

Tracking Progress Towards the Global COVID-19 Vaccination Targets:

An Overview of the WHO-IMF Vaccine Tracker

Ruchir Agarwal, Ganchimeg Ganpurev, Seungeun Lee,
Yunhui Lin and Brandon Joel Tan

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Ganchimeg Ganpurev, Seungeun Lee, Yunhui Lin and Brandon Joel Tan

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ABSTRACT: The global vaccination targets of 40% coverage in all countries by end-2021, and 70% by mid-2022 were endorsed by multilateral institutions as part of the Multilateral Leaders Task Force and key stakeholders during the US Global COVID-19 Summit in 2021. We introduce the WHO-IMF Vaccine Tracker which measures progress towards these targets along each stage of a vaccine's journey from procurement, to delivery, and to in-country administration. The objective of the tracker is to identify where gaps in progress towards the targets exists in order to identify what steps need to be taken. As of June 2022, the share of population that has been fully vaccinated is 75%, 78%, 54%, and 14% for HIC, UMIC, LMIC, and LIC groups, respectively. About 86 countries missed the end-2021 40% target. Of 91 AMC countries, about 30 appear to have potential challenges in absorptive capacity. Over 100 countries have missed the mid-2022 70% target, while about 61 of 209 countries have already met the vaccination target.

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Prepared by Ruchir Agarwal, Ganchimeg Ganpurev, Seungeun Lee, Yunhui Lin and Brandon Joel Tan*

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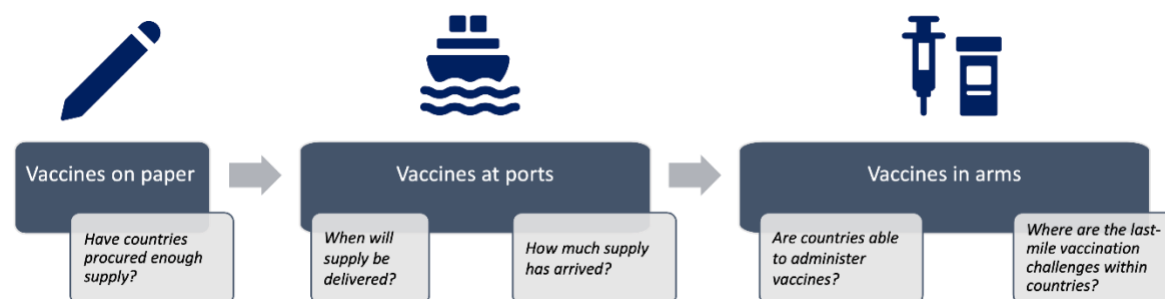
I. Introduction

We are in the third year of the COVID -19 pandemic, and the health and economic losses continue to grow. More than 6 million people have died according to official estimates (with studies estimating the actual death toll ranging from 16 to 20 million, approximately equal to that of World War I), and the IMF's *World Economic Outlook* (IMF 2022) has projected the cumulative output loss from the pandemic through 2024 to be about \$13.8 trillion. The sharp rise in cases and deaths in some countries in Asia and the resurgence of cases in Europe are a stark reminder that the pandemic is not over.

The world has a comprehensive COVID-19 toolkit of vaccines, tests, treatments, and Personal Protective Equipment (PPE) to mitigate this risk, with vaccines acting as a first line of defense and remaining highly effective at reducing serious illness and deaths (when boosted), even as the virus has continued to mutate. Multilateral institutions as part of the Multilateral Leaders Task Force and key stakeholders during the US Global COVID-19 Summit in 2021 established the global vaccination targets to be 40% coverage in all countries by end-2021 and 70% coverage in all countries by mid-2022.

In this paper, we introduce the WHO-IMF Vaccine Tracker which aims to track progress towards these global targets. The tracker is structured to monitor progress at each stage of a vaccine's journey from procurement to delivery to in-country administration. Figure 1 presents the tracker's conceptual framework and structure.

Figure 1: Conceptual Framework and Structure of WHO-IMF Vaccine Tracker



Source: IMF Staff.

The first section of the tracker focuses “Vaccines on paper”, asking the question: “Have countries procured enough supply?” Here, a comprehensive database is compiled to track the number of vaccine doses secured by countries and areas through different channels, including bilateral agreements with manufacturers, donations from other countries, multilateral agreements through the COVAX Facility, World Bank Group, Asian Development Bank or other institutions/sources. By aggregating contracted doses

across different channels and manufacturers, the tracker provides an assessment of whether countries have contracted sufficient supply of vaccine doses to reach the global targets.

In the second section, the tracker focuses on “Vaccines at ports”. Here, the tracker not only tracks delivered supply which has already arrived at the ports of a country, but also forecasts when contracted supply will be delivered using a prediction algorithm. The prediction algorithm relies on manufacturer production estimates based on data reported to the WHO and IMF, COVAX’s allocation mechanism, African Vaccine Acquisition Trust’s reported supply and allocation rules, and forecasting bilateral deliveries using a model calibrated to historical data. This section of the tracker provides an assessment of whether a country has received or when a country will receive sufficient vaccine supply to reach the global targets.

Finally, the third section focuses on “Vaccines in arms” or in-country vaccine deployment. This section has two components. First, an assessment of country absorption: Are countries able to administer vaccines that have been delivered to their ports? This assessment includes data on the rejection of COVAX allocated vaccine doses, vaccine product utilization, and the rate of daily vaccination. Second, an assessment of in-country equity: Where are the last-mile delivery challenges within countries? Here we report vaccination coverage across sub-national regions and across gender to identify gaps in vaccination progress.

As of June 2022, the share of population that has been fully vaccinated is 75%, 78%, 54%, and 14% for HIC, UMIC, LMIC, and LIC groups, respectively. About 86 countries missed the end-2021 40% target. Of 91 AMC countries, about 30 appear to have potential challenges in absorptive capacity. Over 100 countries are expected to miss the mid-2022 70% target, while about 61 of 209 countries have already met the vaccination target.

This paper is structured as follows. Section 2 will describe the “Vaccines on paper” section of the tracker. Section 3 will describe the “Vaccines at ports” section of the tracker. Section 4 will describe the “Vaccines in arms” section of the tracker. Section 5 will conclude.

II. Vaccines on Paper

The first step towards a country reaching the global vaccination targets is to sign agreements to purchase vaccines. In this section of the tracker, we establish a comprehensive database to track the number of vaccine doses secured by countries and areas through different channels, including bilateral agreements with manufacturers, donations from other countries, multilateral agreements through the COVAX Facility, World Bank Group (WBG), Asian Development Bank (ADB) or other institutions/sources.

The data for this section can be found at this [link](#).

Methodology

This tracker calculates the “Secured and/or Expected Vaccine Supply” for each country. Secured and/or Expected Vaccine Supply” here refers to doses countries and areas have committed to purchase under contracts with manufacturers. Note that due to production schedules and issues as well as local absorption capacity constraints, these doses may be made available to countries over varying time frames which section “Vaccines at ports” will focus on. This measure is reported both in doses and as a percentage of the country’s population.

The “Secured and/or Expected Vaccine Supply” variable includes the following components:

1. Secured doses (excluding any optional doses on contracts) through bilateral agreements between countries and areas and vaccine manufacturers (excluding regional agreements which are handled separately below), collected through the COVAX Global Market Assessment by BMGF, CEPI, Gavi, PAHO Revolving Fund, UNICEF, and WHO largely leveraging public sources of information (e.g. press coverage).
2. Bilateral donations
 - a. Data from UNICEF, national authorities, and other public sources
3. Secured doses under the COVAX Facility
 - a. COVAX Advanced Market Commitment (AMC): assuming 40% coverage¹ for all AMC 91 economies, an estimated 300 million doses for India, 10% additional coverage for low-income countries, and 10% additional coverage for fragile and conflict-affected countries and areas
 - b. COVAX SFP: doses allocated to COVAX SFP-committed economies based on first several rounds of allocations
 - c. The final total secured doses from COVAX is calculated as below:
 - i. AMC countries: $\text{Max}(\text{COVAX allocated doses}, \text{COVAX AMC})$
 - ii. SFP countries: COVAX allocated doses
4. EU deal with manufacturers: member countries were allocated an amount proportional to their population
5. Other sources:
 - a. Subset of the 220 million J&J doses that have been ordered through the African Vaccine Acquisition Trust (AVAT) (excludes the 180 million optional doses)
 - b. Vaccines through COVAX cost-sharing mechanism
 - c. Direct purchases financed by the World Bank that have already been executed and may not appear in the bilateral agreements yet
6. Domestic production capacity

¹ Assuming 2 doses per person. 40% coverage means total number of doses needed is 80% of population.

7. Adjustments:

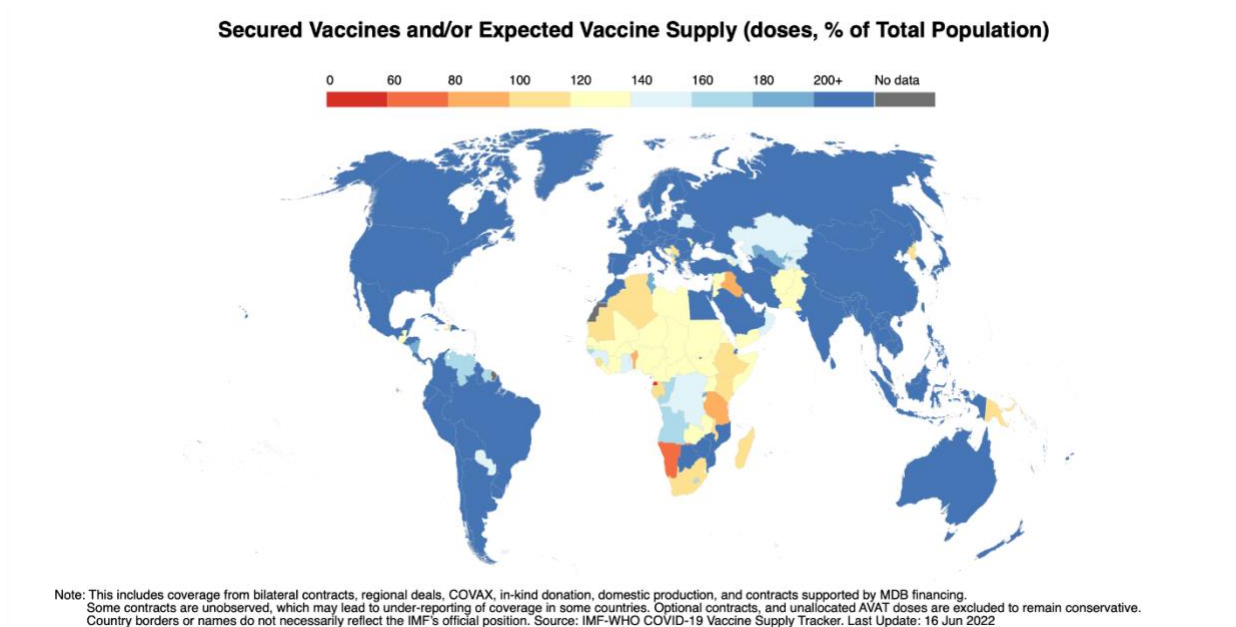
- a. Bilateral deals/bilateral donations/COVAX donations adjustments: based on secondary checks of the original numbers using various sources and dialogue with national authorities.
- b. Adjustments based on total vaccinations: when total vaccinations (based on WHO and Our World in Data reporting of the number of total vaccinations) is greater than the sum of secured doses under deals, adjustments are made to reflect higher supply availability.
- c. Adjustment based on total delivered doses: when total delivered doses (based on UNICEF COVID-19 Vaccine Market Dashboard) is greater than the sum of secured doses, adjustments are made to reflect higher supply availability.

In our database, we also include underlying data on (i) all bilateral deals signed between countries and vaccine companies by contract with the corresponding deal date, and (ii) the number of doses delivered through direct donations.

Results

Figure 2 presents a map of “Secured and/or Expected Vaccine Supply” by country, as displayed on the IMF-WHO COVID-19 Vaccine Tracker. Currently, 53 out of 196 countries have not contracted sufficient doses to reach the 70% vaccination target. Almost all of these countries are lower-middle or low income countries and are in Africa.

Figure 2: Vaccines on Paper



Our data suggests that middle-income countries and some low-income countries did have capacity to enter into advance purchase agreements, but that they did so later than high-income countries (Table 1).

Table 1: Timing of bilateral contracts for vaccines

World Bank country income classification	Number of advance purchase agreements	Average month contract signed	Earliest month contract signed
High income	211	December 2020	May 2020
Low income	8	May 2021	February 2021
Lower-middle income	105	March 2021	August 2020
Upper-middle income	135	February 2021	August 2020

Source: IMF-WHO COVID-19 Vaccine Tracker.

High-income countries signed contracts as early as May 2020, and on average in December 2020. Middle-income countries signed contracts on average three months later. The low-income countries that did sign contracts signed them on average five months later. The earliest purchase by a low-income country was in February 2021, nine months later than the earliest purchase by a high-income country. ACT-A did make an advance commitment to procure vaccine doses in June 2020 but did not manage to raise resources to scale up purchases until after December 2020 (see Agarwal and Gopinath, forthcoming). The Africa Vaccine Acquisition Trust (AVAT), another multilateral initiative, made its first purchase commitment in April 2021.

Agarwal and Reed (2022) studies our contract-level data for vaccines and finds that ordering vaccines early on could have cut the delays in delivery by more than half.

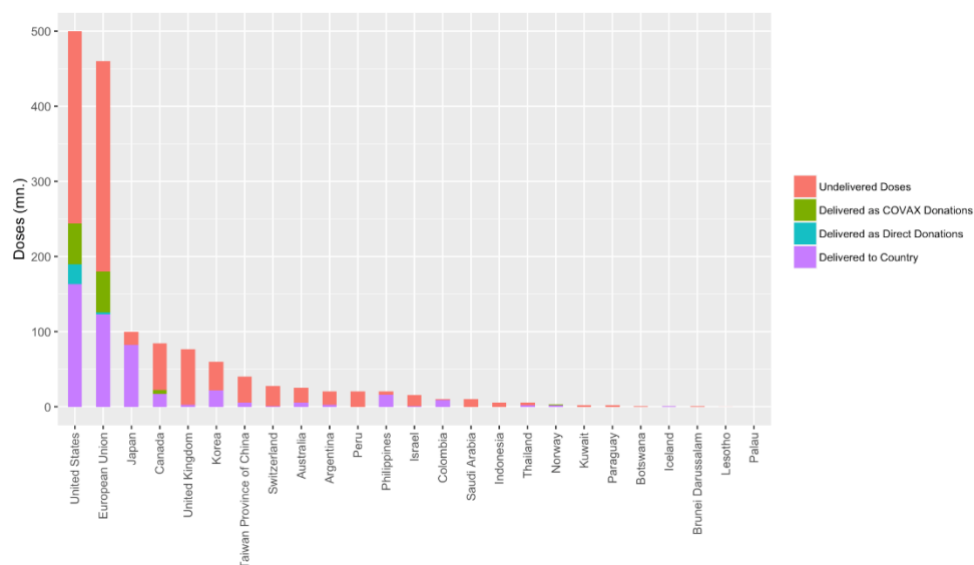
III. Vaccines at Ports

Delays in the delivery of vaccine supply have resulted in slower progress towards the global vaccination targets for many countries. The next section of the tracker first presents data on the number of doses that been delivered to each country by product and channel, and second forecasts when contracted (but not yet delivered) doses will be delivered.

Delivered Doses

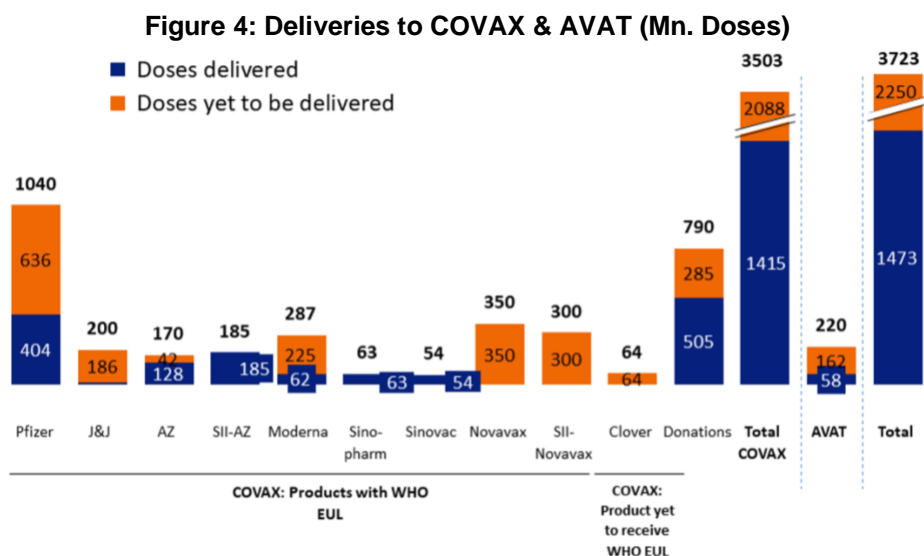
First, the tracker presents a detailed view on country-level contracts by vaccine manufacturer. The data can be found at this [link](#). The tracker breaks down for the each country the number of contracted doses which has delivered to the country, the number of contracted doses which have not been delivered, the number of doses which have been donated directly, and the number of doses which have been delivered through COVAX. Figure 3 presents the country by country data for Moderna.

Figure 3: Moderna Country-level Contracts



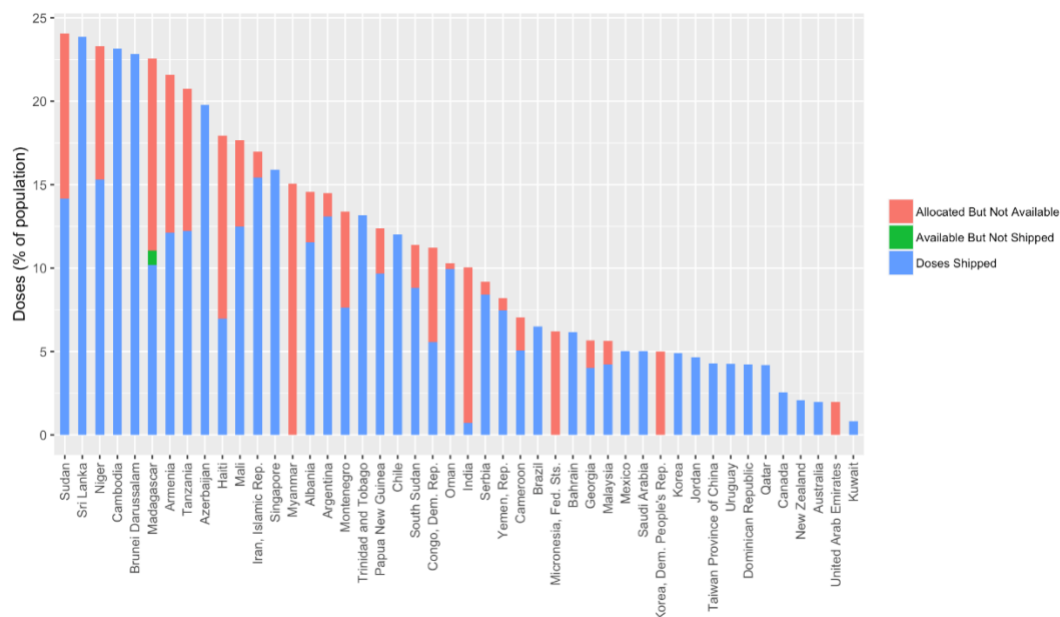
Source: IMF-WHO COVID-19 Vaccine Tracker.

Second, the tracker provides detailed data on COVAX and AVAT doses. Figure 4 breaks down the share of COVAX and AVAT contracted doses which have been delivered by vaccine product. Only 40% of COVAX-contracted doses and 26% of AVAT-contracted doses have been supplied for delivery so far.



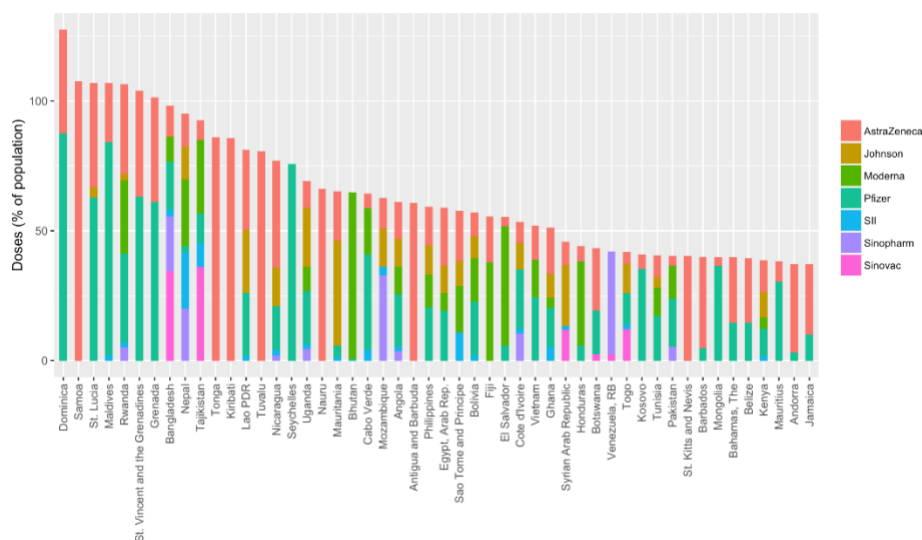
Sources and Notes: COVAX, UNICEF, Africa CDC, IMF staff calculations. Committed doses are doses that the COVAX facility is required to procure. Support from e US has allowed COVAX to secure 1b Pfizer doses. These include a donation of 700m doses, and the rest 300m doses is treated as non-donations. However, for this presentation all 1b facilitated doses are included in the Pfizer category. The secured supply agreement numbers for SII-AstraZeneca and SII-Novavax are approximated based on COVAX Facility candidate-specific supply information. The dose donations are based on COVAX estimates based on commitments from donors to share doses bilaterally with the COVAX facility.

For COVAX, we provide data on the number of doses which have been allocated by country broken by whether the doses have been shipped, have not been shipped but are available, and are not available for shipping yet. Figure 5 presents this data for the 50 countries with the most allocated doses.

Figure 5: COVAX Allocations and Shipments (top 50 countries)

Source: UNICEF Vaccine Market Dashboard, IMF & WHO Staff calculations.

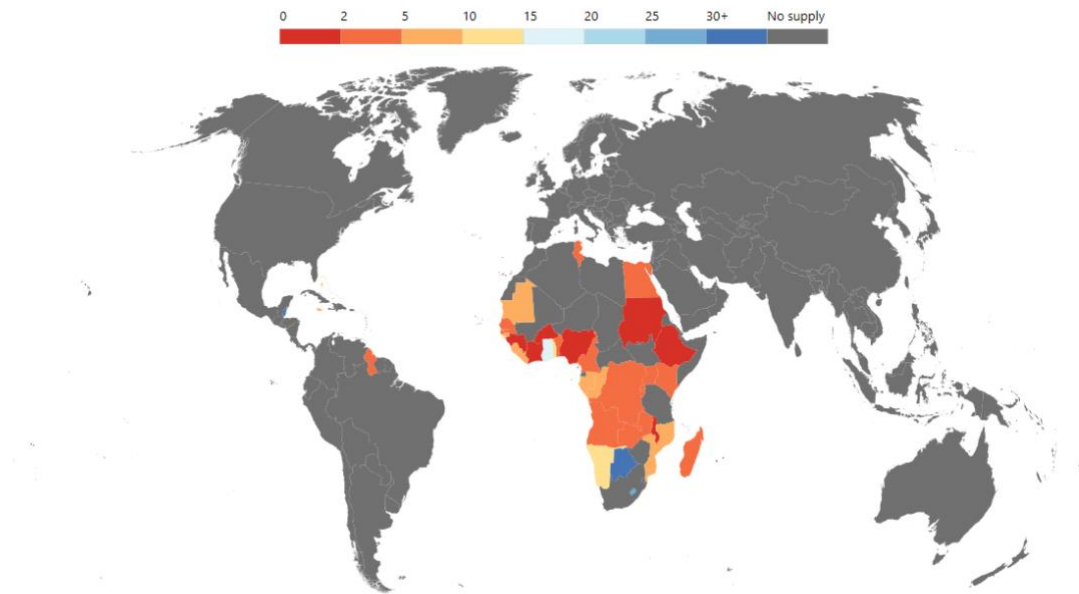
The tracker also further breaks the delivered doses down by vaccine product for the 50 countries with the most delivered doses, as shown in Figure 6.

Figure 6: COVAX Shipments by Vaccine (top 50 countries)

Source: UNICEF Vaccine Market Dashboard, IMF & WHO Staff calculations.

The tracker also tracks the number of doses delivered by AVAT to each country. Figure 7 presents a map of the number of doses delivered by AVAT by country.

Figure 7: AVAT Doses Delivered (% of population)



Source: UNICEF Vaccine Market Dashboard, IMF & WHO Staff calculations. Country borders or names do not necessarily reflect the IMF's official position.

Last, the data also presents a detailed picture of the number of vaccine doses which have been donated by donor country. The data can be downloaded at this [link](#). Table 2 presents the data breaking down the number of doses which have been pledged/announced versus delivered by each country, as well as by channel (whether direct or through COVAX).

Table 2: Dose donations pledge and delivered (in millions)

Donor	Doses Announced			Dose Donations Delivered To Date				% Delivered		
	Total 2021-2022	Through COVAX	Through Direct Donations	Total	Through COVAX	Through Direct Donations	Confirmed Supply by COVAX	Pledge at G7 Summit or Jun'21 to Jun'21	of G7 Summit or Jun'21 Pledge Delivered	of Total Announced Doses Delivered
Australia	60.0	19.1	40.9	34.5	-	34.5	-	-	-	1
Canada	51.5	50.7	0.8	15.1	14.3	0.8	15.1	13	116%	29%
Japan	60.0	37.2	22.8	40.1	19.3	20.8	11.3	30	134%	67%
United Kingdom	107.0	100.0	7.0	36.2	29.7	6.5	26.2	100	36%	34%
United States	900.0	818.9	81.1	335.9	256.0	79.9	693.4	580	58%	37%
European Union	589.9	490.8	78.9	360.4	299.7	60.7	293.6	147	245%	61%
France	145.0	138.1	6.9	68.3	62.2	6.0	64.1	60	114%	47%
Germany	175.0	164.1	10.9	104.9	94.1	10.8	99.1	30	350%	60%
Italy	72.0	66.4	5.6	48.0	42.4	5.6	43.9	15	320%	67%
Spain	74.0	64.3	9.7	47.8	44.5	3.2	46.3	-	-	65%
Portugal	7.4	4.5	2.9	6.8	3.9	2.9	2.4	-	-	92%
Belgium	15.0	8.5	0.4	8.6	8.2	0.4	8.2	-	-	57%
Finland	4.0	3.7	-	2.8	2.8	-	1.4	-	-	69%
Sweden	11.0	6.0	1.0	7.6	6.6	1.0	5.9	-	-	69%
Denmark	10.5	4.9	3.3	10.5	7.3	3.3	4.7	-	-	100%
Netherlands	31.8	22.4	9.2	21.3	14.7	6.6	16.3	-	-	67%
Ireland	4.0	1.0	0.3	1.9	1.6	0.3	1.3	-	-	47%
Others	40.2	7.0	28.7	32.1	11.5	20.6	-	-	-	80%
Hong Kong SAR, China	8.0	7.5	-	0.9	0.9	-	11.5	-	-	12%
New Zealand	9.0	3.2	0.7	2.8	2.5	0.2	0.9	-	-	31%
Norway	7.0	5.0	0.8	6.8	6.0	0.8	-	-	-	97%
South Korea	5.0	3.2	3.1	2.0	-	2.0	-	-	-	40%
Switzerland	8.0	4.0	-	1.8	1.8	-	1.6	-	-	22%
Turkey	5.9	9.2	5.9	3.7	-	3.7	-	-	-	63%
UAE	3.9	0.6	3.9	3.3	-	3.3	-	-	-	85%
India	13.8	-	13.8	13.8	-	13.8	-	-	-	100%
China	165.4	-	165.4	120.0	-	120.0	-	-	-	73%
Others	42.0	-	26.2	18.9	0.3	18.7	-	-	-	45%
Total	2,036	1,549	481	996	631	366	1,054	870	65%	49%

Source: IMF-WHO COVID-19 Vaccine Tracker

The tracker also breaks down delivered doses by vaccine product and channel, as presented in Appendix Table 1.

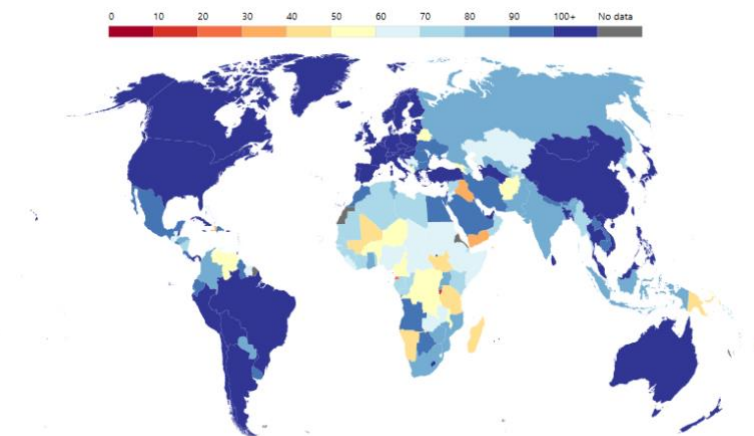
Forecasting Delivery Schedules

In this section, the tracker presents forecasts monthly vaccine supply by country and product. These forecasts have helped quantify gaps in expected vaccine supply to track progress towards the global vaccination targets, identify where there may be opportunities to swap or donate excess doses to countries not expected to reach the targets, and give countries foresight into when vaccine supply will arrive to prepare for the vaccine roll-out.

The forecasts are constructed from the following steps. First, we forecast company production capacity and apply a risk adjustment based direct conversations with vaccine manufacturing companies and other sources. Second, we account for COVAX vaccine supply and allocation. We allocate doses according to rounds that have already been announced, then allocate future rounds based on the principles of the COVAX allocation mechanism. Third, we account for AVAT deliveries based. We start with AVAT's announced expected supply over time and assume allocation is proportional to the number of doses ordered based on country-level data from AVAT. Fourth, we compute the number of doses expected to be delivered for bilateral contracts by subtracting COVAX, AVAT and non-COVAX donations from the total expected production (Total Bilateral = Total expected production – COVAX – AVAT – Non-COVAX donations). We then distribute this supply to countries with secured bilateral deals with weights on: 1) The share of undelivered secured doses, as countries with more outstanding contracts to be fulfilled should receive more doses, 2) Daily vaccination rates, as countries that are vaccinating their populations quickly/slowly are expected to receive doses more quickly/slowly, 3) Current delivery rates, as countries who have been receiving more deliveries are expected to continue to receive more in the near-term, and 4) Level of vaccine coverage, as countries with lower vaccine coverage may demand doses more urgently. We calibrate these weights based on historical data.

Figure 8 presents the forecasted vaccine supply for each country by September 2022.

Figure 8: Expected Effective Vaccine Supply (% of Population) by Country



Source: IMF & WHO Staff calculations. Country borders or names do not necessarily reflect the IMF's official position.

IV. Vaccines in Arms

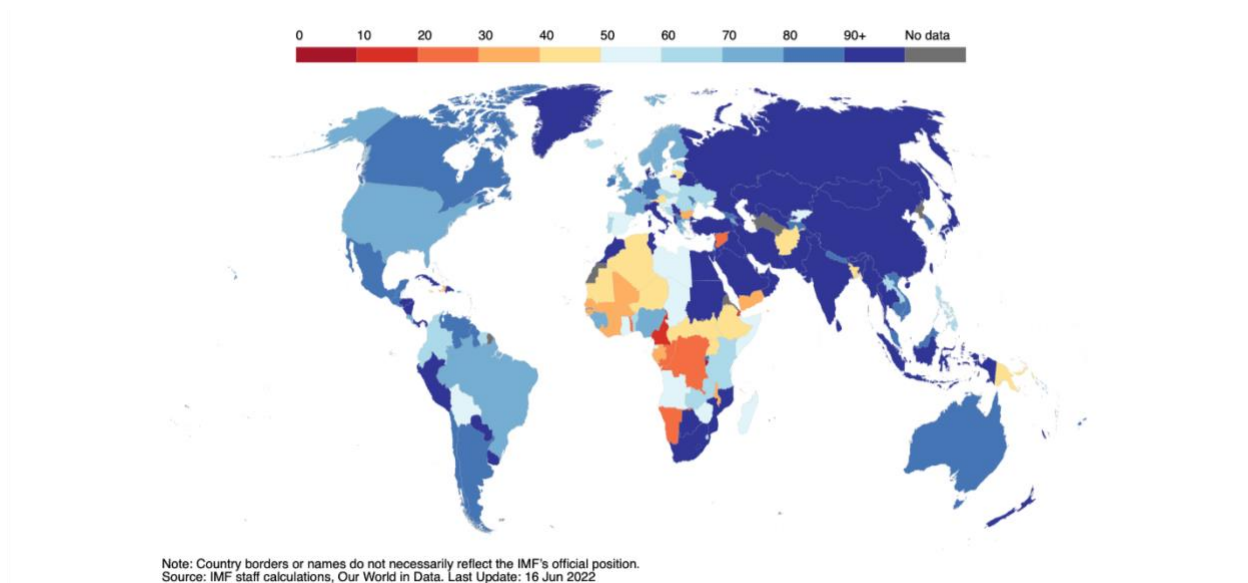
In the last section, the tracker monitors the risks in COVAX allocation & supply and country absorption capacity, and tracks vaccination rates within countries by region and gender. As of 2022, the global supply of vaccines is not currently a binding constraint and in-country deployment challenges in converting vaccine supply at ports into shots in arms has become the key barrier for countries in reaching the global vaccination targets.

COVID-19 Country Readiness and Risks

In this section of the tracker, we present assessments of country vaccine supply absorption capacity based on various metrics.

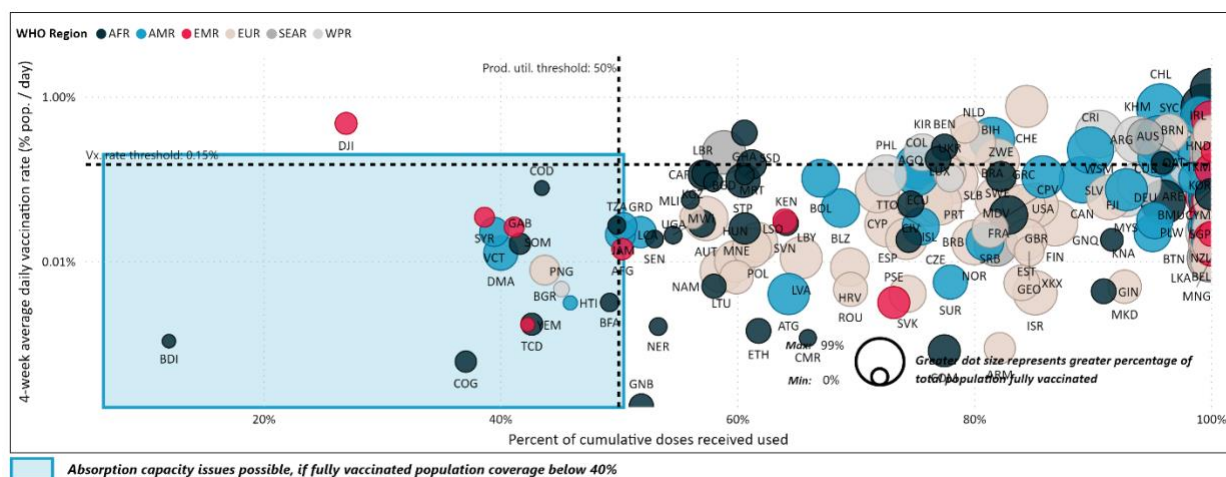
First, Figure 9 presents the share of delivered doses which have been administered by country. Low vaccine utilization is largely concentrated among lower income countries, particularly in Africa.

Figure 9: Administered Doses as a Percent of Delivered Doses by Country



Second, our tracker presents a comparison of product utilization against 4-week daily vaccination rate across AMC participants (Figure 10). The WHO's COVID-19 Vaccine Delivery Partnership assesses countries with below 50% product utilization (share of delivered doses administered) and below 0.15% of the population vaccinated per day to have absorption capacity issues if less than 40% of the country's population is fully vaccinated.

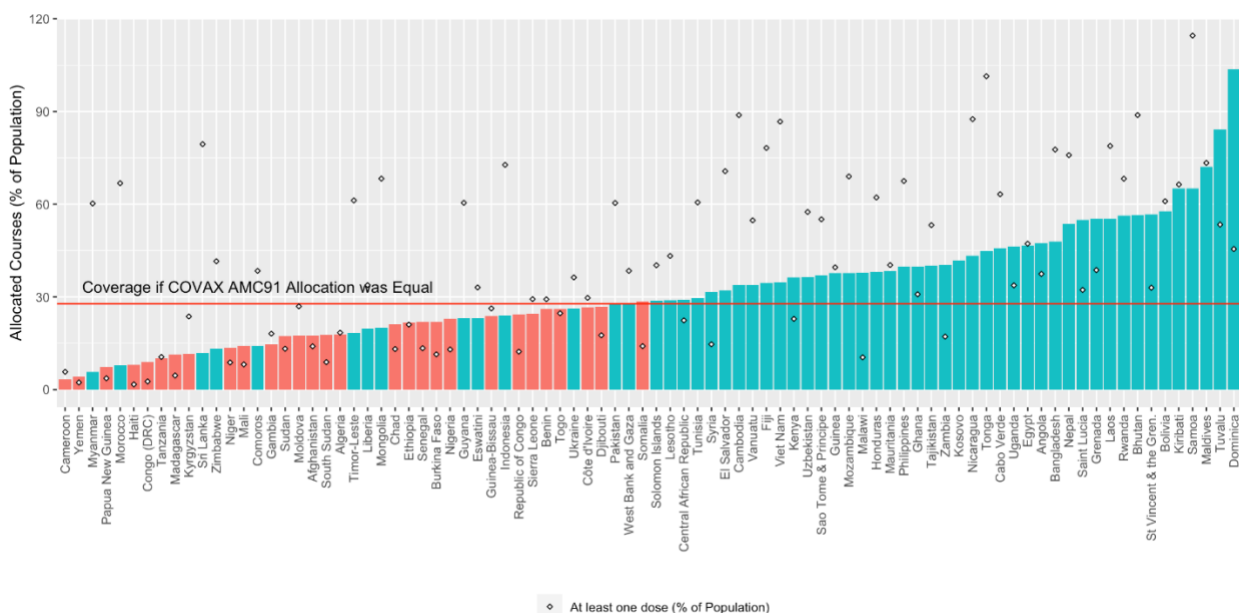
Figure 10: Product utilization versus daily vaccination rate



Sources: COVID-19 Vaccine Delivery Partnership data | Notes: Two AMC participants are not vaccinating: 1). Eritrea, 2). DPR Korea; two are not reflected in the UNICEF Market Dashboard: 1) Marshall Islands, 2) Micronesia.

Last, we present data on the cross-country distribution of COVAX AMC allocation to identify countries who have rejected allocated doses or asked for their allocated doses to be delayed, due to low demand for supply or absorption capacity challenges. Figure 11 presents courses allocated by COVAX to AMC countries as a fraction of population. The figure includes an indicative measure of countries with possible absorption capacity issues in red, which is defined as those with % of population vaccinated with at least one dose less than 30% and COVAX allocation as % of population less than median.

Figure 11: Cross-Country Distribution of COVAX AMC Allocation



Notes: 1. Cost sharing and SFP allocations excluded; 2. The list includes 87 of the 92 AMC countries. Two countries are not vaccinating, and two AMC are covered through other mechanisms (Micronesia and Marshall Islands). And owing to its size, India has a reduced access as per the December 2020 Board decision; 3. The AMC equal allocation calculation represents the coverage the AMC countries would receive if they total AMC doses were allocated equally across the countries (that is total courses allocated less cost sharing and SFP allocations divided by population of the AMC countries represented here); 4. A course equals one dose of J&J or two doses of all other vaccines for comparability. Source: UNICEF, COVAX, OWID, IMF Staff calculations.

In Appendix Figure 1, we also present the cross-country distribution of COVAX AMC delivery.

Sub-national Vaccination

The last section of the tracker presents data on vaccination rates within countries by region and gender, covering 16 countries: Australia, Bangladesh, Brazil, Cameroon, India, Indonesia, Japan, Malaysia, Mongolia, New Zealand, Papua New Guinea, South Africa, South Korea, Turkey, United Kingdom, and United States. The data is collected and updated based on various administrative data sources for each country, as documented in Appendix Section A.II. The data can be found at this [link](#).

For example, in Figure 12, we present the share of people with at least one dose and fully vaccinated by sub-district in India.

Figure 12: Sub-district vaccination rates in India

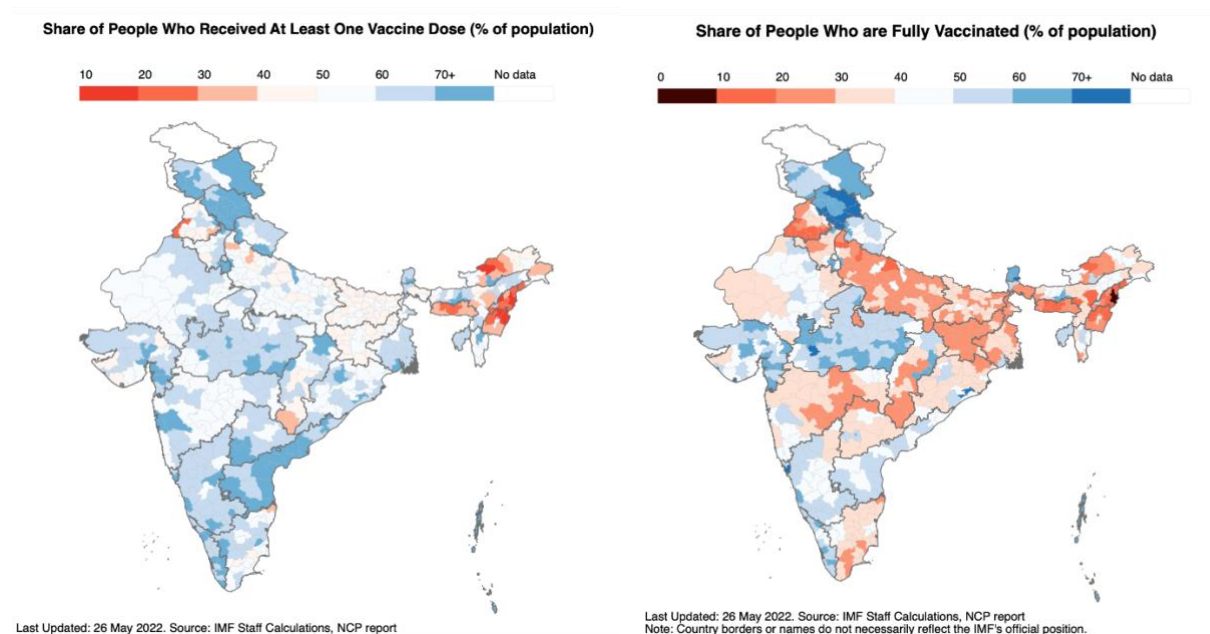
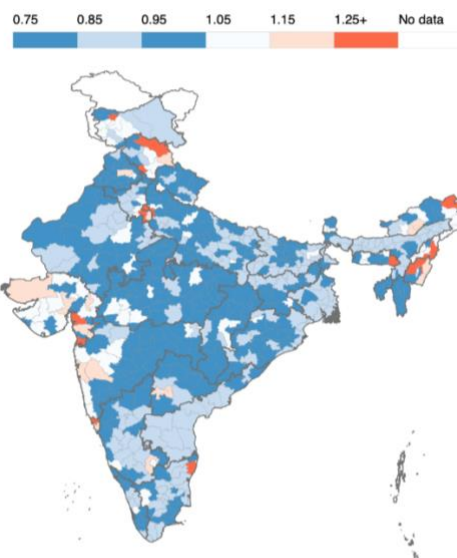
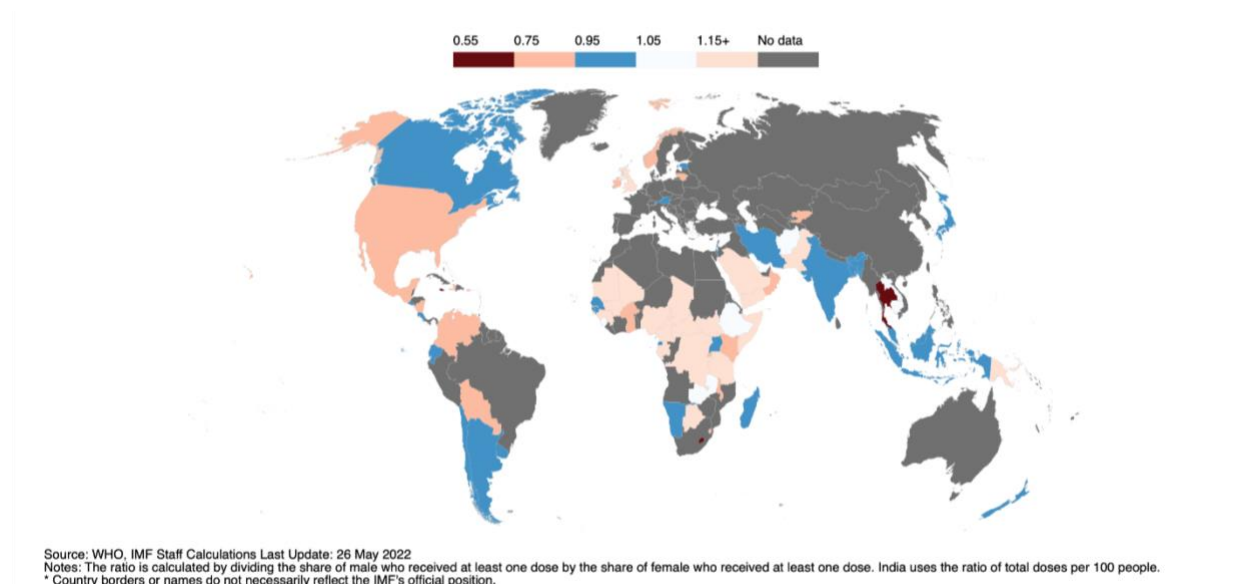


Figure 13 presents the gender equity in vaccination by sub district in India. Specifically, we plot the ratio of number of vaccine doses administered to males as share of the male population and number of vaccine doses administered to females as share of the female population

Figure 13: Ratio of Male to Female Total Doses Administered as a % Population

Source: Directorate General of Health Services (DGHS), IMF Staff Calculation. Last Update: 26 May 2022
 Note: The ratio is calculated by dividing the share of male in total doses administered by the share of female.
 *Ratio = 1 means that the shares of males and female who received at least one vaccine dose are the same.

Finally, the tracker also presents a map of the gender equity in vaccination by country (Figure 14).

Figure 14: Ratio of Male to Female Rates of Receiving At Least One Vaccine Dose

Source: WHO, IMF Staff Calculations Last Update: 26 May 2022
 Notes: The ratio is calculated by dividing the share of male who received at least one dose by the share of female who received at least one dose. India uses the ratio of total doses per 100 people.
 * Country borders or names do not necessarily reflect the IMF's official position.

V. Conclusion

Vaccines are a critical line of first line of defense in reducing serious illness and deaths (when boosted) from COVID-19 and in mitigating the economic effects of the pandemic.

The WHO-IMF Vaccine Tracker comprehensively tracks progress towards the global vaccination targets, monitoring progress at each stage of a vaccine's journey from procurement to delivery to in-country administration. This data has supported policymakers in identifying where and in which countries gaps towards the global targets exist, and how the gaps can be addressed. The tracker enhances transparency on progress towards the global targets by sharing data and analysis in the public domain.

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A.I. Appendix Tables and Figures

Appendix Table 1: Dose donations delivered by product (in millions)

Panel A: Direct Donations

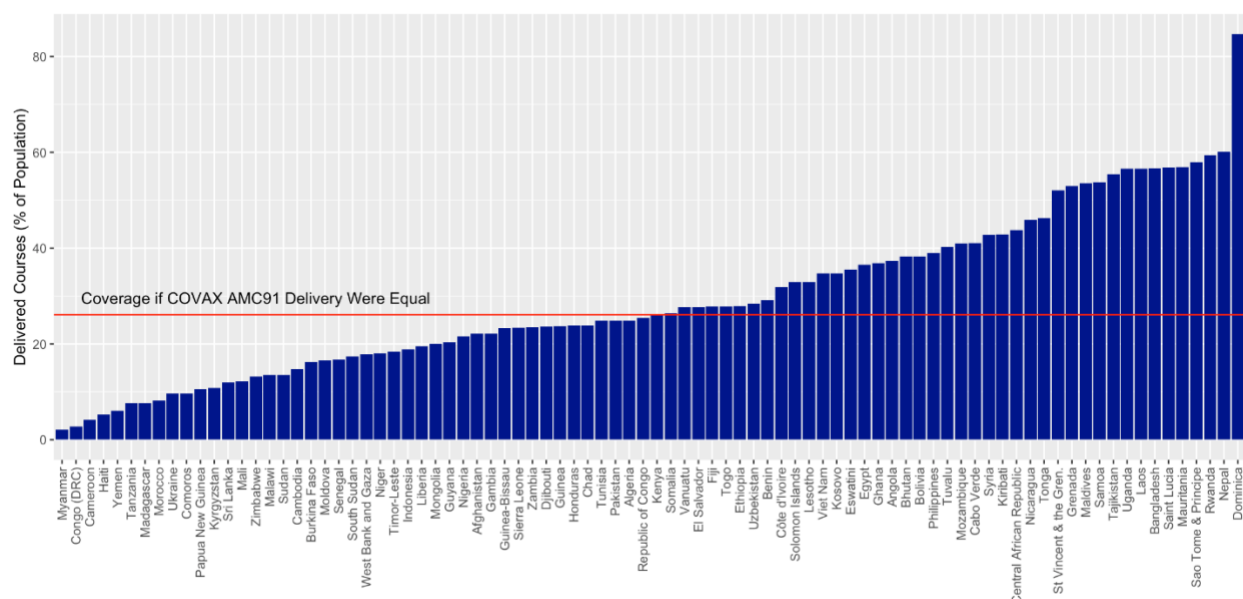
Donor	J&J	Moderna	Pfizer	AstraZeneca	Sinopharm	Sinovac	Novavax	Bharat	Sputnik V	Unknown/Other
Australia	-	7	16	11	-	-	-	-	-	-
Canada	-	-	-	1	-	-	-	-	-	-
Japan	-	-	-	21	-	-	-	-	-	-
United Kingdom	-	-	0	6	-	-	-	-	-	-
United States	9	26	36	8	-	-	-	-	-	-
European Union	4	5	4	43	1	-	-	-	-	-
France	1	0	4	1	-	-	-	-	-	-
Germany	-	-	2	9	-	-	-	-	-	-
Italy	3	-	-	3	-	-	-	-	-	-
Spain	-	1	-	3	-	-	-	-	-	-
Portugal	-	-	-	3	-	-	-	-	-	-
Belgium	-	-	-	0	-	-	-	-	-	-
Finland	-	-	-	-	-	-	-	-	-	-
Sweden	-	1	-	-	-	-	-	-	-	-
Denmark	-	0	-	3	-	-	-	-	-	-
Netherlands	1	2	0	3	-	-	-	-	-	-
Ireland	-	-	-	0	-	-	-	-	-	-
Others	-	0	1	18	1	-	-	-	-	-
Hong Kong SAR	-	-	-	-	-	-	-	-	-	-
New Zealand	-	-	0	0	-	-	-	-	-	-
Norway	-	1	-	0	-	-	-	-	-	-
South Korea	-	-	-	2	-	-	-	-	-	-
Switzerland	-	-	-	-	-	-	-	-	-	-
Turkey	-	-	-	-	-	4	-	-	-	-
UAE	-	-	0	-	2	-	-	-	-	0
India	-	-	-	11	-	-	-	3	-	-
China	-	-	-	-	74	46	-	-	-	-
Others	0	0	0	12	1	2	-	-	1	2
Total	14	40	60	116	77	52	-	3	2	2

Panel B: COVAX Donations

Donor	J&J	Moderna	Pfizer	AstraZeneca	Sinopharm	Sinovac	Novavax	Bharat	Sputnik V	Unknown/Other
Australia	-	-	-	-	-	-	-	-	-	-
Canada	-	6	-	8	-	-	-	-	-	-
Japan	-	-	-	19	-	-	-	-	-	-
United Kingdom	4	-	-	26	-	-	-	-	-	-
United States	47	54	154	-	-	-	-	-	-	-
European Union	116	54	32	97	-	-	-	-	-	-
France	19	8	7	28	-	-	-	-	-	-
Germany	28	32	8	26	-	-	-	-	-	-
Italy	21	2	7	12	-	-	-	-	-	-
Spain	17	6	9	12	-	-	-	-	-	-
Portugal	2	1	0	0	-	-	-	-	-	-
Belgium	4	1	-	4	-	-	-	-	-	-
Finland	2	-	-	1	-	-	-	-	-	-
Sweden	2	-	-	5	-	-	-	-	-	-
Denmark	4	1	-	2	-	-	-	-	-	-
Netherlands	9	3	-	3	-	-	-	-	-	-
Ireland	1	-	-	1	-	-	-	-	-	-
Others	6	1	0	4	-	-	-	-	-	-
Hong Kong SAR	-	-	-	1	-	-	-	-	-	-
New Zealand	1	-	-	1	-	-	-	-	-	-
Norway	3	1	0	2	-	-	-	-	-	-
South Korea	-	-	-	-	-	-	-	-	-	-
Switzerland	-	-	-	2	-	-	-	-	-	-
Turkey	-	-	-	-	-	-	-	-	-	-
UAE	-	-	-	-	-	-	-	-	-	-
India	-	-	-	-	-	-	-	-	-	-
China	-	-	-	-	-	-	-	-	-	-
Others	0	-	-	0	-	-	-	-	-	-
Total	172	116	186	157	-	-	-	-	-	-

Source: IMF-WHO COVID-19 Vaccine Tracker

Appendix Table 1: Cross-Country Distribution of COVAX AMC Delivery



Notes: The list includes 88 AMC91 countries who have been allocated doses from COVAX. Two countries are not vaccinating, and the Marshall Islands is covered through other mechanisms. Owing to its size, India has a reduced access as per the December 2020 Board decision. A course equals one dose of J&J or two doses of all other vaccines for comparability. The AMC equal delivery calculation represents the coverage the AMC countries would have received if the total AMC doses were delivered equally across the countries (that is total courses delivered divided by population of the AMC countries represented here). Source: IMF staff calculations based on UNICEF and COVAX.

A.II. Subnational COVID-19 Vaccination Rates: Data Sources

1. Australia
 - a. Source: Australian Immunization Register
 - b. Rates by State
 - c. The source provides information for the shares of people who received at least one dose and who are fully vaccinated by state.
2. Bangladesh
 - a. Source: Directorate General of Health Services (DGHS)
 - b. Rates by Gender, District, Gender x District
 - c. The source provides information for the number of first and second doses administered by gender and district. It also provides district-level population data. The shares of vaccinated people are calculated based on the population data.
3. Brazil
 - a. Source: Ministério da Saúde do Brasil
 - b. Source of population data: Instituto Brasileiro de Geografia e Estatística (IBGE)
 - c. Rates by State
 - d. The source provides information for the number of first and second doses administered by state. The shares of vaccinated people are calculated based on the population data from IBGE. The population data is the 2020 estimates of the 2011 Census.
4. Cameroon
 - a. Source: openAFRICA
 - b. Source of population data: Presidency of the Republic of Cameroon (PRC)
 - c. Rates by Region
 - d. The source provides information for the number of first and second doses administered by region. The shares of vaccinated people are calculated based on the population data from PRC.
5. Indonesia
 - a. Source: Kementerian Kesehatan
 - b. Rates by Province
 - c. The source provides information for the shares of people who received first and/or second doses by province.
6. India
 - a. Source: CoWIN
 - b. Source of population data: Wang et al. (2021), "Population Estimates for Districts and Parliamentary Constituencies in India, 2020."
 - c. Rates by Gender, District, Gender x District
 - d. The source provides information for the number of first and second doses administered by district, and the gender composition of the administration. It also

provides information for the number of total doses administered by gender x district. The shares of vaccinated people are calculated based on the population data.

7. Japan

- a. Source: Chief Information Officers (CIO)
- b. Rates by Gender, Prefecture, Gender x Prefecture
- c. The source provides information for the shares of people who received first and/or second doses by gender and prefecture.

8. Malaysia

- a. Source: Ministry of Health (MOH)
- b. Rates by State
- c. The source provides information for the shares of people who received first and/or second doses by state.

9. Mongolia

- a. Source: National Center for Communicable Diseases (NCCD)
- b. Rates by State
- c. The source provides information for the shares of people who received first and/or second doses by state.

10. New Zealand

- a. Source: Ministry of Health (MOH)
- b. Rates by State
- c. The source provides information for the shares of people who received first and/or second doses by state.

11. Papua New Guinea

- a. Source: National Department of Health of Papua New Guinea (NDOH)
- b. Rates by Province
- c. The source provides information for the shares of people who received first and/or second doses by province.

12. South Africa

- a. Source: National Department of Health (NDH)
- b. Source of population data: CEIC Global Database
- c. Rates by Gender, Province, Gender x Province
- d. The source provides information for the shares of people who received at least one vaccine dose by province and the gender composition of people who received at least one vaccine dose. It also provides the number of total doses administered by district and vaccine brand name. The number of fully vaccinated people is calculated by adding the numbers of second doses of Pfizer vaccine and Johnson & Johnson's Janssen administered. The share of fully vaccinated people is calculated based on the population data from CEIC Global Database. The population data is the 2017 estimates, adjusted for overall population growth rate of 5.3% between 2017 and 2021.

13. South Korea

- a. Source: Ministry of Health and Welfare of South Korea

- b. Rates by Province
 - c. The source provides information for the shares of people who received first and/or second doses by province.
- 14. Turkey
 - a. Source: Republic of Turkey Ministry of Health
 - b. Population source: Turkish Statistical Institute
 - c. The source provides information for the shares of adults (18+) who are fully vaccinated. Using the population data from Turkish Statistical Institute, the share of total population who are fully vaccinated are calculated by the staff.
- 15. United Kingdom
 - a. Source: National Health Service (NHS)
 - b. Source of population data: Office for National Statistics (ONS)
 - c. Rates by Gender, Region, Gender x Region
 - d. The source provides information for the number of first and second doses administered by gender and state. The shares of vaccinated people are calculated based on the 2020 estimates from ONS.
- 16. United States
 - a. Source: Centers for Disease Control and Prevention (CDC)
 - b. Rates by Gender, State
 - c. The source provides the number of first and second doses administered and the gender composition. It also provides the share of vaccinated people by state.

Table. Summary for Availability of Subnational information for COVID-19 Vaccination

	Gender*	Jurisdiction**	Gender x Jurisdiction***
Australia	X	O	X
Bangladesh	O	O	O
Brazil	X	O	X
Cameroon	X	O	X
India	O	O	O
Indonesia	X	O	X
Japan	O	O	O
Malaysia	X	O	X
Mongolia	X	O	X
New Zealand	X	O	X
Papua New Guinea	X	O	X
South Africa	O	O	O
South Korea	X	O	X
Turkey	X	O	X
United Kingdom	O	O	O
United States	O	O	X

* Gender composition of first and second doses administered. Information about both first and second doses is provided for Bangladesh, Japan, the UK, and the US. South Africa has data only for the first dose and India provides the gender composition of total doses administered.

** The regional information is district-level in Bangladesh and India, state-level in Australia, Brazil, Mongolia, Nigeria and the US, province-level in Indonesia, Papua New Guinea, South Africa, and Turkey, region-level in Cameroon and the UK, and prefecture-level in Japan.

*** Bangladesh, Japan, South Africa, and the UK provide gender x jurisdiction information about people who received at least one vaccine dose. India provides the number of total doses administered per 100 people.



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