HUMAN DEVELOPMENT DATA STORY

# COVID-19 AND HUMAN DEVELOPMENT:

# Exploring global preparedness and vulnerability



# **COVID-19 AND HUMAN DEVELOPMENT**

# Exploring global preparedness and vulnerability

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**COVID-19** crisis is more than a global health emergency; it is a systemic human development crisis, reflecting our interaction with the ecosystem we are part of, which is already affecting the economic and social dimensions of development in unprecedented ways.

Policies to reduce vulnerabilities and build capacities to tackle crises, both in the short and long term, are vital to enable individuals and societies to better weather and recover from these shocks. The two dashboards here look at how prepared countries are for a crisis like COVID-19 and how vulnerable they are.

### Preparedness of countries to respond to COVID-19

Every society, group, and individual is vulnerable to adverse events. However, when it comes to shocks such as COVID-19 pandemic, our ability to respond is significantly lower and unequally distributed.

Data visualization and dashboard 1 below present a series of indicators for human development groups, regions and 189 countries that show the level of preparedness to respond and cope with the impacts of COVID-19 crisis, including a nation's level of human development, healthcare system capacity and internet access.

The level of human development and its inequality, together with healthcare system capacity, can portray countries' preparedness to respond effectively and efficiently to a health crisis. For example, a very high human development country has on average 55 hospital beds, over 30 physicians, and 81 nurses per 10,000 people, compared to 7 hospital beds, 2.5 physicians, and 6 nurses in a least developed country.

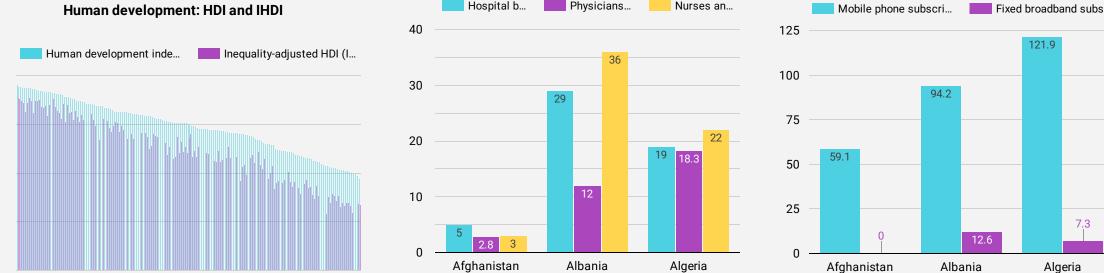
Widespread lockdowns around the world mean many people are having to rely on Internet access to work, continue with their education, and interact with others. The digital divide has become more significant than ever, as hundreds of millions of people around the globe still don't have access to reliable broadband internet.

### INTERACTIVE DATA VISUALIZATION (ACCESS ONLINE AT HTTP://HDR.UNDP.ORG): **EXPLORE PREPAREDNESS OF COUNTRIES TO RESPOND TO COVID-19**

Country

Health system capacity

Internet connectivity



### HUMAN DEVELOPMENT DASHBOARD 1: PREPAREDNESS OF COUNTRIES TO RESPOND TO COVID-19

### Level of preparedness: High Medium Low

Note: In the dashboard below there is no index of preparedness or an index of vulnerability that can be used for unique ordering or ranking of the countries. Human Development Index is not an index of preparedness or index of vulnerability. Instead, for each indicator in the table, countries are divided into five groups of roughly equal sizes. The intention is not to suggest thresholds or target values for the indicators, but to allow a crude visual assessment of a country performance relative to others. For example, a country that is in the top quintile group in an indicator performs better than 80 percent countries in this indicator. Similarly, a country in the medium group performs better than 40 percent of countries but also worse than 40 percent of countries. Countries can be ordered by any indicator in the table by clicking on its name in the header of the dashboard, by clicking again the ordering is reversed. Rankings are not provided in the dashboards. Data source: download at http://hdr.undp.org/sites/default/files/preparedness\_vulnerability\_dashboards\_12.xlsx

	Human Development				Health s	Connectivity			
Human Development Groups	Human development index (HDI) (value), 2018	Inequality- adjusted HDI (IHDI) (value), 2018	Inequality in HDI (percent), 2018	Physicians (per 10,000 people), 2010-17	Nurses and midwifes (per 10,000 people), 2010-18	Hospital beds (per 10,000 people), 2010-18	Current health expenditure (% of GDP), 2016	Mobile phone subscription (per 100 people), 2017- 18	Fixed broadband subscriptions (per 100 people), 2017- 18
Very high human development	0.892	0.796	10.8	30.4	81	55	12.0	127.8	30.5
High human development	0.750	0.615	17.9	16.5	30	32	5.7	113.6	18.8
Medium human development	0.634	0.507	20.0	7.3	17	9	3.9	91.9	2.4
Low human development	0.507	0.349	31.1	2.1	8	6	4.5	67.5	0.4

Regions	Human development index (HDI) (value), 2018	Inequality- adjusted HDI (IHDI) (value), 2018	Inequality in HDI (percent), 2018	Physicians (per 10,000 people), 2010-17	Nurses and midwifes (per 10,000 people), 2010-18	Hospital beds (per 10,000 people), 2010-18	Current health expenditure (% of GDP), 2016	Mobile phone subscription (per 100 people), 2017- 18	Fixed broadband subscriptions (per 100 people), 2017- 18
Developing countries	0.686	0.547	20.3	11.5	23	21	5.3	99.2	10.2
Arab States	0.703	0.531	24.5	11.1	21	15	4.9	100.3	7.4
East Asia and the Pacific	0.741	0.618	16.6	14.8	22	35	4.8	117.6	21.3
Europe and Central Asia	0.779	0.689	11.5	24.9	61	51	5.2	107.3	14.6
Latin America and the Caribbean	0.759	0.589	22.4	21.6	47	20	8.0	103.6	12.8
South Asia	0.642	0.520	19.0	7.8	17	8	4.1	87.7	2.2
Sub-Saharan Africa	0.541	0.376	30.5	2.1	10	8	5.3	76.9	0.4
Least developed countries	0.528	0.377	28.6	2.5	6	7	4.2	70.9	1.4
Small Island developing states	0.723	0.549	24.0	22.2	28	25	5.9	80.5	6.4
Organisation for Economic Co- operation and Development	0.895	0.790	11.7	28.9	80	50	12.6	119.3	31.6
World	0.731	0.596	18.6	14.9	34	28	9.8	104	14

## HUMAN DEVELOPMENT DASHBOARD 1: PREPAREDNESS OF COUNTRIES TO RESPOND TO COVID-19 (CONTINUED)

# Level of preparedness: High Medium Low

Note: In the dashboard below there is no index of preparedness or an index of vulnerability that can be used for unique ordering or ranking of the countries. Human Note: In the dashboard below there is no index of preparedness of an index of Vulnerability that can be used for unique ordering of ranking of the countries. Human Development Index is not an index of preparedness or index of vulnerability. Instead, for each indicator in the table, countries are divided into five groups of roughly equal sizes. The intention is not to suggest thresholds or target values for the indicators, but to allow a crude visual assessment of a country performance relative to others. For example, a country that is in the top quintile group in an indicator performs better than 80 percent countries in this indicator. Similarly, a country in the medium group performs better than 40 percent of countries but also worse than 40 percent of countries. Countries can be ordered by any indicator in the table by clicking on its name in the header of the dashboard, by clicking again the ordering is reversed. Rankings are not provided in the dashboards. Data source: download at <u>http://hdr.undp.org/sites/default/files/preparedness\_vulnerability\_dashboards\_12.xlsx</u>

puntry	Human development ad index (HDI)	Development Inequality- In djusted HDI (IHDI) ralue), 2018	nequality in I HDI (J (percent), 2018	Physicians per 10,000 people), 10 2010-18	Health syst Nurses and He midwifes (per ,000 people), 2010-18	ospital beds	rrent health sul benditure (% 100 j GDP), 2016	Connectivity Mobile phone Fixed bscription (per subsc people), 2017- 100 pe 18	d broadba riptions (j ople), 201
ger entral African Republic nad	0.377 0.381 0.401	0.272 0.222 0.250	27.8 41.6 37.7	0.5 0.6 0.5	3 2 4	3 10 -	6.2 4.3 4.5	40.6 27.7 45.1	
uth Sudan rundi	0.413 0.423	0.264	36.1 30.1	- 0.5	- 7	- 8	- 6.2	33.5 56.5	
ali itrea rkina Faso	0.427 0.434 0.434	0.294 - 0.303	31.2 - 30.0	1.4 - 0.6	4 - 6	7 4	3.8           3.0           6.8	115.1       20.4       97.9	(
erra Leone ozambique ongo (Democratic Republic of the)	0.438 0.446 0.459	0.282 0.309 0.316	35.7 30.7 31.0	0.3 0.7 0.9	10 4 5	- <mark>-</mark> 7 -	16.5       5.1       3.9	88.5 47.7 43.4	(
ninea-Bissau men	0.461	0.288	37.5 31.8	2 3.1	14 7 1	10 7	6.1 5.6	79 55.2	
oeria ninea nmbia	0.465 0.466 0.466	0.314 0.310 0.293	32.3 33.4 37.2	0.4 0.8 1.1	4 16	8 3 11	9.6 5.5 4.4	56.6       96.1       139.5	(
hiopia alawi bouti	0.470 0.485 0.495	0.337	28.4 28.7	1 0.2 2.2	8 3 5	3 13 14	4.0 9.8 3.5	37.2 39 41.2	(
ghanistan aiti dan	0.496 0.503 0.507	0.299	- 40.5 34.6	2.8 2.3 4.1	3 7 8	5 7 8	10.2 5.4 5.7	59.1 57.5 72	(
go negal	0.513	0.350	31.7 32.5	0.5	3	7 3	6.6 5.5	77.9 104.5	(
ote d'Ivoire sotho nin	0.516 0.518 0.520	0.331 0.350 0.327	35.7 32.5 37.1	2.3 0.7 1.6	9 7 6	- - 5	4.4 8.1 3.9	134.9 113.8 82.4	(
adagascar auritania	0.521 0.527 0.528	0.386 0.358 0.387	25.8 32.1 26.7	1.8 1.8 0.9	1 10 6	2 - 5	6.0 4.2 6.2	40.6 103.7 57.3	(
nzania (United Republic of) geria	0.528	0.397	24.9 34.6	0.9	4	- <sup>-</sup>	4.1 3.6	77.2 88.2	-
vanda omoros Ipua New Guinea	0.536 0.538 0.543	0.382	28.7 45.3 -	1.3 1.7 0.5	8 9 5	16 22 -	6.8 7.6 2.0	78.9 59.9 47.6	(
rian Arab Republic	0.549 0.557 0.560	- - 0.386	- 31.1	12.2 2 9.8	15 21 5	15 14 6	- 5.2 2.8	98.4 73.8 72.6	
mbabwe Imeroon	0.563	0.435	22.8 34.1	0.8	12 9	17 13	9.4 4.7	89.4 69.1	
ngola Pepal Phya	0.574 0.579 0.579	0.392 0.430 0.426	31.7 25.8 26.3	2.1 6.5 2	- 27 15	- 3 14	2.9 6.3 4.5	43.1 139.4 96.3	( : (
umbodia /anmar uatorial Guinea	0.581 0.584 0.588	0.465	20.1 23.2	1.7 8.6 4	10 10 5	8 9 21	6.1 5.1 3.4	119.5 113.8 45.2	(
mbia nana	0.591	0.394	33.4 28.3	0.9 1.8	9 12	20 9	4.5 4.4	89.2 137.5	(
nuatu o People's Democratic Republic watini (Kingdom of)	0.597 0.604 0.608	- 0.454 0.430	- 24.9 29.3	1.7 5 0.8	14 10 20	17 15 21	3.7 2.4 7.7	79.9 51.9 93.5	(
ongo o Tome and Principe	0.608	0.456 0.507	25.0 16.8	1.2 3.2	17 23	29	4.6 6.0	98.9 77.1	(
cronesia (Federated States of) ngladesh utan	0.614 0.614 0.617	0.465 0.450	- 24.3 27.1	1.9       5.3       3.7	33 3 15	32 8 17	12.6 2.4 3.5	- 97.3 93.3	: (
ribati onduras mor-Leste	0.623 0.623 0.626	0.464 0.450	- 25.5 28.0	2 3.1 7.2	48 9 17	19 7 59	11.9 8.4 4.0	46.6 79.2 103.2	:
amibia dia	0.645 0.647	0.418	35.3 16.9	3.7 7.8	28 21	27	9.1 3.7	112.7 86.9	
caragua Iatemala Ibo Verde	0.651 0.651 0.651	0.501	23.0 27.4 -	10.1       3.6       7.7	16 9 12	9 6 21	8.7       5.8       5.2	115.1 118.7 112.2	:
jikistan Salvador Iyana	0.656 0.667 0.670	0.574 0.521 0.546	12.5 21.9 18.5	17 15.7 8	52 23 13	48 13 16	7.0 7.0 4.2	111.5 146.9 83	
rgyzstan procco	0.674 0.676	0.610	9.5	18.8       7.3	64 11	45 11	6.6 5.8	122.6 124.2	:
q Ilestine, State of et Nam	0.689 0.690 0.693	0.552	19.8 13.5 16.3	8.2 - 8.2	17 - 14	14 - 26	3.3 - 5.7	94.9 89.5 147.2	1' : 1:
arshall Islands ypt	0.698	0.492	- 29.7	4.6 7.9	35 14	27 16	23.3 4.6	27.6 95.3	
ibon Iivia (Plurinational State of) uth Africa	0.702 0.703 0.705	0.544 0.533 0.463	22.5 24.2 34.4	3.6       16.1       9.1	26 7 35	63 11 -	3.1           6.9           8.1	138.3 100.8 153.2	· · · · · ·
moa donesia oya	0.707 0.707 0.708	0.583	- 17.5 -	3.4 3.8 21.6	19 21 67	- 12 37	5.5 3.1	63.6 119.8 91.5	:
rkmenistan	0.710	- 0.578	- 18.5	23.7 22.2	121 46	40 74	6.3 6.6	75.9 162.9	1:
oldova (Republic of) ilippines nga	0.711 0.712 0.717	0.638	10.4 18.2 -	32 12.8 5.2	45 2 39	58 10 26	9.0 4.4 5.3	88 110.1 105.8	1
aldives	0.719 0.720	0.568 0.558	21.0 22.6	10.4 11.3	40	43 13	10.6 6.1	166.4 85.5	1
riname Iraguay	0.723 0.724 0.724	0.617 0.559 0.562	14.7 22.7 22.5	23.4 12.3 13.7	34 41 12	14 31 13	5.5       6.1       8.0	87.6 139.5 107	1:
i ominica enezuela (Bolivarian Republic of)	0.724 0.724 0.726	- - 0.600	17.3	8.4 10.8	29 59 -	23 38 8	3.5 5.3 3.2	117.8 105.8 71.8	10
maica int Vincent and the Grenadines	0.726 0.728	0.604	16.7 -	13.2 6.6	11 26	17 26	6.1 3.6	101 96.1	22
tswana banon bongolia	0.728 0.730 0.735	- - 0.635	- 13.6	3.7       22.7       28.9	33 26 40	18 29 70	5.5 8.0 3.8	150 64.5 133.2	( (
nisia int Lucia ominican Republic	0.739 0.745 0.745	0.585 0.617 0.584	20.8 17.2 21.5	12.7 1.1 15.6	26 16 3	23 13 16	7.0 5.3 6.2	127.7 101.7 84.1	؛ 11 -
raine rerbaijan	0.750 0.754	0.701	6.5 9.4	30.1 34.5	71 70	88 47	6.7 6.9	122.6 103.9	1:
uador iina ru	0.758 0.758 0.759	0.607 0.636 0.612	19.9 16.1 19.4	20.5 17.9 12.7	12 23 14	15 42 16	8.4       5.0       5.1	92.3 115 123.8	1 2
prth Macedonia geria menia	0.759 0.759 0.760	0.660 0.604 0.685	13.1 20.4 9.9	28.7 18.3 29	38 22 56	44 19 42	6.3 6.6 9.9	98.5 121.9 121.3	2
olombia azil	0.761 0.761	0.585 0.574	23.1 24.5	20.8 21.5	13 97	15 22	5.9 11.8	129.9 98.8	1 1,
enada ailand exico	0.763 0.765 0.767	0.635	17.0 22.5	14.5 8.1 22.5	31 30 29	37 21 15	5.2 3.7 5.5	102.1 180.2 93	2 1: 1:
snia and Herzegovina Itigua and Barbuda int Kitts and Nevis	0.769 0.776 0.777	0.658 - -	-	20 27.6 25.2	63 31 40	35 38 23	9.2 4.3 5.7	104.1 192.8 147.7	2
iba Lanka	0.778 0.780	0.686	- 12.1	81.9 9.6	78 21	52 36	12.2 3.9	47.4 115.1	
borgia bania osta Rica	0.786 0.791 0.794	0.692 0.705 0.639	12.0 10.9 19.5	51 12 11.5	41 36 8	26 29 12	8.4 6.7 7.6	133.4 94.2 169.9	1: 1:
nama auritius	0.795	0.626	21.2 13.6	15.7 20.2	14 34	23 34	7.3 5.7	130.1 151.4	1
n (Islamic Republic of) inidad and Tobago rbia	0.797 0.799 0.799	0.706 - 0.710	11.5 - 11.1	11.4 26.7 31.3	19 35 61	15 30 57	8.1 6.5 9.1	108.5 140.1 97.6	2
ychelles alaysia hamas	0.801 0.804 0.805	-	-	9.5 15.1 19.4	33 41 31	36 19 29	3.9 3.8 6.4	184.3 134.5 99	2
rkey uguay	0.806 0.808	0.676	16.2 13.0	17.6 50.5	26 19	27 28	4.3 9.1	97.3 149.9	1
iwait rbados ilau	0.808 0.813 0.814	0.675	17.0	25.8 24.9 11.8	70 60 53	20 58 48	3.9       7.0       11.7	178.6 122.6 134.4	3
mania ontenegro Igaria	0.816 0.816 0.816	0.725 0.746 0.713	11.1 8.6 12.5	22.6 23.3 39.9	61 57 53	63 40 68	5.0 7.6 8.2	116.2 180.7 118.1	2 2
ızakhstan Iarus	0.817 0.817	0.759 0.765	7.1 6.4	32.5 40.8	85 114	67 110	3.5 6.3	142 122.9	1 3
ssian Federation gentina nan	0.824 0.830 0.834	0.743 0.714 0.732	9.9 14.0 12.2	40.1 39.6 19.7	86 26 43	82 50 16	5.3 7.5 4.3	157.4 132.1 133.4	1
batia hrain	0.837 0.838	0.768 -	8.3	30 9.3	81 25	56 20	7.2 4.9	105.6 133.3	2
ngary Inei Darussalam ile	0.845 0.845 0.847	0.777 - 0.673	8.0 - 20.5	32.3 17.7 10.8	66 66 9	70       27       22	7.4 2.3 8.5	103.4 131.9 134.4	3 1 1
tar rtugal via	0.848 0.850 0.854	0.742 0.776	- 12.7 9.1	- 33.4 31.9	66 64 48	12 34 58	3.1 9.1 6.2	141.9 115.6 107.3	3
vakia udi Arabia	0.857 0.857	0.804	6.2	24.6 23.9	92 57	58 27	7.1 5.7	132.8 122.6	2
dorra ited Arab Emirates nuania	0.857 0.866 0.869	0.774	- - 10.9	33.3 23.9 43.4	40 56 79	25 12 73	10.4 3.5 6.7	107.3 208.5 164.3	3
and eece prus	0.872 0.872 0.873	0.801 0.766 0.788	8.1 12.2 9.7	24 45.9 19.5	57 34 53	65 43 34	6.5 8.5 6.9	134.7 115.7 100.9	1 3 3
onia y	0.882 0.883	0.818 0.776	7.3	34.7 40.9	65 59	50 34	6.7 8.9	145.4 137.5	3
Ita nce echia	0.885 0.891 0.891	0.815 0.809 0.850	8.0 9.2 4.6	38.3 32.3 43.1	90 97 84	47 65 65	9.3 11.5 7.1	140.2 108.4 119.2	2
ain venia	0.893 0.902	0.765 0.858 0.777	14.3 4.8	40.7 30	55 97	30 46	9.0 8.5	115.9 118.7	3
rea (Republic of) ael kembourg	0.906 0.906 0.909	0.809	14.2 10.8 9.5	23.7 32.2 30.3	70 52 123	115 31 48	7.3       7.3       6.2	129.7 127.7 132.2	2
stria pan chtenstein	0.914 0.915 0.917	0.843	7.7 3.6	51.4 24.1	82 115	76 134	10.4 10.9 -	123.5 139.2 124.6	3
gium ited States	0.919 0.920	0.849 0.797	7.6	33.2 25.9	111 86	62 29	10.0 17.1	103.4 123.7	3
ited Kingdom w Zealand nada	0.920 0.921 0.922	0.845 0.836 0.841	8.2 9.2 8.8	28.1 30.3 26.1	83 110 99	28 28 27	9.8 9.2 10.5	117.5 134.9 89.2	3
nland	0.925 0.930	0.876 0.873	5.3 6.1	38.1 44.6	147 103	44 25	9.5 10.4	132.2 125.1	3
etherlands ngapore veden	0.933 0.935 0.937	0.870 0.810 0.874	6.8 13.3 6.7	35.1 23.1 54	111 72 115	47 24 26	10.4 4.5 10.9	120.6 145.7 125.1	4
eland Istralia	0.938 0.938	0.885 0.862 0.815	5.7 8.1 13.1	39.7 35.9	157 127	32 38	8.3 9.3 -	126.1 113.6 259.4	4
ong Kong, China (SAR)	0.939								3
ong Kong, China (SAR) ermany land vitzerland	0.939 0.939 0.942 0.946	0.861 0.872 0.881	8.3 7.5 6.8	42.1 30.9 42.4	132 143 173	83 28 47	11.1 7.4 12.2	129.3 103.2 129.6	4

#### Definitions

Human Development Index (HDI): A composite index measuring average achievement in three basic dimensions of human development-a long and healthy life, knowledge and a decent standard of living. See Technical note 1 at

 $http://hdr.undp.org/sites/default/files/hdr2019\_technical\_notes.pdf for details on how the HDI is calculated.$ 

Inequality-adjusted HDI (IHDI): HDI value adjusted for inequalities in the three basic dimensions of human development. See Technical note 2 at http://hdr.undp.org/sites/default/files/hdr2019\_technical\_notes.pdf for details on how the IHDI is calculated.

Inequality in HDI: Percentage difference between the IHDI value and the HDI value.

Physicians: Number of medical doctors (physicians), both generalists and specialists, expressed per 10,000 people. Nurses and midwives: Number of professional nurses, professional midwives, auxiliary nurses, enrolled nurses, enrolled midwives and other associated personnel, such as dental nurses and primary care nurses, expressed per 10,000 people.

Hospital beds: Number of hospital beds available, expressed per 10,000 people. Current health expenditure: Spending on healthcare goods and services, expressed as a percentage of GDP. It excludes capital health expenditures such as buildings, machinery, information technology and stocks of vaccines for emergency or outbreaks.

Mobile phone subscriptions: Number of subscriptions for the mobile phone service, expressed per 100 people. Fixed broadband subscriptions refers to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s, expressed per 100 people. It includes both residential subscriptions and subscriptions for organizations.

#### Main Data Sources

Column 1: HDRO calculations based on data from UNDESA (2019b), UNESCO Institute for Statistics (2019), United Nations Statistics Division (2019b), World Bank (2019a), Barro and Lee (2018) and IMF (2019).

Column 2: Calculated as the geometric mean of the values in inequality-adjusted life expectancy index, inequality-adjusted education index and inequality-adjusted income index using the methodology in Technical note 2 (available at http://hdr.undp.org/sites/default/files/hdr2019\_technical\_notes.pdf).

Column 3: Calculated based on data in columns 1 and 2.

Columns 4 and 5: WHO (World Health Organization) (2019). Global Health Observatory. www.who.int/gho/. Accessed 15 July 2019.

Columns 7. World Bank (2019a). World Development Indicators database. Washington, DC. http://data.worldbank.org. Accessed 15 July 2019.

Column 8: ITU (International Telecommunication Union) (2019). ICT Facts and Figures 2019. www.itu.int/en/ITU-D/Statistics/Pages/stat/. Accessed 8 August 2019.

Column 9: World Bank (2020). World Development Indicators database. Washington, DC. http://data.worldbank.org. Accessed 02 April 2020

Note: For each indicator in the table, countries are divided into five groups of roughly equal sizes. The intention is not to suggest thresholds or target values for the indicators, but to allow a crude assessment of a country performance relative to others. For example, a country that is in the top quintile group in an indicator performs better than 80 percent countries in this indicator. Similarly, a country in the medium group performs better than 40 percent of countries but also worse than 40 percent of countries

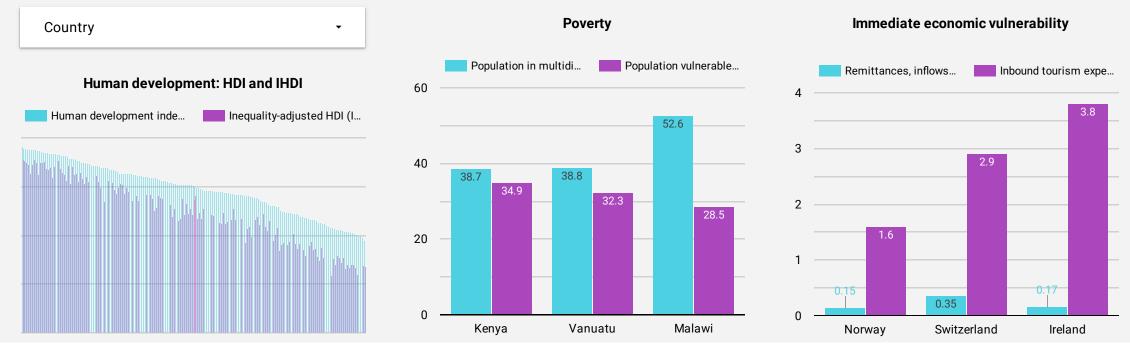
### **Exploring vulnerabilities: COVID-19**

Although everyone is potentially affected in one way or another by this pandemic, some individuals and groups are more vulnerable, and suffer far more harm and have a much longer road to recovery.

Dashboard 2 and data visualization below present indicators for human development groups, regions and 189 countries that reflect human vulnerability, including poverty, social protection and labor programs, and an economy's exposure to the immediate economic impacts of travel bans.

Poverty adds to the high risks of long-lasting consequences. Despite recent progress in poverty reduction, about 1 in 4 people still live in multidimensional poverty or are vulnerable to it, and more than 40 percent of the global population does not have any social protection.

Globalization has brought new opportunities and efficiency gains, but, as witnessed with COVID-19 pandemic, disruptions at one point of the chain can trigger serious local problems elsewhere. The effects of such events may be detrimental for countries and people that, for example, heavily depend on tourism such as island countries, inflows of remittances, or receiving official development assistance.



### INTERACTIVE DATA VISUALIZATION (access online at http://hdr.undp.org): SELECT AND EXPLORE VULNERABILITIES OF COUNTRIES TO PANDEMICS

# HUMAN DEVELOPMENT DASHBOARD 2: VULNERABILITY TO PANDEMICS

Level of vulnerability: Low Medium High Note: In the dashboard below there is no index of preparedness or an index of vulnerability that can be used for unique ordering or ranking of the countries. Human Development Index is not an index of preparedness or index of vulnerability. Instead, for each indicator in the table, countries are divided into five groups of roughly equal sizes. The intention is not to suggest thresholds or target values for the indicators, but to allow a crude visual assessment of a country performance relative to others. For example, a country that is in the top quintile group in an indicator performs better than 80 percent countries in this indicator. Similarly, a country in the medium group performs better than 40 percent of countries but also worse than 40 percent of countries. Countries can be ordered by any indicator in the table by clicking on its name in the header of the dashboard, by clicking again the ordering is reversed. Rankings are not provided in the dashboards. Data source: download at <a href="http://hdr.undp.org/sites/default/files/preparedness\_vulnerability\_dashboards\_12.xlsx">http://hdr.undp.org/sites/default/files/preparedness\_vulnerability\_dashboards\_12.xlsx</a>



			Population li income po		Imme	diate economic vu	Inerability		
Human Development Groups	Population in multidimensional poverty (%), 2009-18	Population vulnerable to multidimensional poverty (%), 2009- 18	PPP \$1.90 a day (%), 2010-18	National poverty line (%), 2010-18	Working poor at PPP\$3.20 a day (% of total employment), 2018	Social protection and labour programs (% of population without any), 2007-2016	Remittances, inflows (% of GDP), 2018	Net official development assistance received (% of GNI), 2017	Inbound tourism expenditure (percent of GDP), 2016-18
Very high human development	-	-	0.6	-	-	31.3	0.3	-	2.3
High human development	4.5	12.5	2.1	10.4	8.5	38.8	1.0	0.1	1.5
Medium human development	29.4	18.4	17.7	23.0	40	31.9	4.1	0.8	1.4
Low human development	62.3	16.2	45.1	44.0	68.4	86.1	4.6	4.7	1.7

Regions	Population in multidimensional poverty (%), 2009-18	Population vulnerable to multidimensional poverty (%), 2009- 18	PPP \$1.90 a day (%), 2010-18	National poverty line (%), 2010-18	Working poor at PPP\$3.20 a day (% of total employment), 2018	Social protection and labour programs (% of population without any), 2007-2016	Remittances, inflows (% of GDP), 2018	Net official development assistance received (% of GNI), 2017	Inbound tourism expenditure (percent of GDP), 2016-18
Developing countries	23.1	15.3	12.6	19.3	25.9	43	1.5	0.3	1.8
Arab States	15.7	9.4	4.7	23.0	14.9	52.8	2.7	1.7	3.6
East Asia and the Pacific	5.6	14.9	1.5	5.1	10.1	41.7	0.6	0.0	1.4
Europe and Central Asia	1.1	3.6	-	11.5	9.2	42.6	2.8	0.7	4.2
Latin America and the Caribbean	7.3	7.5	3.8	-	6.8	40.6	1.6	0.1	1.6
South Asia	31.0	18.8	17.4	22.9	43	25.1	3.4	0.4	1
Sub-Saharan Africa	57.5	17.2	43.5	43.0	63.1	79.4	2.9	2.8	2
Least developed countries	59.0	17.8	36.7	38.1	59.7	84.5	4.6	4.9	2.4
Small Island Developing States	22.6	12.9	-	-	17.7	75.3	6.9	1.5	8.3
Organisation for Economic Co- operation and Development	-	-	0.7	-	-	36	0.3	-	2.1
World	-	-	10.5	19.1	25	42.3	0.7	0.3	1.9

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## HUMAN DEVELOPMENT DASHBOARD 2: VULNERABILITY TO PANDEMICS (CONTINUED)

Level of vulnerability: Low Medium High Note: In the dashboard below there is no index of preparedness or an index of vulnerability that can be used for unique ordering or ranking of the countries. Human Development Index is not an index of preparedness or index of vulnerability. Instead, for each indicator in the table, countries are divided into five groups of roughly equal sizes. The intention is not to suggest thresholds or target values for the indicators, but to allow a crude visual assessment of a country performance relative to others. For example, a country that is in the top quintile group in an indicator performs better than 80 percent countries in this indicator. Similarly, a country in the medium group performs better than 40 percent of countries but also worse than 40 percent of countries. Countries can be ordered by any indicator in the table by clicking on its name in the header of the dashboard, by clicking again the ordering is reversed. Rankings are not provided in the dashboards.

Data source: download at <u>http://hdr.undp.org/sites/default/files/preparedness\_vulnerability\_dashboards\_12.xlsx</u>

Country -			opulation li income pov				Immediate e	economic vulnera	bility
Country	Population in multidimensional poverty (%), 2009-18 ▼	Population vulnerable to multidimensional poverty (%), 2009-18	PPP \$1.90 a day (%), 2010-18	poverty di	: PPP\$3.20 a lab av (% of total	al protection and our programs (% Rer of population infl hout any), 2007- GI 2016	nittances. de	Net official evelopment assistance ceived (% of GNI), 2017	ound tourism expenditure cent of GDP), 2016-18
South Sudan Niger Chad	91.9 90.5 85.7	6.3 5.1 9.9	- 44.5 38.4	82.3 44.5 46.7	- 73.0 64.2	93.8 78.6 97.0	35.3 3.1 -	60.5 15.2 6.6	0.8
Burkina Faso Ethiopia	83.8 83.5	7.4 8.9	43.7 30.8	40.1 23.5	71.1	95.7 86.8	3.0 0.5	7.4 5.1	1.4 4.4
Central African Republic Mali Madagascar	79.4 78.1 77.8	13.1 10.9 11.8	- - 77.6	- 70.7	85.9 78.5 88.2	98.7 94.3	5.1 3.1	23.4 9.0 7.0	1.3 7.3
Burundi Congo (Democratic Republic of the) Mozambique	74.3 74.0 72.5	16.3 16.8 13.6	71.8 76.6 62.9	64.9 63.9 46.1	89.6 87.7 76.3	- 88.9 93.7	1.2 3.0 2.5	13.5 6.2 14.5	0.1 0.1 2.3
Guinea-Bissau Benin	67.3 66.8	13.0 19.2 14.7	62.9 67.1 49.5	46.1 69.3 40.1	80.6 69.4	-	2.5       1.8       3.6	14.5       8.4       7.4	2.3 1.4 1.7
Liberia Guinea Sierra Leone	62.9 61.9 57.9	21.4 17.2 19.6	40.9 35.3 40.1	50.9 55.2 52.9	71.4 67.3 77.2	85.6 96.1 69.8	11.9 0.4 1.3	20.8 4.6 14.8	- 0.1 1.0
Afghanistan Tanzania (United Republic of)	55.9 55.4	19.0 18.1 24.2	40.1 - 49.1	54.5 26.4	70.3 70.3	91.2 87.1	2.0 0.8	14.8	0.3 4.3
Gambia Uganda	55.2 55.1	21.8 24.9	10.1 41.7	48.6 21.4	32.1 66.3	91.7 39.3	15.1 4.5	18.5 7.9	10.3 3.9
Rwanda Zambia Senegal	54.4 53.2 53.2	25.7 22.5 16.4	55.5 57.5 38.0	38.2 54.4 46.7	74.5 69.4 61.3	68.6 98.4 83.2	2.4 0.4 9.2	13.7 4.1 4.4	5.6 2.8 2.2
Malawi Sudan	52.6 52.3	28.5 17.7	70.3 12.7	-	85.7 25.7	58.5 92.6	0.6	24.1 0.7	0.6
Nigeria Angola Mauritania	51.4 51.1 50.6	16.8 15.5 18.6	- 47.6 6.0	- 31.0	69.1 54.0 16.7	93.6 - 54.8	6.1 0.0 1.6	0.9 0.2 5.8	0.5 0.5 0.1
Togo Yemen	48.2 47.7	21.8 22.1	49.8 18.8	55.1 48.6	64.4 83.6	97.0	8.5 12.5	7.2	5.1 0.3
Côte d'Ivoire Timor-Leste Cameroon	46.1 45.8 45.3	17.6 26.1 17.3	28.2 30.7 23.8	46.3 41.8 37.5	53.1 67.3 37.8	67.1 64.7 95.0	0.8 3.4 0.9	2.3 10.2 3.5	1.3 3.0 1.6
Bangladesh Haiti	41.7 41.3	21.4 21.8	14.8 24.2	24.3 58.5	44.8 42.2	82.2 80.5	5.7 30.9	1.4 11.6	0.1 6.7
Kenya Pakistan Myanmar	38.7 38.3 38.3	34.9 12.9 21.9	36.8 3.9 2.0	36.1 24.3 24.8	59.3 30.3 19.6	72.6 83.2 97.7	3.1 6.7 3.9	3.2 0.7 2.4	2.0 0.3 2.3
Namibia Comoros	38.0 37.3	20.3 22.3	13.4 17.6	17.4 42.4	13.6 31.1	83.9	0.4	1.4       6.2	3.4 6.4
Bhutan Cambodia Nepal	37.3 37.2 34.0	17.7 21.1 22.3	1.5 - 15.0	8.2 17.7 25.2	12.6 59.9 35.4	97.1 96.9 56.5	2.3 5.8 28.0	5.1 4.1 5.0	4.8 19.7 2.7
Lesotho Zimbabwe	33.6 31.8	24.4 27.4	26.9 33.9	49.7 70.0	64.3 42.9	93.7 70.4	15.4 6.0	5.1 3.5	0.9
Ghana Guatemala India	30.1 28.9 27.9	22.0 21.1 19.3	13.3 8.7 21.2	23.4 59.3 21.9	16.8 12.7 46.7	36.3 36.7 6.0	5.8 12.1 2.9	2.2 0.5 0.1	1.5 2.0 1.0
Congo Lao People's Democratic Republic	24.3 23.1	21.3 21.2	37.0 22.7	40.9 23.4	60.1 42.5	- 98.3	0.1 1.5	1.4 3.0	0.5 4.2
Sao Tome and Principe Honduras Eswatini (Kingdom of)	22.1 19.3 19.2	19.4 22.3 20.9	34.5 16.5 28.4	66.2 48.3 58.9	- 25.1 11.7	- 44.2 48.4	4.2 20.1 3.3	10.8 2.1 3.4	17.0 3.1 0.3
Morocco Nicaragua	18.6 16.3	13.2 13.2	1.0 3.2	4.8 24.9	5.7 22.8	48.4 59.0 31.8	5.8 11.5	1.8 4.2	8.0 4.1
Gabon Peru Mongolia	14.8 12.7 10.2	17.5 12.5 19.2	3.4 2.6 0.5	33.4 20.5 28.4	5.6 10.3 1.9	- 35.1 0.1	0.1 1.5 4.4	0.8 0.0 7.8	0.2 2.2 4.0
Mongolia Suriname Iraq	10.2       9.4       8.6	19.2 4.5 5.2	0.5 - 2.5	28.4 - 18.9	1.9       14.5       8.4	0.1 - 16.4	4.4 0.0 0.3	7.8       0.8       1.5	4.0 2.1 0.9
El Salvador Syrian Arab Republic	7.9 7.4	9.9 7.7	1.5 -	29.2	6.2 58.3	41.9	20.7	0.6	5.3
Tajikistan Indonesia Mexico	7.4 7.0 6.3	20.1 9.1 4.7	4.8 4.6 1.7	27.4 9.8 41.9	16.4 24.2 8.8	60.7 42.6 34.3	29.0 1.1 2.9	3.7 0.0 0.1	2.3 1.5 1.9
Mexico South Africa Philippines	6.3 6.3 5.8	4.7 12.2 7.3	1.7 18.9 6.1	41.9 55.5 21.6	8.8       17.1       23.3	34.3 20.2 59.4	2.9 0.3 10.2	0.1 0.3 0.0	1.9 2.7 2.9
Egypt Viet Nam	5.2 4.9 4.8	6.1 5.6	3.2 1.9	32.5 6.7 27.0	12.4 7.4	44.5 65.1	11.5 6.5	0.0	5.1 4.1 2.0
Colombia Jamaica Paraguay	4.8 4.7 4.5	6.2 6.4 7.2	4.1 - 1.6	27.0 19.9 24.2	6.2 3.5 2.8	34.3 41.7 36.6	1.9       15.9       1.7	0.3 0.4 0.4	2.0 19.7 1.0
Ecuador Belize	4.5 4.3	7.5 8.4	3.3	25.0 -	8.2 9.2	27.4 60.6	2.8 4.8	0.2 2.0	1.7 25.3
China Dominican Republic Brazil	3.9 3.9 3.8	17.1 5.2 6.2	0.5 0.4 4.4	1.7 22.8	5.9 3.6 2.8	36.9 65.5 46.2	0.2 8.4 0.2	0.0 0.2 0.0	0.3 9.3 0.3
Guyana North Macedonia	3.4 2.5	5.8 2.9	- 4.4	21.9	6.3 0.7	-	7.9 2.7	1.4       1.4	0.8 2.8
Barbados Kyrgyzstan	2.5 2.3	0.5	- 0.9	- 22.4	0.5	42.1	2.3 33.2	0.4	21.6 6.0
Bosnia and Herzegovina Algeria Libya	2.2 2.1 2.0	4.1 5.8 11.3	0.1	16.9 5.5 -	0.2 1.2 0.4	49.7 - -	10.7 1.1 -	2.4 0.1 1.1	5.5 0.1 0.2
Saint Lucia Tunisia	1.9 1.3	1.6 3.7	4.7 0.2	25.0 15.2	3.2	- 85.6	1.7 5.1	0.7 2.0	52.7 5.8
Palestine, State of Moldova (Republic of) Thailand	1.0 0.9 0.8	5.4 3.7 7.2	1.0 0.0 0.0	29.2 9.6 9.9	1.4 0.3 0.1	89.3 43.4 20.6	17.0 16.3 1.5	12.8 2.4 0.1	6.0 4.4 12.9
Maldives Albania	0.8	4.8 5.0	0.0	8.2 14.3	12.1 0.9	85.2 45.1	0.1	0.9	57.9
Trinidad and Tobago Kazakhstan Turkmenistan	0.6 0.5 0.4	3.7 1.8 2.4	- 0.0	- 2.5	0.6 0.1 24.2	- 49.8 -	0.6 0.4 0.0	0.0 0.0 0.1	2.3 1.6
Jordan Montenegro	0.4	0.7 4.3	0.1	14.4 23.6	1.8 0.3	26.8 43.6	10.3 10.8	7.2 2.4	14.7 22.2
Serbia Armenia	0.3 0.2	3.4 2.7	5.5 2.1	24.3 23.5	0.3 7.9	39.0 33.2	8.6 12.0	4.1 2.1	3.8 9.9
Ukraine Fiji Dominica	0.2 - -	-	0.0	1.3 34.0	0.1 8.0 -	29.7 85.7 -	11.0 5.2 9.2	1.1       3.0       3.9	1.7 25.0 22.0
Venezuela (Bolivarian Republic of) Saint Vincent and the Grenadines	- -	-	•	33.1	17.3	-	0.0	0.0	0.0 29.6
Botswana Tonga Lebanon	· ·	-	16.1 1.0 0.0	- 27.4	22.3 - 0.2	- 98.7 -	0.2 40.7 12.7	0.6 18.4 2.4	3.1 10.9 15.3
Azerbaijan Grenada	- -	-		6.0	0.1	35.4	2.6 4.0	0.3	6.0 45.4
Uzbekistan Antigua and Barbuda Saint Kitts and Nevis	· ·	•		-	49.8 - -		3.0 2.2 2.2	1.1 0.7 <u>3.6</u>	2.6 59.8 35.3
Samoa Cuba	· .	-	1.1 -	20.3	- 0.9	66.4 -	16.4 -	15.9 0.6	22.4
Bolivia (Plurinational State of) Sri Lanka Georgia	· ·	-	4.5 0.8 4.5	34.6 4.1 20.1	9.1 6.7 11.2	21.8 66.9 35.3	3.5 8.4 12.6	2.6 0.3 3.1	6.3
Marshall Islands Costa Rica	- -	-	- 1.4	- 21.0	- 1.1	- 33.4	14.1 0.9	26.9	9.5 6.6
Panama Mauritius Iran (Islamic Republic of)	-	- - -	1.7 0.2 0.3	22.1 10.3 -	2.9 0.6 0.5	36.6 53.4	0.8 1.7 0.3	0.1 0.1 0.0	8.6 15.2 1.0
Seychelles Malaysia	-	-	0.3 1.1 0.0	39.3 0.4	0.5	- 15.9	0.3 1.5 0.5	0.0 1.4 0.0	38.4 6.1
Bahamas Turkey Cabo Verde	-	-	- 0.1 3.2	- 13.9 35.0	0.2 0.4 12.9	- 49.6 -	- 0.2 13.0	- 0.4 7.2	24.8 4.8 26.4
Cabo Verde Uruguay Kuwait	-	-	3.2 0.1 -	35.0 8.1 -	12.9 0.1 0.7	- 20.2 -	13.0 0.2 0.0	7.2 0.1 -	26.4 4.1 0.6
Palau Romania	-	-	- 3.5	23.6	-	- 16.3	0.8	7.9	42.2 1.4 7.8
Bulgaria Belarus Kiribati	-	-	1.3 0.0 -	22.0 5.6	- 0.3 -	26.4 23.6 -	3.7 2.0 9.7	- 0.5 21.2	7.8 2.0 2.1
Russian Federation Argentina	-	-	0.0	12.9 32.0	0.1 0.6	22.1 53.6	0.5 0.1	- 0.0	1.1 1.2
Micronesia (Federated States of) Oman Croatia		-	15.4 - 0.5	41.2 - 19.4	0.3	- - 29.3	7.1 0.1 4.7	25.1 0.0 0.2	7.9 3.8 19.9
Bahrain Hungary	-	-	- 0.6	- 14.9	-	- 10.6	- 3.1	-	10.2 6.2
Vanuatu Brunei Darussalam Chile	-	-	13.2 - 0.3	12.7 - 8.6	0.2	- - 12.3	2.2 - 0.0	15.7 - 0.0	37.1 1.4 1.3
Chile Equatorial Guinea Qatar	-	-	0.3 - -	8.6 - -	0.8 22.7 0.1	-	0.0 - 0.2	0.0 0.1 -	1.3 - 7.9
Portugal Latvia	-	-	0.4	22.5	-	- 19.7	0.2	-	10.0 3.0 2.1
Slovakia Saudi Arabia Andorra	-	-	1.4 - -	12.6 - -	- 0.1 -	-	2.1 0.0	- - -	3.1 2.2
United Arab Emirates Lithuania	-	-	0.0	- 22.2	0.5	- 18.1	2.6	-	5.2 2.7
Solomon Islands Poland Papua New Guinea	- - -	-	25.1 0.3 -	12.7 15.4 -	51.9 - 50.8	- 35.6 95.8	1.2 1.2 0.0	15.3 - 2.5	6.5 2.7 0.1
Greece Cyprus	-	-	0.9 0.0	-	-	-	0.2	-	9.9 13.8
Estonia Italy Malta	-	-	0.3 1.4 0.2	21.8 - -	-		1.9 0.5 1.8		7.6 2.5 12.7
Malta France Czechia	-	-	0.2 0.0 0.0	- - 9.7	-	- - -	1.8 1.0 1.6	- - -	12.7 2.6 3.4
Spain Slovenia	-	-	0.7	- 14.3	-	-	0.2	· ·	5.7 6.3
Korea (Republic of) Israel Luxembourg	- - -	- - -	0.2 0.2 0.3	-	0.1 - -	- - -	0.4 0.3 2.9		1.2 2.2 7.8
Austria Japan	-	-	0.3	-	-	-	0.7	-	5.6 0.9
Liechtenstein Djibouti	-	-	- 17.1 0.1	- 21.1	-	- 79.1	- 3.2 2.2	- 6.9 -	- 2.9 2.0
Belgium			0.1 1.2 0.2	-	-	- - -	2.2 0.0 0.2	-	2.0 1.2 1.7
	-	-			-		0.2	-	5.6
Belgium United States United Kingdom New Zealand Canada	- - -	•	- 0.5	-	-	· ·	0.1		1.3
Belgium United States United Kingdom New Zealand			- 0.5 0.1 0.1 0.2	- - - -	-		0.1 0.3 0.4 0.3		1.3 2.1 2.6 2.8
Belgium United States United Kingdom New Zealand Canada Canada Finland Denmark Netherlands Singapore Sweden		- - - - - -	0.1 0.1 0.2 - 0.2		- - - 0.1		0.3 0.4 0.3 - 0.6		2.1 2.6 2.8 5.6 2.7
Belgium United States United Kingdom New Zealand Canada Finland Denmark Netherlands Singapore		• • • • •	0.1 0.1 0.2	-			0.3 0.4 0.3		2.1 2.6 2.8 5.6
BelgiumUnited StatesUnited KingdomNew ZealandCanadaFinlandDenmarkNetherlandsSingaporeSwedenIcelandEritreaAustraliaHong Kong, China (SAR)Germany			0.1 0.2 0.2 0.2 0.0 0.5 0.5		-		0.3 0.4 0.3 - 0.6 0.7 0.7 0.1 0.1 0.1	- () - () - () - () - () - () - () - ()	2.1 2.6 2.8 5.6 2.7 12.0 1.0 3.3 11.5
Belgium United States United Kingdom New Zealand Canada Canada Finland Denmark Netherlands Singapore Sweden Sweden Iceland Eritrea Australia	· · · · · · · · · · · · · · · · · · ·		0.1 0.1 0.2 0.2 0.0 - 0.5 -		- - 73.7 -		0.3 0.4 0.3 - 0.6 0.7 - 0.1 0.1	<ul> <li></li></ul>	2.1 2.6 2.8 5.6 2.7 12.0 1.0 3.3 11.5

#### Definitions

 Definitions

 Population in Multidimensional poverty: Percentage of the population with a deprivation score of at least 33 percent. It is expressed as a share of the population in the survey year, the number of poor people in the survey year and the projected number of poor people in 2017.

 Population vulnerable to multidimensional poverty: Percentage of the population at risk of suffering multiple deprivations—that is, those with a deprivation score of 20–33 percent.

 Population living below PPP \$1.90 a day: Percentage of the population living below the international poverty line of \$1.90 (in purchasing power parity terms [PPP]) a day.

 Population living below national poverty line: Percentage of the population living below the national poverty line, which is the poverty line deemed appropriate for a country by its authorities. National estimates are based on population-weighted subgroup estimates from household surveys.

 Working poor at PPP\$3.20 a day: Proportion of employed people who live on less than \$3.20 (in purchasing power parity terms) a day, expressed as a percentage of the total employed population ages 15 and older.

 Coverage of social protection and labor programs. Percentage of population participating in social insurance, social safety net, and unemployment benefits and active labor market programs. We present the percentage of population without any social protection or labour program. Estimates include both direct and indirect beneficiaries.

 Remittances, inflows: Earnings and material resources transferred by international migrants or refugees to recipients in their country of origin or countries in which the migrant formerly resided.

 Inbound tourism expenditure by nistemational inbound visitors, includ

separate classification.

Net official development assistance received: Disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies to promote economic development and welfare in countries and territories on the Development Assistance Committee list of aid recipients, expressed as a percentage of the recipient country's gross national income (GNI).

#### Main data sources

Columns 1 and 2: HDRO calculations based on data on household deprivations in health, education, and standard of living from various household surveys listed in column 1 using a revised methodology described in Technical note 5 (available at http:// hdr.undp.org/sites/default/files/hdr2018\_technical\_ notes.pdf).

Columns 3 and 5: World Bank (2020). World Development Indicators database. Washington, DC. http://data.worldbank.org. Accessed 02 April 2020

Column 4: ILO (2019). ILOSTAT database. www.ilo.org/ilostat. Accessed 17 June 2019.

Column 4: ILO (2019). ILOSTAT database. www.ilo.org/ilostat. Accessed 17 June 2019. Column 6: ILO (International Labour Organization) (2018b). World Social Protection Report 2017–19. Geneva. www.social-protection.org/gimi/gess/ShowWiki.action?id=594. Accessed 13 April 2018. Column 7: and 8 World Bank (2019a). World Development Indicators database. Washington, DC. http://data.worldbank.org. Accessed 15 July 2019. Column 9: World Tourism Organization (2020), Compendium of Tourism Statistics dataset, Madrid, http://statistics.unwto.org/method\_notes\_tourism\_stat\_database\_2019ed. Accessed 02 April 2020.