Policy brief

Monitoring G20 contributions to global Covid-19 health equity: issues and options

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Key messages

A focus on the systematic monitoring of G20 country policy responses to Covid-19 facilitates better understanding of the extent to they have supported health equity globally and where they fall short, and highlights actions G20 countries can take to place equity at the front and centre of recovery efforts.

The brief proposes indicators covering three significant policy areas: 1) financing, 2) excess vaccine procurement and the redistribution of any surplus, and 3) the promotion of intellectual property sharing and medical exports.

Any efforts to construct a composite index must consider carefully how to treat the indicators, weight indicators and dimensions, and aggregate the data; the brief outlines options and their implications.

Efforts to monitor G20's Covid-19 response are beset by limitations, not least the absence of indicators on actions no member country has taken, such as compelling pharmaceutical companies to share vaccines, knowledge and patents with poorer countries.

The available data reveals huge variation in G20 country performance, irrespective of their incomes, and between what countries have done and what they could have done to advance equity.

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About this publication

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1 Introduction

Vaccine inequity is a formidable challenge to confronting Covid-19. Richer countries have been repeatedly singled out for policies and actions that advance their own (narrowly conceived) domestic interests at the expense of people living in poorer countries and the global public good.[1] As of March 2022, close to 80% of the population in high- and upper-middle- income countries had received at least one vaccination against Covid-19, compared with fewer than 15% in low-income countries. Indeed, fewer than 40% of people had received even one dose in 62 of 199 countries or territories.[2] Based on the current trend, the World Health Organization (WHO) target of vaccinating 70% of people in all countries by September 2022 (WHO, 2021) is unlikely to be reached, despite the public endorsement of G20 leaders (AFP, 2021). There are concerns that the roll-out of Covid-19 tests and therapeutics is following a similarly inequitable trajectory.

This brief aims to contribute to understanding better the extent to which G20 countries have supported equity in the global health response to Covid-19 through the systematic monitoring of their policies and commitments. In particular, the exercise identifies relevant dimensions, proposes indicators based on the available data, and outlines issues involved in using this data to construct a composite index of G20 performance. Section 2 describes the dimensions and indicators selected, and Section 3 discusses options for constructing an index. Section 4 focuses on limitations of such an index. An online Annex contains further details, discussing gaps in the data, data sources and the method used to construct each indicator. The accompanying data file provides data for each indicator and illustrates different ways in which the data could be used to construct a composite index.

1 E.g., Watkins (2021) identifies 'the abject failure of G7 and G20 political leaders to equitably share' vaccinations as 'the defining hallmark of the pandemic'. Director-General Tedros Adhanom Ghebreyesus (among others) has condemned 'vaccine apartheid' (Reuters, 2021), while Ayoade Alakija argues that vaccine inequity reinforces global inequalities – with Africa being 'always last in line, the afterthought' (cited in Newey et al., 2021).

2 Computed from 'COVID-19 Data Explorer Our World in Data', Mathieu et al., 2021 (accessed 25 March 2022).

2 Selection of dimensions and indicators

We identified three dimensions: (1) financing for vaccines, testing and therapeutics; (2) control of vaccine supply and distribution; and (3) intellectual property and export restrictions affecting vaccine production and distribution. The selection derives from a review of academic and grey literature, media accounts, G20 policy statements, the recommendations of other international forums, and the available cross-national data. Criteria included conceptual coherence, the availability of data in the public domain, and the empirical soundness of the indicators individually and jointly. This process led to the construction of nine indicators (Table 1; Box 1; see also Excel file).

Table 1 Dimensions and indicators used in the G20 Covid-19 Global Health Equity Index

Dimension	Indicator
Financing vaccines, testing and therapeutics	Contributions to ACT-A 2020–21 and 2021–22 funding rounds as percentage of fair share
	Share of G20 development assistance in 2020 for the health response to Covid-19 relative to share in G20 GNI
Procurement and sharing of vaccine doses	Share of the global vaccine supply procured by each G20 country relative to its share in the global population (%)
	Share of surplus vaccines each country has donated to COVAX/AVAT or bilaterally (%)
	Share of dose donations made through COVAX or AVAT (%)
	Share of vaccine donations that have been delivered (%)
Sharing intellectual property and removing export restrictions on medical products	Whether or not a country supports the TRIPS waiver at the WTO
	Whether or not a country supports C-TAP
	Number and duration of export restrictions on medical products

Box 1 Data sources and methodology

The data sources and method used to construct the indicators reported in Table 1 and below are described in an online Technical Annex to this paper. However, a few points warrant mention here. First, the indicators are constructed to account for the disparate economic strength and populations of the G20 countries. Financing is expressed as a percentage of each country's 'fair share' or its share in the G20's GNI; the numbers of vaccines a country procures are expressed as a percentage of its population; and we consider the share of (surplus) vaccines donated rather than absolute numbers. Second, where a given variable is not relevant to a particular country, we did not include it in computing the dimension score for that country; for example, we did not expect countries that did not procure surplus vaccines to make any donations (though South Africa did in fact do so). Finally, we provide data for the European Union (EU) where the European Commission takes a political position or where the EU acts as a collective – but we do not include these data points in the dimension or index computations both because of missing data and because some actions, such as vaccine donations, have been largely delegated to member states.

Dimension 1: Financing vaccines, testing and therapeutics

As of October 2021, when its first funding round closed, the WHO-led Access to Covid-19 Tools – Accelerator (ACT-A) had raised $18.9 billion, distributed among its four pillars – vaccines, diagnostics, treatment and health system strengthening. Despite these efforts (and an IMF call for an additional $13 billion for the Covid-19 health response) there remained a $23 billion funding gap.[3] Our focus is on financial pledges to ACT-A, given its central role in the Covid-19 response.[4] It has been particularly important for low- and lower-middle-income countries, which have obtained 80% and 30% of their respective doses from the Covid-19 Vaccines Global Access initiative (COVAX) (ACT-A, 2021: 4; Figure 1.2). We complement this with a measure of development assistance directed to the Covid-19 health response.

3 Kanter (2021); see also COVID-19 Task Force Dashboard (covid19taskforce.com). The IMF proposal aimed at '(1) vaccinating ... at least 60% of the population in all countries by mid-2022; (2) tracking and insuring against downside risks; and (3) ensuring widespread testing and tracing, maintaining adequate stocks of therapeutics, and enforcing public health measures in places where vaccine coverage is low' (Agarwal and Gopinath, 2021).

4 Per Gulrajani and Silcock (2020: 11): 'as many have already noted, tackling coronavirus is a global problem that can only be resolved through collective solutions underpinned by "unity, solidarity and renewed multilateral cooperation".'

Indicator 1.1: Contributions to ACT-A 2020–21 and 2021-22 funding rounds as percentage of fair share

Rationale: Donor contributions as a percentage of their fair share against ACT-A funding needs provide a gauge of immediate financial commitments to the Covid-19 health response.[5]

Limitations: In focusing on ACT-A, we are considering one strand only of the multilateral health response to Covid-19. India and Indonesia are not assigned a 'fair share' so the countries lack data for this indicator.

Indicator 1.2: Share of G20 development assistance for the health response to Covid-19 relative to share in G20 GNI

Rationale: This measure captures health assistance for Covid-19 disbursed in 2020, based on project-level data on commitments and disbursements from major international development agencies.[6]

Limitation: This is a modelled indicator that includes only international (rather than bilateral) flows.

Dimension 2: Procurement and sharing of vaccine doses

Analysis of vaccine purchases indicates significant excess and unused doses in many G20 countries. Estimates suggest a surplus of 1.2 billion doses in G7 countries in 2021, including over 1 billion in the United States (US) alone.[7] This dimension is concerned with inequalities in vaccine supply and with the extent to which countries have shared surplus doses.

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5 The initial round sought to deliver to lower- and middle-income countries 2 billion vaccine doses (enough to vaccinate up to 20% of the population of each country), 500 million tests, up to 245 million treatment courses and protection for health workers (ACT-A, 2021a: Appendix 2; UN, 2020). These targets have been revised upward in the current round.

6 The Global Burden of Disease (GBD) 2020 Health Financing Collaborator Network (2021: 1318): 'few research efforts have provided estimates of health spending associated with the COVID-19 pandemic, and these vary in their scope and completeness'. These authors note the problems associated with the available data sources – the Economist Intelligence Unit's Covid-19 health funding tracker, the Kaiser Family Foundation Donor Funding for the Global Novel Coronavirus Response tracker, the Centre for Disaster Protection's database, Devex's interactive website, the Covid-19 Research Project tracker – and conclude: 'Although these existing studies track various aspects of the funding targeted toward the pandemic response, none reports comprehensive tracking for the health sector'. We explored too the inclusion of ODA for health, but this is reported consistently for only DAC members and countries who choose to report to DAC, and therefore excludes Argentina, Brazil, Mexico, India, Indonesia and South Africa. CGD has constructed an indicator of Finance for Development – an ODA-like measure of cross-border concessional finance for all G20 countries – but the latest year available is 2018, pre-dating Covid, and it does not disaggregate spending for health.

7 According to Airfinity (2021), for example, if the G7 members each reserved two vaccine doses and a booster for all adults, they would retain over 1.2 billion unused doses in 2021. See Behar (2022) on the US.

Indicator 2.1: Share of the global vaccine supply procured by each G20 country relative to its share in the global population (%)

Rationale: Richer countries benefited from advance purchase agreements (APAs) with pharmaceutical companies, with pre-orders often well in excess of need. This approach sought to mitigate the risks of vaccine candidates being unsuccessful and uncertain production timelines. However, it severely impeded the ability of poorer countries to procure vaccines directly and that of COVAX to obtain vaccines for Advance Market Commitment for vaccines (AMC) countries and allocate them according to WHO principles (Wouters et al., 2021). In fact, even middle-income countries with adequate financing (e.g. Mexico, Peru) were unable to place orders, while low-income countries made their first significant purchases in January 2021, eight months after the US and United Kingdom made their first deals.[8] We include this indicator on the basis that the ability to make excess vaccine purchases in a context of scarcity reflects global power imbalances and the ability of a small minority of countries to stockpile vaccines for their own use.

Limitations: We cannot capture the very different regimes underlying these APAs, nor the different unit values to which countries committed. For example, the US government is said to have provided a blueprint for vaccine development, to have insulated vaccine companies from risk and not to have negotiated on price. The EU is said to have insisted on negotiation with and regulation of pharmaceutical companies – reflected in a much lower price per dose but a later delivery schedule (Gebrekidan and Apuzzo, 2021).

Indicator 2.2: Share of surplus vaccines each country has donated to COVAX/AVAT or bilaterally (%)

Rationale: Countries can reallocate surplus vaccines through supply agreements or through donations (in each case, bilateral or through COVAX/AVAT). We measure the extent to which countries with a vaccine surplus (doses secured from bilateral or multilateral supply agreements, or donations) have pledged to donate this surplus.

Limitations: We do not discount donations with a short shelf life as this information is not publicly available. We do not know if donations will be delivered. We do not account for other forms of solidarity such as vaccine swaps or sales on preferential terms. UNICEF cautions that the context is highly dynamic and subject to change, and the frequency of reporting is not uniform.

Indicator 2.3: Share of dose donations made through COVAX or AVAT (%)

Rationale: We highlight contributions to COVAX and AVAT, given that their pooled procurement model and disbursement strategy promote vaccine equity. Bilateral vaccine donations may reflect strategic imperatives – so-called vaccine diplomacy – rather than need (Kiernan et al. 2021).

8 UNICEF data cited in Collins and Holder (2021).

Limitations: We do not discount donations with a short shelf life as this information is not publicly available. UNICEF cautions that the context is highly dynamic and subject to change, and the frequency of reporting is not uniform.

Indicator 2.4: Share of vaccine donations that have been delivered (%)

Rationale: The share of pledged doses that have been delivered to the recipient country provides an indication of the extent to which countries have followed through on their donations.

Limitations: We do not discount donations with a short shelf life as this information is not publicly available. UNICEF cautions that the context is highly dynamic and subject to change, and the frequency of reporting is not uniform.

Dimension 3: Sharing intellectual property and removing export restrictions on medical products

A handful of countries and companies control access to the global production of vaccines, tests and therapeutics. The sharing of intellectual property (IP) is neither the sole nor necessarily the most critical impediment to geographically dispersed production; indeed, many argue that, on its own, its practical value would be limited. Nonetheless, the willingness of countries to support IP sharing has become a potent symbol and rallying call for many advocates of vaccine equity. Relatedly, export restrictions also inhibit the free supply of vaccines alongside other medical products, with harmful effects on poorer countries.

Indicator 3.1: Whether or not a country supports the TRIPS waiver at the WTO

Rationale: The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) refers to an international agreement led by the World Trade Organization (WTO) aiming to protect intellectual property rights and trade. In October 2020, the governments of India and South Africa, with the support of 62 WTO member states, proposed a TRIPS Agreement waiver that would temporarily waive IP rights protections for technologies needed to prevent, contain, or treat Covid-19 (WTO, 2020). Advocates contend that public monies that contributed to the development of Covid-19 patents merit such a step, while critics contend that the waiver could lead to the inefficient allocation of raw materials and supplies (Peacocke et al., 2021).

Limitations: We cannot capture the nuance associated with countries' positions – for example, the US' limited support for the waiver. Furthermore, countries have vastly different incentives to support the TRIPS waiver depending on whether they have any significant pharmaceutical industry benefiting from IP protection.

Indicator 3.2: Whether or not a country has endorsed C-TAP

Rationale: The Covid-19 Technology Access Pool (C-TAP) calls for the 'voluntary sharing of knowledge, intellectual property and data, as well as a guarantee of free access and use by WHO member countries for drugs and vaccines that are developed' (Peacocke et al., 2021). Proposed by Costa Rica and adopted by WHO, as of January 2022 the initiative has been endorsed by 43 countries: 31 middle-income, 11 high-income and 1 lower-income.

Limitations: Countries have vastly different incentives to support C-TAP depending on whether they have any significant pharmaceutical industry benefiting from IP protection.

Indicator 3.3: Number and duration of export restrictions on medical products

Rationale: To protect their domestic populations, many countries adopted one or more measures to regulate or restrict the export of medical products used in the public health response to the pandemic, including vaccines. Though perhaps an understandable reaction to supply shortages, such policies harm smaller and poorer countries who 'have little or no prospect of achieving self-sufficiency' (Gulrajani and Silcock, 2020: 29).

Limitations: Policies may apply to some but not all products in a category, they may not be applied uniformly within a jurisdiction, and they may not apply equally to all trading partners (The Global Trade Alert Team, 2020).

3 Index construction: issues and options

We undertook a rigorous assessment of the indicators, individually and jointly, with a view to examine the possibilities for constructing a composite index. This included scrutiny of outliers, various normalisation and standardisation methods, correlation analysis, and experiments with different weighting structures and aggregation approaches.

Indicator treatment

We opted to preserve outliers in the data given that they appear to indicate very different policy commitments to vaccine equity rather than measurement error. We decided against standardising the data (e.g. through log transformation and/or the use of z-scores) on the basis that we did not think it reasonable to assume decreasing marginal returns to equity where contributions were higher, nor to minimise variations in the indicators. Instead, we opted for a simple min-max normalisation to re-scale the indicators on a 0–1 scale. This decision is not without consequence as it will assign more weight to differences in indicators that have a narrower range of values. We constructed an index that scored positions on TRIPS and C-TAP jointly between 1 and 5 to maximise variation in support of IP sharing. The indicators show the expected correlations – for example, the financing variables are positively correlated, as are the vaccine donation variables; while those countries that have given more financing to the Covid-19 health response are less likely to support intellectual property sharing (Table 2). However, none of the correlations are very high, which would suggest that the indicators included are redundant.

Table 2 Correlation between indicators proposed for a Covid-19 health response index

	ACTA	IHME	VacSharePop	Donations	Covax	Delivered	Sum_IP	Export Res
ACTA	1	–	–	–	–	–	–	–
IHME	0.4933	1	–	–	–	–	–	–
VacSharePop	–0.4811	–0.4931	1	–	–	–	–	–
Donations	0.2934	0.0237	–0.1472	1	–	–	–	–
Covax	0.4161	0.3792	–0.5494	0.4758	1	–	–	–
Delivered	0.0853	–0.1407	0.0958	–0.0675	–0.1129	1	–	–
Sum_IP	–0.7198	–0.5796	0.4351	–0.1768	–0.4092	–0.0648	1	–
Export Res	0.1414	0.098	–0.0668	0.1598	–0.0874	0.456	–0.3265	1

Note: ACT-A is Contributions to ACT-A 2020–21 and 2021–22 funding rounds as percentage of fair share; IHME is Development assistance in 2020 for health response to Covid-19 relative to GNI; VacSharePop is the total share of the potential global vaccine supply procured by each G20 member relative to its share in the global population. Donations is the share of surplus vaccines each country has donated to COVAX/AVAT or bilaterally. COVAX is the share of dose donations made through COVAX or AVAT; Delivered is the share of vaccine donations that have been delivered. Sum_IP combines whether or not a country supports the TRIPS waiver at the WTO and whether or not a country has endorsed C-TAP. Export Res denotes the number and duration of export restrictions on medical products.

Weighting of dimensions and indicators

Rather than being prescriptive about weighting the indicators and dimensions, we explore the implications of different normative and empirical approaches to the selection of weights. Within the dimensions, we first proposed assigning equal weights to each indicator (and taking the arithmetic average of indicator scores within each dimension). This aligns with the advice of Atkinson et al. (2002): 'The interpretation of the set of indicators is greatly eased where the individual components have degrees of importance that, while not necessarily exactly equal, are not grossly different'. However, we produce two versions of the vaccine dimension (Table 3). The first assigns equal weights assigned to all four indicators, while the second assigns 50% weight to the indicator of vaccine procurement, and the remaining 50% to the three indicators of redistribution. The two vaccine dimension scores exhibit a high correlation (about 80%), as expected, but the financing, vaccine and IP/Trade scores are not highly correlated, again suggesting each is contributing unique information (Table 4).

In the online Annex, we illustrate these different possible approaches to indicators and index construction. Factor analysis shows that the variables load on one factor (eigenvalue>2.5) and therefore coherently contribute to an underlying construct. The factor loadings also lend some empirical support to the equal weighting of the dimensions.

Aggregation

The most common approach to index construction is to take the arithmetic average of the average scores for each dimension, which allows for substitutability between them. The use of geometric average, in contrast, minimises the potential for substitutability. In the online Annex, we illustrate the indices that would result from use of both the geometric and arithmetic averages.

Robustness

It is worth noting that the rankings derived in the four scenarios, based on different weighting and aggregation approaches, are relatively highly correlated (Table 5): All correlations are above 50%. The rankings vary most when comparing scores derived from the arithmetic and geometric averages, which highlights both that country level performance has been unequal across the dimensions and that the choice of aggregation method matters.

It goes beyond the scope of this exercise to compute confidence intervals for the index scores. This means that the resulting ranking (and differences between countries) may not be robust. It may be desirable to assume a certain error – e.g. 10% – in each score and compute how it affects the ranking. A common sensitivity test is to test the robustness of the ranking to the inclusion of the indicators within by computing the index minus each indicator in turn; if the index is robust, the ranking should remain reasonably consistent.

Table 3 Commitment to international Covid-19 health response: dimension scores

G20 Country	Finance	Vaccine 1*	Vaccine 2*	IP/Trade
Argentina	0.00	0.47	0.58	0.72
Australia	0.26	0.18	0.12	0.56
Brazil	0.01	0.20	0.41	0.60
Canada	0.73	0.46	0.37	0.33
China	0.03	0.43	0.57	0.55
France	0.32	0.63	0.56	0.32
Germany	0.87	0.39	0.38	0.31
India	0.03	0.48	0.62	0.44
Indonesia	0.01	0.22	0.44	0.99
Italy	0.39	0.57	0.48	0.47
Japan	0.71	0.48	0.49	0.33
Mexico	0.00	0.48	0.62	0.78
Russia	0.32	0.37	0.55	0.53
Saudi Arabia	0.48	0.51	0.65	0.33
South Africa	0.04	0.87	0.90	0.94
South Korea	0.12	0.32	0.43	0.32
Turkey	0.00	0.45	0.57	0.50
United Kingdom	0.63	0.52	0.47	0.20
United States	0.21	0.77	0.71	0.54

Note: shaded cells indicate median or below; unshaded cells indicate above-median performance.

Table 4 Correlation among dimensions proposed for a Covid-19 health response index

	Finance	Vaccine_v1	Vaccine_v2	IP/Trade
Finance	1	–	–	–
Vaccine_v1	0.0624	1	–	
Vaccine_v2	-0.3393	0.7969	1	
IP/Trade	-0.6909	0.0063	0.3197	1

Table 5 Rank order correlation among potential Covid-19 health response index scenarios

	Vac1_AA	Vac2_AA	Vac1_GM	Vac2_GM
Vac1_AA	1	–	–	–
Vac2_AA	0.8842	1	–	–
Vac1_GM	0.714	0.5474	1.00	–
Vac2_GM	0.6596	0.5754	0.9526	1

Note: The prefix AA indicates an arithmetic average and the prefix GA indicates a geometric average. Vac v1 and v2 refer to the two version of the vaccines dimension, per the weighting of the indicators within, as explained above. The suffix N refers to normatively derived equal weights across the dimensions while the suffix FA refers to weights derived from factor analysis.

4 Limitations

The limitations relating to specific indicators are discussed above. Any composite index also has several limitations. We sought to identify the most up-to-date and relevant data possible, which involved making judgements about indicators and time periods. In addition, given rapid changes, in Covid-19 itself and in the policy response, an index provides a snapshot at one moment in time. Moreover, it aims to capture indicators which can be consistently measured across countries. This limits the extent to which it can measure different aspects of the Covid-19 response. For example, as described in the Annex, we did not shortlist data on vaccine sales or supply agreements with multilateral initiatives, as this data is relevant for only about half the countries in our sample (those that are significant vaccine producers). Even though we only include indicators that are broadly applicable, there are inevitably some gaps: the European Commission, India and Indonesia, for example, are not assigned a financial contribution to ACT-A; nor is there data on EU export policy. An additional deficit is in up-to-date data on financing, and on countries' support for the regional production of vaccines, tests and therapeutics. Furthermore, there are some anomalies in the available datasets, and data is often not comparable between them.[9]

The data we have assembled is focused on the supply-side of the Covid-19 response. It does not consider bottlenecks within countries which could affect their ability to absorb or distribute vaccinations (and the extent to which this may shape donor commitments). Most importantly, it is able to measure only commitments made (at least partially) by at least one G20 member country, not commitments that none opted to make. Notably, the deals Western leaders struck with pharmaceutical companies are said to have omitted any provisions that would have compelled the companies to share vaccines, knowledge and patents with poorer countries:

> By partnering with drug companies, Western leaders bought their way to the front of the line. But they also ignored years of warnings – and explicit calls from the World Health Organization – to include contract language that would have guaranteed doses for poor countries or encouraged companies to share their knowledge and the patents they control. (Gebrekidan and Apuzzo, 2021)

Finally, we took several decisions regarding which indicators to include and how to treat them – whether and how to standardise or normalise. Each of these decisions will have affected an eventual index, as will decisions on how to weight and aggregate the data within and across dimensions.

9 For example, until recently, the IMF-WHO Covid-19 Vaccine Supply Tracker denoted vaccine supply in courses (vaccine coverage for one person, which could be two doses or one dose, depending on the vaccine) whereas other datasets (e.g. UNICEF) provide vaccine supply in doses. Without knowing the composition of each country's vaccine supply, it was difficult to link the data.

These limitations notwithstanding, what does emerge clearly from the data is the huge variation in levels of performance among G20 countries – variation that is not well explained by differences in their incomes. Moreover, such an exercise highlights the gap between what each G20 country has accomplished and what it could have done if it emulated best performance within each category. The task ahead is to work out what G20 countries can do to place equity at the front and centre of recovery efforts, and how this can be most effectively monitored.

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