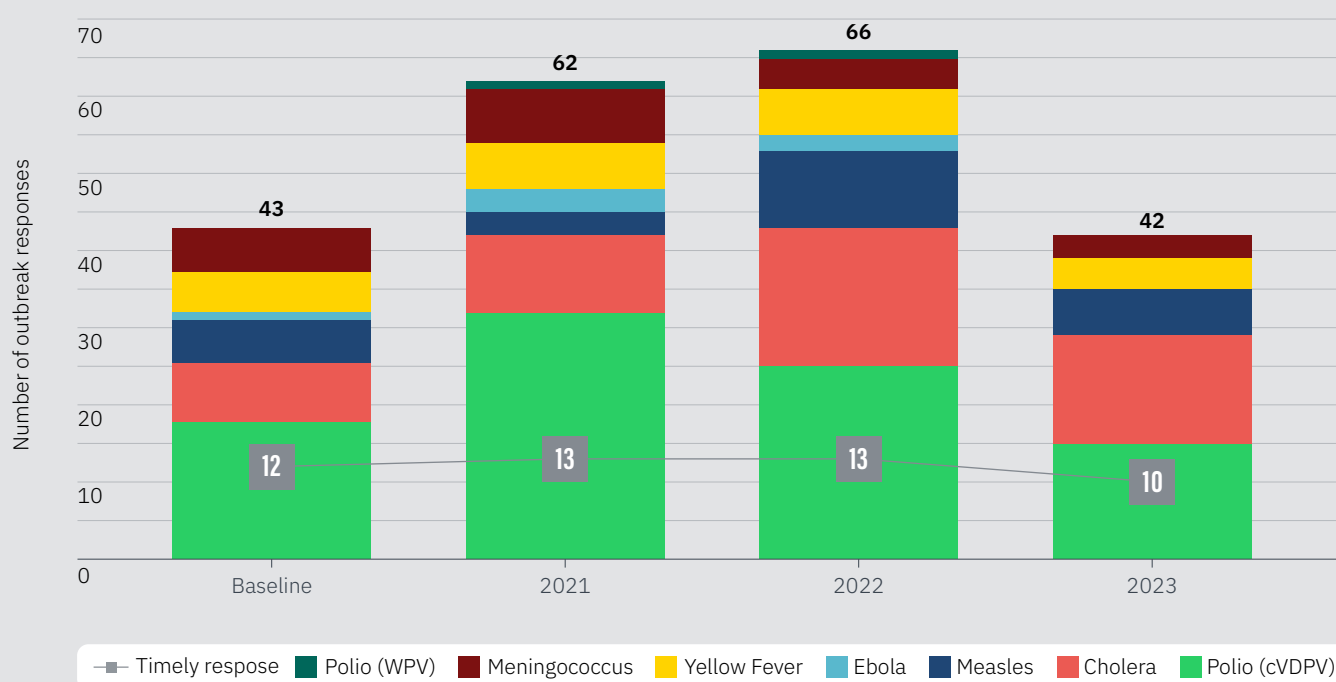


**Note:** Baseline outbreak count is the average number of outbreaks by disease 2018–2020.

In support of outbreak vaccination campaigns, the ICG shipped over 1.8 million doses of yellow fever vaccine to three countries in 2023 (1.4 million to Central African Republic, 0.2 million to Guinea, and 0.2 million to Niger).

**Meningococcus**: No responses met timeliness criteria in either 2023 (four outbreak responses) or 2022 (three outbreak responses). Two vaccine requests were submitted by Niger and one by Nigeria in 2023. The second submission from Niger was a complex request encompassing approximately 50 subdistricts in five districts, which required defining the areas already vaccinated since 2021. Bottlenecks in the submission from Nigeria included challenges with laboratory confirmation, data validation by authorities, and competing outbreaks/priorities. Delays in shipment also occurred.

Timeliness targets are challenging, especially because outbreak detection and response focus on small populations. Countries tend to submit requests when multiple areas exceed a detection threshold, leading to delays. Timeliness is likely to improve in 2024, following the updated WHO outbreak response recommendations based on pentavalent vaccine.

**Polio (cVDPV and WPV)**: Timeliness of responses to cVDPV outbreaks has been steadily improving, with timeliness criteria met in 33% of outbreaks in 2023 (five out of 15), compared with 20% in 2022 (five out of 20) and three times the proportion at baseline (11%). However, two-thirds

of responses still did not meet timeliness criteria. As no new wild poliovirus outbreaks occurred outside endemic countries, timeliness assessment was not applied to wild poliovirus responses in 2023.

**Cholera**: Cholera accounted for more than 70% of all internationally supported outbreak response vaccination campaigns in 2023. The proportion of timely responses declined from 30% at baseline, to 17% (three out of 18) in 2022 and 7% (one out of 27) in 2023. The ICG distributed over 36 million oral cholera vaccine (OCV) doses to 12 countries.

In 2023, the ICG received 27 requests, of which 26 were approved. However, lack of data meant that timeliness could be assessed for only 14 responses (partly because it is difficult to define the start of an outbreak in endemic settings and no incidence threshold has been defined for an epidemic). In addition, for 2023, acute OCV shortage in 2023 seriously impacted vaccine delivery times and decision-making. Indicator definitions and timeliness criteria are under review.

**Ebola virus disease**: In contrast to the general trend, the response to Ebola virus disease outbreaks has been consistently timely, with all campaigns in both 2021 and 2022 (one in 2021 and two in 2022) meeting the relevant timeliness criteria, contributing to the rapid containment of both outbreaks. No Ebola virus disease outbreaks occurred in 2023.

There is considerable scope to improve the timeliness of outbreak responses. The timeliness of responses could be improved by more rapid detection of vaccine-preventable disease outbreaks, acceleration of globally supported responses to those outbreaks, and the rapid launch of outbreak responses using vaccine already present in affected countries, with proper planning to prevent later routine immunization stockouts. Early detection, investigation, notification and response to outbreaks could be enhanced by continuous updating of global outbreak response support mechanisms, including outbreak response guidance, to reflect lessons learnt and best practices, and by ensuring provision of timely technical assistance to countries.

FIGURE 33
**Proportion of international outbreak responses that were designated timely, by VPD type and year**
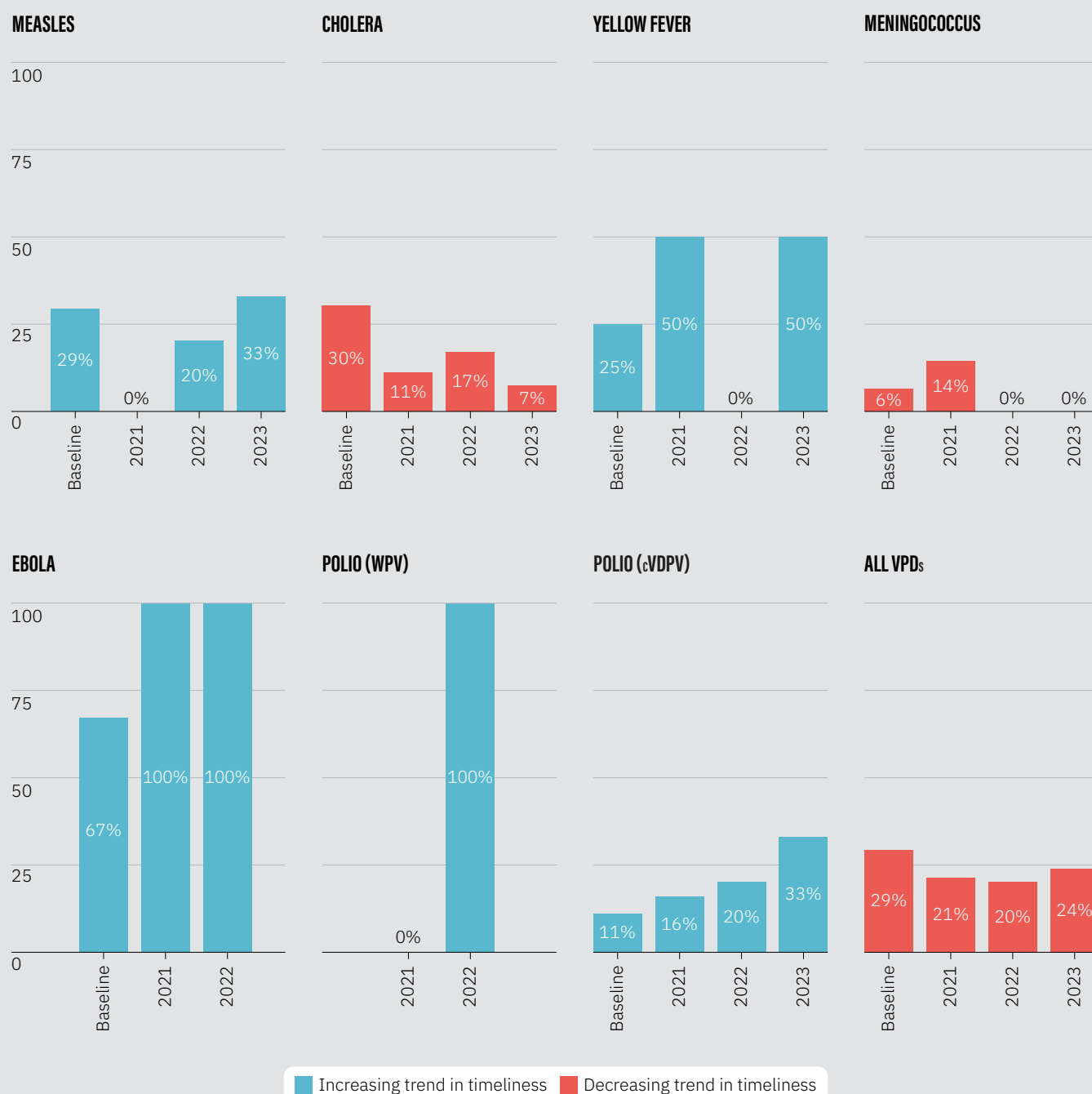


**Note:** Baseline is the average percentage of international outbreak responses that were designated timely between 2018-2020. Trend is based on comparison with baseline. No categorizable responses to wild poliovirus outbreaks occurred in 2018–2020 so no baseline figure is provided.

# SP 6.1
## Global healthy vaccine markets

Health of global vaccine markets, disaggregated by vaccine

**2023 summary:**

- **Five of twelve assessed global vaccine markets were considered "healthy" in 2023, an increase of one (IPV) from 2022.**

- **Five markets were considered "concerning", one fewer than in 2022, and two markets were considered "unhealthy", the same number as 2022.**

- **Market health has improved for IPV and HPV vaccines but deteriorated for cholera vaccine.**

The global vaccine market indicator provides insights into the health of vaccine markets for select antigens, as a measure of access to vaccines globally, across all countries (high-income, upper-middle income, lower-middle income and low-income), all products (sold globally or in a specific country or region), all suppliers (selling globally or in a specific country or region) and all procurement channels (self-procurement or pooled procurement) for which information is available. In 2023, the global dataset included data from 209 countries and territories, 130 suppliers and 87 vaccine products.

The indicator includes an assessment of the total number of suppliers, relative concentration among them, suppliers' ability to distribute globally and the state of the development pipeline. These assessments are integrated to provide an overall measure of whether the market is healthy, concerning, or unhealthy for each vaccine type.

The total number of suppliers making a specific vaccine gives a partial picture on supply security and competition in the market; the market share of the two largest producers provides a sense of how balanced the market is between different suppliers, while global distribution of each manufacturer indicates how many vaccines are available in multiple regions. Lastly, the innovation criterion indicates the number of vaccines in late-stage development.

Five of twelve assessed global vaccine markets were considered healthy in 2023, an increase of one over 2022 (IPV) (Table 4). Five markets were considered concerning in 2023, one fewer than in 2022. The HPV market improved from unhealthy in 2022 to concerning in 2023 due to an additional local manufacturer, greater distribution of products to more regions and an increased pipeline.

Two markets were considered unhealthy in 2023, the same number as in 2022. As in 2022, the hexavalent combination vaccine market was unhealthy in 2023, due to a limited number of manufacturers, concentration of market share among few suppliers, limited global distribution and limited pipeline. Products available through 2022 contain acellular pertussis and are targeted to high- and middle-income countries. A hexavalent whole-cell vaccine more suitable for low- and middle-income countries was WHO prequalified in December 2023, suggesting a potential shift in global market health in the future.

The cholera market has shifted from concerning in 2022 to unhealthy in 2023, due to the exit of a key supplier.

TABLE 4

**IA2030 Global Market Indicator: Comparison of 2022 vs. 2023 indicator results**

| Vaccine | IA2030 GLOBAL MARKET INDICATOR 2023 (with 2023 data) | | |
| --- | --- | --- | --- |
| | 2022 Market health | 2023 Market health | Trend analysis Global Market Health 2022 to 2023 |
| **Bacille Calmette-Guerin (BCG) & Tuberculosis** | HEALTHY | HEALTHY | Market remains Healthy |
| **Cholera** | CONCERNING | UNHEALTHY | Market shifted from Concerning to Unhealthy due to supplier exit resulting in worsened concentration among remaining suppliers and fewer manufacturers distributing in multiple regions |
| **Hexa (aP)** | UNHEALTHY | UNHEALTHY | Market remains Unhealthy |
| **HPV** | UNHEALTHY | CONCERNING | Market shifted from Unhealthy to Concerning due to new local manufacturer, manufacturers' increased distribution to more regions and increased pipeline |
| **IPV** | CONCERNING | HEALTHY | Market shifted from Concerning to Healthy as pipeline is now scored this year and pipeline products exist in Phase III |
| **MMR** | CONCERNING | CONCERNING | Market remains Concerning |
| **MR** | CONCERNING | CONCERNING | Market remains Concerning |
| **PCV** | HEALTHY | HEALTHY | Market remains Healthy |
| **Penta** | HEALTHY | HEALTHY | Market remains Healthy |
| **Rota** | CONCERNING | CONCERNING | Market remains Concerning |
| **Td** | HEALTHY | HEALTHY | Market remains Healthy |
| **YF** | CONCERNING | CONCERNING | Market remains Concerning |

The Gavi Healthy Markets Framework (HMF)[16] includes an assessment of market health for markets supported by Gavi for 54 Gavi-eligible low- and lower middle-income countries in 2023. In 2023, vaccines received by Gavi-eligible countries with Gavi support represented 14% of global vaccine volumes. For vaccines covered by the HMF (cholera, HPV, IPV, MR, Pneumo, Penta, Rota, YF), Gavi markets represented over 40% of global volumes in 2023[17].

[16] Market Shaping (gavi.org)

The HMF has a different scope from the IA2030 global market health indicator (including a subset of countries and products and different indicator criteria and scoring guidelines[18]) so the two indicators are not directly comparable. However, Gavi's HMF assessment is included this year to provide additional insights on market challenges and opportunities that low- and lower middle-income countries specifically face (Table 5).

**IA2030 Global Market Indicator 2023 and Gavi Healthy Market Framework Assessment 2023 for relevant insights on vaccine markets for low- and lower middle-income countries**

| Vaccine | IA2030 Global Market Indicator 2023 | Gavi HMF 2023 | Trend analysis Global Market Health 2023 and Gavi HMF 2023 |
|---|---|---|---|
| Cholera | UNHEALTHY | UNACCEPTABLE and requires further intervention | Cholera market unhealthy globally and for Gavi-eligible countries due to concentrated supplier base, creating supply security risks. |
| HPV | CONCERNING | UNACCEPTABLE with conditions for improvement | HPV market concerning globally and for Gavi-eligible countries remained unhealthy due to unbalanced supply and demand across available products, requiring careful planning and creating supply security risks. |
| IPV | HEALTHY | ACCEPTABLE with risks | IPV market healthy globally and for Gavi-eligible countries. |
| MR | CONCERNING | ACCEPTABLE with risks | MR market concerning globally due to concentrated market share among suppliers; while the HMF framework considers the MR market to be healthy for Gavi-eligible countries as supply meets demand as well as countries' product preferences, the market share concentration is also seen as a risk needing intervention. |
| PCV | HEALTHY | ACCEPTABLE with risks | Pneumo market healthy globally and for Gavi-eligible countries; for Gavi-eligible countries, the unbalanced demand for different products may pose a risk to market health. |
| Penta | HEALTHY | ACCEPTABLE with risks | Penta market healthy globally and for Gavi-eligible countries; for Gavi-eligible countries, the interplay between penta and future hexa programmes may pose a risk to market health. |
| Rota | CONCERNING | UNACCEPTABLE and requires further intervention | Rota market concerning globally and for Gavi-eligible countries was unhealthy due to supply disruptions and delayed supply availability. |
| YF | CONCERNING | ACCEPTABLE with risks | YF market concerning globally and, while healthy for Gavi-eligible countries, requires careful planning due to fragile balance between supply and demand. |

[17] WHO 2023 Global Vaccine Market dataset (sources used for the dataset include but are not limited to the WHO/UNICEF Joint Reporting Form (JRF), WHO MI4A Industry survey, the Global Vaccine Market Model (GVMM), the International Coordination Group (ICG), price data published by UNICEF Supply Division, the PAHO Revolving Fund and the US Centers for Disease Control and Prevention, publicly reported lot release by regulatory authorities in China, and publicly reported sales for more than 20 companies).

[18] HMF-explainer.pdf (gavi.org)

# SP 6.2
## Financial resources for immunization programmes

Proportion of countries whose domestic government and donor expenditure on primary health care increased or remained stable

**2023 summary:**

- **Data on primary health care financing during 2018–2021 are available for only approximately 10% of countries.**

- **Funding for primary health care increased in most of these countries.**

- **Numbers are too small for general conclusions on primary health care financing to be drawn.**

WHO publishes expenditure on primary health care, using country-reported health accounts data and harmonizing data for international comparison purposes. Complete data on primary health care (PHC) expenditure in constant US$ per capita for 2018–2021 are available for only 21 countries[19], in part due to the COVID-19 pandemic. Limited conclusions can therefore be drawn on trends in immunization programme resourcing.

Of the 21 countries reporting data since 2018, national expenditure on PHC from domestic sources and donors increased in 19 (90.5%) between 2018 and 2021, including during the pandemic.

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[19] Of these 21 countries, nine are low-income, six lower middle-income, four upper middle-income and two high-income countries. Of the 19 low- and middle-income countries, 11 also reported complete data for SP6.3.

# SP 6.3
## Immunization expenditure from domestic resources

Proportion of low- and middle-income countries whose share of national immunization schedule vaccine expenditure funded by domestic government resources increased or remained stable

**2023 summary:**

- **Domestic funding of vaccines increased or remained stable in 84% of low- and middle-income countries reporting full data for 2018–2023.**

- **Full data for this period are available for only 41.5% of low- and middle-income countries, and the representativeness of reporting countries is unclear.**

Out of 135 low- and middle-income countries, 94 countries (69.6%) reported 2023 data on total and government expenditure on vaccines to the WHO/UNICEF Joint Reporting Form. Of these, 56 countries (41.5% of all low- and middle-income countries) reported full data for 2018–2023[20].

Among the 56 countries, the share of vaccine expenditure funded with domestic government resources increased in 38 countries (67.9%) between 2018 and 2023. In nine countries (16.1%), this share was maintained at a stable level (16.1%), and in a further nine countries the domestic share of resourcing decreased.

At the regional level, the proportion of countries reporting increased or stable expenditure varied from 50% to 100% across the six WHO regions (Table 6). However, the limited reporting in most regions makes it difficult to draw firm conclusions on regional trends.

TABLE 6

**Number of low- and middle-income countries reporting increased, stable or decreased domestic government expenditure on immunization**

| Region | No. of countries reporting* | Increased expenditure | Stable expenditure | Decreased expenditure |
|---|---|---|---|---|
| AFR | 22/45 (48.9%) | 18 | 0 | 4 |
| AMR | 10/25 (40.0%) | 5 | 4 | 1 |
| EMR | 2/16 (12.5%) | 1 | 0 | 1 |
| EUR | 9/19 (47.4%) | 7 | 2 | 0 |
| SEAR | 6/11 (54.5%) | 2 | 1 | 3 |
| WPR | 7/19 (36.8%) | 6 | 1 | 0 |
| Total | 56/135 (41.5%) | 39 | 8 | 9 |

*Number of low- and middle-income countries reporting data and the percentage of such countries that they represent.

These results should be interpreted in the context of the World Bank report *From Double Shock to Double Recovery*[21] and the 2024 WHO report *Global spending on health: Coping with the pandemic*[22]. The WHO report found that global spending on health increased in 2021, driven by government spending and out-of-pocket spending, and external aid for

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[20] Of the 56 countries, 12 were low-income, 28 lower middle-income and 16 upper middle-income countries in 2019; 11 of these countries also reported full time series data for SP 6.2.

[21] https://www.worldbank.org/en/topic/health/publication/from-double-shock-to-double-recovery-health-financing-in-the-time-of-covid-19

[22] https://www.who.int/publications/i/item/9789240086746

health in low-income countries. However, it concluded that sustaining government spending and external aid at 2021 levels could prove challenging given the deterioration in global economic conditions, rising inflation and increased debt-servicing obligations.

The draft 2024 World Bank report *From Double Shock to Double Recovery* highlights the continued erosion of public investments in health since 2022, with what appears to be a de-prioritization of health in public spending. There are large differences between countries, driven by differences in macro-fiscal context. This calls for a targeted attention to sustain critical health programmes and support countries at risk of decreasing funding for health or with historically volatile growth.

# SP 7.1
## Capacity for innovation

The SP7 Working Group has developed a detailed programme of work to assess and characterize evidence needs at country level with a view to improving the capacity for research and innovation in and for low- and middle-income countries. Particular attention is being placed on implementation research.

Complementing this work, efforts are underway to define a more appropriate indicator in this area. In the interim, the former indicator (the proportion of countries with an immunization research agenda) has been discontinued.

# SP 7.2
## New vaccine development
Progress towards global vaccine research and development targets

A methodology to identify priority endemic pathogens for new vaccine research and development (R&D) was developed through engagement with key stakeholders at the country, regional and global level. The approach was developed through a partnership between the IA2030 SP7 Working Group, WHO's Product Development for Vaccines Advisory Committee (PDVAC) and members of Regional Immunization Technical Advisory Groups (RITAGs).

In 2022, a survey based on multi-criteria decision analysis (MCDA) methodology was developed with input from key global and regional stakeholders and disseminated widely. Preliminary results were presented to SAGE in March 2023. Following further refinement based on SAGE comments and stakeholder consultations, in December 2023 the global list of priority endemic pathogens and related use-cases for new vaccine and monoclonal antibody development (Annex 1) was endorsed by PDVAC.

The aim of the list is to create alignment among regional and global health research and innovation organizations

on which vaccine R&D efforts should be prioritized. Regional and global lists may also assist low- and middle-income countries that are establishing local production of vaccines in deciding which pathogens to target for vaccine development, based on their regional context. Multinational vaccine manufacturers, biotech companies, and academic and other research organizations may also use the information to determine their priorities for vaccine R&D.

A draft M&E framework has also been developed for the list, based on the current status of vaccine development for each vaccine use case – "research", "advance product development" and "prepare to implement". Progress through these categories will be tracked for each pathogen, each vaccine use case and for the portfolio as a whole. A scorecard will be developed to visualize progress in vaccine R&D, with interim updates every two years aligned with IA2030 reporting.

A separate set of activities coordinated by the WHO R&D Blueprint has generated an updated list of priorities for pathogens of pandemic potential.

# 05
# SUPPLEMENTARY ANALYSES

# 5.1 HUMANITARIAN SETTINGS

Further analyses have been carried out on a subset of IA2030 Impact Goal indicators in countries and territories experiencing humanitarian challenges. The analyses are intended to provide an indication of the scale of immunization challenges in such countries/territories and the extent to which they contributed to the limited progress made towards Impact Goal indicator targets in 2023.

The main findings are:

- Countries/territories with humanitarian settings accounted for **more than half (53%) of the excess future deaths** that will occur because vaccination coverage targets were missed in 2023.

- They accounted for **more than half (55%) of zero-dose children** in 2023, even though they make up only 31% of the 2023 birth cohort.

- Average **DTP3 coverage** in such countries/territories was 70%, **14% lower than the global average**.

- Countries/territories with humanitarian settings were markedly more likely to experience **large or disruptive outbreaks** of measles, cVDPV and cholera.

The analyses indicate that countries/territories with humanitarian settings are making a significant contribution to the slower-than-anticipated progress towards IA2030 goals in 2023.

These countries/territories face a diverse range of challenges. Each setting is unique, and tailored solutions will be required that reflect the realities of each individual context.

### Birth cohort

Countries/territories with humanitarian settings account for a significant proportion of the world's annual birth cohort – in 2023, **31% of births** occurred in such countries/territories.

### Projected deaths averted

An estimated 1.35 million future deaths were averted by vaccination in 2023 in countries/territories with humanitarian settings. An additional 227,000 future deaths could have been avoided had coverage targets been met in these countries/territories in 2023. Countries/territories with humanitarian settings account for 53% of the total number of deaths that could have been averted by vaccination in 2023.

### Zero-dose children

In 2023, 8 million zero-dose children were born in countries/territories with humanitarian settings, representing 55% of the total number of zero-dose children worldwide. Zero-dose children are therefore significantly over-represented in these countries/territories.

### Coverage

Average DTP3 coverage in countries/territories with humanitarian settings was 70%, compared with a global average of 84% – a difference of 14%.

### Large or disruptive outbreaks

For measles, cVDPV and cholera, large or disruptive outbreaks were markedly more likely to occur in countries/territories with humanitarian settings. Large or disruptive outbreaks of measles, for example, occurred in 58% of such countries/territories compared to 24% of other countries/territories (Figure 34). The difference was even greater for cVDPV outbreaks, which were recorded in 52% of countries/territories with humanitarian settings compared with 11% of other countries/territories.

The risk of a cholera outbreak was almost 16 times greater in countries/territories with humanitarian settings, the risk of a cVDPV outbreak was 8.6 times greater, and the risk of having a measles outbreak 4.4 times greater.

FIGURE 34

**Proportion of countries with large or disruptive outbreaks of measles, cVDPV and cholera in 2023.**
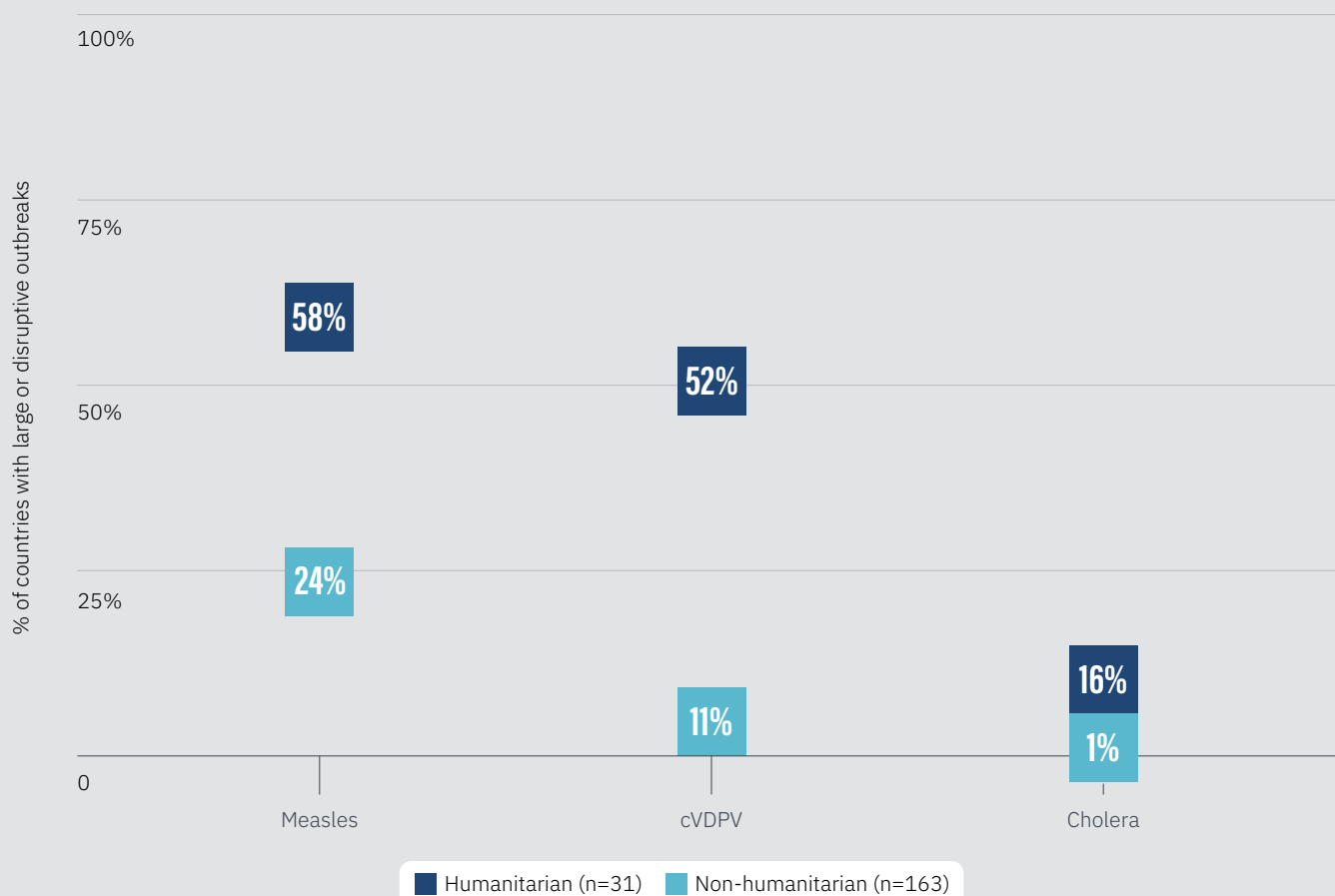
# 5.2 INITIAL ESTIMATES OF COVERAGE IN 2024

Coverage estimates for 2023 included in this Global Progress Report are based on country submissions to the eJRF process. They have been through a collation and verification process to ensure their reliability before wider release (as WUENIC estimates).

WHO also receives ongoing data from countries during the year on volumes of vaccine use. At quarterly intervals, countries provide data (via WHO regions) on the number of doses used in preceding months. Potentially, this information could provide more up-to-date data relating to coverage to inform decision-making. However, as the data have not been through WUENIC verification processes, they may not be a reliable indicator of coverage, and there are question marks about the completeness of data supplied to the global level.

To explore this issue, WHO has examined country-supplied data at various time points during 2023 and 2024, and compared the 2023 data with WUENIC estimates for 2023.

Only a subset of countries regularly provide complete data. Figure 35 shows the aggregate number of DTP1 doses reported for 52 regularly reporting countries, representing 46% of the annual birth cohort, up to June 2024, as of

December 2024. Figure 35 also includes a comparison with the trends seen in 2023 at a similar timepoint (November 2023), for the same set of countries.

The comparison suggests that, in the first half of 2024, the number of doses of DTP1 administered may have increased compared with 2023. However, implications for coverage in 2024 are highly uncertain, for the following reasons:

- The data are derived from a non-representative subset of countries from just three WHO regions. The African Region is over-represented and is characterized by a growing population, so an increase in the number of doses used may not necessarily translate into increased coverage.

- The data are provisional and are updated by countries over the year. Figure 35 also shows the trend in 2023 following the finalization of data submissions, illustrating the difference between the reported data as of November 2023 and after finalization. Data for 2024 will show a similar increase as additional country updates are received.

- Even the final country-reported data for 2023 show inconsistencies with WUENIC estimates.

FIGURE 35

**Country-reported data on cumulative total of DTP1 doses used during the first six months of 2024 and 2023, as of different time points.**
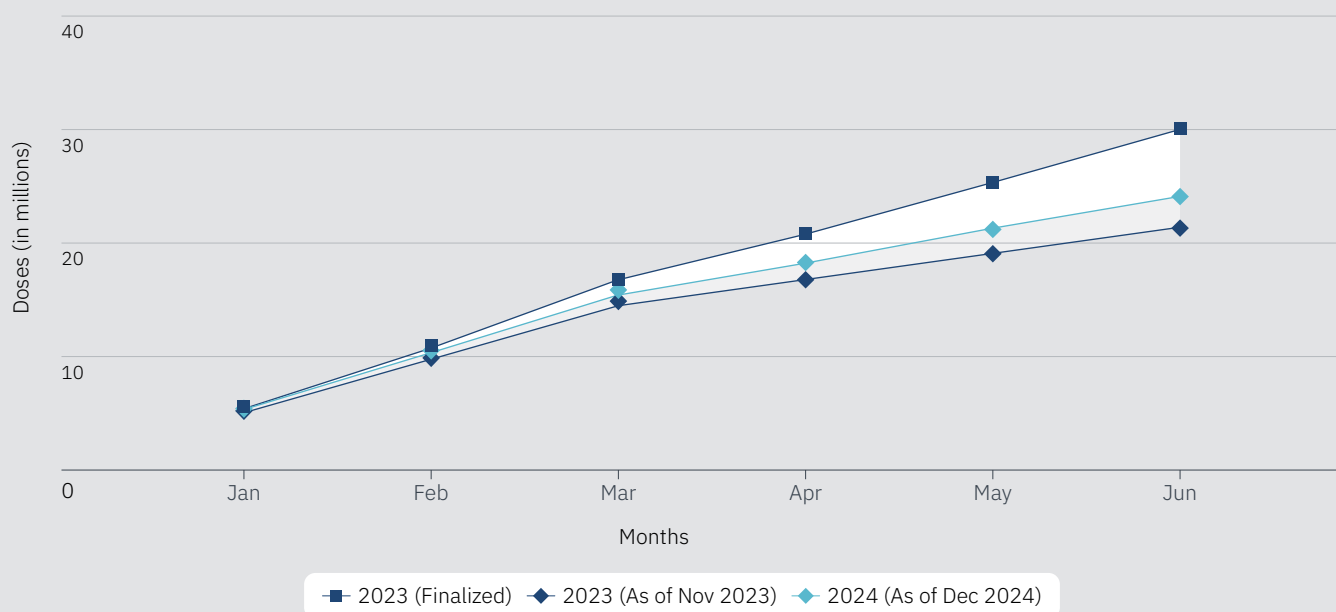


**Note:** Because countries update their submissions, the number of doses used by a particular month will rise over time, as seen for 2023 data. Similar patterns over time are seen for other vaccinations (e.g. DTP3, MCV1).

As things stand, it is challenging to obtain country data that are comprehensive and reliable as well as timely. Timeliness is affected by the inevitable lag in country reporting, as well as subsequent retrospective updating of past submissions. Hence, data on doses used at a particular timepoint will not provide a reliable indication of the actual number of vaccine doses used at that timepoint until many months later. Furthermore, dose volumes do not translate directly to coverage, given fluctuations in birth cohort size.

A comparison of annual trends (as above) can provide some indication of year-to-year progress. However, this makes the assumption that the patterns of country reporting and updating are similar each year, which is not necessarily the case. Updates generally reflect addition of data from subnational areas that were slow to submit data to the national level. Late-reporting areas may vary from year to year, affecting how national figures change during the course of the year.

During the COVID-19 pandemic, many countries developed ways to track COVID-19 vaccine coverage in near real-time. This information was used to inform efforts to rapidly build coverage, particularly among high-priority groups. It has been suggested that a similar approach could be taken with other types of immunization.

However, at the global level, there is likely to be a trade-off between coverage data timeliness and reliability. Moreover, it is not clear that, for routine as opposed to emergency vaccination, the benefits of timeliness outweigh the costs in terms of lower data reliability. If improved timeliness of coverage data is seen to be an important goal to pursue, a strong use case needs to be developed to demonstrate how greater timeliness would facilitate national, regional and global decision-making. Furthermore, other types of data, for example on programmatic activities, could provide more timely and reliable insights.

Notwithstanding these caveats, there are strong arguments to improve data use within countries, to support quality improvement cycles at all subnational levels. Data recording continues to be a predominantly paper-based process in many settings, with minimal local use of data to improve microplanning. Improving data use at the national and subnational level, as outlined in the IA2030 strategy, remains a key goal.

# 06
# CONCLUSIONS

Since the launch of the EPI initiative in 1974, tremendous progress has been made in ensuring ever greater numbers of infants are protected against an ever-wider range of vaccine-preventable diseases. An **estimated 154 million lives have been saved since 1974 by vaccination**, making a substantial contribution to reductions in child mortality.

Over the past decade, however, progress has been much slower. The main success has been a steady increase in the **breadth of protection indicator**, largely due to new vaccine introductions. Globally, **DTP coverage** and the numbers of **zero-dose children** have barely changed over the past ten years.

Immediately after launch, the IA2030 strategy was thrown off course by the **COVID-19 pandemic**. Since the end of the pandemic, few indicators have returned to pre-pandemic levels and only one, new vaccine introductions in low- and middle-income countries, is on the trajectory required to achieve 2030 targets. This is largely due to the substantial number of COVID-19 vaccine introductions – a great achievement but the original goal was to complete the introduction of essential infant vaccines worldwide.

Although the beginnings of a recovery were seen in 2022, this has not been sustained. Improvements in key IA2030 indicators have slowed, come to a halt or, for numbers of zero-dose children, gone into reverse.

Nevertheless, global averages hide much heterogeneity, and country-level data indicate that high performance, and improving performance, are possible even under challenging circumstances. The "positive outliers" should be a guard against fatalism and an inspiration to others. **Although there are many headwinds, problems are solvable**. However, this will require concerted efforts, led by countries and supported by global and regional partners, to strengthen national immunization systems.

## LINKING MONITORING TO ACTION

Given the limited progress, monitoring and evaluation (M&E) activities need to be better leveraged to support these efforts at national, regional and global levels. Ideally, M&E activities are **integrated within planning processes**, so that data provide insights into progress and the effectiveness of interventions, and data analysis informs choice of action – the classic **monitoring, evaluation and action (ME&A) or continuous quality improvement cycle**. So far,

the emphasis in IA2030 has been on monitoring, and the potential for data to drive action has not been fully realized.

Further, we need to reflect critically on the effectiveness of IA2030 M&E activities in supporting action. Impact Goal indicators play a key role in assessing progress, helping us to understand whether we are on- or off-track. However, if progress is off-track, they provide little insights into why.

Strategic Priority indicators focus on key aspects of immunization systems, and can provide a valuable sense of the state of play globally in these areas. Yet there are clear gaps in what these indicators are tracking, data are not always available for some important indicators, and the data by themselves are rarely sufficient to suggest corrective actions. More in-depth analyses are needed to understand root causes and to identify possible solutions.

ME&A cycles should be the engines of change at global, regional and country levels – indeed, at every level of the system right down to individual facilities. Achieving global targets will be dependent on progress at the country level, so strengthening of national ME&A processes must be a high priority.

The question then is how regional and global ME&A activities can best be leveraged to support country progress. More thought needs to be given to the type of data collected at different levels, how it can best be analysed to generate actionable insights, and how these insights can be used to drive action in support of countries.

Different types of data will be needed at different levels. However, the reporting burden on countries also needs to be recognized. At the global level, before requesting ever more data from countries, we need to be asking whether there is a good "use case" for these data – can their analysis drive action at the global level and, if so, how? Can we aggregate data on the indicators that are most useful at the national/programmatic level, rather than requesting additional information?

It is easy for monitoring to be seen as a chore – a mandated activity that is of no benefit or interest to those collating or reporting the data. However, data should be the driver of change – indeed, one of the IA2030 core principles is "data-driven". More strongly embedding this principle in future IA2030 work will help to ensure that the power of data is better mobilized to strengthen immunization programmes and save lives.

# 07
# ANNEXES

# ANNEX 1 USE CASES AND ACTION CATEGORIES FOR PATHOGENS ON THE GLOBAL PRIORITY LIST

| Pathogen | Use Case | Action Category (as of December 2023) | | |
| --- | --- | --- | --- | --- |
| | | Research | Advance Product Development | Prepare to Implement |
| **Totals** | | 10 use cases 6 pathogens | 18 use cases 11 pathogens | 6 use cases 4 pathogens |
| **Cytomegalovirus (CMV)** | Prevention and/or modification of sequelae associated with congenital CMV, by vaccinating women and girls prior to pregnancy | | ☐ | |
| **Dengue virus** | Vaccination of dengue-naive and -seropositive individuals, to prevent dengue febrile illness induced by any dengue serotype | | | ☐ |
| **Extra-intestinal pathogenic *E. coli* (ExPEC)** | Prevention of invasive *E. coli* disease, including urinary tract infections or bacteraemia, in high-risk populations | | | ☐ |
| | Maternal immunization during pregnancy to prevent invasive *E. coli* disease, such as neonatal sepsis and meningitis, in neonates and young infants | ☐ | | |
| **Group A streptococcus (GAS)** | Prevention of GAS disease: pharyngitis, impetigo and invasive disease in young children. Potential for prevention of GAS immune-mediated sequelae: acute rheumatic fever and rheumatic heart disease | ☐ | | |
| **Group B streptococcus (GBS)** | Maternal immunization during pregnancy to prevent GBS-related stillbirth and invasive GBS disease in neonates and young infants | | ☐ | |
| | Prevention of GBS infections in older adults | ☐ | | |
| **Hepatitis C virus** | Prevention of chronic hepatitis C virus infection in persons at risk | ☐ | | |
| | Therapeutic vaccines to improve treatment outcomes for chronic hepatitis C virus infections | ☐ | | |
| **HIV-1** | Prevention of HIV in high-risk populations | ☐ | | |
| | Treatment and/or cure of HIV infection in HIV-1-positive individuals (includes vaccines, monoclonal antibodies, and combined approaches) | ☐ | | |
| | Preventive monoclonal antibodies for HIV-1 infection in confirmed HIV-negative individuals at substantial risk of HIV infection and their sexual partners; prevention of HIV-1 infection in neonates and infants with HIV exposure | ☐ | | |

| | | Action Category (as of December 2023) | | |
| Pathogen | Use Case | Research | Advance Product Development | Prepare to Implement |
|---|---|---|---|---|
| **Influenza** (use cases will be updated following revision of preferred product characteristics for influenza vaccines) | Universal-type influenza A vaccines for prevention of severe influenza illness caused by human influenza A virus infection | | ☐ | |
| | Improved seasonal influenza vaccines | | ☐ | |
| *Klebsiella pneumoniae* | Maternal vaccination during pregnancy to prevent neonatal sepsis caused by the major disease-causing serotypes of *K. pneumoniae* | ☐ | | |
| | Preventing *K. pneumoniae*-attributable disease, including pneumonia, bloodstream infections, and/or urinary tract infections in high-risk populations | ☐ | | |
| *Leishmania* **species** | Prevention of visceral leishmaniasis and/or cutaneous leishmaniasis and/or prevention or treatment of post-kala azar dermal leishmaniasis | | ☐ | |
| *Mycobacterium tuberculosis* **(TB)** | Prevention of active pulmonary TB disease (with or without evidence of latent infection), including in those with HIV infection | | | ☐ |
| | Prevention of TB disease in infants and young children, including in infants with HIV infection | | | ☐ |
| | Adjunctive treatment of TB, or to prevent relapse following cure in patients being treated for active TB | | ☐ | |
| **Non-typhoidal** *Salmonella* | Paediatric vaccines for prevention of invasive disease caused by non-typhoidal *Salmonella* in children aged 6–36 months | | ☐ | |
| | Prevention of invasive disease caused by non-typhoidal *Salmonella* in other individuals at high risk | | ☐ | |
| **Norovirus** | Prevention of norovirus acute gastroenteritis for children in all countries from 6 weeks of age | | ☐ | |
| | Prevention of norovirus acute gastroenteritis for adolescents, adults, and/or older persons in all countries (including travellers) | | ☐ | |
| *Plasmodium falciparum* **(malaria)** | Prevention of blood-stage infection due to *P. falciparum* malaria at the individual level, for populations or age groups who experience high incidence of infection | | ☐ | |
| | Prevention of malaria transmission at the community level for children and adults, including women of childbearing age | | ☐ | |
| | Monoclonal antibodies for prevention of blood-stage infection due to *P. falciparum* and/or reduction of clinical malaria | | ☐ | |

| Pathogen | Use Case | Action Category (as of December 2023) | | |
| --- | --- | --- | --- | --- |
| | | Research | Advance Product Development | Prepare to Implement |
| **Respiratory syncytial virus (RSV)** | Maternal vaccination of women during pregnancy, for prevention of severe RSV disease in offspring during the neonatal period and early infancy | | | ■ |
| | Immunization of infants, for prevention of RSV disease in infants and young children | | ■ | |
| | Monoclonal antibodies for prevention of severe RSV disease for all infants in the first 6 months of life and for high-risk young children entering their second RSV season | | | ■ |
| *Shigella* **species** | Prevention of moderate to severe diarrhoea due to *Shigella* in infants from 6 months and children up to 36 months of age | | ■ | |
| | Prevention of *Shigella*-attributable dysentery and diarrhoea for high-risk populations | | ■ | |
| *Staphylococcus aureus* | Prevention of severe infection in populations at risk | | ■ | |
| | Monoclonal antibodies for prevention or treatment of disease caused by *S. aureus* | | ■ | |

# ANNEX 2 IA2030 GLOBAL M&E FRAMEWORK INDICATOR REVISIONS 2024

In 2024, the IA2030 Monitoring and Evaluation (M&E) Working Group received proposals for revisions to 11 indicators included in the M&E Annex to the IA2030 Framework for Action. Indicators were reviewed by a sub-group of the M&E Working Group (2024 M&E Indicator Revision Task Team) and prioritized for review based on their feasibility, importance and urgency to resolve for the 2024 reporting cycle. Recommendations from this sub-group were implemented in the reporting of global monitoring results in the IA2030 Global Progress Report 2024

*For more information on the indicators reported, please see WHO's Indicator Metadata Registry (IMR). Impact goal and strategic priority objective indicators are listed in the registry with the prefix "IA2030".*

| ID | Identified challenge(s) with indicator or reporting *(following 2022 official data reporting)* | Summary of changes for 2024 Global Progress Report *(implemented in 2023 official data reporting)* |
|---|---|---|
| **IMPACT GOAL (IG) INDICATORS** | | |
| IG 1.2 | **Programmatic**: Not all vaccine introductions are included in existing indicator. **Measurement:** Difficult to understand number of introductions completed relative to the number of introductions needed. | **Update reporting:** Update list of vaccines to include typhoid and separately report on DTP booster doses. Also recommend including dengue introductions for at-risk countries when reported and malaria introductions, but not introductions for cholera and rabies vaccines. No changes to measurement approach for 2024, but reconsider for 2025 reporting cycle and beyond. |
| IG 1.3 | **Interpretation:** Despite very large numbers of measles outbreaks, trend for large or disruptive outbreaks shows a decrease due to time period selected for baseline. | **Modify indicator:** For measles only, change baseline to the average of the annual count of countries experiencing large or disruptive outbreaks between 2011 and 2020. The baseline was previously reported as the average between 2018 and 2020. |
| **STRATEGIC PRIORITY (SP) OBJECTIVE INDICATORS** | | |
| SP 1.1 | **Data availability:** Difficult for countries to interpret and report on criteria #2 and #3; relevant questions removed from eJRF. | **Modify indicator:** Keep only criteria #1 (composite indicator on functional NITAG or equivalent). |
| SP 1.3 | **Data availability:** Difficult for countries to report on timeliness of data; relevant questions removed from eJRF. | **New indicator:** Use interim composite indictor of polio (non-polio acute flaccid paralysis rate) and measles (non-measles, non-rubella discard rate) surveillance performance indicators. |
| SP 1.4 | **Data availability:** Difficult for countries to report at health facility level. | **Modify indicator:** Revise to report district-level (instead of facility-level) stockouts. |
| SP 4.1 | **Programmatic:** With increased evidence of protection with single-dose HPV vaccine and adoption of single-dose strategy by many national immunization programmes, monitoring of HPV coverage could be achieved by monitoring HPV1, instead of HPVc (final dose coverage). | **No change:** Maintain HPVc for HPV coverage monitoring (number of doses varies by country). |
| SP 6.1 | **Programmatic:** List of antigens could be updated as some vaccines gain volume while others are slowly being replaced. | **Update reporting:** Update list of vaccines to replace PPSV with PCV and monitor cholera, yellow fever, MR, MMR, and meningococcal vaccines MenACWY-135 and MenACWYX. |

| ID | Identified challenge(s) with indicator or reporting *(following 2022 official data reporting)* | Summary of changes for 2024 Global Progress Report *(implemented in 2023 official data reporting)* |
|---|---|---|
| **SP 6.2, SP 6.3** | **Interpretation:** To keep measurement coherent over time, need to measure progress for same set of countries annually, but country reporting of expenditure data to the eJRF is not systematic and regular. With a diminishing number of countries reporting data over time, monitoring results are inaccurate. | **Update reporting:** Update list of vaccines to replace PPSV with PCV and monitor cholera, yellow fever, MR, and MMR. In future, also monitor MenACWY-135 and MenACWYX. |
| **SP 7.1** | **Interpretation:** Difficult to interpret and use reported information | **Update reporting:** Indicator not reported as review ongoing. |
| **SP 7.2** | **Indicator availability:** None reported. | **No change:** Review of newly proposed indicator is still pending and will be reconsidered for 2025 reporting cycle and beyond. |

**IMMUNIZATION AGENDA 2030**