Progress and Challenges with Achieving Universal Immunization Coverage

2022 WHO/UNICEF Estimates of National Immunization Coverage

Sources:

- Member State reports to WHO and UNICEF up to 26 June 2023
- The 2023 World Bank Development Indicators Online
- United Nations, Population Division, 2022 revision

Estimates as of July 2, 2023

World Health Organization

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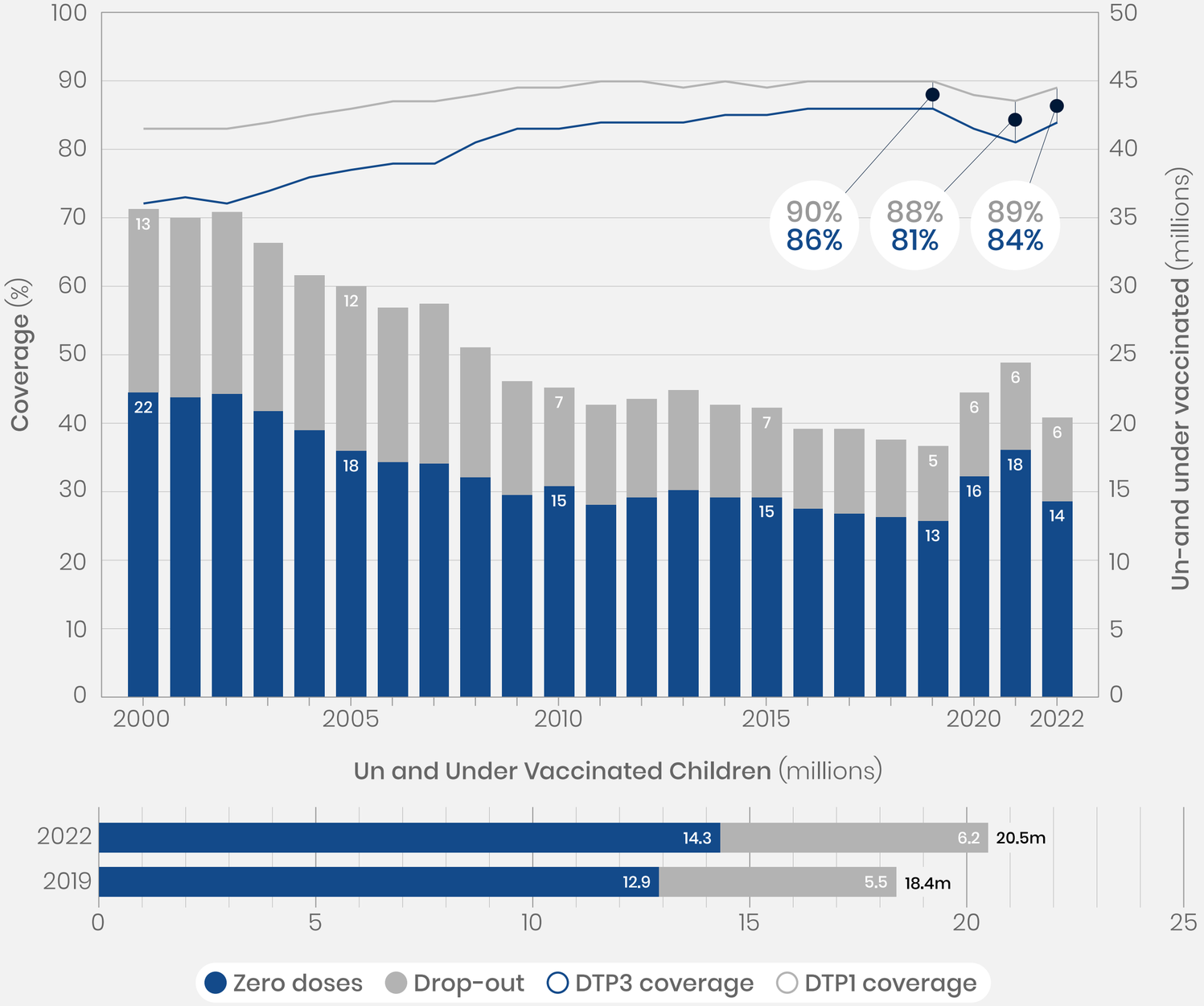
DTP immunization coverage almost recovered to 2019 levels

The key goal of the Immunization Agenda 2030 is to make vaccination available to everyone, everywhere, by 2030. The Covid-19 pandemic, associated disruptions, and Covid-19 vaccination efforts strained health systems in 2020 and 2021, resulting in setbacks.

In 2022, global vaccination coverage with DTP-containing vaccine partially recovered. The number of children missing out on all routine immunization vaccination - "zero-dose children" – improved from 18.1 in 2021 to 14.3 million. However, this is not yet back to pre-pandemic level of 12.9 million (2019).

Coverage of the third dose of vaccine protecting against diphtheria, tetanus, and pertussis (DTP-3) recovered to 84% in 2022, leaving 20.5 million children vulnerable to vaccine-preventable diseases, improved from 2021 (81%, 24.5 million) but also not back to 2019 performance yet (86%, 18.4 million)..

In this analysis, zero-dose children are those who lack any dose of DTP. Under-vaccinated are those who received one dose, but not a third protective dose.

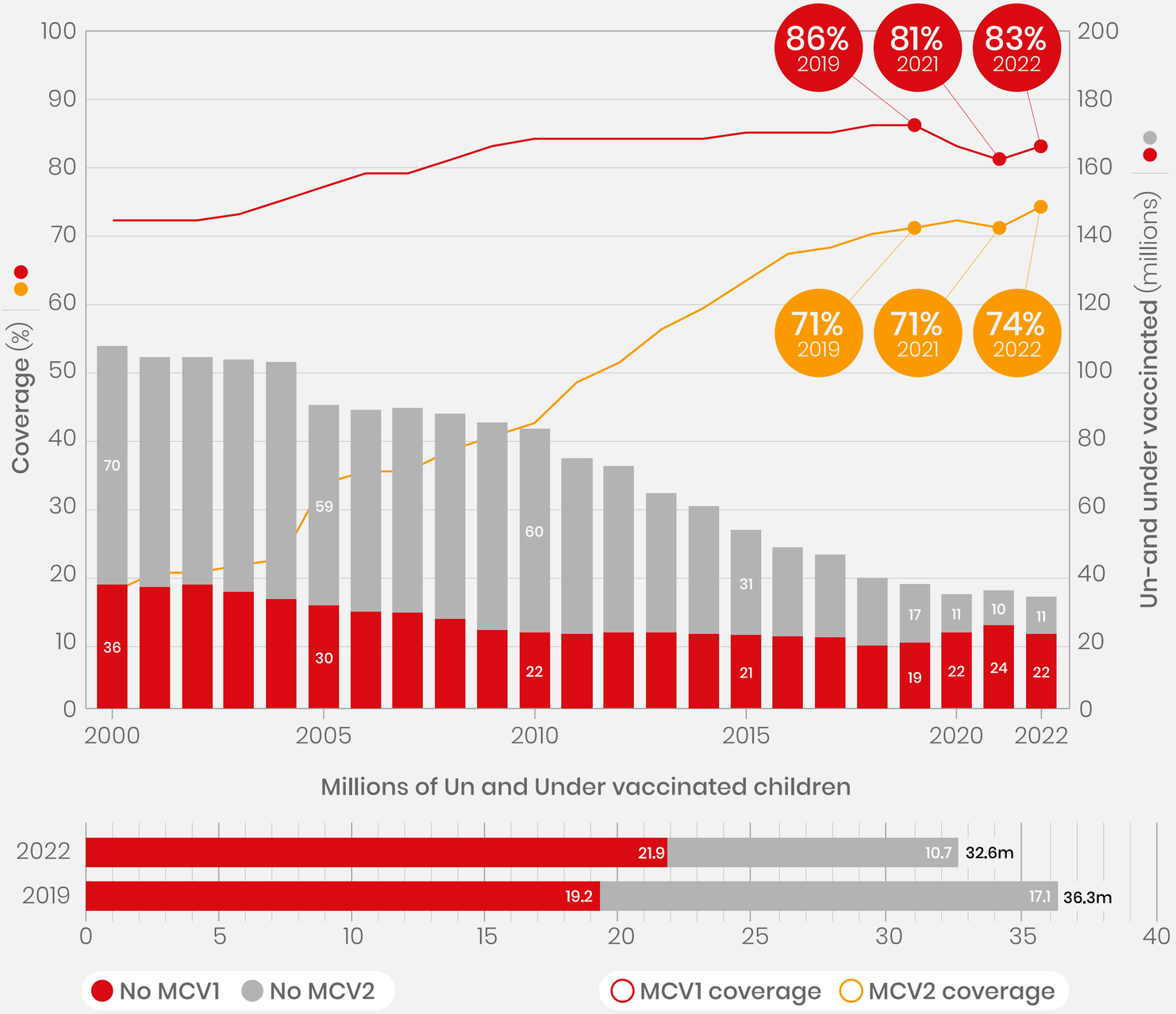


Measles containing vaccine (MCV) coverage shows less recovery than DTP vaccination

Measles, because of its high transmissibility, acts as a “canary in the coalmine”, quickly exposing any immunity gaps in the population. The coverage of measles containing vaccine is thus often used as a leading tracer for protection.

The proportion of children receiving a first dose of measles vaccine – typically at 9 or 12 months - increased from 81 to 83%, still below the 2019 level of 86%. 21.9m children missed their routine first dose of measles.

Coverage of the second dose of measles containing vaccine – typically administered to children between 18 months and five years old – continued to benefit from the introduction of this dose in national schedules. With 11 countries introducing MCV2 since 2019, global coverage stood at 74% in 2022.



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Post pandemic recovery in number of zero dose children varies by region and by Gavi status

The number of zero dose children – those never vaccinated with even a first dose of DTP-containing vaccine, fell in all regions apart from the African Region.

The Gavi Alliance currently provides support to 57 countries home to 10.2 million zero-dose children (71% of the total, 14.3 million). Improvements were seen relative to 2021 (12.4 million), but not yet back to 2019 pre-pandemic levels (9.0 million).

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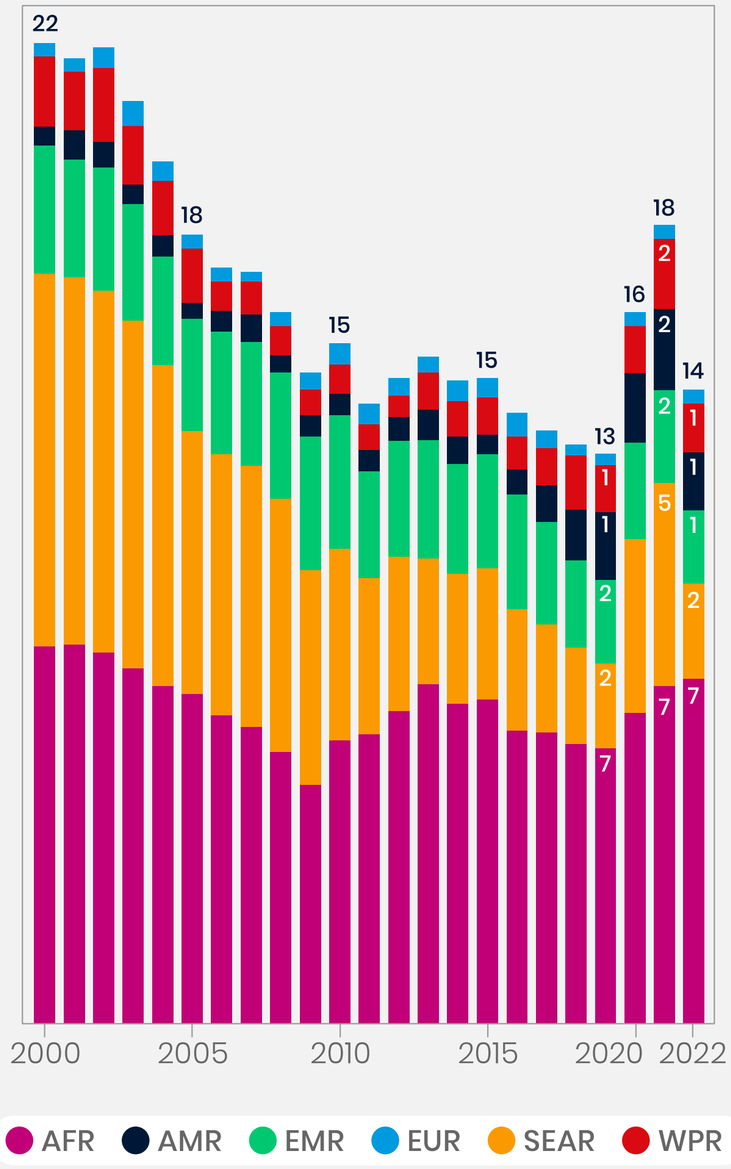
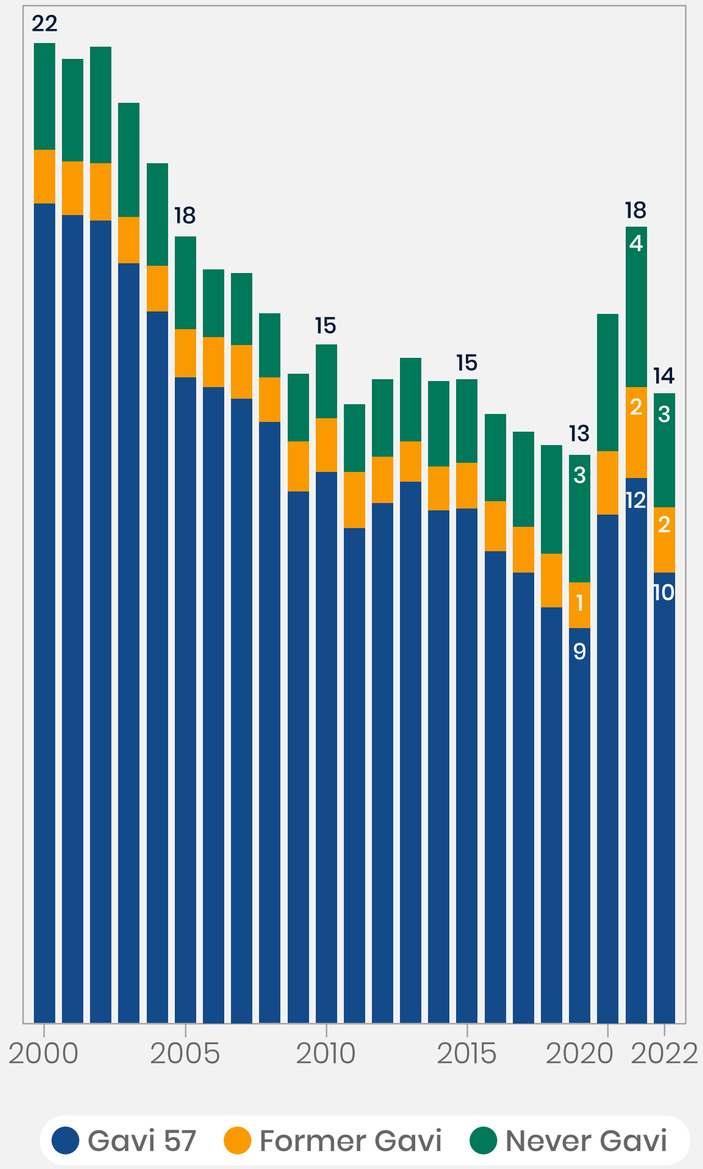
Zero dose children by WHO region (millions)



Zero dose children in Gavi countries (millions)

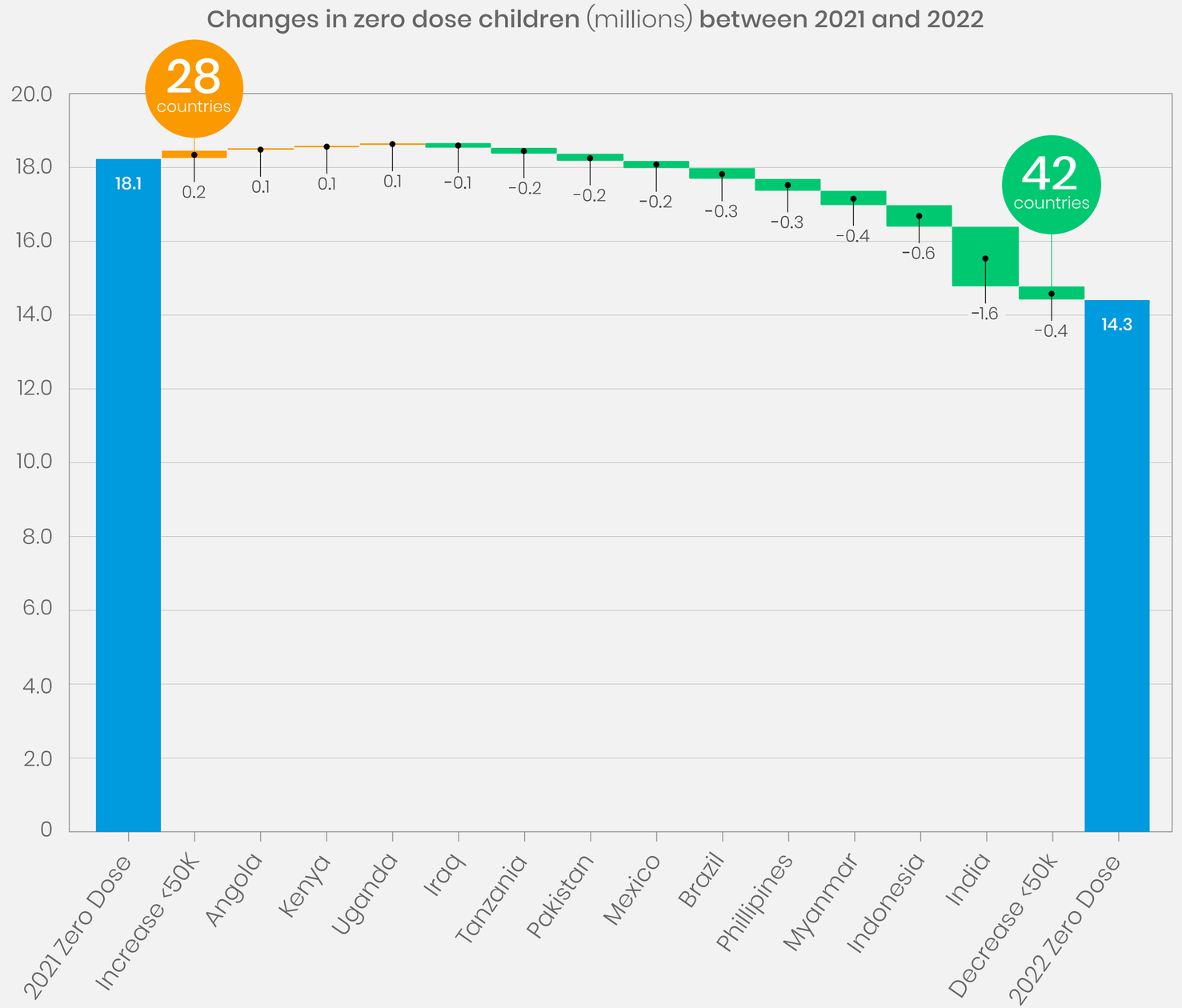


Post-pandemic recovery of zero-dose children is concentrated in large countries

India and Indonesia experienced a robust recovery from the pandemic disruptions, accounting for an outsized share of the global recovery in the number of zero dose children.

Countries in which increases (N=28) or decreases (N=42) of <50K zero dose children occurred, are summed and grouped respectively on the plot.

Not shown on this plot are 105 countries with no change in the estimate of zero dose children.

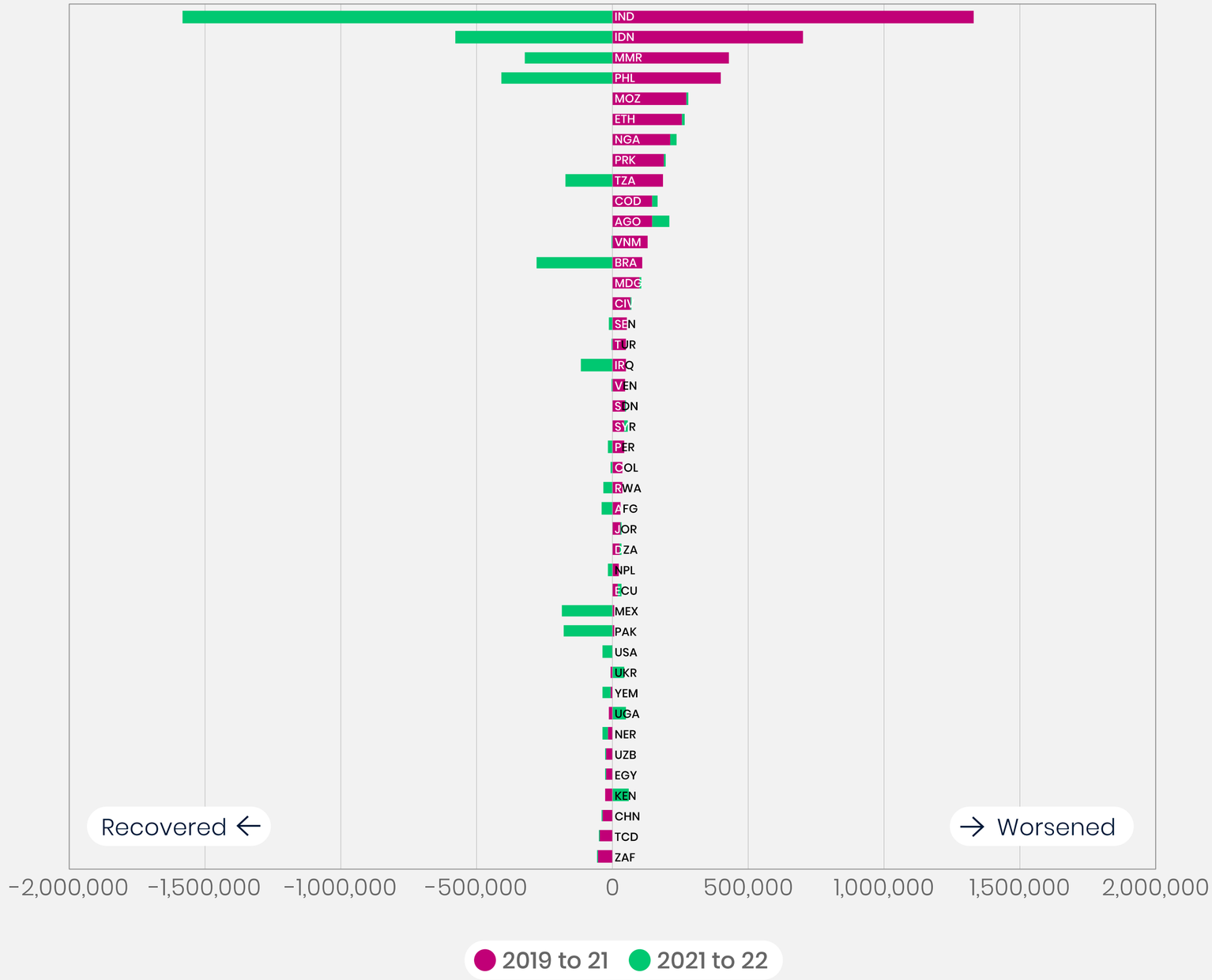


Change in Zero Dose Children during the pandemic and in 2022*

Pandemic impact is of notable magnitude, especially in large countries.

Some of these countries (approximately 15) experienced a subsequent robust recovery, while others have yet to recover.

* Only includes countries with an absolute change of at least 20,000 children in either time period



Countries with the most unprotected children in 2022

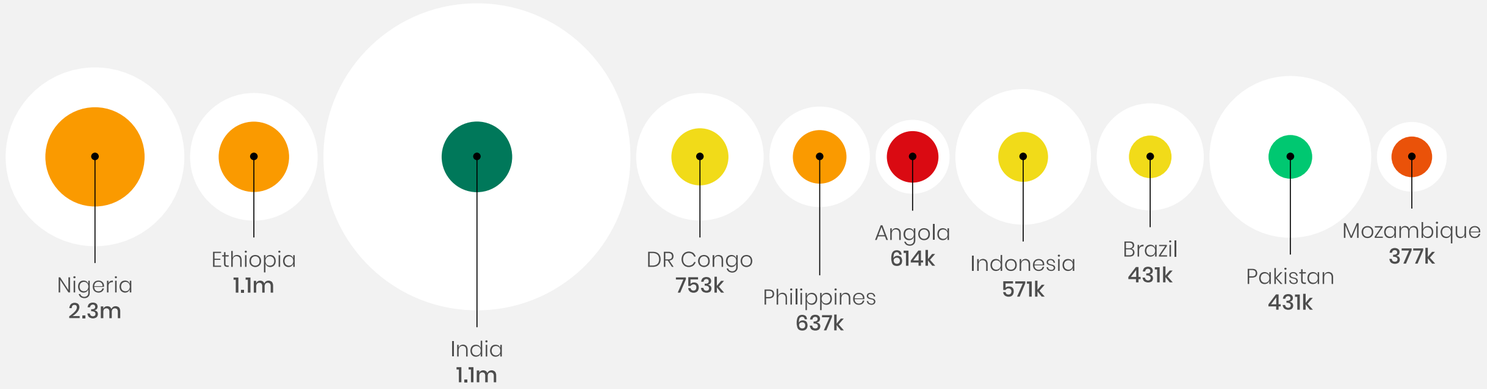
Just 10 countries account for 58% of zero-dose children. Roughly the same countries also account for 58% of the children missing out on a measles vaccine.

Among the leading 10 countries for DTP zero dose children in 2022, Mozambique has replaced Myanmar that was in this group in 2021.

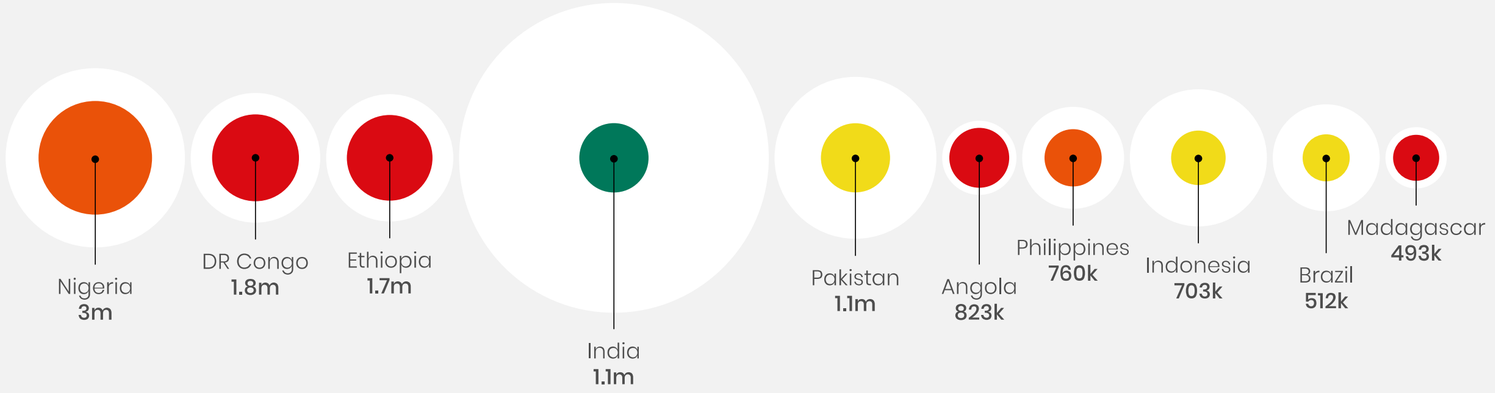
Among the MCV zero dose group a Madagascar has replaced Tanzania in 2022 compared with 2021.

Absolute numbers of left out children is driven by a combination of population size and programme performance, which ranges from low to strong performing programmes.

No DTP1 (zero dose)



No measles vaccine



Coverage according to legend, bubbles sized to numbers of surviving infants and unprotected children.

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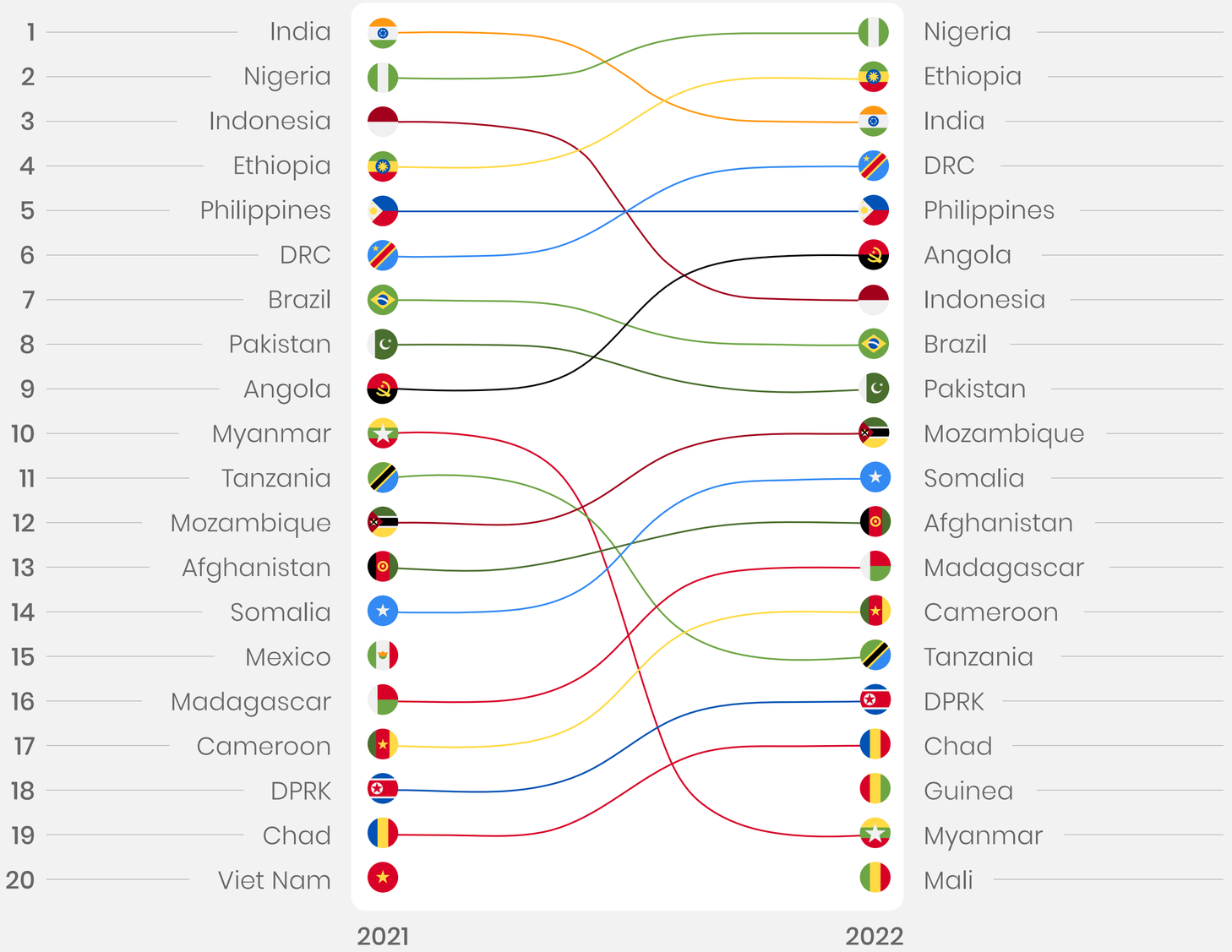
20 IA2030 priority countries

20 countries were prioritised in the context of the Immunization Agenda 2030, based on their number of zero-dose children in 2021 (defined as those who lack any dose of DTP).

The chart compares the ranking by this measure between 2021 and 2022.

Top 20 zero-dose countries rank, 2021-2022



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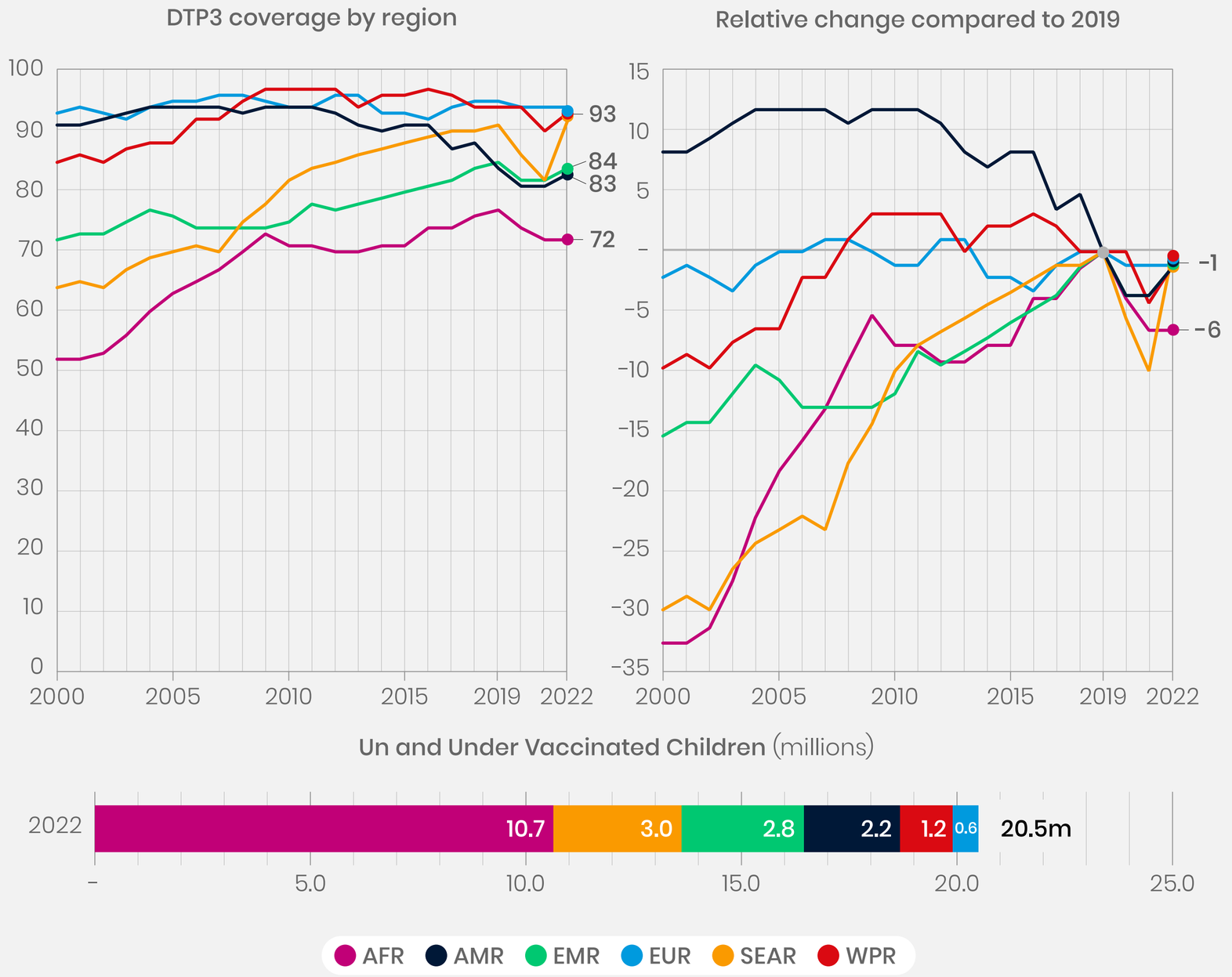
DTP immunization recovered almost to 2019 levels in most WHO Regions

Coverage of a third dose of vaccine protecting against diphtheria, tetanus, and pertussis (DTP-3) recovered to just below 2019 levels in all regions apart from the African Region, which is still 6 percent below 2019 levels (relative reduction, not absolute difference in percentage points).



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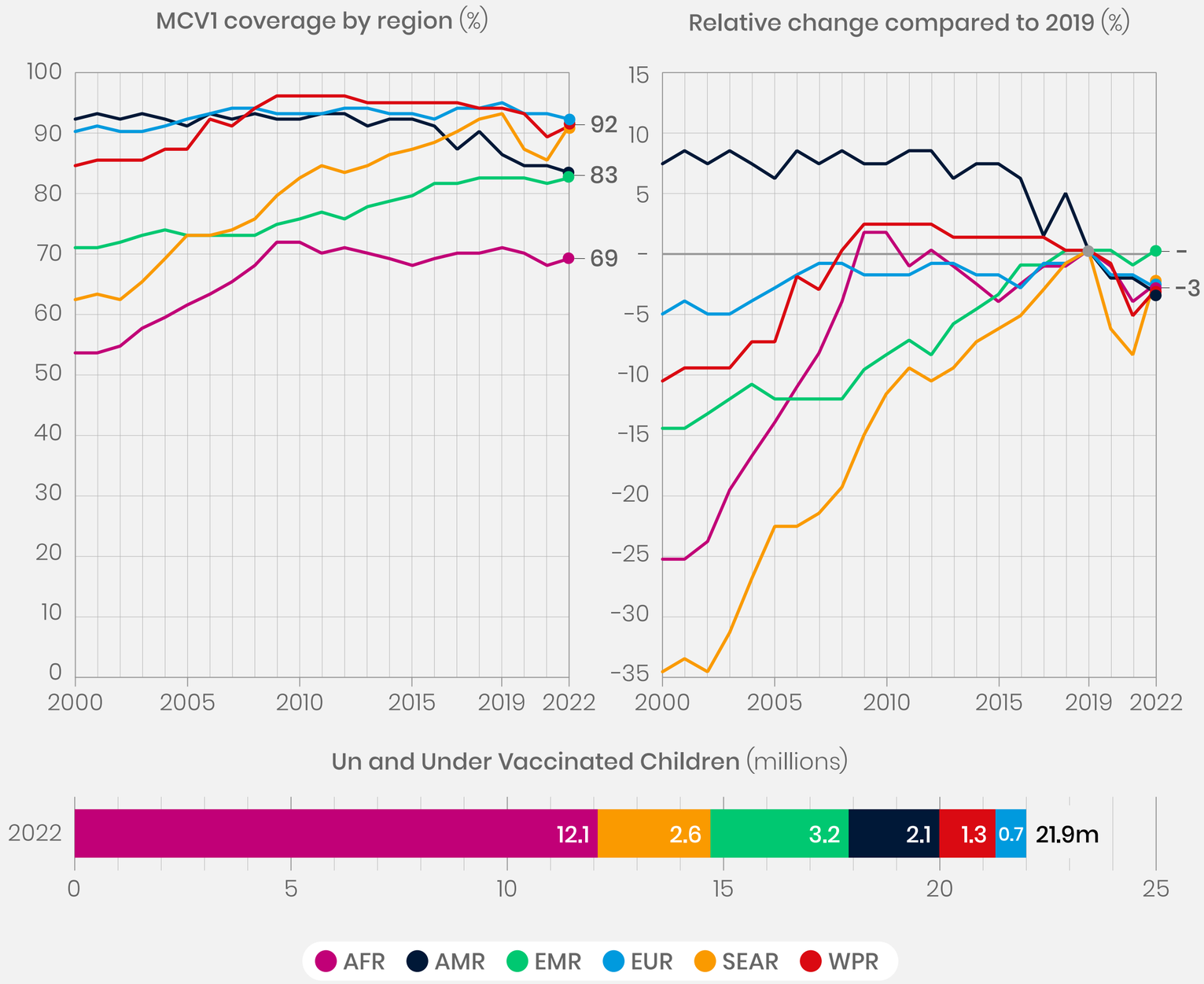
Measles immunization recovered most in the South-East Asian, Western Pacific, and Eastern Mediterranean Regions

While recovery seems well under way in in the South-East Asian, Western Pacific, and Eastern Mediterranean Regions, the African Region and the Region of the Americas continue to lose momentum as far as Measles Containing Vaccine coverage is concerned. (DTP coverage shows better recovery in the Americas).

Regions that have increased coverage over the past 2 decades show post-pandemic resilience.



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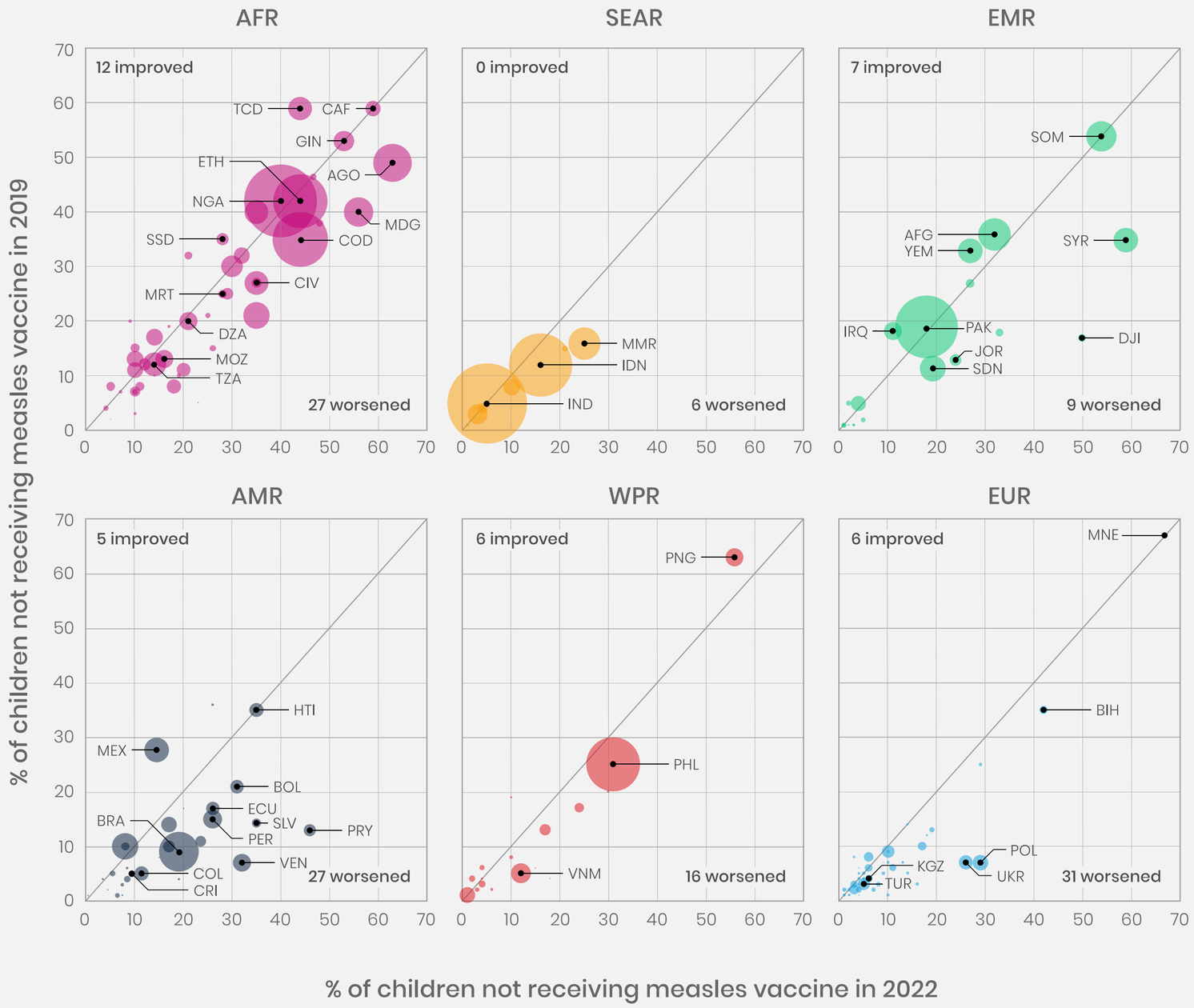
Many countries have still not recovered measles coverage to pre-pandemic level, and many are getting worse

Despite the recovery in global coverage, many countries have still not attained pre-pandemic levels, and many countries have worsened in every Region.

Although improvements are seen in 36/195 (18%) countries, and 43/195 (22%) are back to the performance of 2019, too many 116/195 (60%) have still not recovered even back to pre-pandemic performance.

Though note that among the 116 not recovered, 24 have >95% coverage.

Likewise in some regions where few improved, they were and remain at >95% coverage.



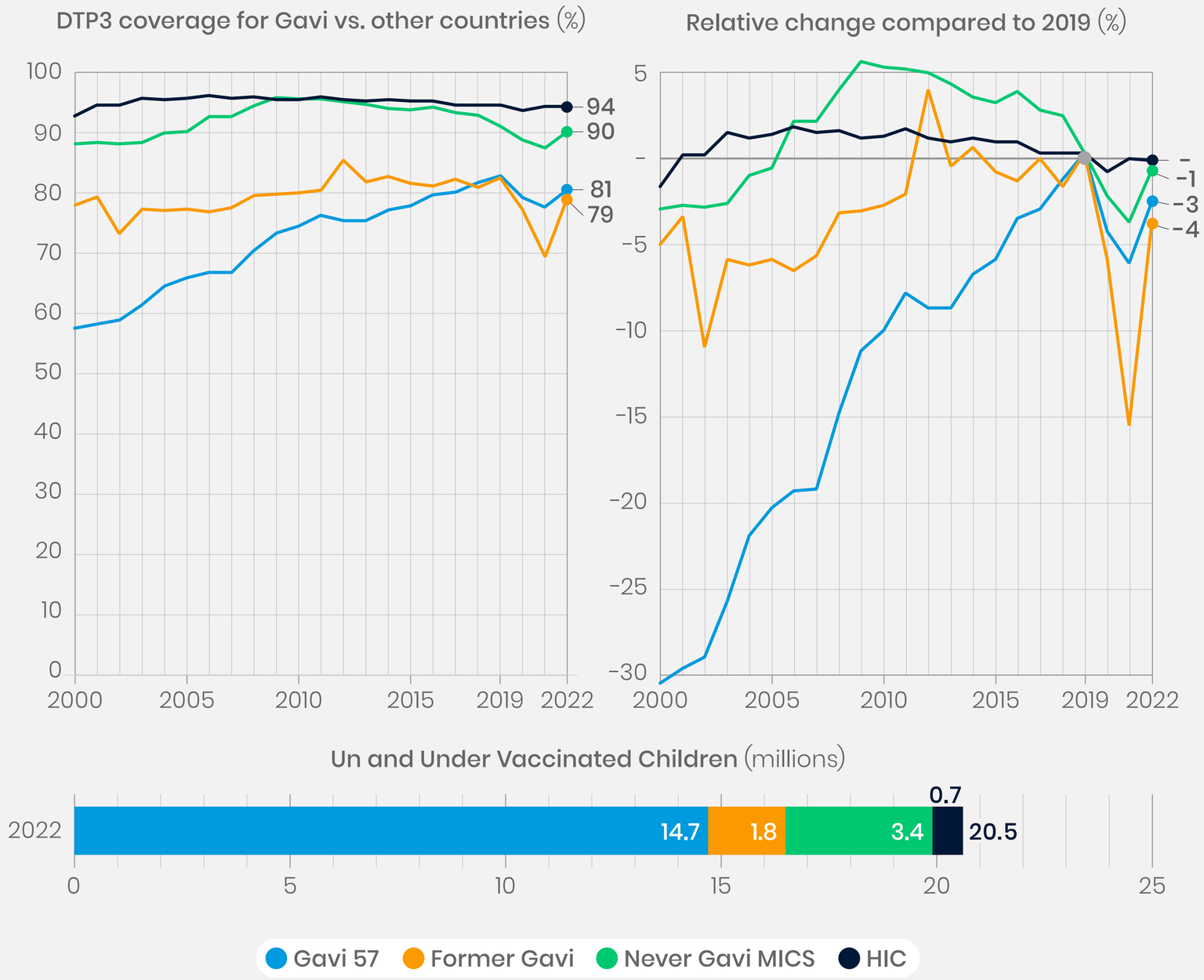
Former Gavi countries have not been as resilient as other countries during the pandemic and its recovery phase (DTP3)

The group of countries that benefit from Gavi Alliance support as well as the non-Gavi Middle Income Countries (MICs) experienced backsliding during the pandemic and partially recovered to 2019 levels. The group of High Income Countries did not experience a noticeable setback.

The 57 countries that currently receive support through the Gavi Alliance have increased DTPcv-3 coverage from 78% in 2021 to 81% in 2022, one percentage point below the level in 2019.

Countries that are no longer receiving Gavi support have been hit harder during the pandemic but are showing partial recovery.

This plot does not show the underlying diversity in each group.

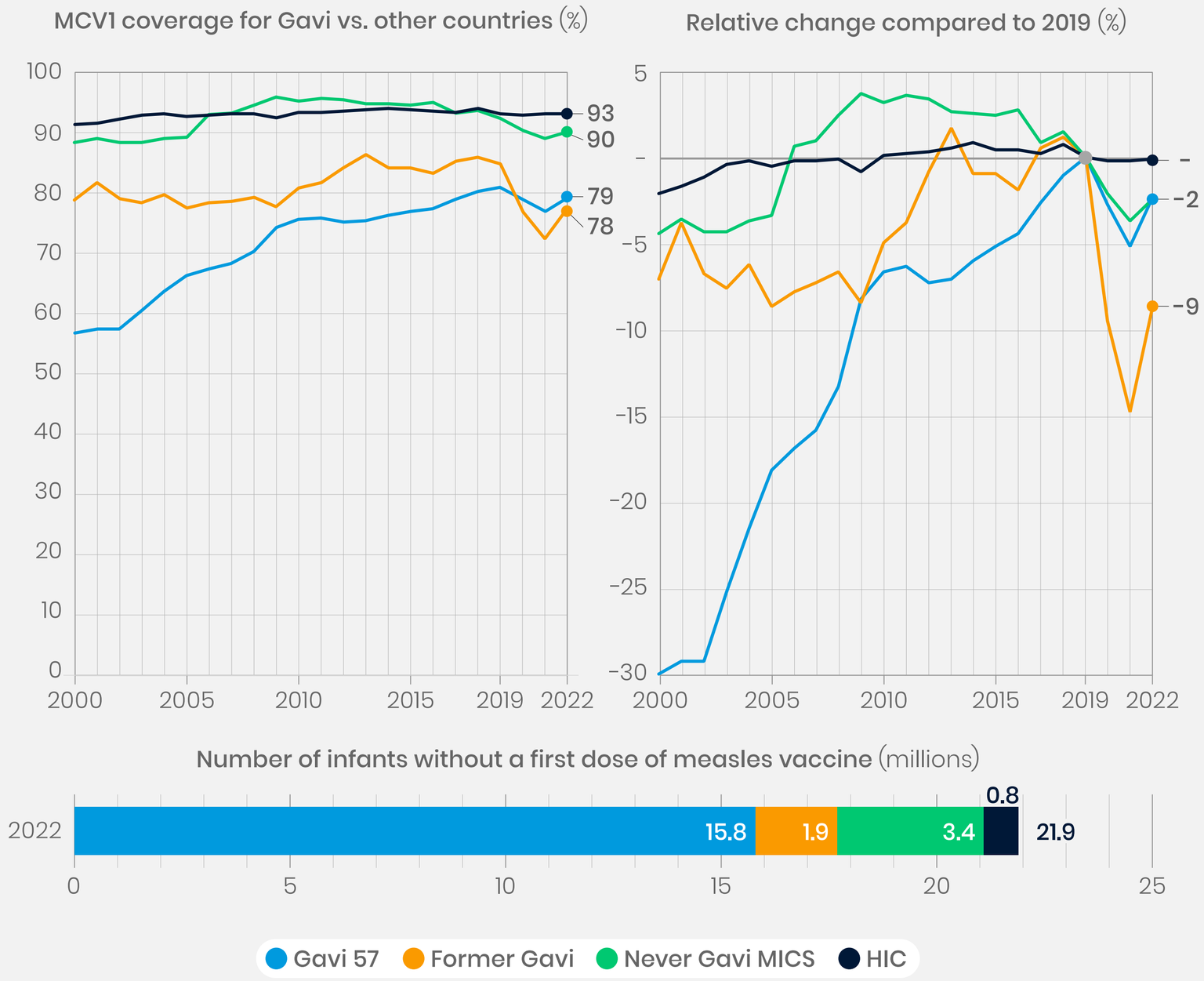


Former Gavi countries have not been as resilient as other countries during the pandemic and its recovery phase (MCV)

The 57 countries that currently receive support through the Gavi Alliance have increased MCV1 coverage from 77% in 2021 to 79% in 2022, two percentage points below the level in 2019.

Countries that are no longer receiving Gavi support have been hit harder during the pandemic and are showing slower recovery.

High Income Countries did not experience a noticeable setback.



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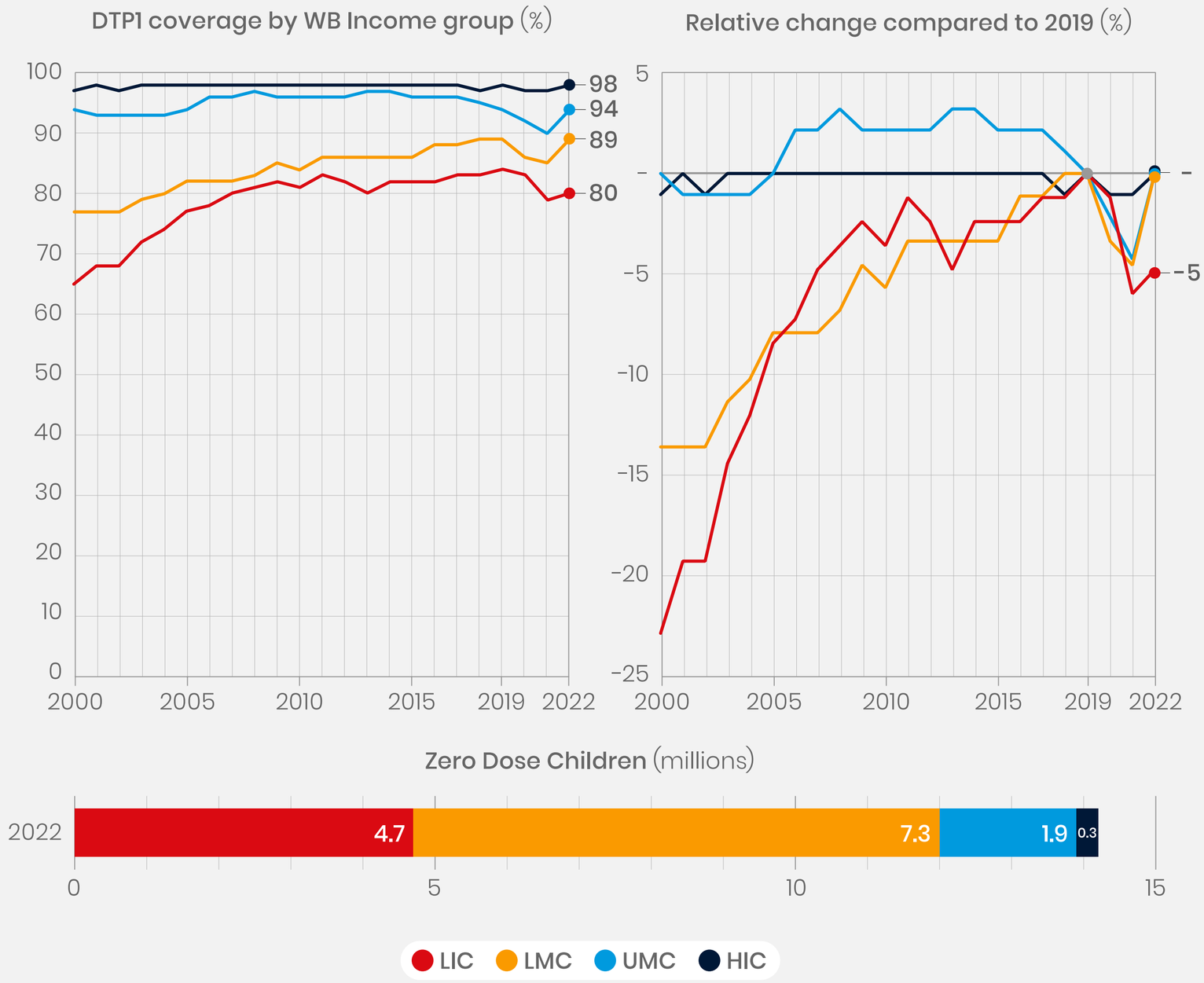
Low-Income countries (LICs) are lagging in the recovery – DTP1

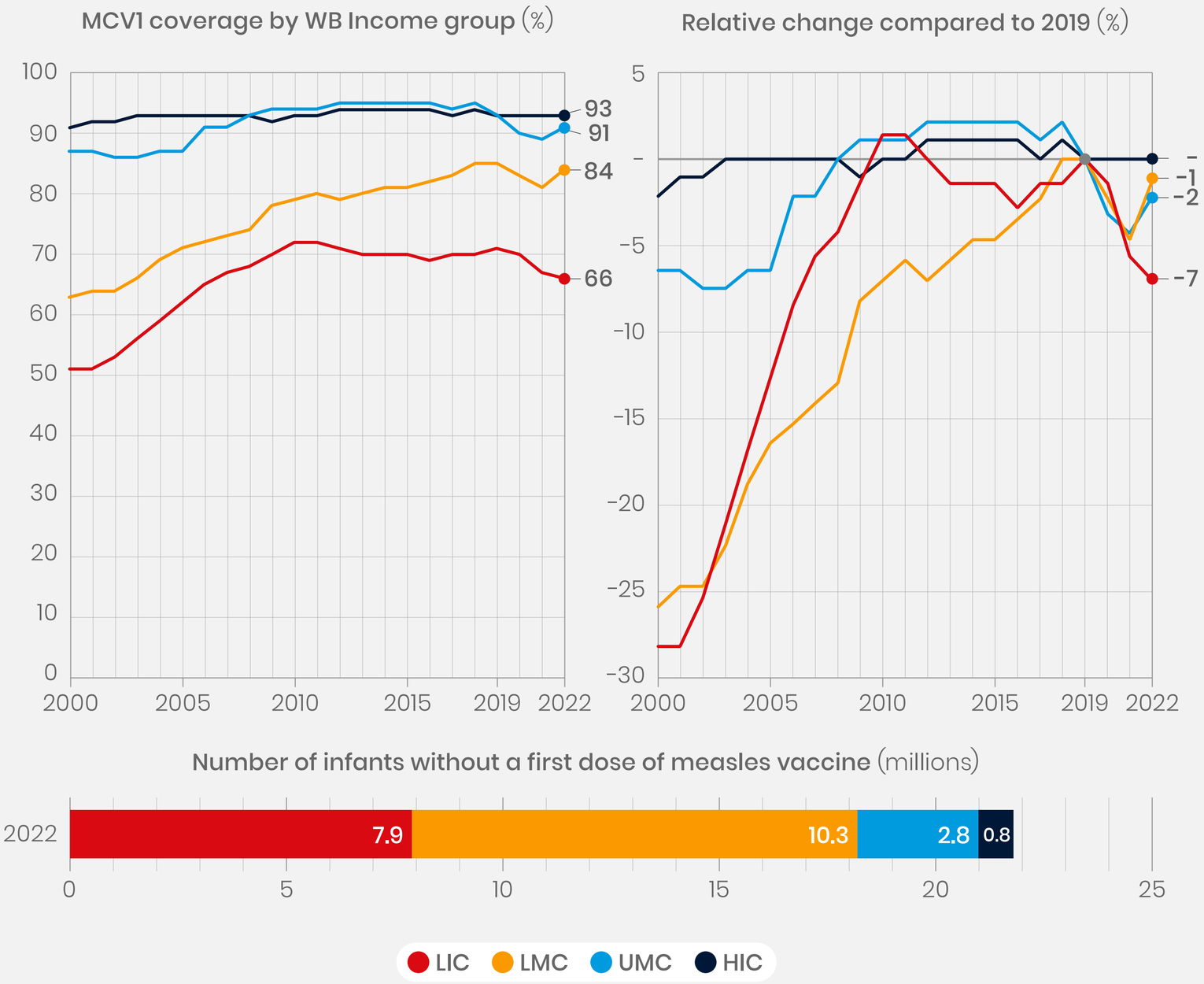
Low-income countries, defined by World Bank, are trailing behind DTP coverage levels achieved in 2019 and are showing limited signs of recovery, rising 1 percentage point, but remaining well below other World Bank income groups. This is despite improvements in the 2000's that then stagnated somewhat in the 2010's.

18% of all infants reside in LICs, but 33% of zero dose children reside in LICs.



Low-Income countries (LICs) are lagging in the recovery– MCV1

Low-income countries are trailing behind MCV1 coverage levels achieved in 2019, showing no signs of recovery, but instead falling another 1% compared to 2021.

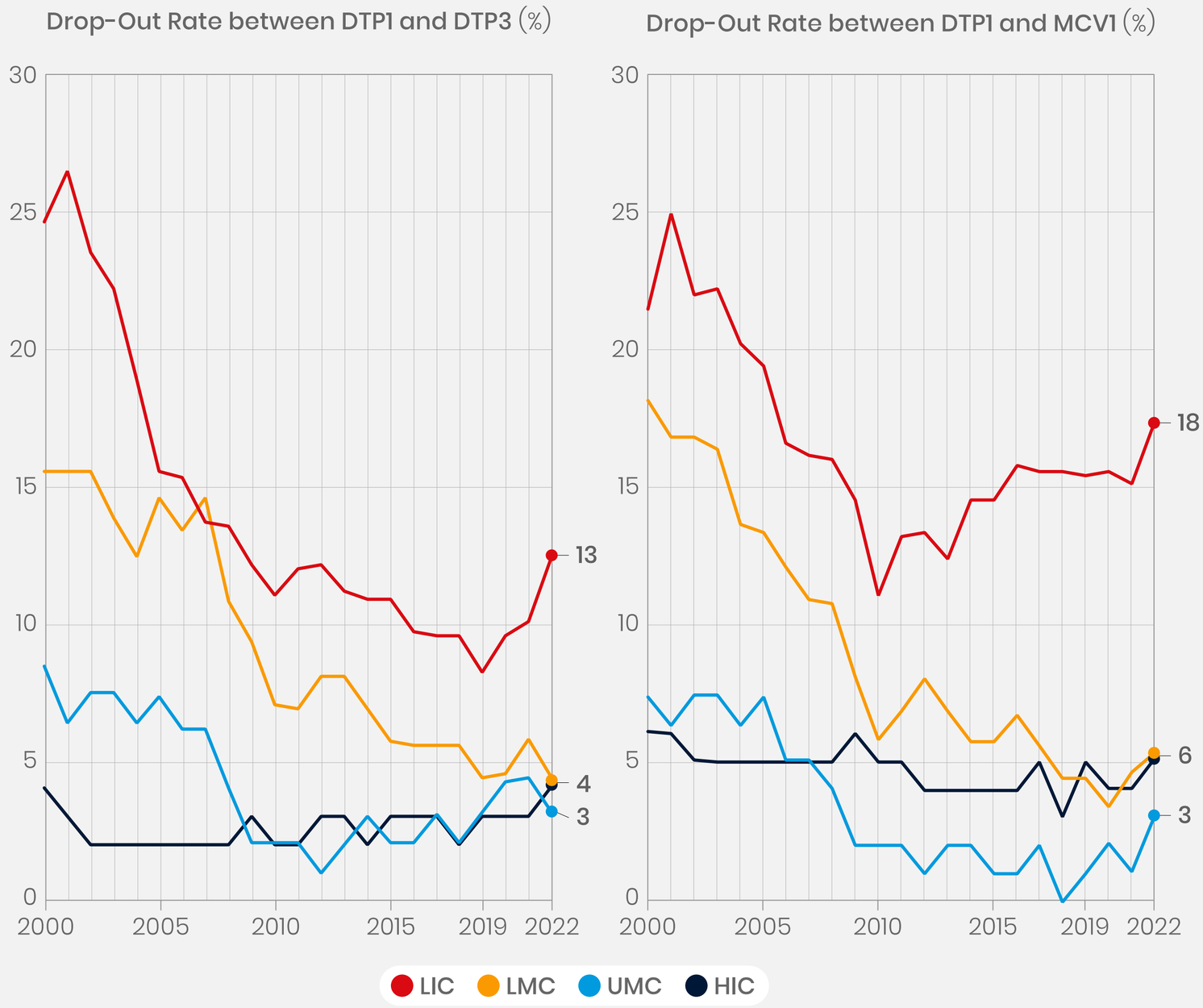


LICs show high drop-out rates after a child receives DTP1

Drop-out rates between DTP1 and DTP-3 and especially to MCV1 are very high in low-income countries. The problem is greater still by MCV2 (not shown), and this sustains measles outbreaks.

In Low-Income Countries, 13% of children who receive a first dose of DTP do not receive a third dose, and 18% do not receive a measles vaccine, implying that these countries often struggle to provide a full course of vaccines by the age of one.

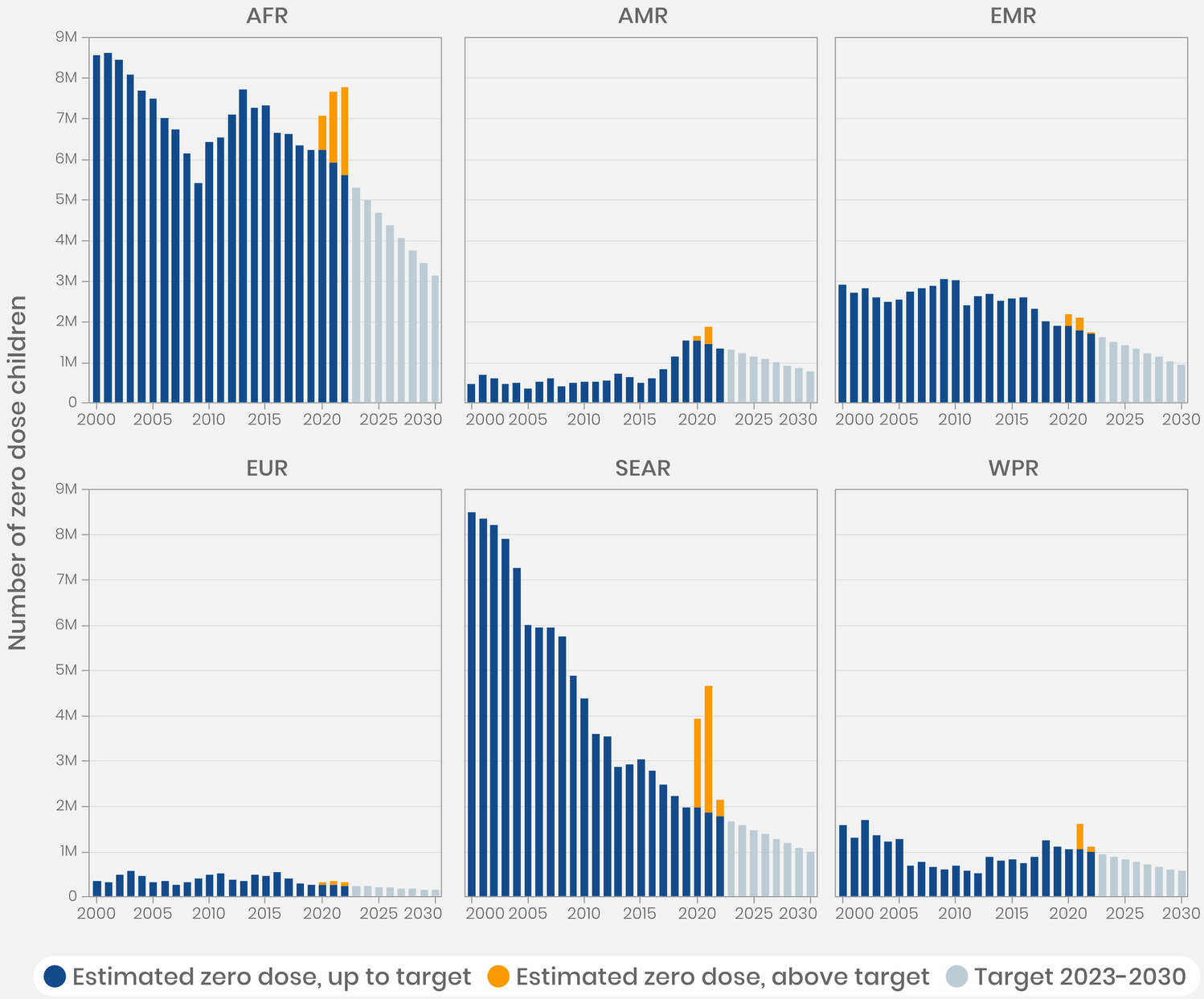
Drop-out analyses are one in a series of monitoring metrics which should inform country investments.



Recovery from the 2020 and 2021 backsliding is needed to reach the objectives of the Immunization Agenda 2030

The challenges posed by the pandemic jeopardize the objectives of the Immunization Agenda 2030.

IA2030 aims to leave no one behind with immunization and calls on all countries to reduce the number of "zero dose children" by half by 2030. During the pandemic, all Regions added zero-dose children, while recovery has been variable.



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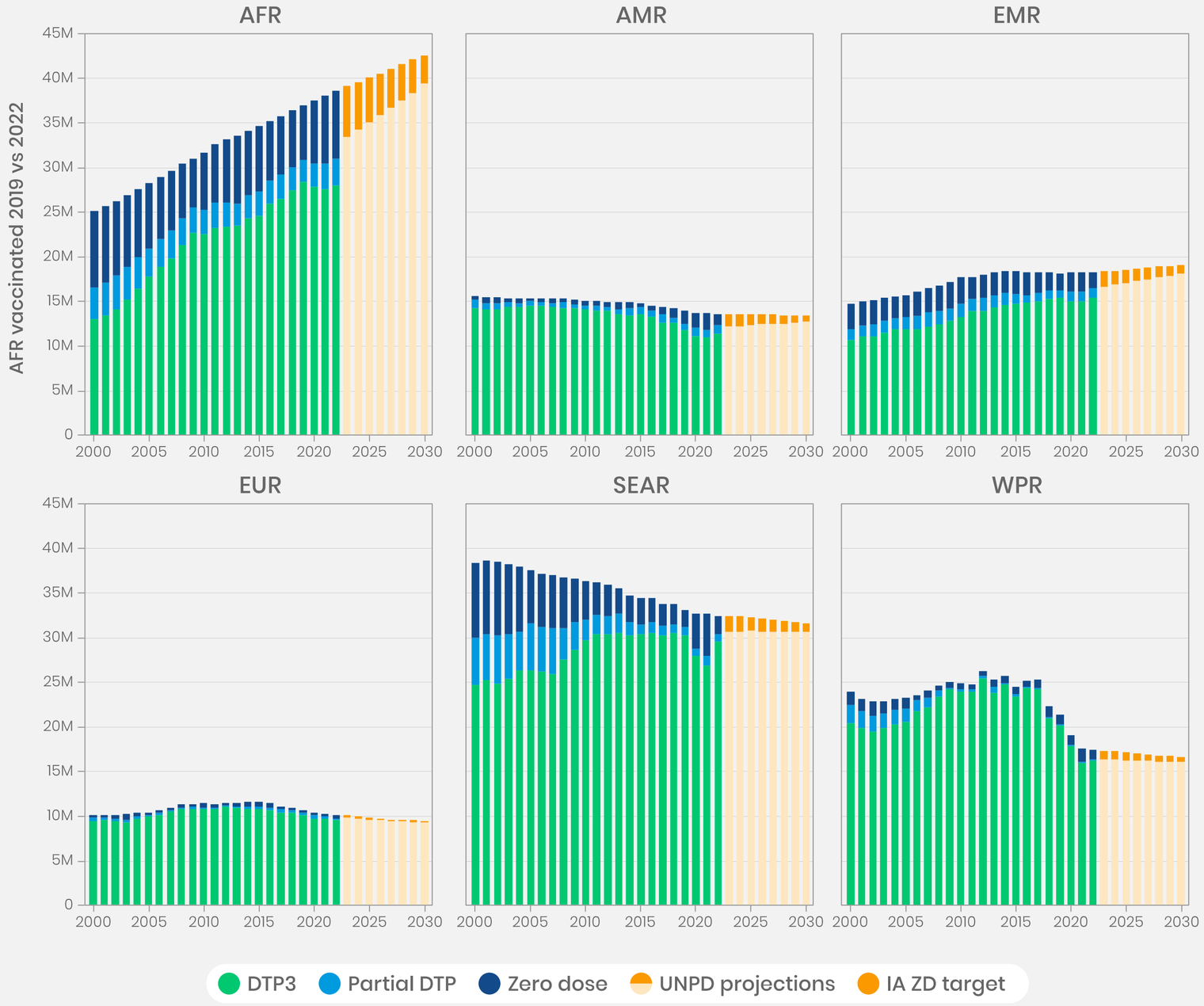
Demographics in AFR add to the challenge of reaching everyone everywhere

IA2030 aims to leave no one behind with immunization and calls on all countries to reduce the number of “zero dose children” by half by 2030.

Collectively the countries in the AFR region are projected by UN Population Division to have substantial growth in the birth cohort through 2030. To simply maintain current coverage, an ever increasing number of infants and children will need to be vaccinated. To make progress beyond current coverage will require substantial increases in immunization programme and health system capacity. For all other regions, to achieve the IA2030 targets for reduced numbers of ZDC means vaccinating approximately the same number of children now being reached, because the size of the birth cohort will fall (e.g. EUR, SEAR, WPR), or modest increases in the number of children to be vaccinated (eg. EMR, AMR).

In this analysis, zero-dose children are those who lack any dose of DTP. Under-vaccinated are those who received one dose, but not a third protective dose.

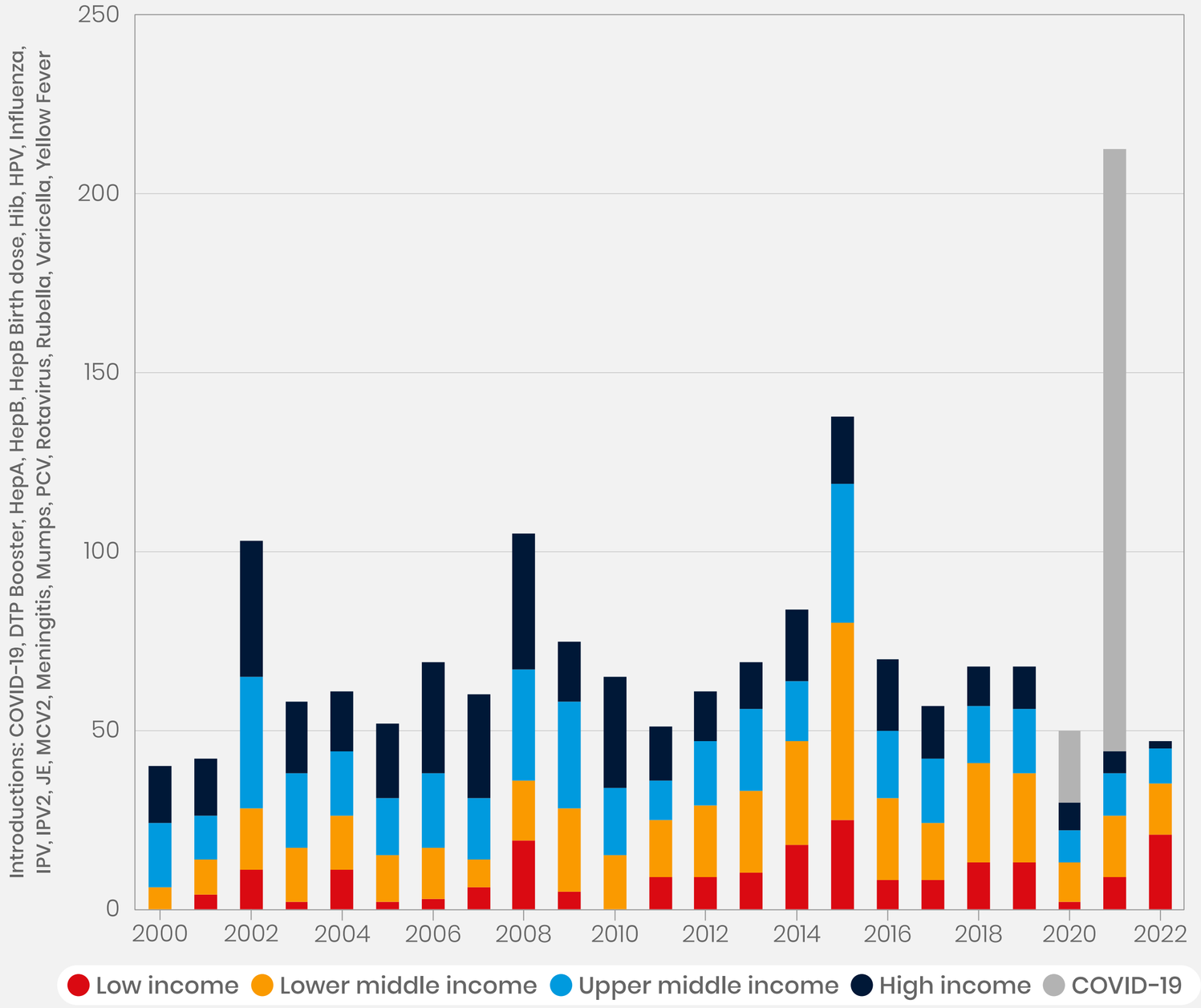


The pace of new and underused vaccine introductions other than COVID-19 vaccine, is increasing since the pandemic

The largest number of vaccine introductions, ever, was in 2021, with the majority being Covid-19 vaccine.

The pace of new vaccine introductions, other than Covid-19 vaccine, slowed during the pandemic. This rate is now improving, with 47 introductions in 2022:

- 17 countries introduced a second dose of Inactivated Polio Vaccine,
- 9 introduced Human Papilloma Virus vaccine,
- 6 introduced a second dose of Measles,
- 3 introduced Pneumococcal Conjugate Vaccine,
- 2 introduced Rotavirus Vaccine.



New vaccines have been scaled up across the world, providing an increasing breadth of protection for children that are reached

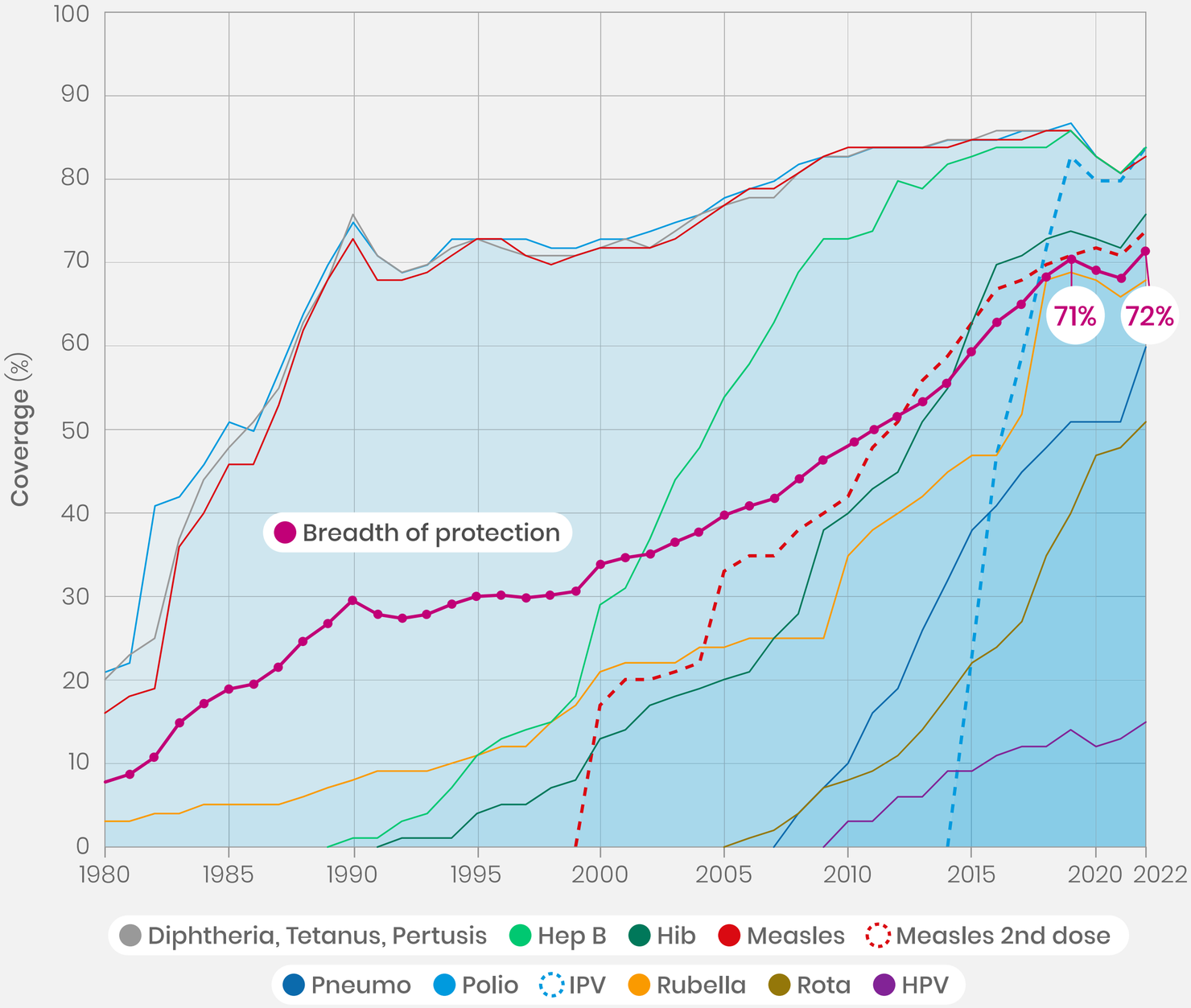
In 2022, the average coverage for vaccines targeting 11 diseases stood at 72% compared with 8% in 1980.

The breadth of protection is a cross-sectional programme performance indicator, defined as the average global coverage achieved for a set of globally recommended antigens across multiple age ranges.

This list includes: polio, measles*, rubella, diphtheria, tetanus, pertussis (DTP), hepatitis B (Hep-B), Haemophilus influenzae type B (Hib), Pneumococcal vaccine, Rotavirus Vaccine, Inactivated Polio Vaccine (IPV**), and Human Papilloma Virus vaccine (HPV).

** Includes first and second doses*

*** IPV coverage weighted to reflect the part of the population that receives IPV in addition to oral polio vaccines*



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The increase in breadth of protection contrasts with the incremental improvement in expanding vaccination services to everyone.

Breadth of protection is a combination of the number of vaccines in a country immunization programme, and the coverage achieved for each vaccine.

After 2010, there has been limited global progress with expanding vaccination coverage to un-and under served populations for vaccines already in the programme. This global finding is an average across regions and countries, some of whom have increased while others have fallen back. However, those that are reached have benefitted from a wider portfolio of vaccines thereby protecting children and adolescents reached against many more diseases.

The 2022 spidergram also displays the breadth of protection in 2019 for comparison with the pre-pandemic values. Vaccine introductions have played an important role in increasing the 2022 coverage.

For each antigen, coverage with the dose that completes the recommended schedule is shown

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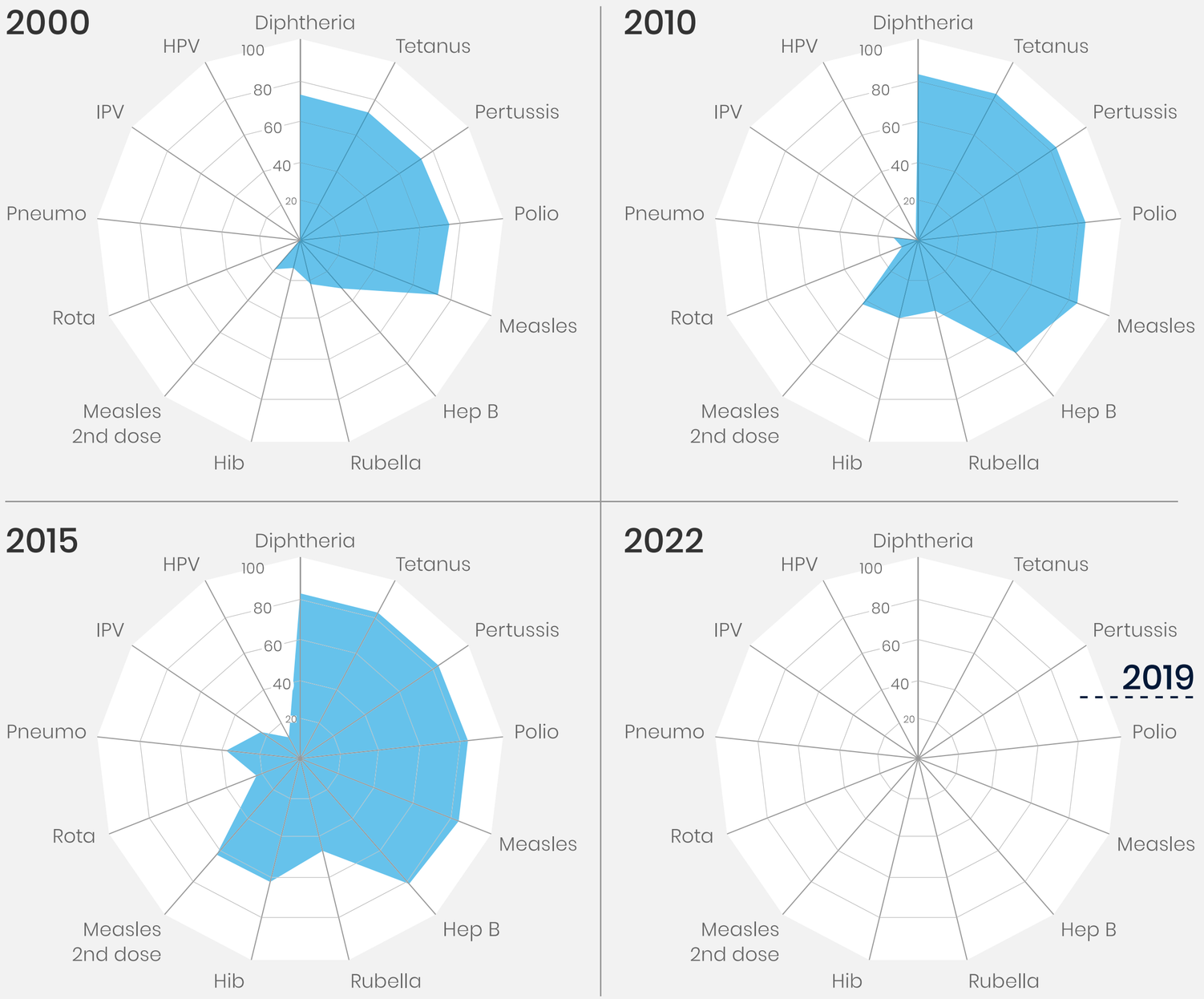


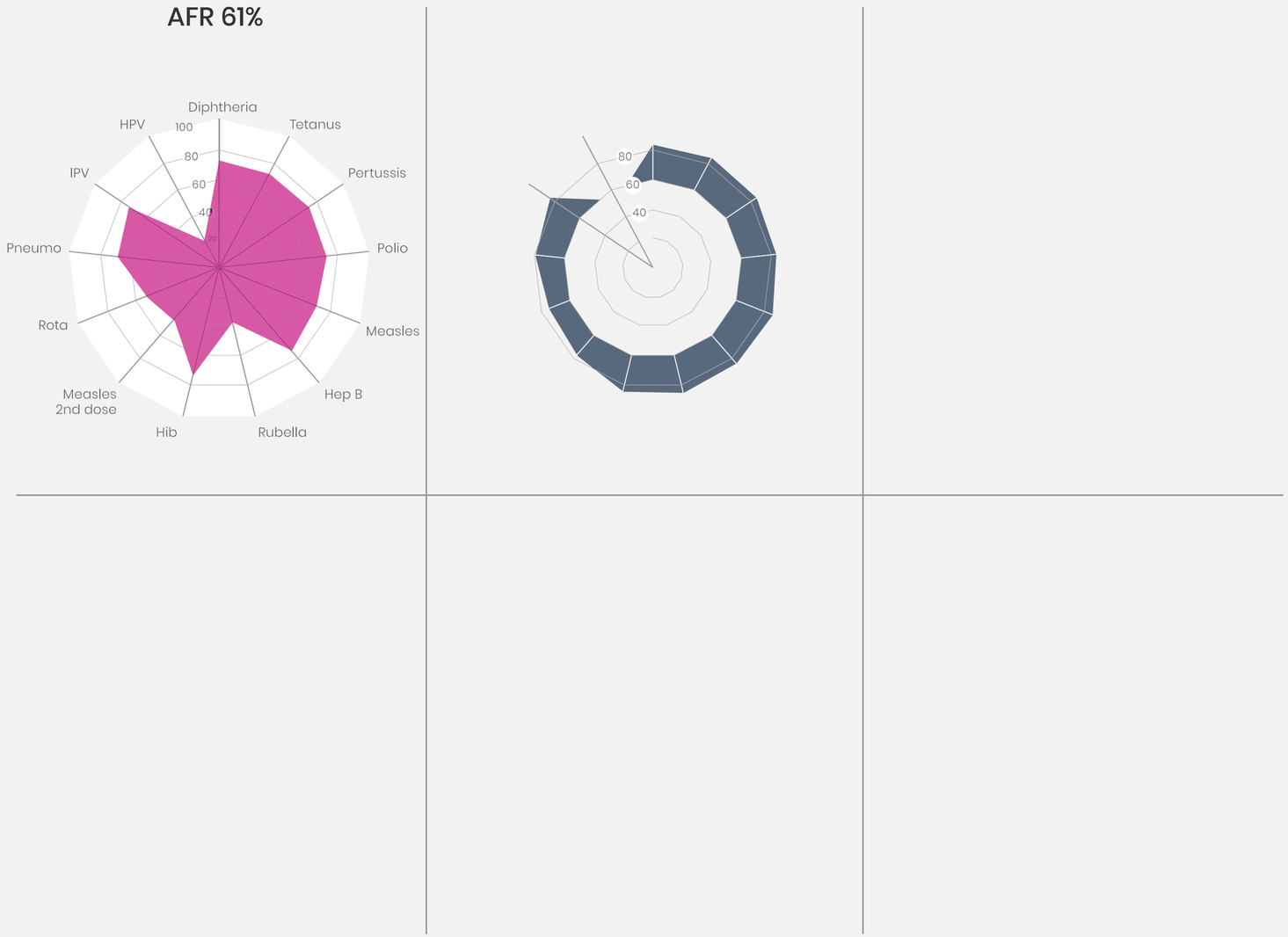
Breadth of Protection by WHO Region compared with 2019

The breadth of protection varies by WHO region, with the differences attributable to both which vaccines are in country programmes, and the coverage of those vaccines in the programme.

Gains in 2022 compared to 2019 are largely attributable to introduction of vaccines into country programmes.

The pace and prioritisation of new vaccine introduction has differed by Region, with the Region of the Americas achieving the most complete introduction of all globally recommended vaccines.

For each antigen, coverage with the dose that completes the recommended schedule is shown

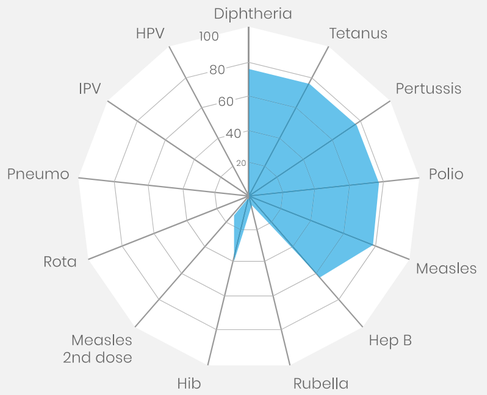


Countries that have benefitted from Gavi support have largely caught up with other countries in terms of vaccine introductions

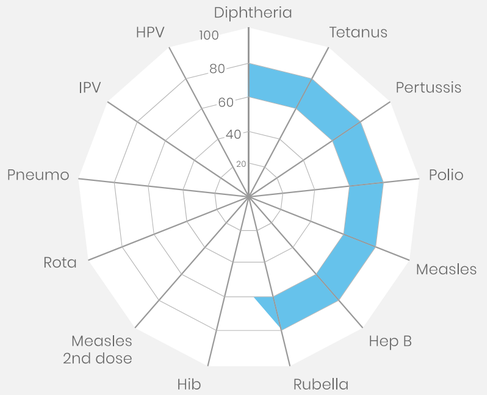
Thanks to vaccine introduction support, Gavi countries have introduced new and under-utilised vaccines at an accelerated pace.

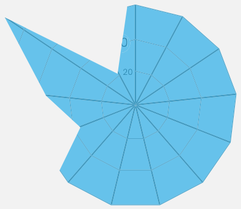
In 2022, Gavi countries lead the rest of the world with Pneumococcal Conjugate Vaccine and Rota Virus Vaccine, while still lagging in terms of Human Papilloma Virus Vaccine introduction.

Gavi Countries (including transitioned countries)



Countries that never received Gavi Alliance Support





Vaccination coverage in countries at risk for Yellow Fever is too low

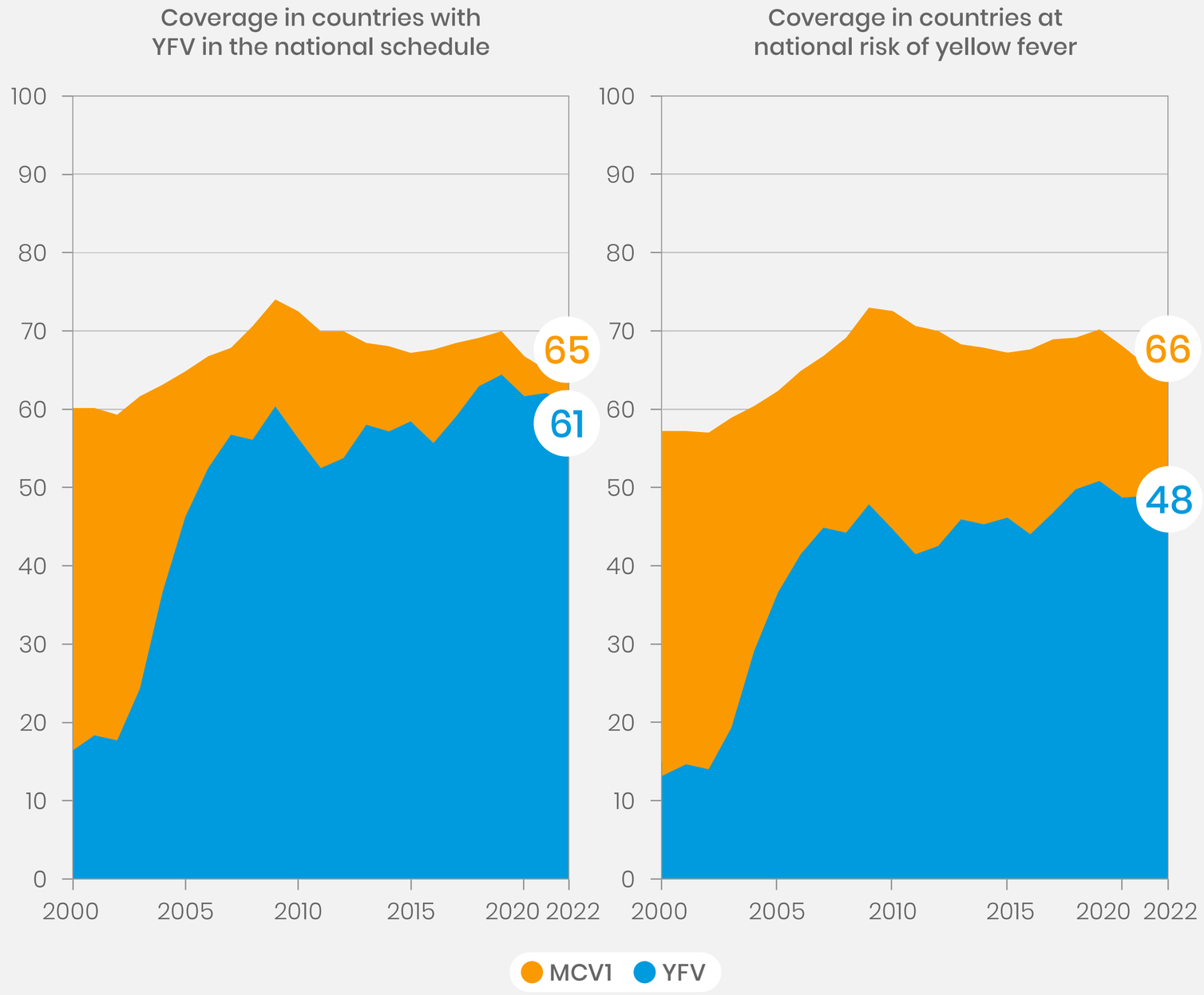
Yellow Fever Vaccine (YFV) coverage in all countries at risk stood at 48% in 2022*. That is too low to avoid outbreaks, and frequent high-quality supplementary campaigns are required.

To improve coverage, YFV needs to be introduced in the countries at risk that have not done so yet (Ethiopia, Sudan and South Sudan). Uganda introduced YFV in 2022 which will result in noticeable improvement in 2023.

The first dose of measles vaccine is administered at the same age as YFV, and coverage is therefore expected to be similar. The left hand panel shows that coverage of these two vaccines in countries with both vaccines in the national schedule converged in the last few years**.

**Analysis excludes countries with subnational risk (Argentina, Kenya, and Panama).*

***Left hand panel excludes Uganda, which has started but not completed introduction.*



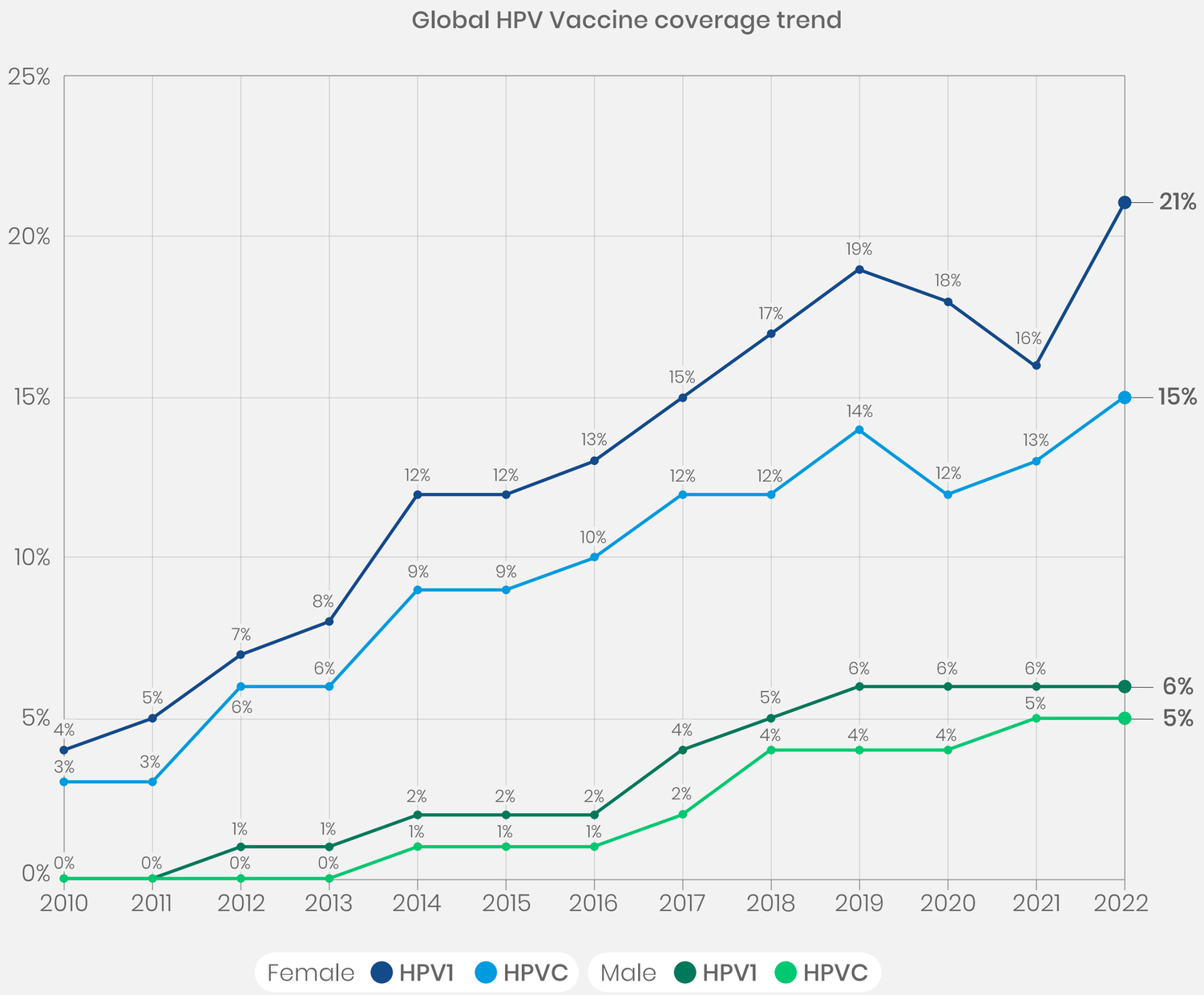
Global HPV coverage has recovered to pre-pandemic levels

Global HPV vaccine coverage has started to recover and surpassed pre-pandemic levels
for the first time

Improvements in global HPV coverage are due to new introductions in L/MICs as well as restarting interrupted programs due to COVID or supply challenges.

Global coverage is still far below the 2030 cervical cancer elimination goal of 90% HPV vaccine coverage among girls 15 years of age.

(Note the Y-axis is shown only up to 25%. Post pandemic improvements are seen, but there is a long way to go to achieve high global coverage.)



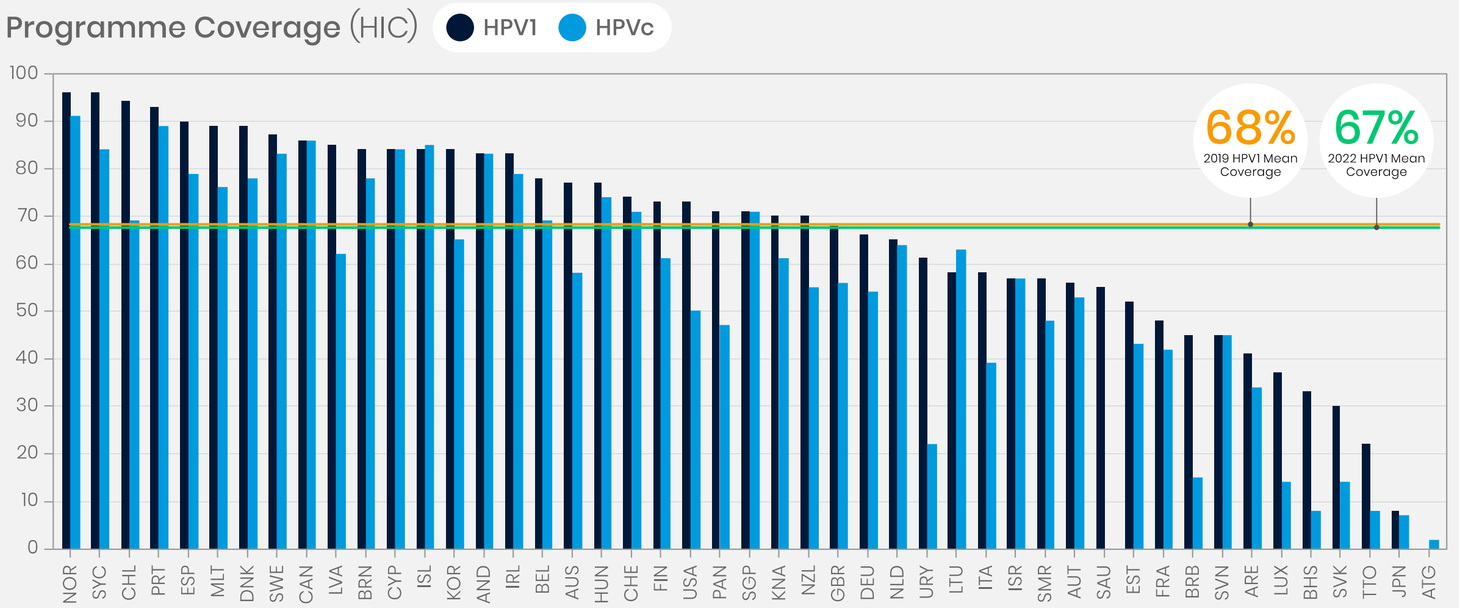
HPV vaccine coverage is still low in L&MIC compared with 2019

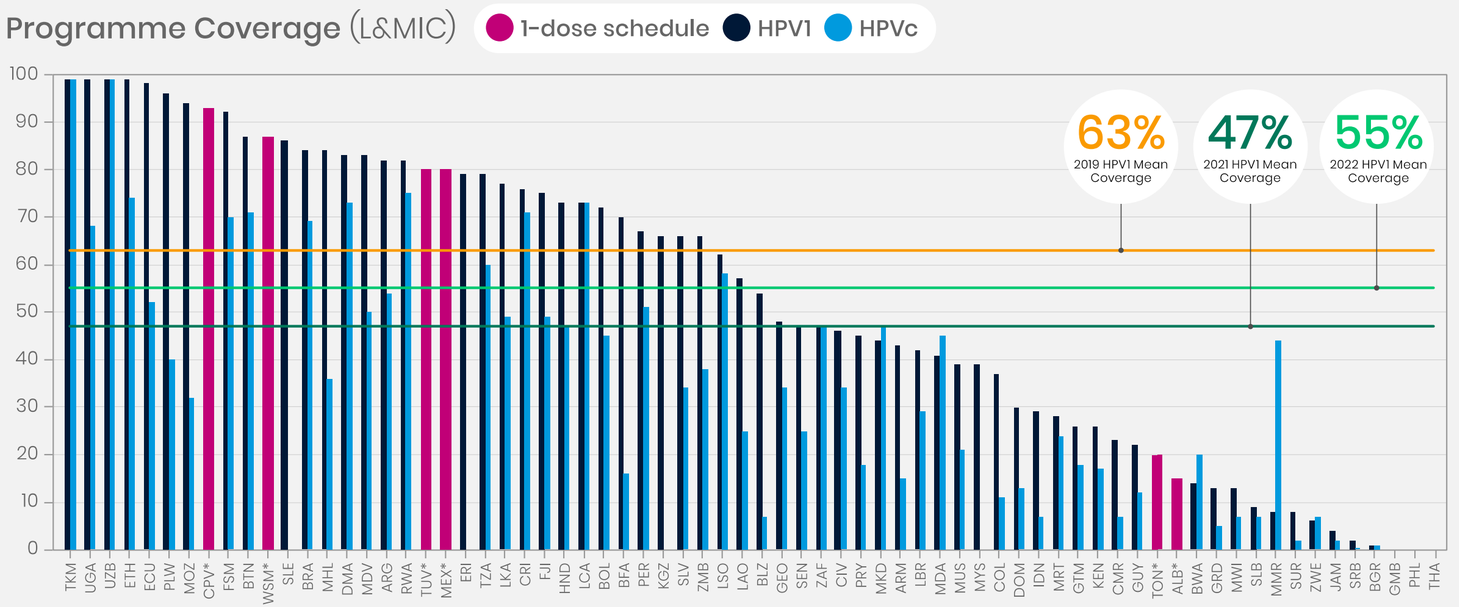
While average coverage improved in L&MIC in 2022, it is still below 2019 levels. HIC continue to show stable programme performance

- In L&MIC mean first coverage at 55%, while recovered from 47% in 2021, is still lower than that in 2019 (63%).
- Meanwhile, HIC continue to show stable coverage (mean 67%) comparable to pre-pandemic levels.

Urgent action is required to further improve HPV vaccine coverage and catching up missed girls to raise levels of protection

By the end of 2022, 6 countries reported to have switched to a single dose schedule.



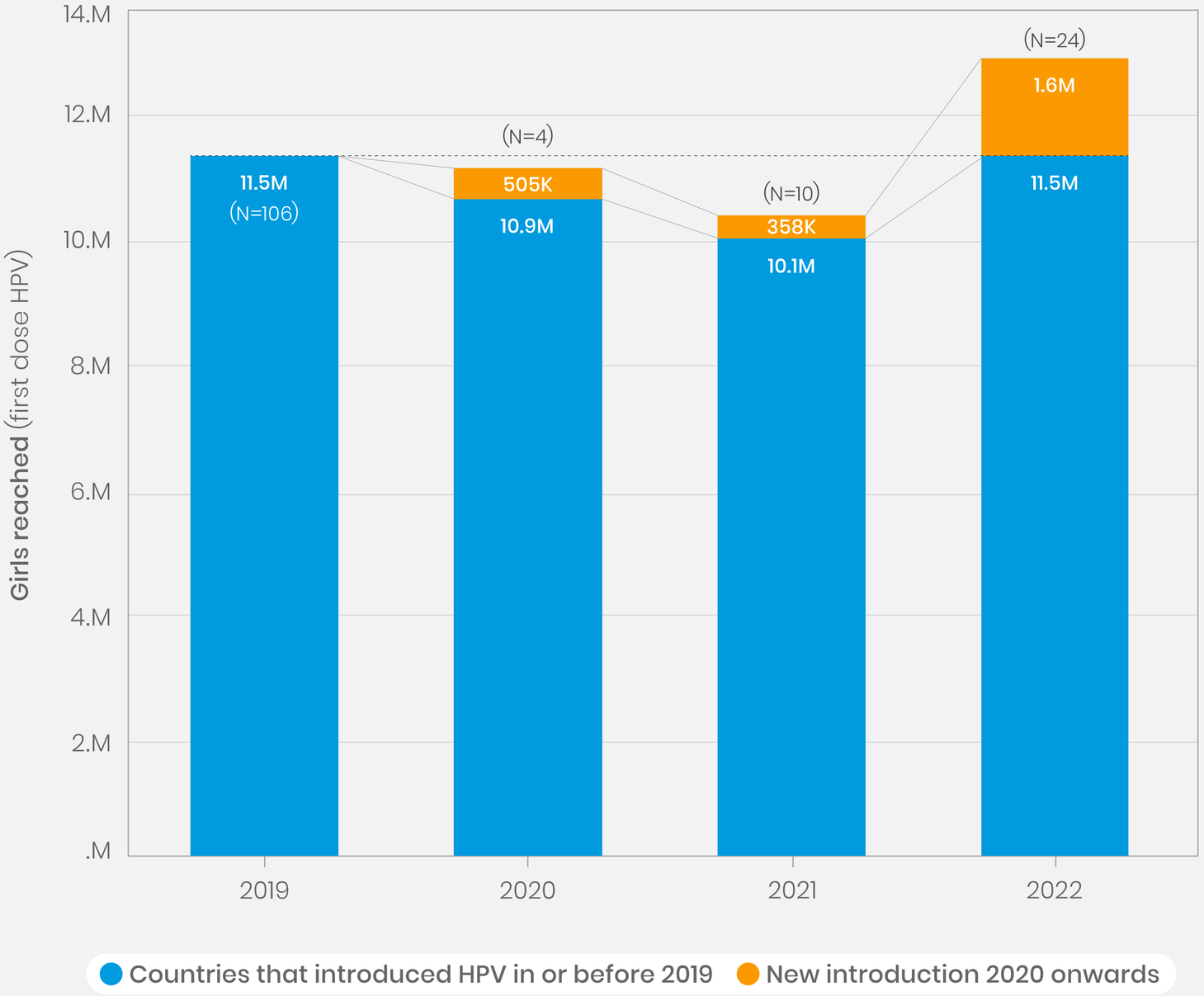


HPV program performance has recovered, and coverage has exceeded pre-pandemic levels because of new introductions

Programme recovery plus new introductions contribute strongly to the increased number of girls reached in 2022.

HPV programme performance the 106 countries that had an existing HPV program, returned in 2022 to prepandemic coverage levels.

In addition, new introductions have led to coverage exceeding that seen in 2019.



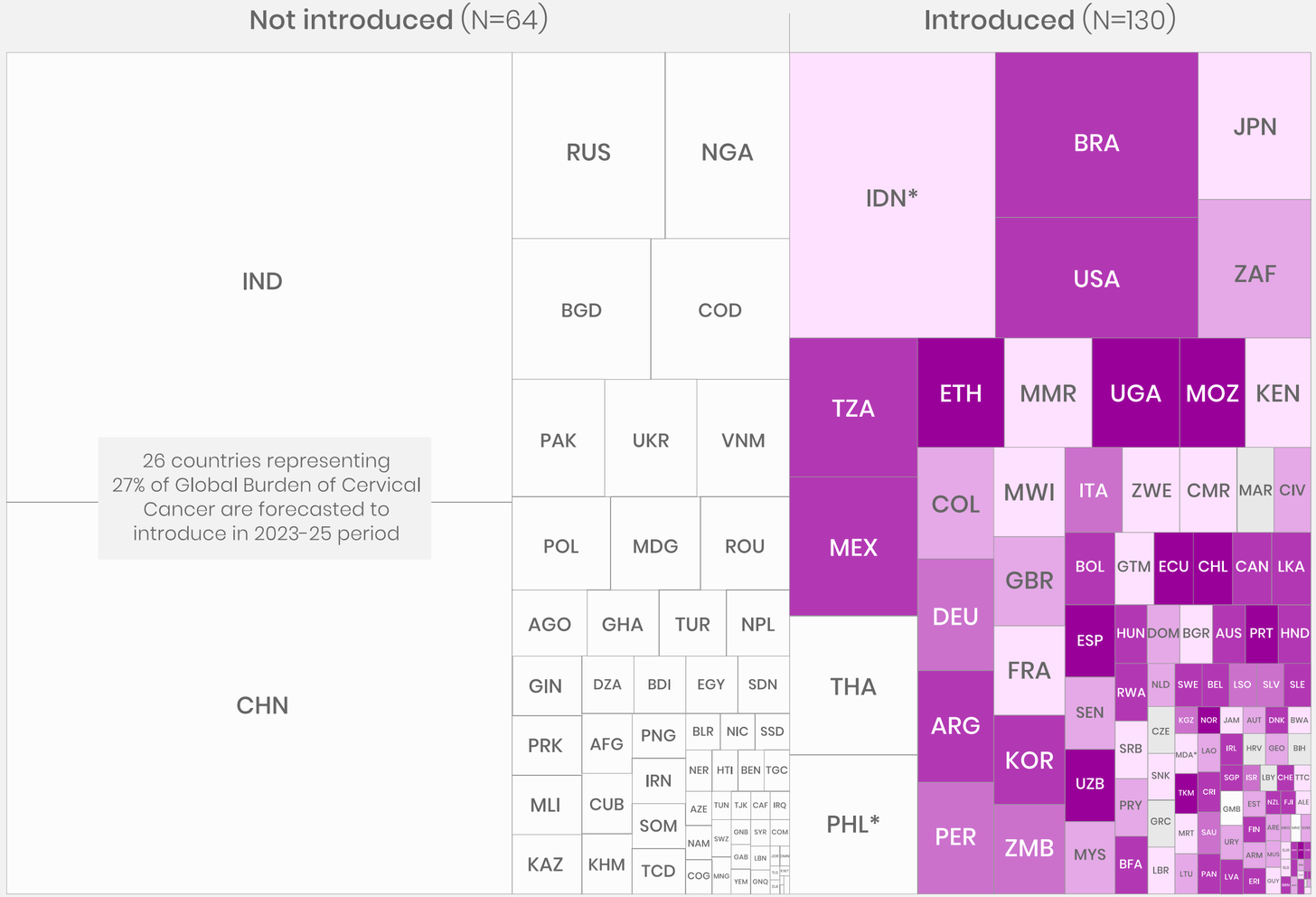
57% of global cervical cancer cases occur in countries that have not yet introduced HPV vaccination

The 130 countries that are using HPV vaccines represent 43% of the global burden of cervical cancer. HPV vaccination now will contribute to reducing this burden in future years (GLOBOCAN 2020, IARC).

To reduce the global burden and reach elimination by the end of the century, it is paramount that HPV vaccine is introduced in all countries particularly those with high incidence, as well as low or medium incidence countries with large populations.

Over the coming years, introduction in many populous countries is expected to increase the proportion of cervical cancer disease burden that will be prevented

Low vaccine coverage in many countries using HPV vaccine leads to many girls still not being protected against cervical cancer despite the HPV vaccine being available in the immunization programme.



*Subnational introduction

HPV 1st dose coverage

0% <30% 30-49% 50-69% 70-89% ≥90% No estimates available

Size of the squares is proportional to the number of annual cervical cancer cases

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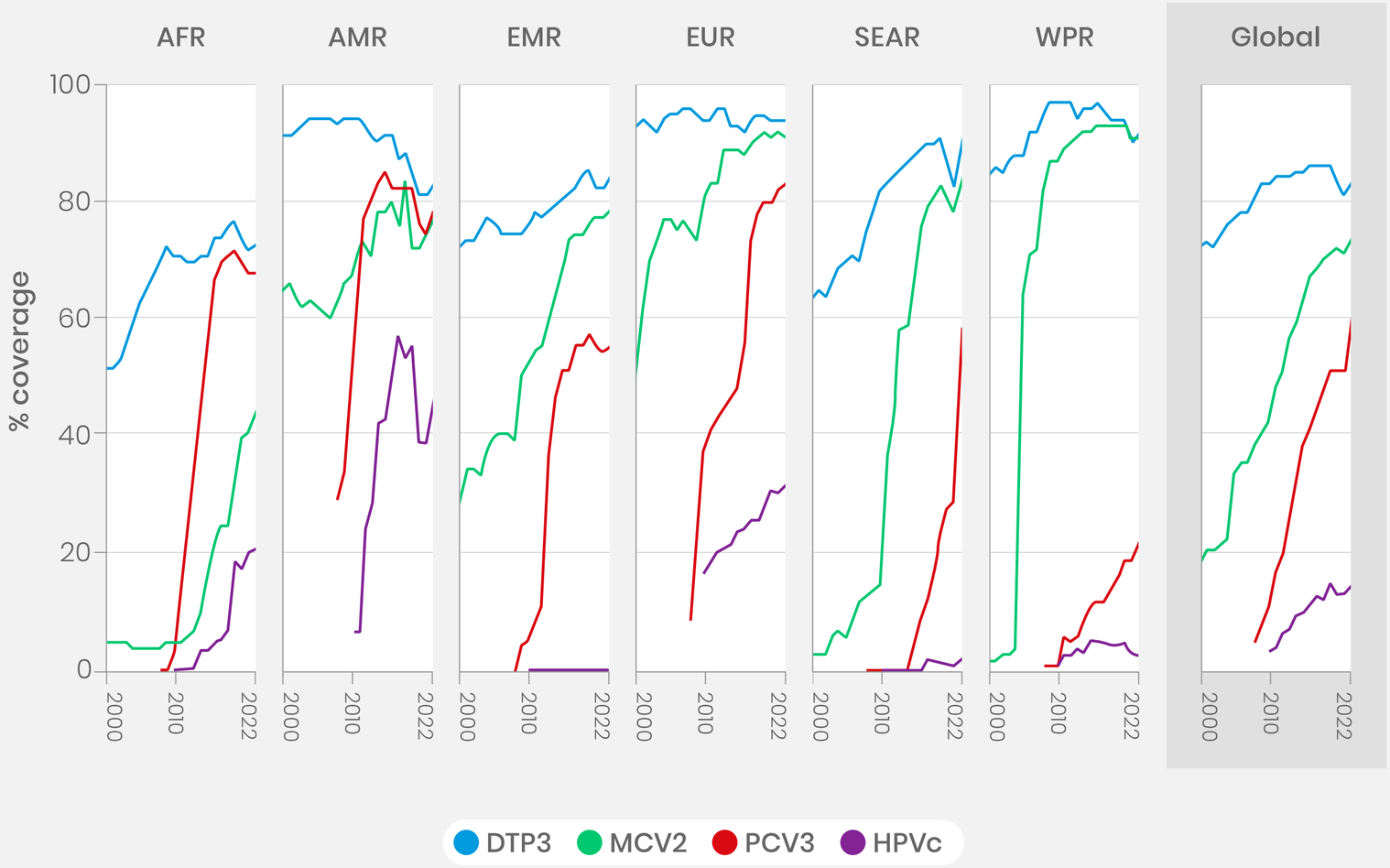
Four vaccination coverage indicators contribute to Sustainable Development Goal 3, indicator b.1

Introductions over the last decade have resulted in steep increases in coverage, a reduction during the pandemic and some initial recovery.

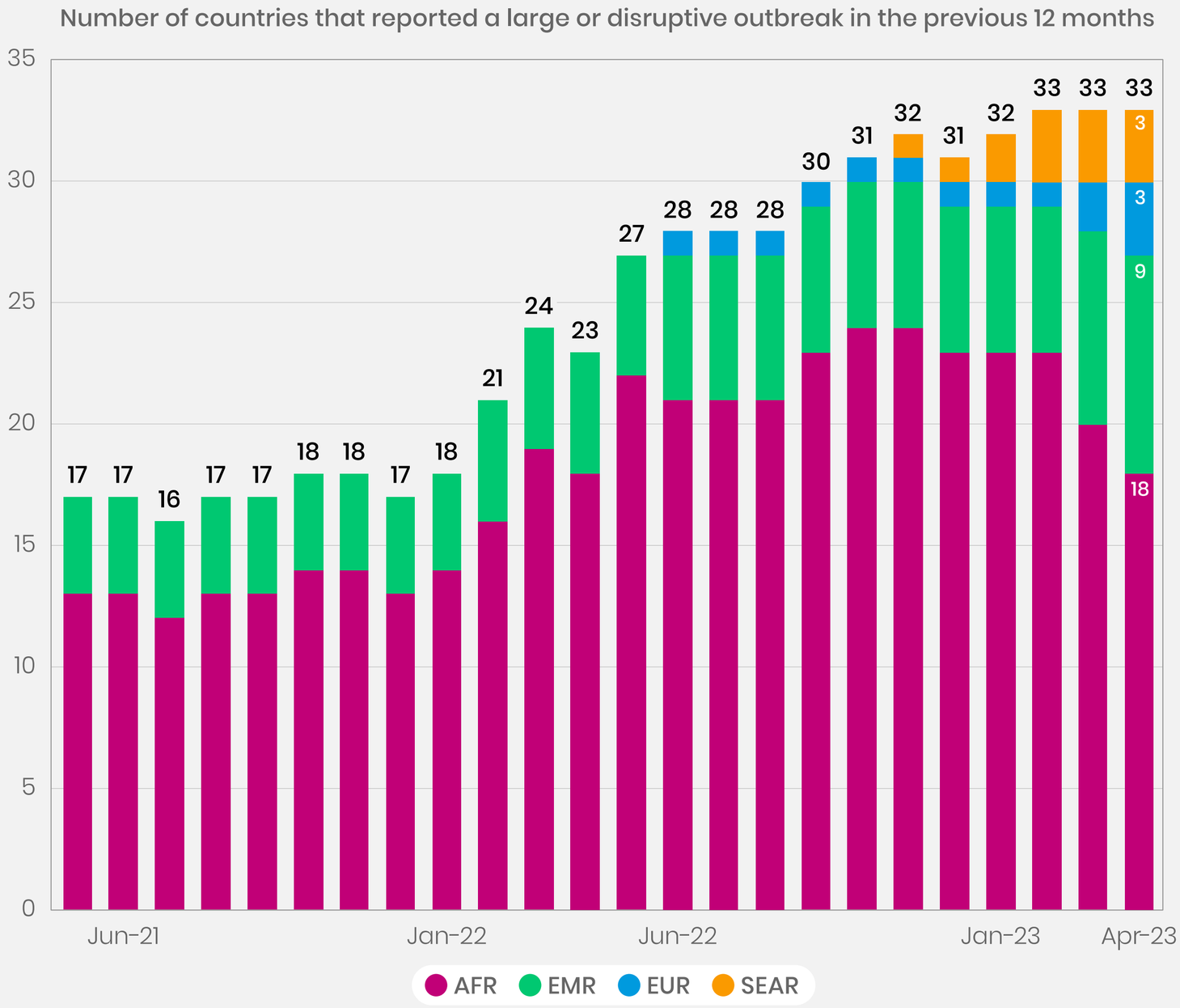
Recovery in DTP3, while MCV2, PCV3, and HPVc also benefit from additional introductions.

HPV however is not on the same steep trajectory as some of the other new vaccines.



Large and Disruptive Measles Outbreaks are increasing

Currently, 33 countries have reported large and disruptive Measles outbreaks.



Where to find the data and other materials

WHO Immunization data portal

- On the 18th of July the annual immunization data reported by countries and WUENIC data will be available to download here
- Data is available for download from each data page or from the 'All data' page on the portal
- New from this year WHO and UNICEF coverage estimates country profiles: https://worldhealthorg.shinyapps.io/wuenic-trends-2023

UNICEF Immunization data

https://data.unicef.org/topic/child-health/immunization/