

COVID GAP

Accountability Report

Key Changes and Insights Since Previous Report:

- The vaccination pillar of ACT-A has received additional contributions and is now 69.3% funded.
- The European Commission has now contributed \$326.5 million towards ACT-A, up from \$260 million in the last update.
- In the last two weeks, the average number of daily tests has increased across all income groups except for low-income.
- In the last two weeks, there has been an increase in the number of COVID-19 boosters administered per 100 people across all income groups globally.
- Tanzania reports a daily vaccination rate of 0.48% of the total population, up from 0.21% in the last update (28-day average).

COVID Global Accountability Platform's (COVID GAP's) Accountability Reports highlight and analyze recent developments, track progress toward national, regional, and global targets, and identify high-priority recommendations for a more effective, efficient, and equitable pandemic response and preparedness. Drawing on data across many sources, our team tracks important measures of progress on commitments and remaining gaps, helping to hold leaders and organizations to account on these actions.

Holding Leaders to Account

In the accountability reports, we present real-time analysis and track updates in the dynamic landscape of the global response to COVID-19 across five areas:

1. Funding the Global Response
2. Vaccines and Vaccinations
3. Test and treat
4. Oxygen
5. Pandemic preparedness and health system resilience

Tracking the COVID-19 Pandemic

Trends and changes in the pandemic overall are effectively tracked through several regularly updated dashboards. We recommend:

[Johns Hopkins COVID-19 Dashboard](#)

[Our World in Data](#)

[Pandem-ic](#)

[WHO COVID-19 Dashboard](#)

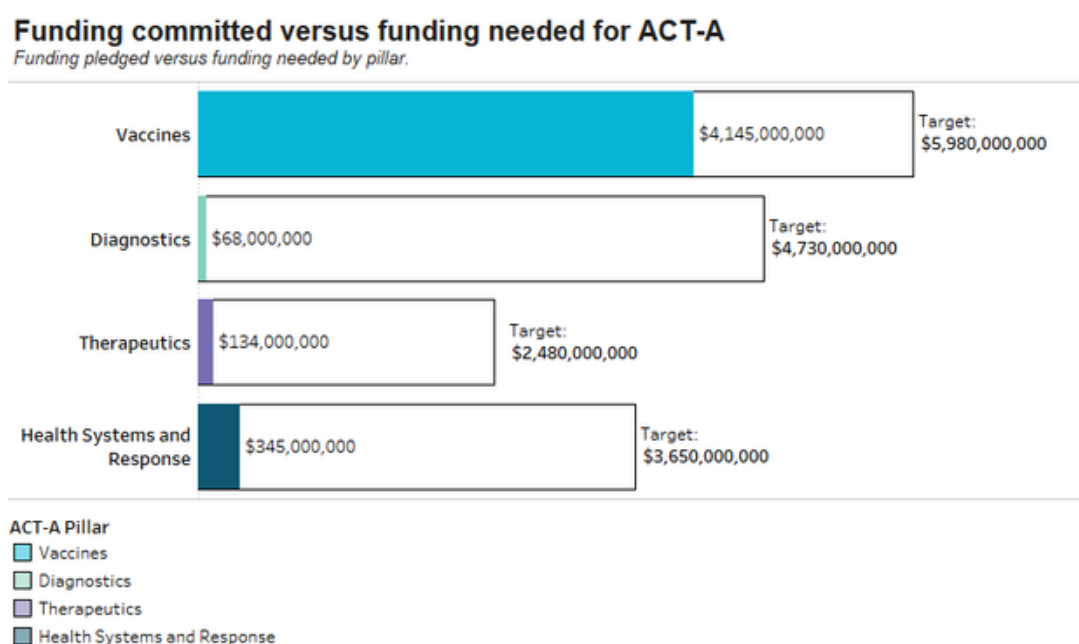
Interactive versions of the charts and graphs below are available at <https://covid19gap.org/view-the-data>. The data visualizations will be updated every two weeks and new metrics will be added over time, as data allow. We welcome feedback and direct engagement to identify and incorporate additional data sources and/or relevant metrics to track.



1. Funding the Global Response

The ACT-Accelerator, the major global multi-lateral initiative coordinating pandemic response, has requested \$16.8 billion in grant funding to support activities from October 2021 to September 2022. Eleven months into its budget year, ACT-A has raised \$5.64 billion, a third of the funding needed to implement its strategy. At 69.3% funded, the vaccines pillar fares best (\$4.14 billion), while the diagnostics pillar has been allocated \$68 million, just 1.4% of the target funding (Figure 1). The lack of funding may be indicative of waning support among wealthier countries for the “no one is safe until everyone is safe” approach.

Figure 1. Donor country funding committed versus requested for ACT-A (2021-2022)



Source: [WHO](#), updated July 25, 2022

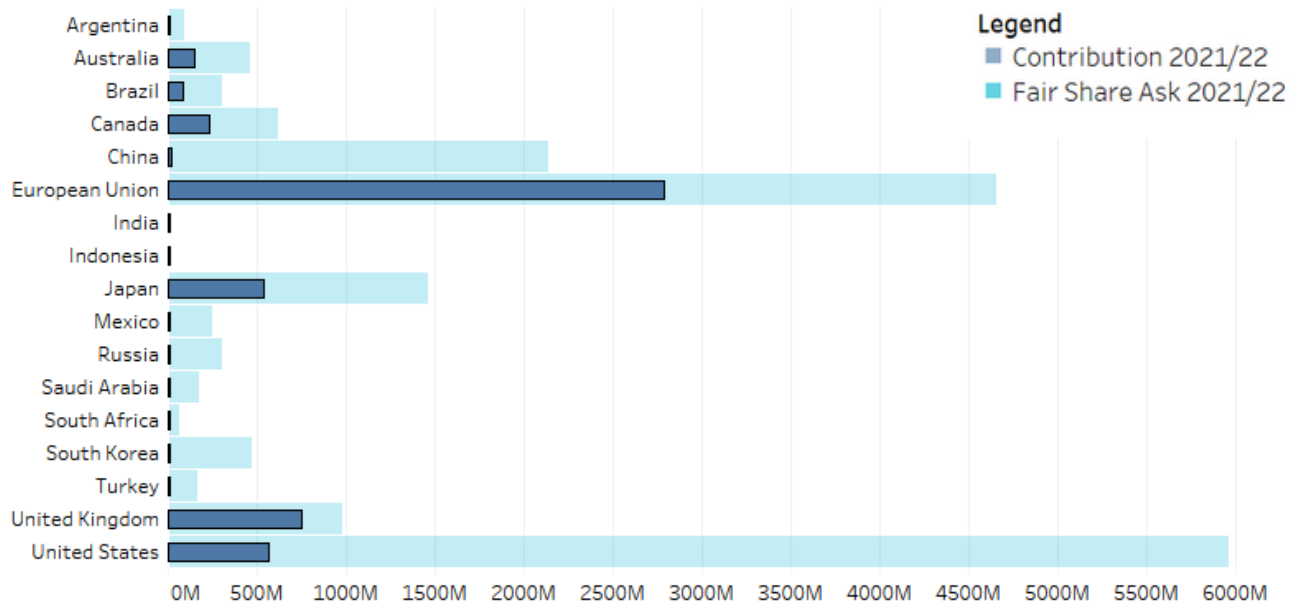
NOTE: These funding targets (tracked at the source listed above) are set for donor countries and differ from those in the ACT-A Strategic Plan, which include expected contributions from development banks and self-funding middle-income countries.

In February 2022, the ACT-Accelerator Facilitation Council's Finance and Resource Mobilization Working Group, chaired by Norway, set out a [“fair share” framework](#) to set contribution benchmarks by country. The calculation of the fair share benchmarks is based on the size of national economies and likely gains from a faster recovery of the global economy and trade.

Several countries made new financial pledges to ACT-A during the Second Global COVID-19 Summit, which are not yet reflected in the ACT-A funding data displayed in Figures 2.1 and 2.2. Canada is the first country to pledge their “fair share ask” for the 2021-2022 budget year (not yet reflected in the ACT-A data). Since the last update, Canada, the United States, and the European Commission have all increased their contributions.

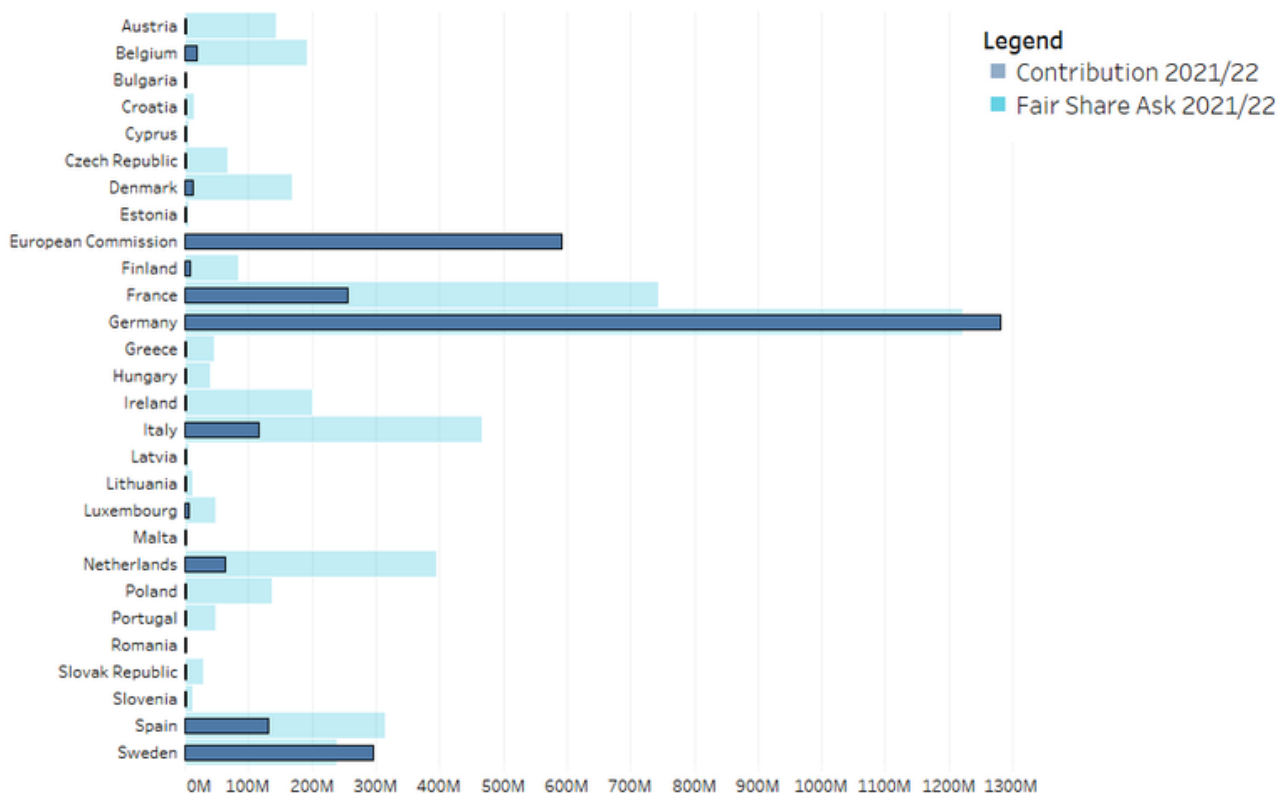


Figure 2.1. ACT-A “fair share” ask versus contribution by country (2021-2022): G20 countries



Source: [WHO](#), updated July 25, 2022

Figure 2.2 ACT-A “fair share” ask versus contribution by country (2021-2022): European Union countries



Source: [WHO](#), updated July 25, 2022

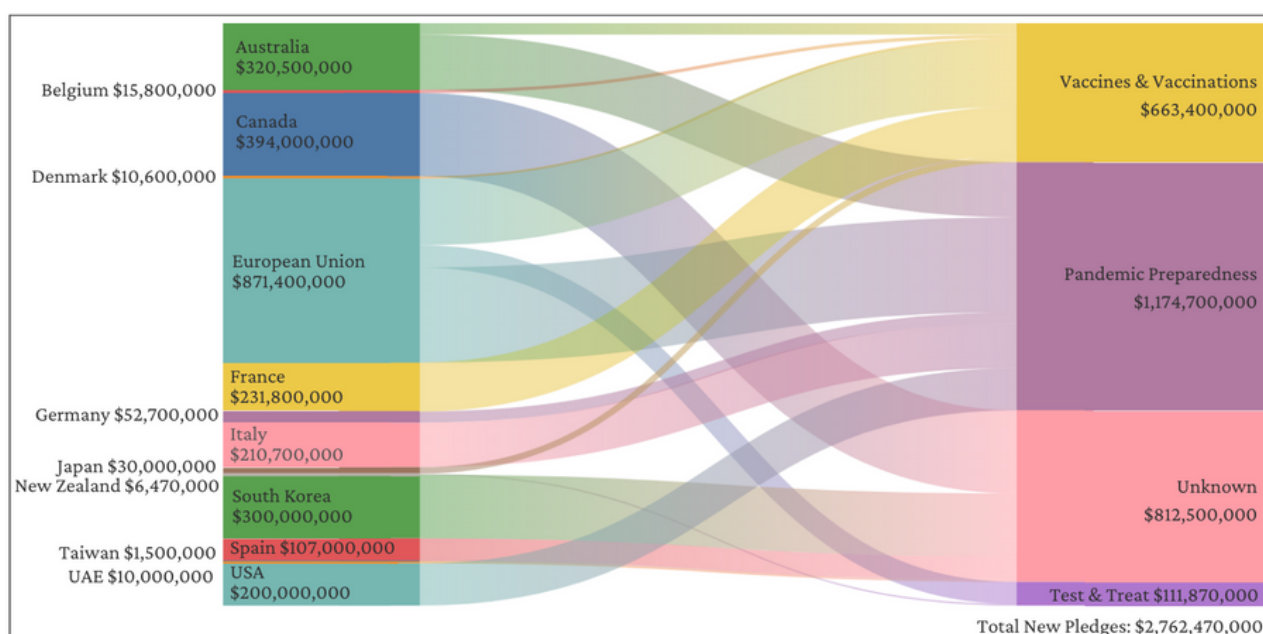


While ACT-A provides a coordination and facilitation mechanism, each organization within the ACT-A structure still fund-raises separately. Recent fundraising and replenishment events directly and indirectly related to the global COVID response have also fallen short of funding targets. The table below shows results from two recent fund-raising events as well as pending fund-raising targets in the near future.

CEPI	The UK hosted the Global Pandemic Preparedness Summit in March 2022 to raise funds for CEPI's 100 Days Mission, which resulted in a total of \$1.5 billion toward a total ask of \$3.5 billion (more on these contributions in Section V: Pandemic Preparedness and Health System Resilience, below).
Gavi	In April 2022, Germany, Indonesia, Senegal, and Ghana co-hosted the Break COVID Now Summit to raise funds for Gavi COVAX Advance Market Commitment (AMC). Of the \$5.2 billion ask to support purchase and delivery of vaccines and in-country capacity support for vaccinations, up to \$4.8 billion has so far been committed, of which \$1.7 billion is from donor countries, up to \$2.1 billion is committed by financing facilities, which will "front-load" financing, and \$1 billion will be provided by multilateral development banks.

At the Second Global COVID-19 Summit in May 2022, more than \$3 billion in new financial commitments were pledged, including about \$2.7 billion from governments and about \$700 million from the private sector. Of this new funding, \$2.5 billion is dedicated toward COVID-19 response activities and \$712 million toward a new pandemic preparedness and global health security financial intermediary fund (FIF) at the World Bank. Many of the pledges from governments (Figure 3) were dedicated to particular areas of the response or specific ACT-A pillars, while other pledges were left unspecified.

Figure 3. New financial commitments from governments pledged at the Second Global COVID-19 Summit



Source: [White House Statement: 2nd Global COVID-19 Summit Commitments](#) and COVID GAP Analysis, updated May 23, 2022



2. Vaccines and Vaccinations

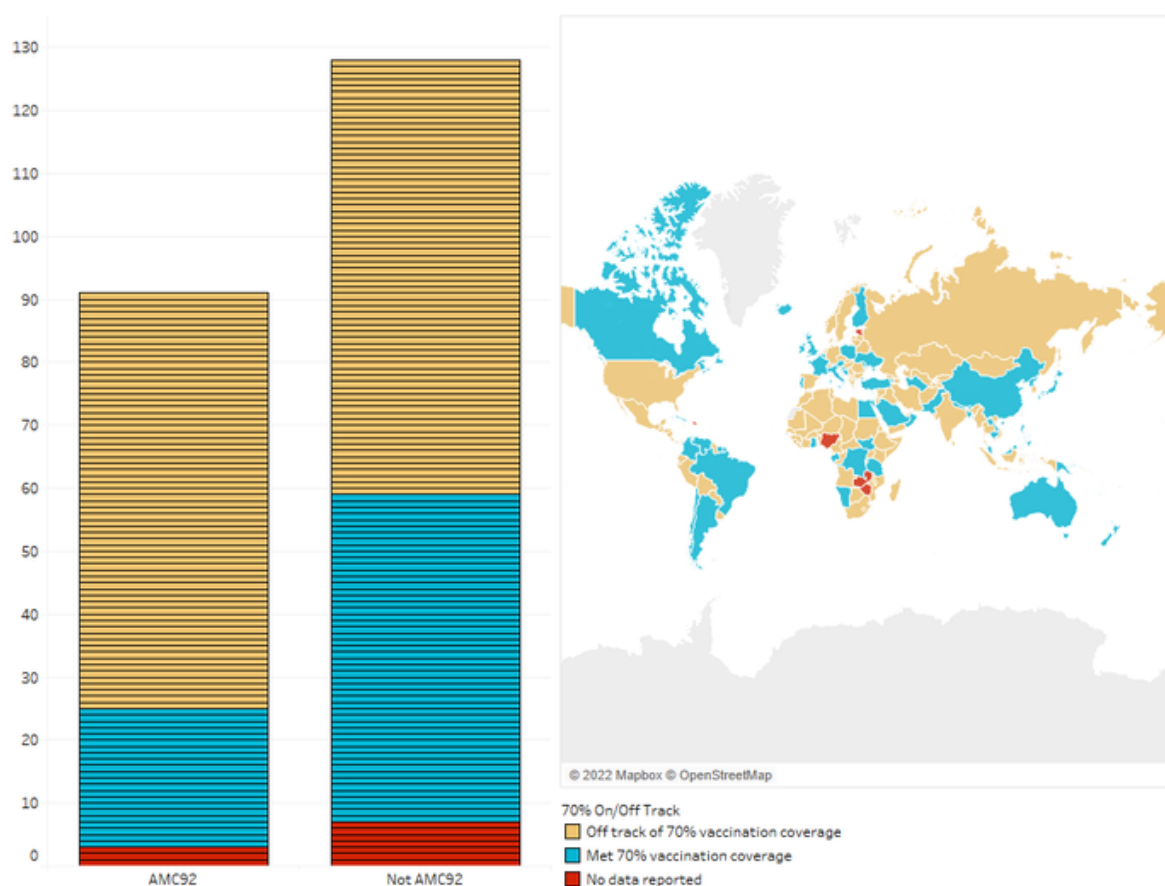
Vaccination Targets: Prioritize Sub-Populations

The rapid development of safe and effective vaccines for COVID-19 was an immense scientific accomplishment. The scale and speed of the roll out of vaccines is also unmatched, though flawed and inequitable.

Global entities, such as the WHO, set ambitious targets for vaccinating the world. Unfortunately, many countries missed the global 10% coverage target (September 2021) and the 40% coverage target (December 2021) and it is widely acknowledged that more than 100 countries have missed the 70% coverage target (June 2022). The first Global COVID-19 Summit set ambitious targets for vaccination coverage with a deadline of the 2022 UN General Assembly (UNGA). Based on the latest WHO CRD data, our analysis indicates over 100 countries are off track to meet the 70% target by the UNGA in September.

According to Our World In Data, only 16.5% of people living in low-income countries have received a full course of COVID-19 vaccination, compared with 73.6% in high-income countries (as of August 8, 2022).

Figure 4. Countries on track to meet the 70% target for primary vaccination coverage by the UN General Assembly (September 2022)

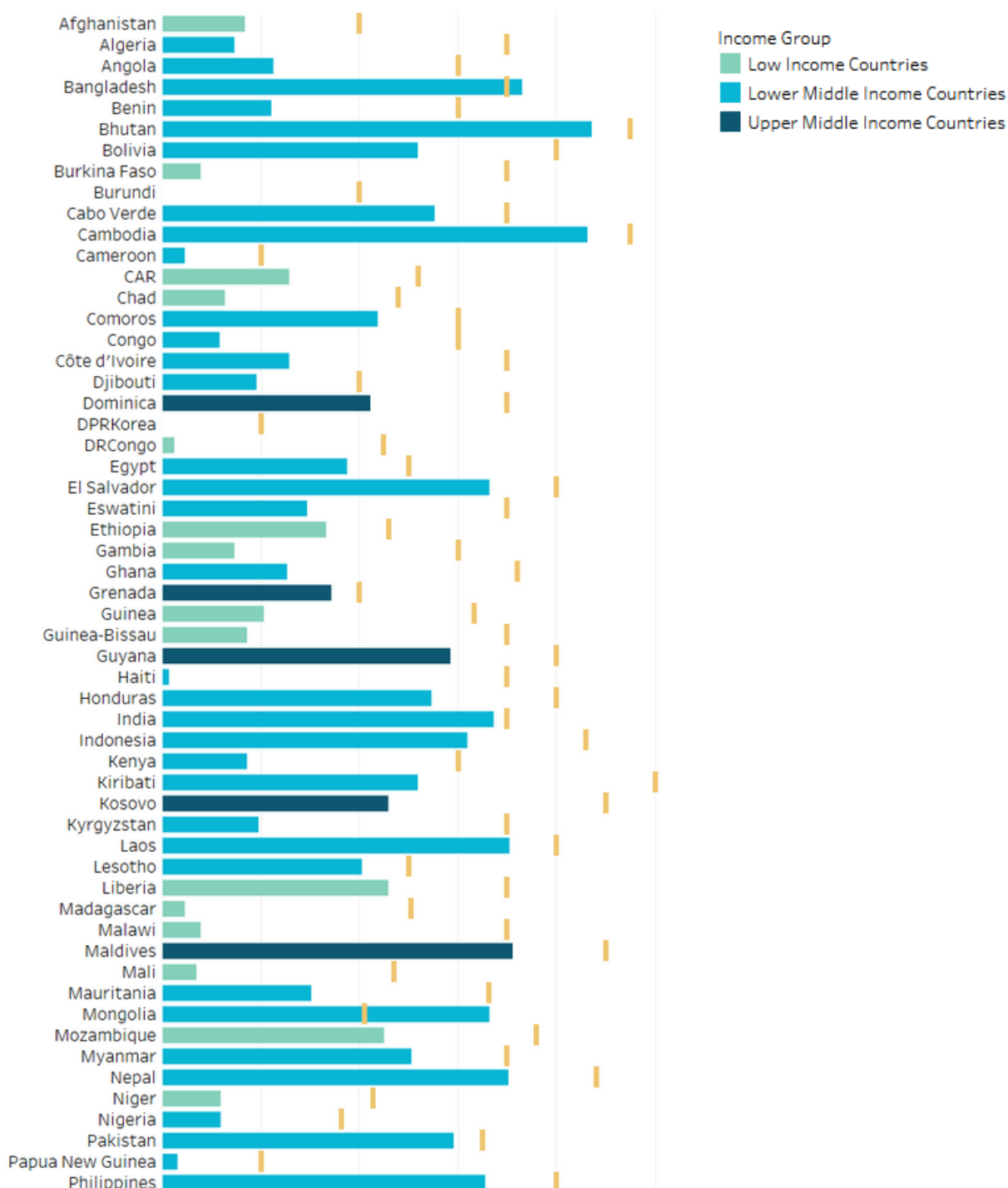


Source: [WHO CRD](#), data updated August 4, 2022



Many countries have set their own national targets for population coverage, which range from 20% to 95% with varying deadlines, but few have met the targets yet (Figure 5). Despite falling short of the targets, progress is being made and vaccinations are steadily increasing in many of these countries (see Figure 8 for vaccine rates in the 34 COVAX priority countries; data on all countries is available on the COVID GAP website).

Figure 5. Country-set vaccination coverage targets versus current coverage (for COVAX Advance Market Commitment countries only)





Source: [WHO CRD](#), data updated August 4, 2022

Note: Gold bars denote country-set coverage targets. Some countries are shown at >100% because of the administration of booster doses.

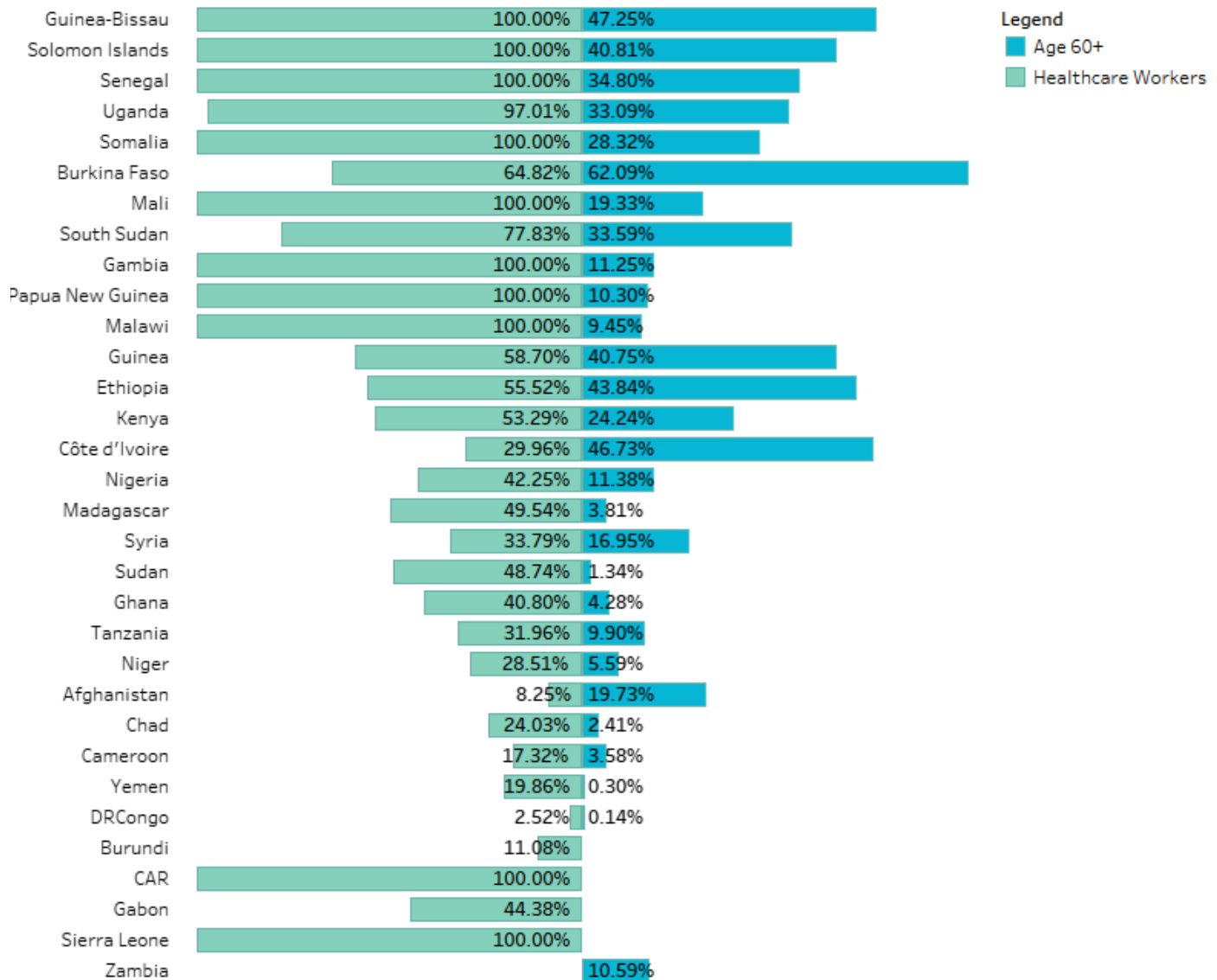
In the face of Omicron and its sub-variants, COVID-19 vaccines have successfully reduced hospitalizations and deaths, even while infection rates remain high among vaccinated populations. Given this context, as we note in The Path Forward report, prioritization for full vaccination, including boosters, should be given to the highest-risk populations, including people over the age of 60, those with comorbidities and suppressed immune systems, and health care workers.

We are able to track vaccination coverage for ages 60+ and for health care workers in many COVAX Advance Market Commitment (AMC) countries (Figure 6) but have not yet found public data on coverage among populations with comorbidities or suppressed immune systems. Such information will be important to track over time to follow progress toward high-priority goals.

In the past two weeks, Senegal, Uganda, Papua New Guinea, Madagascar, Syria, Tanzania, and Burundi have had small increases in vulnerable population coverage.



Figure 6. Vaccination coverage by sub-population (60+ and health care workers) for COVAX concerted support countries

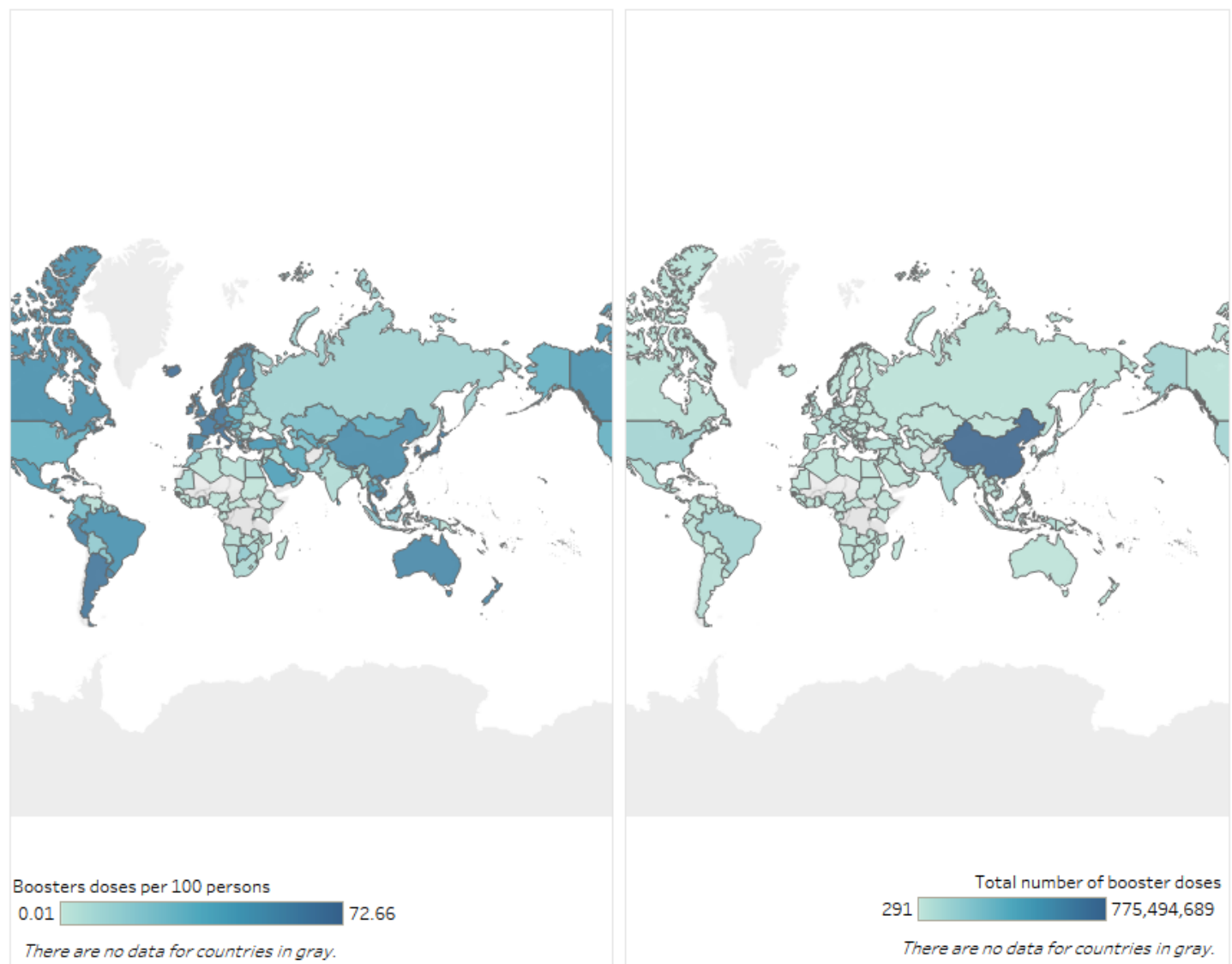


Source: [WHO CRD](#), data updated August 4, 2022

As more of the global population completes primary vaccination, and as protection wanes with time, it is also important to track progress in administering booster doses. Policies on boosters and which populations are eligible for them vary by country and are not easily tracked, but WHO does provide data on the number of boosters administered per 100 people (Figure 7.1). This metric is more appropriate for boosters than percent of population since some countries are already offering 2nd or 3rd boosters to eligible individuals, depending on national policy. However, similar trends are emerging with boosters as with primary vaccination coverage.

More boosters have been administered in high-income countries with coverage decreasing with each income level (Figure 7.2). However, since the last update, there has been an increase in the number of booster doses administered across all income levels. Continued roll out of primary doses in many lower-income countries may explain some of the difference in booster coverage, however inconsistent booster policies across countries creates an additional challenge to drawing insights from this metric.

Figure 7.1. COVID-19 booster doses administered per 100 persons and total COVID-19 booster doses administered

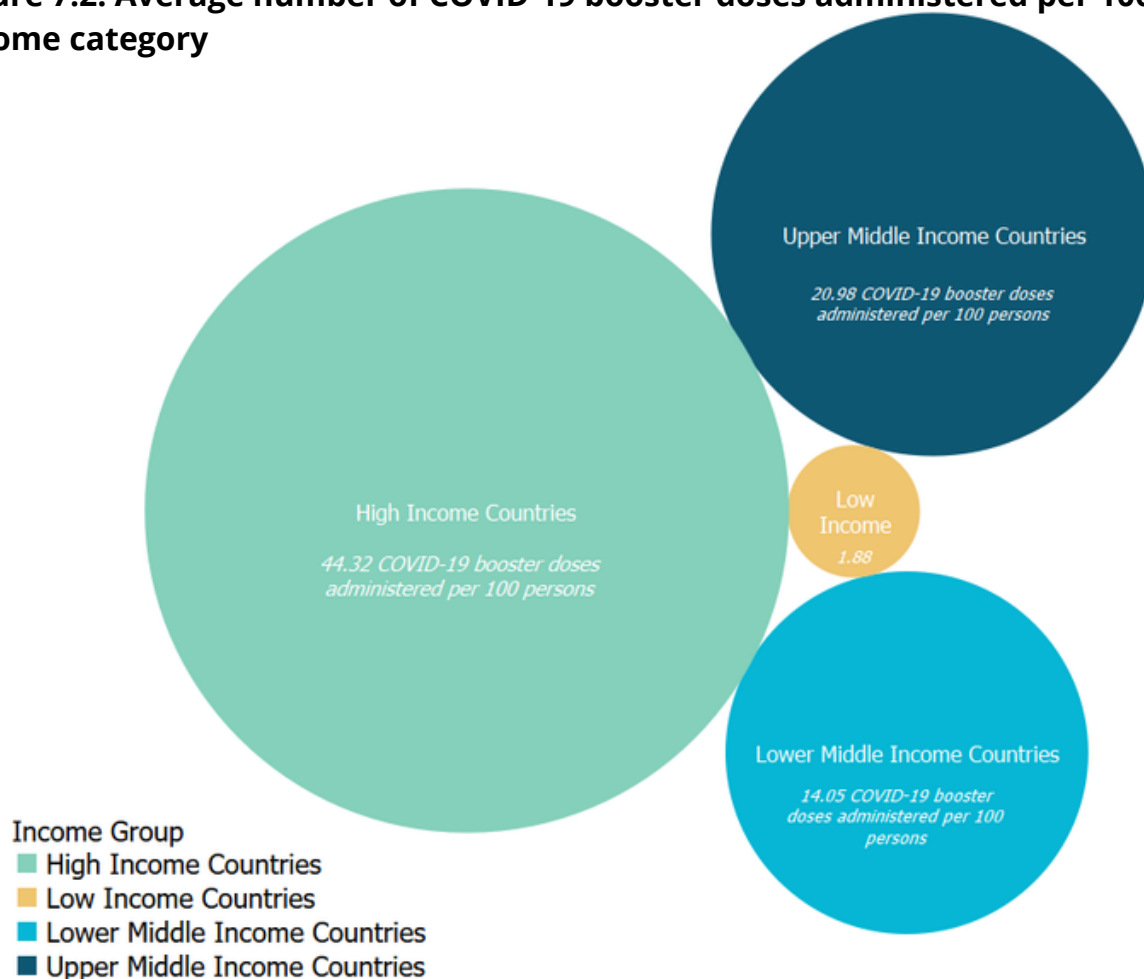


Source: [WHO CRD](#) and [OWID](#), data updated August 4, 2022

Note: WHO data was unavailable and supplemented with data from OWID for the following countries: Hong Kong, Macao, Montenegro, Russia, Serbia, Switzerland, Turkey, and the United Kingdom.



Figure 7.2. Average number of COVID-19 booster doses administered per 100 persons by income category



Source: [WHO CRD](#), data updated August 4, 2022

Challenges to Reaching Coverage Goals

Vaccine supply on a global level has greatly improved over the past year and is no longer the critical limiting factor. However, supply remains an issue at the local level, particularly for low- and lower-middle income countries in Africa, Eastern Mediterranean, and South-East Asia regions (see interactive visuals on the COVID GAP website to filter country vaccination data by region and income).

For many countries, the primary challenge has shifted to having the capacity to utilize available supply before product expiration. Daily vaccination rates in many countries remain low. Low- and lower-middle-income countries report significant challenges to vaccination, including lack of sufficient cold storage and transport, shortage of health care workers, vaccine misinformation, and competing health priorities.

Countries with concerted support from the Global COVID-19 Vaccine Delivery Partnership continue to make modest progress with increasing vaccination coverage. Since our last update, Tanzania's daily vaccination rates have risen to 0.48% from 0.21%. Tanzania has newly flagged supply as a concern and supply remains flagged as a concern for Ethiopia, Gambia, and Guinea.



Figure 8. Average daily vaccination rate, product utilization, and supply challenges for COVAX concerted support countries

	Change in % Pop Fully Vaccinated (Past 28 D..	Daily Vaccination Rates (28 Day Avg)	Product Utilization Rate	Potential Supply Needed
Afghanistan	0.04	0.14%	62.52%	
Burkina Faso	0.00	0.01%	51.72%	
Burundi	0.00	0.00%	12.31%	
Cameroon	0.00	0.00%	52.16%	
CAR	0.02	0.13%	65.17%	
Chad	0.00	0.00%	37.79%	
Côte d'Ivoire	0.02	0.17%	78.67%	
Djibouti	0.03	0.12%	22.42%	
DR Congo	0.00	0.01%	30.26%	
Ethiopia	0.00	0.01%	88.56%	*
Gabon	0.00	0.00%	38.34%	
Gambia	0.00	0.00%	100.00%	*
Ghana	0.02	0.08%	66.35%	
Guinea	0.01	0.02%	85.81%	*
Guinea-Bissau	0.00	0.00%	49.70%	
Haiti	0.00	0.00%	47.20%	
Kenya	0.00	0.01%	64.58%	
Madagascar	0.00	0.01%	48.66%	
Malawi	0.01	0.07%	61.76%	
Mali	0.00	0.02%	62.80%	
Niger	0.01	0.20%	77.92%	
Nigeria	0.01	0.06%	59.07%	
Papua New Guinea	0.00	0.00%	46.24%	
Senegal	0.00	0.00%	43.50%	
Sierra Leone	0.00	0.01%	72.78%	
Solomon Islands	0.01	0.05%	80.76%	
Somalia	0.03	0.09%	43.43%	
South Sudan	0.02	0.08%	79.82%	
Sudan	0.00	0.05%	66.87%	
Syria	0.00	0.03%	42.51%	
Tanzania	0.10	0.48%	83.29%	*
Uganda	0.02	0.09%	59.06%	
Yemen	0.00	0.00%	43.70%	
Zambia	0.02	0.39%	55.80%	

Source: [WHO CRD](#), data updated August 4, 2022

Support is needed to improve in-country storage, transport, and delivery of vaccines. However, funding for this effort has slowed over the past year and the ACT-A vaccinations pillar has only a fraction of the funding requested, eleven months into their fiscal year.

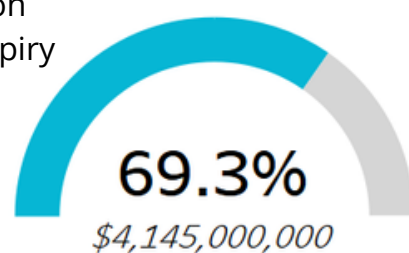
Vaccine Donations

Vaccine donations were a significant aspect of the supply landscape in 2021 but unfortunately deliveries were concentrated at the end of the year, overwhelming recipient countries. In addition, many of the doses donated bilaterally and through COVAX were delivered too close to their expiration dates for recipient countries to use, leading to wastage.

In December 2021, recipient countries refused more than 100 million donated doses, primarily because of the short timeframe before expiry and also in some cases because storage facilities were full.

Figure 9. Proportion of the \$5.98 billion ACT-A vaccines budget that is currently funded

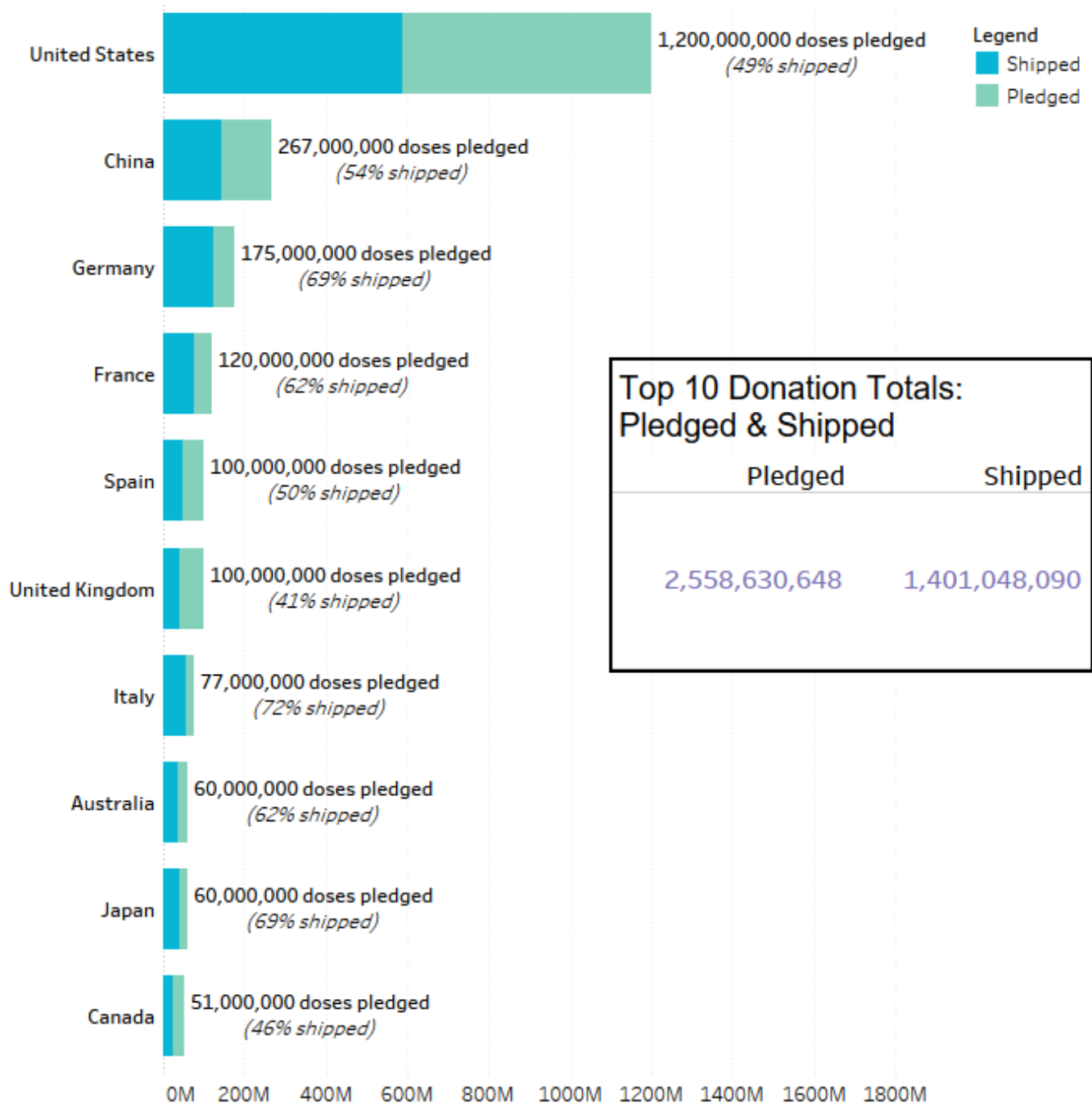
Source: [WHO](#), updated July 25, 2022





Many countries, including the United States, the United Kingdom, Spain, and Canada still have a long way to go to fulfill their donation pledges in 2022 (Figure 10). This needs to be done in concert with recipient countries and multilateral organizations like the African Union's African Vaccines Acquisition Trust (AVAT), so that deliveries can be planned, anticipated, and matched to capacity.

Figure 10. Pledged versus shipped vaccine donations, by top ten donor countries



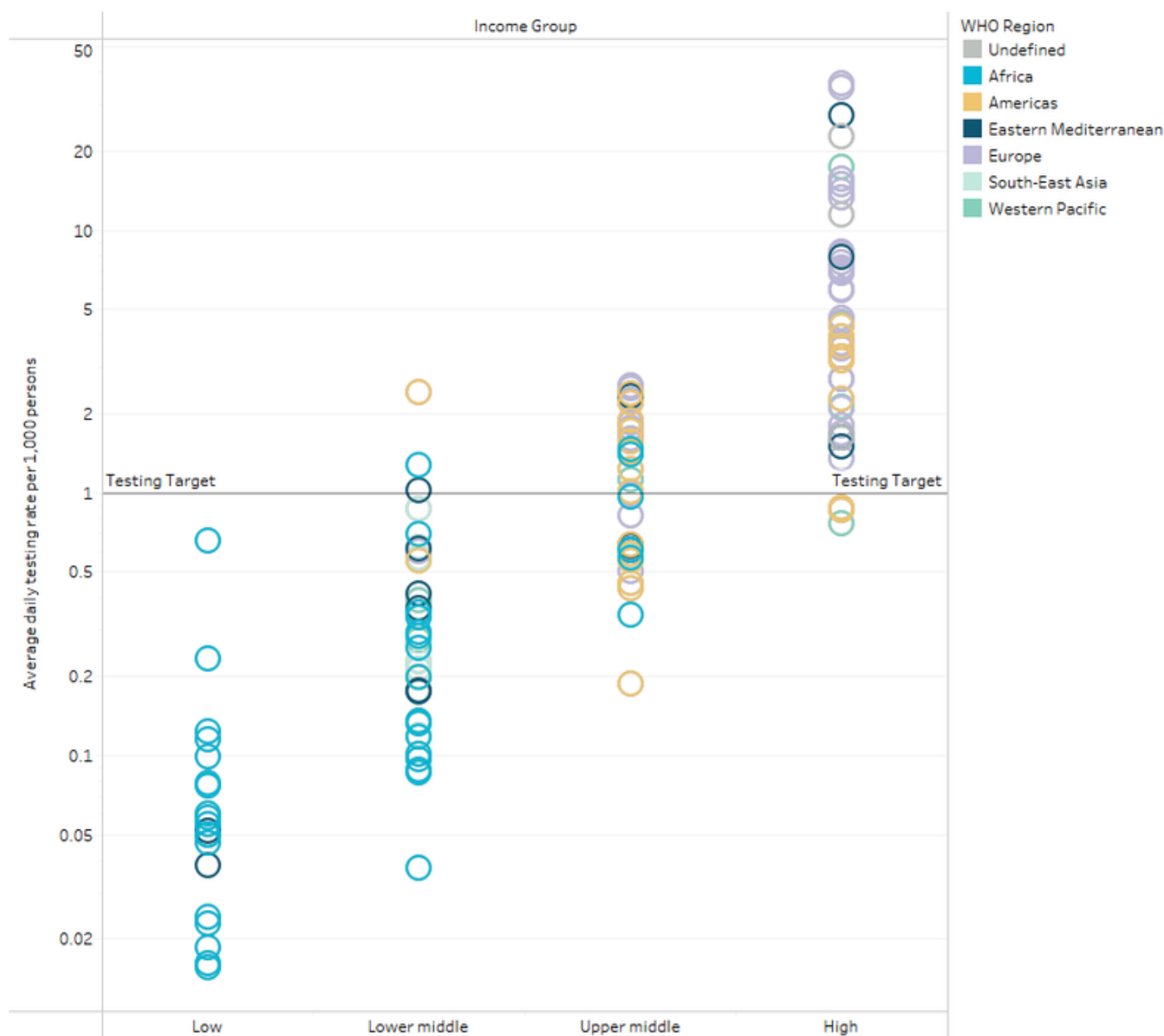
Source: Duke Global Health Innovation Center, updated August 8, 2022



3. Test and Treat

Test-and-treat strategies will be essential for the roll out of oral therapeutics to treat COVID-19. This will depend in part on global access to reliable diagnostics, particularly rapid tests. However, availability of diagnostics remains very low in low- and middle-income countries. Nearly all low- and lower-middle-income countries remain far below the ACT-A target of 1 test per 1,000 people per day (Figure 11.1).

Figure 11.1. Average number of daily tests per 1,000 people from January 1, 2022 to August 6, 2022

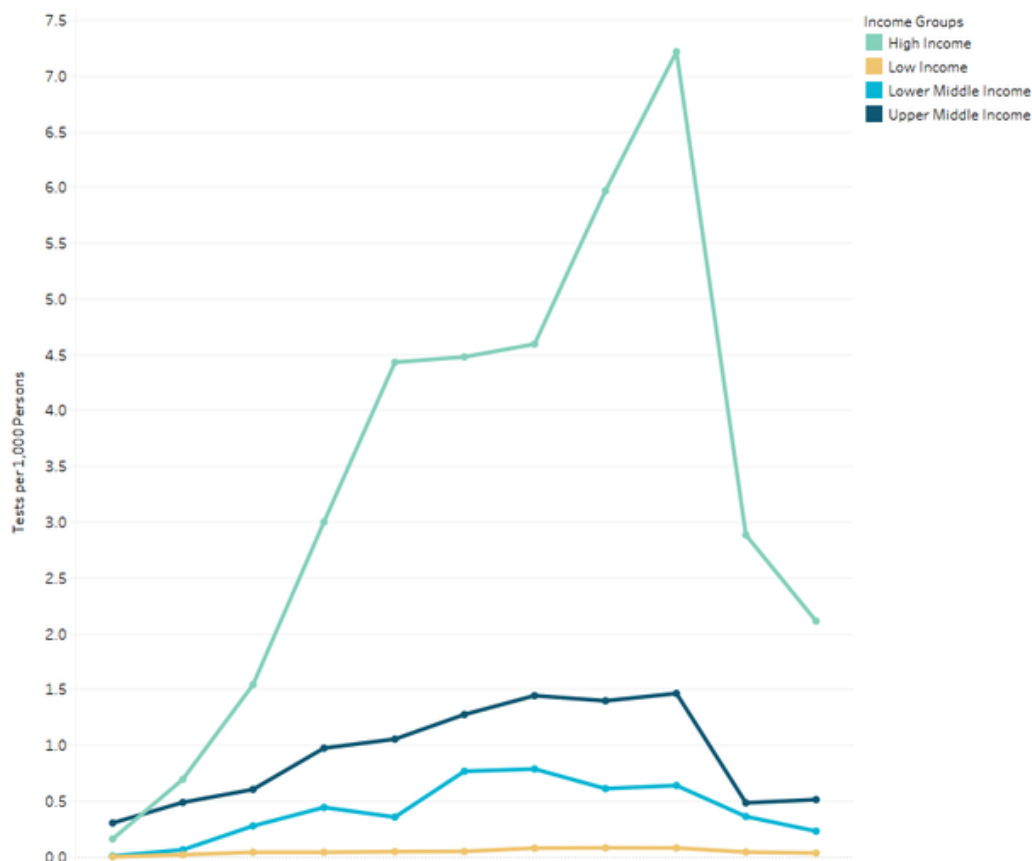


Source: [FIND](#), updated August 6, 2022

Note: Data shown by country, WHO region, and income category. The ACT-A target of 1 test per 1,000 people per day is shown with dotted line. Average number of daily tests includes antigen and PCR tests.



Figure 11.2. Average number of daily tests per 1,000 people by quarter
 Data shown by country income category from Q1 2020 through Q3 2022.



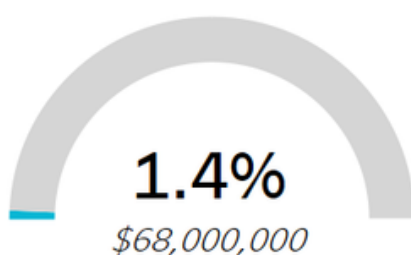
Source: [FIND](#), updated August 6, 2022

Note: Data shown by country income category from January 2020 through August 2022. Average number of daily tests includes antigen and PCR tests.

The average daily testing rate rose steeply for high-income countries in 2021, rising above the 1 test per 1,000 people target in July 2020 and peaking at more than 11 per 1,000 in January 2022. Testing rates for middle-income countries remained far lower, seldom reaching the 1 per 1,000 target. For low-income countries, the line from 2020 to present is essentially flat, with testing rates that have rarely risen to even 0.1 in 1,000 (Figure 11.2). In the last two weeks, the average number of daily tests has increased for all income groups except for low-income.

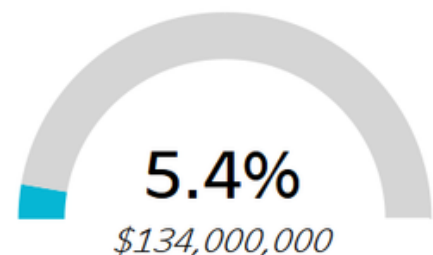
This area of pandemic response has received far less global attention than vaccines. The ACT-A diagnostics pillar has raised just 1.4% of the funding target, while the therapeutics pillar (which includes oxygen as a treatment) has raised 5.4%.

Figure 12.1. Proportion of the \$4.73 billion ACT-A diagnostics budget that is currently funded



Source: [WHO](#), updated July 25, 2022

Figure 12.2. Proportion of the \$2.48 billion ACT-A therapeutics budget that is currently funded



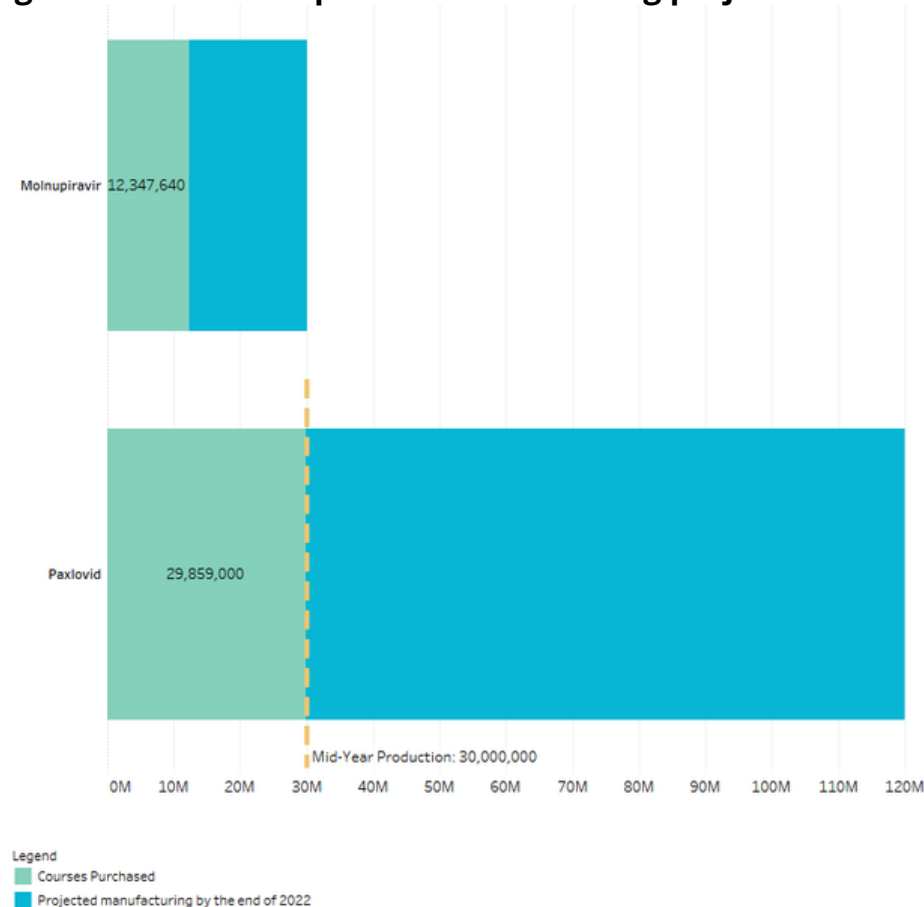
Source: [WHO](#), updated July 25, 2022



Despite broad licensing to generic manufacturers through the Medicines Patent Pool, generic production is unlikely to make a meaningful contribution to supply this year and manufacturing capacity will be largely limited to that of the originator companies, Merck and Pfizer. Merck expects to produce 30 million courses by the end of 2022 and Pfizer expects to produce 120 million courses.

Purchases for both drugs began even before the first regulatory authorizations were received. Pfizer's drug Paxlovid (nirmatrelvir/ritonavir) demonstrated strong efficacy data in Phase 3 clinical trials and therefore has been in greater demand. Pfizer has increased manufacturing of Paxlovid, but coupled with weak demand this could lead to a surplus of up to 70 million courses at the end of 2022.

Figure 13. Oral therapeutic manufacturing projections for 2022 and confirmed purchases



Source: COVID GAP analysis, updated August 8, 2022

Similar to what we saw with vaccines, the majority of the purchases for oral therapeutics to date have been placed by high-income countries, with no purchases by low-income countries (Figure 14).

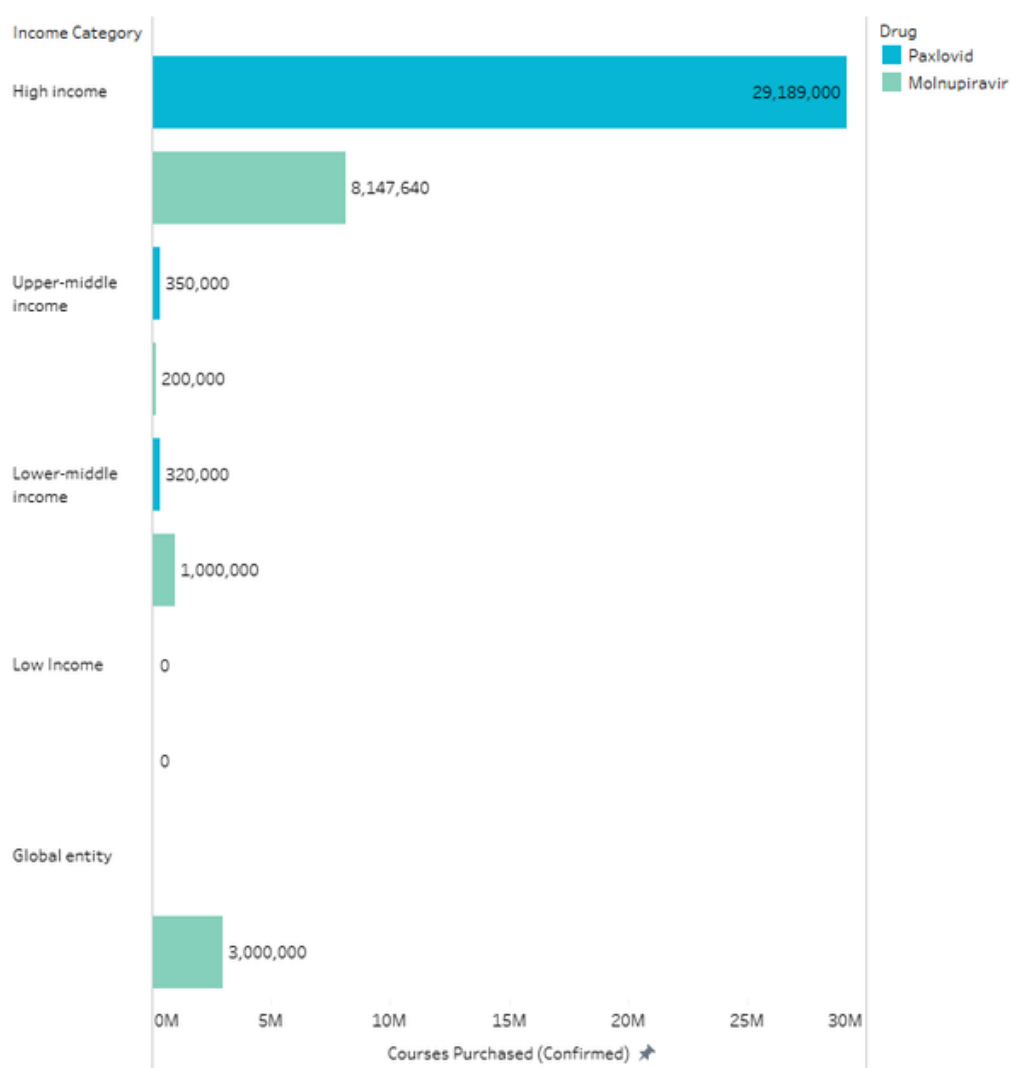
Global Fund has signed a letter of intent with Pfizer for the procurement of up to 6 million treatment courses of Paxlovid (nirmatrelvir/ritonavir). This will make the treatment available to all 130 countries eligible for Global Fund grants, subject to local regulatory approval and authorization. This builds on Global Fund and other partners' announcement at the Second Global Summit to support test-and-treat programs in over 20 LMICs.



UNICEF has [announced](#) a supply agreement with Pfizer for 4 million courses of Paxlovid, dependent on “country demand, clinical recommendations, and necessary approvals.” Pricing information is not publicly available. Merck has also allocated 3 million courses of molnupiravir to UNICEF throughout the first half of 2022 “for distribution in more than 100 low- and middle-income countries following regulatory authorizations.” At the Summit, Merck committed to make another 2 million courses available to USAID at the company’s “best access price.”

Africa CDC has signed a memorandum of understanding (MOU) with Pfizer to make Paxlovid available to countries on the continent at cost. After the announcement of the MOU, Zambia has announced plans to begin procuring Paxlovid.

Figure 14. Oral therapeutics purchases by country income category

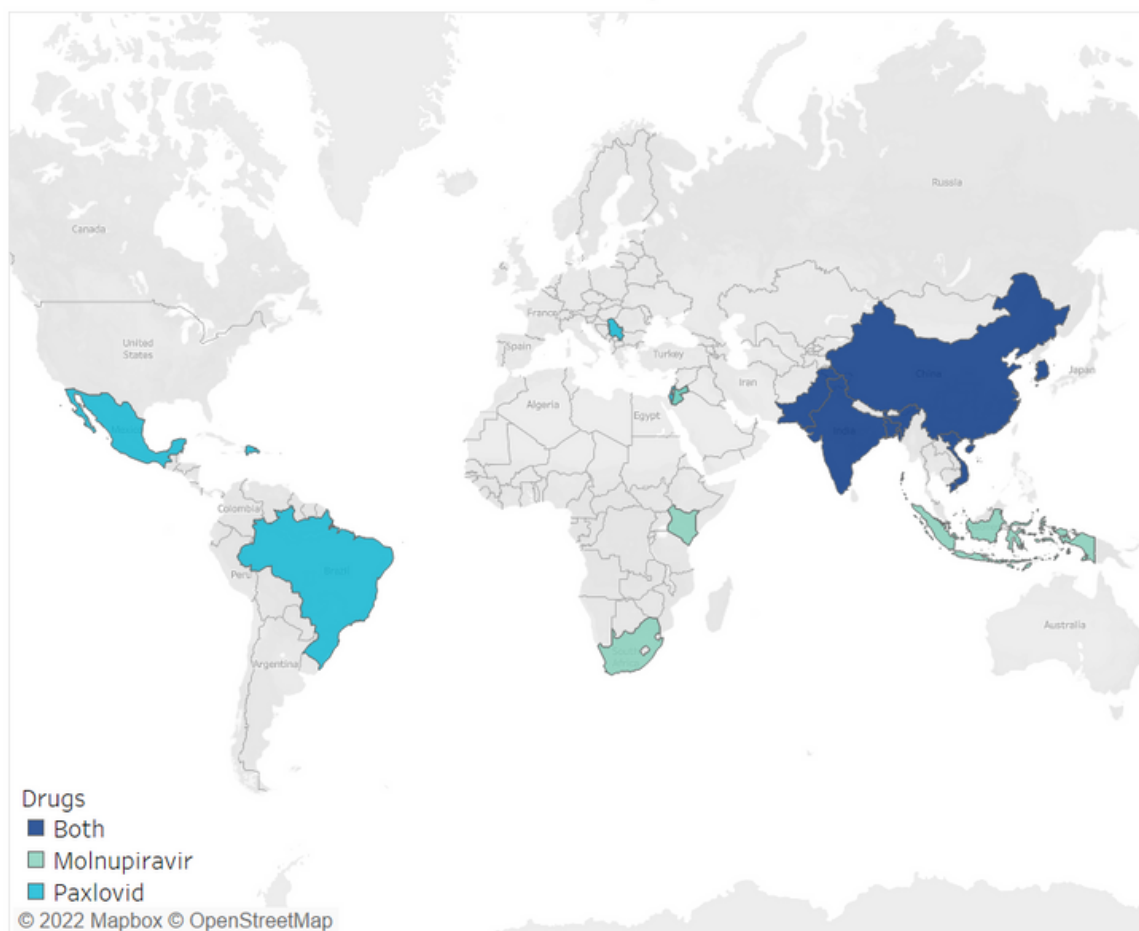


Source: COVID GAP analysis, updated August 8, 2022

Both Merck and Pfizer have licensed their oral therapeutics to 35 manufacturers each. All licenses from Pfizer are through the Medicines Patent Pool (MPP), while Merck has issued eight direct voluntary licenses to generic manufacturers in India in addition to 27 sublicenses via the MPP (Figure 15 and 16).

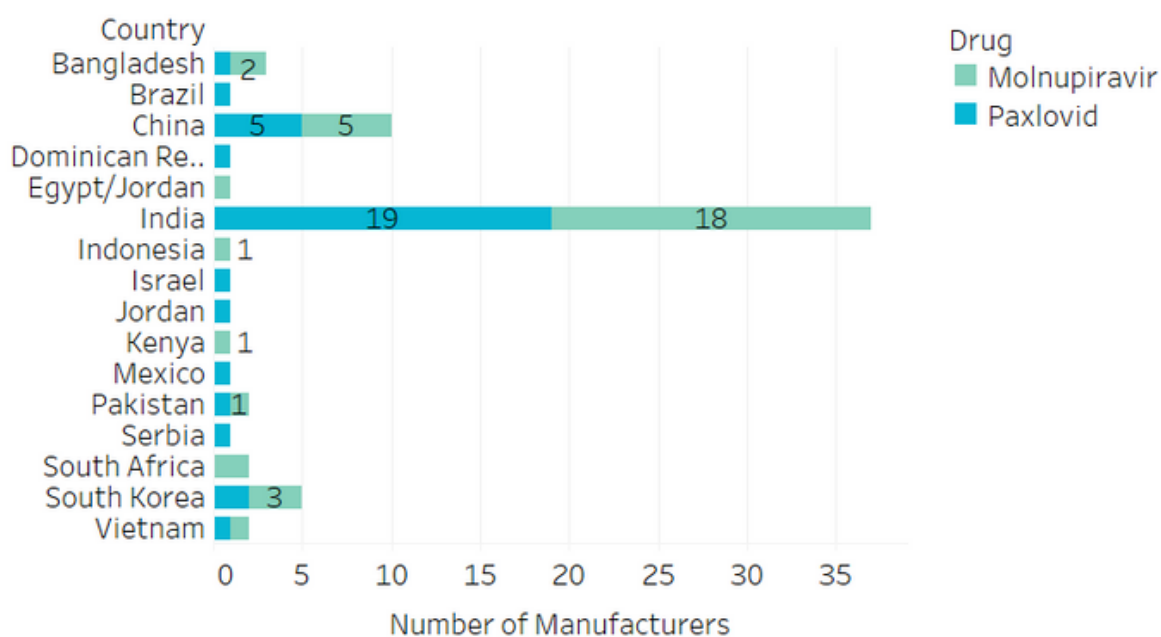


Figure 15. Licensed generic manufacturers for COVID-19 oral therapeutics
MPP sublicensees and voluntary licenses



Source: COVID GAP analysis, up to date as of July 25, 2022

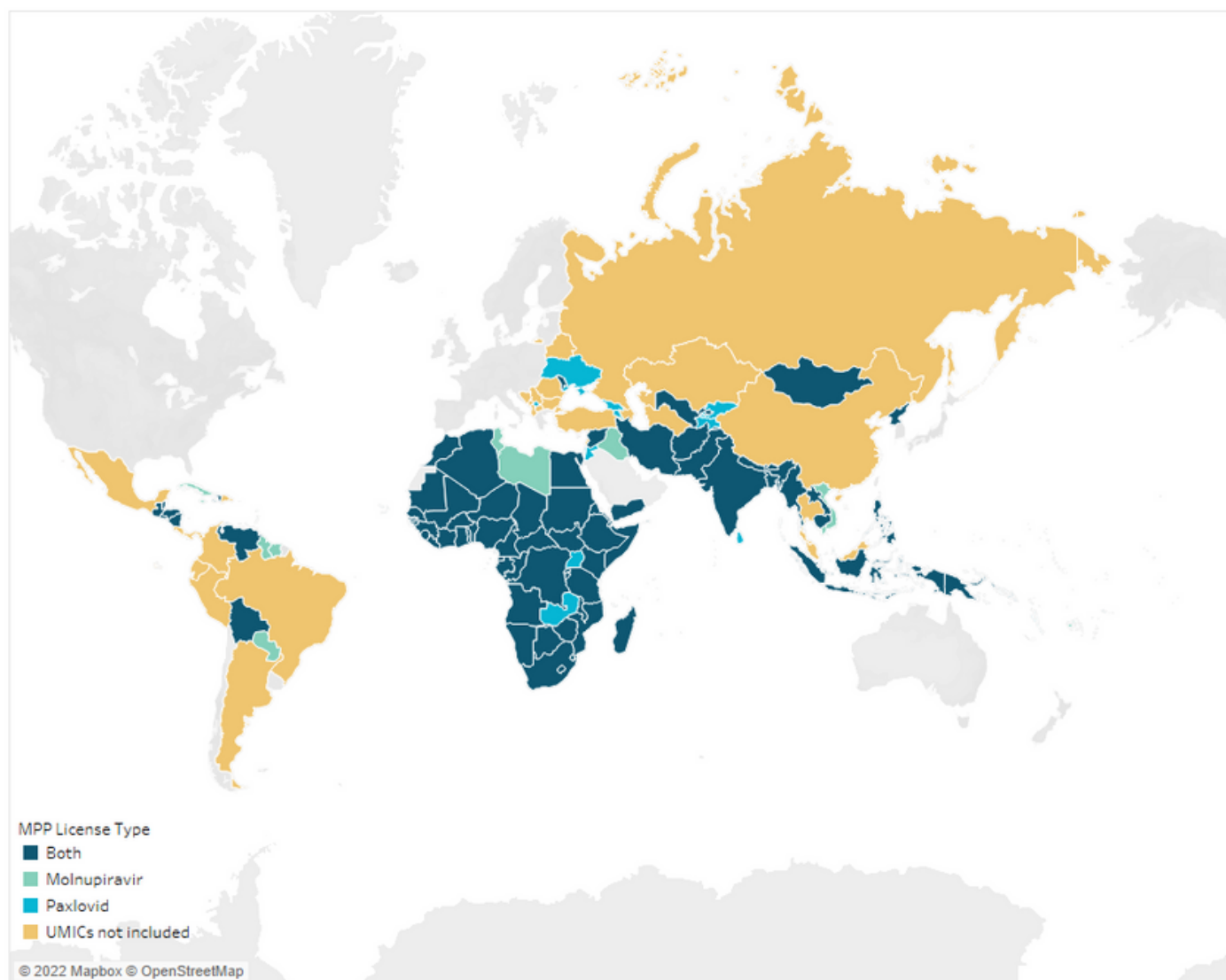
Figure 16. Number of licensed manufacturers by country and drug



Source: COVID GAP analysis, up to date as of July 25, 2022

The licenses through the MPP cover only a subset of countries for distribution. Merck's deal covers 105 low- and middle-income countries and Pfizer's deal covers 95 low- and middle-income countries (Figure 17). Both licensing deals left out some notable upper-middle income countries, shown in yellow in the map below.

Figure 17. Country inclusion in the MPP sublicenses for distribution



Source: Medicines Patent Pool, up to date as of July 25, 2022

While both the treatment and diagnostic pillars of ACT-A remain underfunded, scaling up access to test-and-treat capabilities is a challenge. A joint [initiative](#) between USAID, UNITAID, and other multilateral organizations will support LMICs in building robust test-and-treat capabilities within their health systems. Pfizer and Merck's supply forecasts for 2022 remain the same, and the demand for generic therapeutic options is weak given the current prices of oral therapeutics. The Clinton Health Access Initiative (CHAI) has put [ceiling price](#) commitments in place to provide generic Paxlovid for under \$25 USD per treatment course. Further regulatory support is needed from the US FDA and WHO to speed up the availability of affordable, quality assured generics.



4. Oxygen

Oxygen, currently the most frequently used treatment for COVID-19, is included in the ACT-A therapeutics pillar. ACT-A 2022 targets for oxygen include the supply of essential medical oxygen to 6 to 8 million severe and critical patients by September 2022. However, [reports](#) of oxygen shortages continue.

PATH provides [estimates of COVID-19 oxygen needs](#) for LMICs (which can be viewed by country and income group) based on the number of confirmed COVID cases and assumptions about how many of those cases will require oxygen. The tracker does not include data on available supply or shortages within LMICs.

As the February 2022 [African Union Statement on Access to Medical Oxygen](#) notes, supply of oxygen cylinders and ventilators is not the only issue. Barriers to oxygen access in many LMICs include lack of spare parts to repair equipment, insufficient piping and storage infrastructure, and a lack of financing to implement national oxygen plans and create oxygen systems so countries can meet their own oxygen supply needs.

Recent funding updates:

- Of the \$3.5 billion requested by ACT-A for the therapeutics pillar (which includes \$2.5 billion expected to come from donor countries, as tracked in this report), \$1.4 billion is requested to support oxygen supplies in 2022.
- Unitaid, which chairs the ACT-A Oxygen Emergency Taskforce, recently announced a \$56 million contribution to increase access to medical oxygen but the pillar has been largely unfunded by donor countries.
- The US Government committed \$75 million in December 2021 to USAID's Rapid Response Surge Support effort, which included oxygen production and delivery.

Overall, there is very little public data available on real-time oxygen needs (including actual supply, demand, and shortages). This remains an important gap in the data.

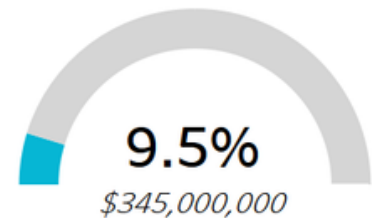
5. Pandemic Preparedness and Health System Resilience

As we note in the Path Forward report, the pandemic response over the past two years has forced countries to redistribute resources away from other pressing health needs. Health systems around the world need increased support to improve primary care provision and resilience, which will help to address the backlog of urgent non-COVID needs and better prepare for additional COVID outbreaks as well as future epidemics. Specific capabilities such as surveillance and robust supply chains will enable improvements in future pandemic preparedness as well as other health system needs.

However, there has been little concrete action toward building health system resilience globally. The ACT-A pillar focused on strengthening health systems, including national preparedness and response plans, is seriously underfunded. Since the last accountability report, there has been no change to funding of this ACT-A pillar.

Figure 18. Proportion of \$3.65 billion ACT-A health systems and response budget that is currently funded

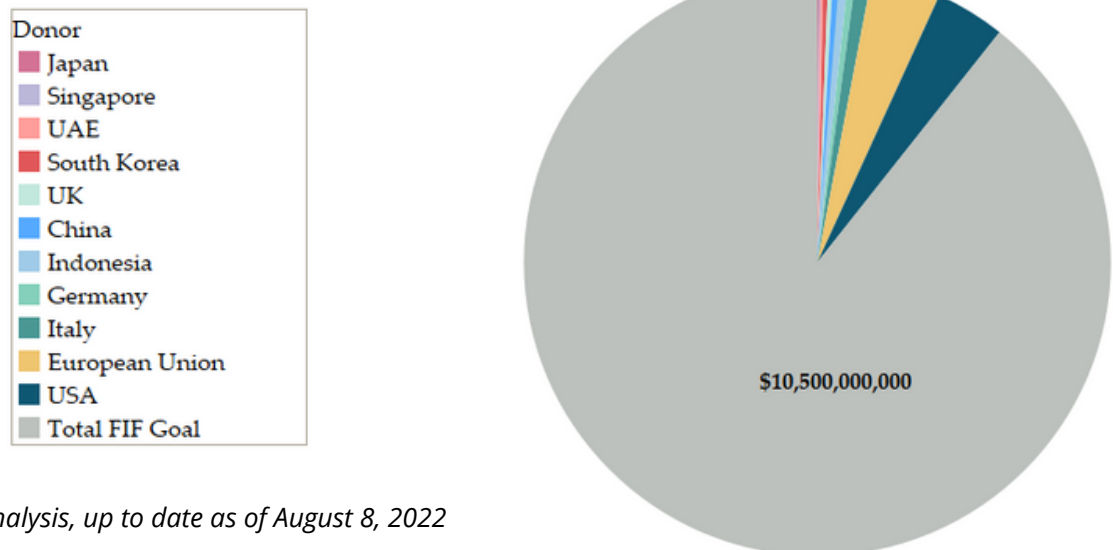
Some steps are being taken to prepare the world for the next pandemic. The World Bank approved a financial intermediary fund (FIF) for pandemic prevention, preparedness, and response. The FIF is expected to be operational in Fall 2022. At the Second Global COVID-19 Summit, countries pledged [new commitments](#) to the FIF. As of June, the U.S., Germany, EU, UK,



Source: [WHO](#), updated July 25, 2022

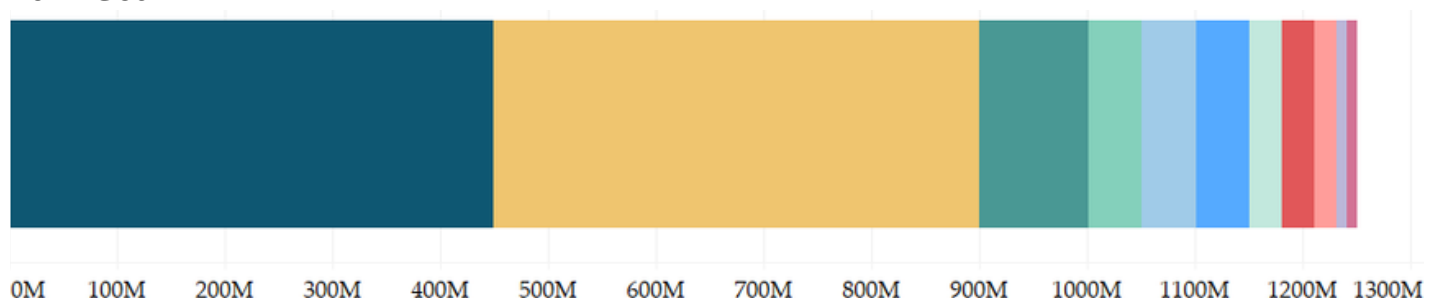
Indonesia, and Singapore have pledged a combined total of \$1.04 billion to the FIF. At the meeting of G20 Finance Ministers and Central Bank Governors in mid-July, China, Italy, the United Arab Emirates, Japan, and South Korea also made new pledges to the FIF (Figure 19.1). Since the last update, there have been no new pledges to the FIF. This is a promising start, but the projected need for the fund is \$10.5 billion per year over the next five years for investments to strengthen the capacity of low- and middle-income countries (Figure 19.2).

Figure 19.1. Government Contributions to the Financial Intermediary Fund (FIF) Toward the 2022 Goal



Source: COVID GAP Analysis, up to date as of August 8, 2022

Figure 19.2. Government Contributions to the Financial Intermediary Fund Toward the 2022 Goal

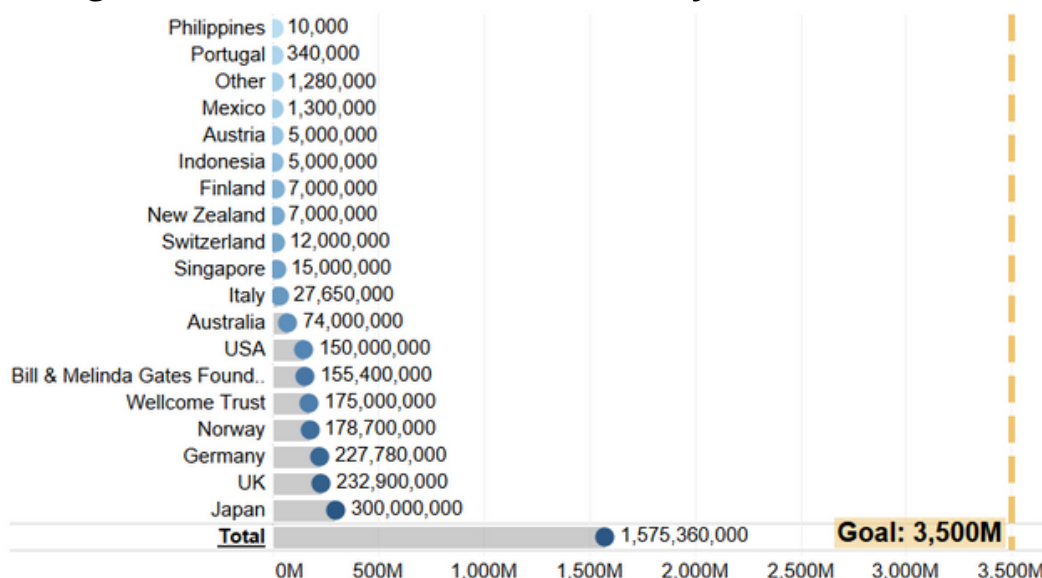


Source: COVID GAP Analysis, up to date as of August 8, 2022



CEPI has launched the 100 Days Mission, an effort to ensure that safe, effective, and affordable vaccines can be developed and deployed within 100 days of the discovery of a new pathogen threat. This strategy includes global surveillance systems, point-of-care testing capacity worldwide, and expanded global manufacturing capacity at the ready to ensure that new vaccines can be equitably distributed. However, fundraising for this effort is off to a slow start, with about \$1.5 billion raised, less than half of the \$3.5 billion target.

Figure 20. Funding commitments made to CEPI's 100 Days Mission



Sources: [CEPI 100 Days Pledges](#) and [CEPI Investment Report](#), updated July 6, 2022

Continued investments in LMIC-based manufacturing are encouraging, though many challenges remain. As detailed in our [recent blog post](#), developments with expected longer-term benefit include:

- As part of WHO's technology transfer hub, Afrigen Biologics in South Africa developed its own version of Moderna's mRNA vaccine, using the publicly available sequence. Afrigen plans to share this with other LMIC manufacturers but production at scale is not likely before the end of 2023.
- The Partnership for African Vaccine Manufacturing released a [framework](#), detailing a plan to build sustainable vaccine development and manufacturing capacity across Africa to prioritize 22 diseases. This effort is expected to cost \$30 billion over 20 years.
- Moderna and BioNTech have committed to establishing manufacturing capacity in Africa. Moderna will develop an mRNA facility in Kenya with assistance from the US government. This facility is expected to produce drug substance for up to 500 million doses of vaccine each year for use across Africa. BioNTech plans to launch modular factories called "Biontainers" to manufacture mRNA vaccines in Rwanda, Senegal, and possibly South Africa.

These and future investments in LMIC manufacturing will need to also focus on developing the supportive ecosystem that can support sustainable capacity. This includes ensuring demand (as demonstrated by the [lack of orders](#) for vaccines made in South Africa's Aspen Pharmaceuticals), a trained workforce, robust regulatory pathways, and financial models that address the challenge of keeping extra capacity at the ready for future health crises.

**Authors:**

Katharine Olson
Krishna Udayakumar

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