A volunteer helps a woman fill out paperwork before her COVID-19 vaccine in Rwanda. COVAX is the only global initiative that is working with governments and manufacturers to ensure COVID-19 vaccines are available worldwide to both higher-income and lower-income countries.

Photo: WHO / Andre Rugema

most urgent priority is to stop the pandemic. It is a moral responsibility of the global community to go beyond nationalistic interests and maintain focus on its poorest, most vulnerable members, since the pandemic will not be over anywhere — as a public health crisis or as a drag on the global economy — until it is under control everywhere.

New integrated approaches that go beyond the actions agreed in the IPoA and Sustainable Development Goals (SDGs) are needed to build systemic resilience to future shocks in all LDCs, trough mechanisms that allow them to deal with risks associated to various types of shocks, both in terms of preparedness and recovery. Focus should be on the transformation of systems from agriculture, digital economy and social protection to the international finance architecture, taking a more integrated approach. The capacity of LDCs and development partners to handle risk and jointly develop new solutions, including through the use of new technologies needs to be strengthened. This means going beyond increased support for LDCs but focus on the creation of opportunities for LDCs to truly take the leadership in their own development and the building of inclusive societies.

A. SPREAD OF COVID-19 AND DIRECT HEALTH EFFECTS

A.1 THE STATE OF COVID-19 IN LEAST DEVELOPED COUNTRIES

With over 124 million confirmed cases and 2.7 million deaths world-wide, reported by the World Health Organization (WHO) (at the time of writing),[3] the COVID-19 pandemic is one of the greatest global challenges in the history of the United Nations. No country was ready to face the novel coronavirus, an invisible enemy that quickly spread across the globe wreaking havoc on even the most advanced public health systems and economies, causing immeasurable human suffering and an unprecedented global social and economic crisis. Grave concerns were immediately voiced about the disastrous effects the pandemic could have on the poorest countries with the weakest health care systems in the world, i.e. the least developed countries.

Almost one year later, the only solution to the COVID-19 pandemic seems to be finally within reach. Several effective vaccines have been developed but the pandemic will not be over anywhere—as a public health crisis or as a drag on the global economy—until it is under control everywhere. Equitable global distribution of effective vaccines is both a moral responsibility of the global community and a global public good requiring strong global solidarity. Until that is assured, the virus and its variants will continue to ravage the world.

Only a handful of least developed countries have so far been spared by the health effects of the virus, thanks to their extreme geographical remoteness further accentuated by the implementation of border closures and travel bans. The rest of the LDCs, especially in Sub-Saharan Africa and Asia, have seen the number of confirmed COVID-19 cases and deaths grow since the beginning of the pandemic, even if at a much lower rate than elsewhere at least initially. Figures A.1 and A.2 show the spread of COVID-19 in the LDCs as compared to other developing countries as well as high-income countries.

Healthcare System Capacities: OECD countries versus Least Developed Countries

[3] The cutoff date for the data analysis in this section is 25 March 2021. All data is from the WHO database on COVID-19, unless otherwise stated. The database is constantly updated: https://covid19.who.int/.

Figures A.1 and A.2 show that the health outcome of the COVID-19 pandemic has been limited in LDCs relative to that in other countries. While LDCs account for about 14 percent of the global population, LDCs have reported only 2 percent of the confirmed global COVID-19 cases and 1 percent of the deaths. The comparatively lower health toll of the pandemic in LDCs has been attributed to different reasons, including early policy action and demographic factors. The figures might also be underestimated because of many factors, among which are relatively limited testing capacities and low health center attendance rates. The pandemic affected most LDCs later than countries in East Asia, Western Europe, and North America. They therefore had the time to adopt early containment and mitigation measures, such as quarantine, social distancing and travel bans, which prevented the pandemic from spreading, at least initially. As shown in this section, within the LDC group, the most affected were the Asian countries, especially Bangladesh and Nepal. African LDCs, on average, have recorded lower infection and mortality rates.

However, as confirmed cases continue to increase worldwide, the present analysis can only be partial. The ultimate impact of the pandemic on individuals and communities living in the most structurally disadvantaged group of countries in the world remains still quite uncertain. Any surge in infections could quickly lead to health crisis scenarios given the insufficient quantity and quality of personnel, equipment, infrastructure and medical supplies in most LDCs, which are a consequence of chronically under-funded health care systems and aggravated by their pre-existing load of infectious and non-infectious diseases.

Data visualization prepared by UNDP and adapted in table A.1 presents a series of indicators for the least developed countries showing the level of preparedness to respond and cope with the impacts of the still unfolding COVID-19 crisis. Highlighted here are the level of human development of the least developed countries, their healthcare system capacity and two indicators on connectivity. 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, as shown in the table A.1, an OECD country has on average 50 hospital beds, about 30 physicians, and 80 nurses per 10,000 people, compared to 7 hospital beds, 2.5 physicians, and 6 nurses in an LDC.

Figure A.1: COVID-19 Cases / 1M Population

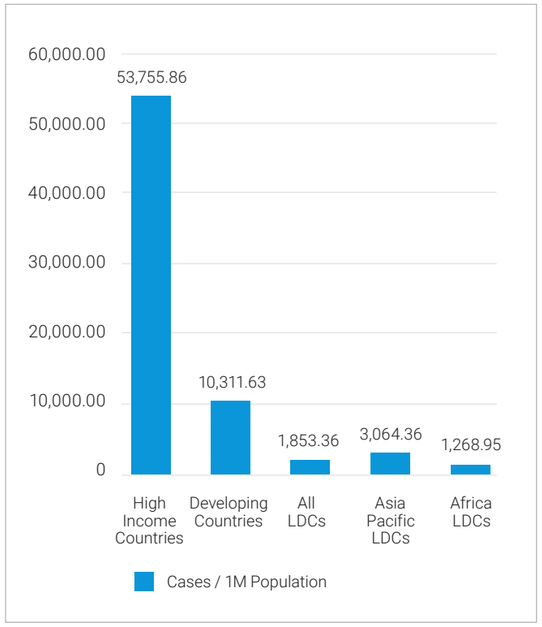
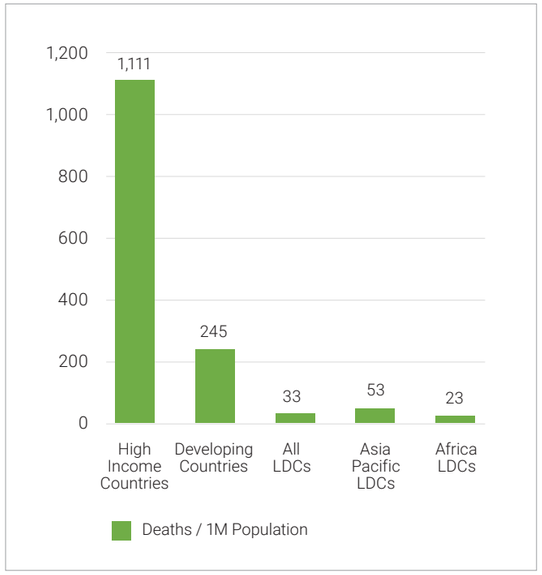


Figure A.2: COVID-19 Deaths / 1M Population



Source: UN-OHRLLS calculations based on data from WHO (https://covid19.who.int/) and UN DESA Population– both accessed on 25 March 2021.

Table A.1: Preparedness of least developed countries to respond to COVID-19

		Human development			Health System			
		Human development index (HDI)	Inequality-adjusted HDI (IHDI)	Inequality in HDI	Physicians	Nurses and midwifes	Hospital beds	Current health expenditure
		(value)		*(%)*	*(per 10,000 people)*			*(% of GDP)*
HDI rank	**Country**	**2018**	**2018**	**2018**	**2010-2018**	**2010-2018**	**2010-2018**	**2016**
131	Timor-Leste	0.626	0.450	28.0	7.2	17	59	4.0
132	Kiribati	0.623	..	..	2.0	48	19	11.9
134	Bhutan	0.617	0.450	27.1	3.7	15	17	3.5
135	Bangladesh	0.614	0.465	24.3	5.3	3	8	2.4
137	Sao Tome and Principe	0.609	0.507	16.8	3.2	23	29	6.0
140	Lao People's Democratic Republic	0.604	0.454	24.9	5.0	10	15	2.4
141	Vanuatu	0.597	..	..	1.7	14	17	3.7
143	Zambia	0.591	0.394	33.4	0.9	9	20	4.5
145	Myanmar	0.584	0.448	23.2	8.6	10	9	5.1
146	Cambodia	0.581	0.465	20.1	1.7	10	8	6.1
147	Nepal	0.579	0.430	25.8	6.5	27	3	6.3
149	Angola	0.574	0.392	31.7	2.1	..	..	2.9
153	Solomon Islands	0.557	..	..	2.0	21	14	5.2
156	Comoros	0.538	0.294	45.3	1.7	9	22	7.6
157	Rwanda	0.536	0.382	28.7	1.3	8	16	6.8
158	Nigeria	0.534	0.349	34.6	3.8	15	..	3.6
159	Tanzania (United Republic of)	0.528	0.397	24.9	0.4	4	7	4.1
159	Uganda	0.528	0.387	26.7	0.9	6	5	6.2
161	Mauritania	0.527	0.358	32.1	1.8	10	..	4.2
162	Madagascar	0.521	0.386	25.8	1.8	1	2	6.0
163	Benin	0.520	0.327	37.1	1.6	6	5	3.9
164	Lesotho	0.518	0.350	32.5	0.7	7	..	8.1
166	Senegal	0.514	0.347	32.5	0.7	3	3	5.5
167	Togo	0.513	0.350	31.7	0.5	3	7	6.6
168	Sudan	0.507	0.332	34.6	4.1	8	8	5.7
169	Haiti	0.503	0.299	40.5	2.3	7	7	5.4
170	Afghanistan	0.496	..	..	2.8	3	5	10.2
171	Djibouti	0.495	..	..	2.2	5	14	3.5
172	Malawi	0.485	0.346	28.7	0.2	3	13	9.8
173	Ethiopia	0.470	0.337	28.4	1.0	8	3	4.0
174	Gambia	0.466	0.293	37.2	1.1	16	11	4.4
174	Guinea	0.466	0.310	33.4	0.8	4	3	5.5
176	Liberia	0.465	0.314	32.3	0.4	1	8	9.6
177	Yemen	0.463	0.316	31.8	3.1	7	7	5.6
178	Guinea-Bissau	0.461	0.288	37.5	2.0	14	10	6.1
179	Congo (Dem Rep of the)	0.459	0.316	31.0	0.9	5	..	3.9
180	Mozambique	0.446	0.309	30.7	0.7	4	7	5.1
181	Sierra Leone	0.438	0.282	35.7	0.3	10	..	16.5
182	Burkina Faso	0.434	0.303	30.0	0.6	6	4	6.8
182	Eritrea	0.434	..	..	..	..	7	3.0
184	Mali	0.427	0.294	31.2	1.4	4	1	3.8
185	Burundi	0.423	0.296	30.1	0.5	7	8	6.2
186	South Sudan	0.413	0.264	36.1	..	..	..	..
187	Chad	0.401	0.250	37.7	0.5	4	..	4.5
188	Central African Republic	0.381	0.222	41.6	0.6	2	10	4.3
..	Somalia	..	..	..	0.2	1	9	..
..	Tuvalu	..	..	..	9.2	38	..	15.5
	Regions							
	Arab States	0.703	0.531	24.5	11.1	21	15	4.9
	East Asia and the Pacific	0.741	0.618	16.6	14.8	22	35	4.8
	Europe and Central Asia	0.779	0.689	11.5	24.9	61	51	5.2
	Latin America and the Caribbean	0.759	0.589	22.4	21.6	47	20	8.0
	South Asia	0.642	0.520	19.0	7.8	17	8	4.1
	Sub-Saharan Africa	0.541	0.376	30.5	2.1	10	8	5.3
	Groups							
	Least developed countries	**0.528**	**0.377**	**28.6**	**2.5**	**6**	**7**	**4.2**
	Developing countries	0.686	0.547	20.3	11.5	23	21	5.3
	Organisation for Economic Co-operation and Development	0.895	0.790	11.7	28.9	80	50	12.6
	World	**0.731**	**0.596**	**18.6**	**14.9**	**34**	**28**	**9.8**

Low Medium-low Medium Medium-high High

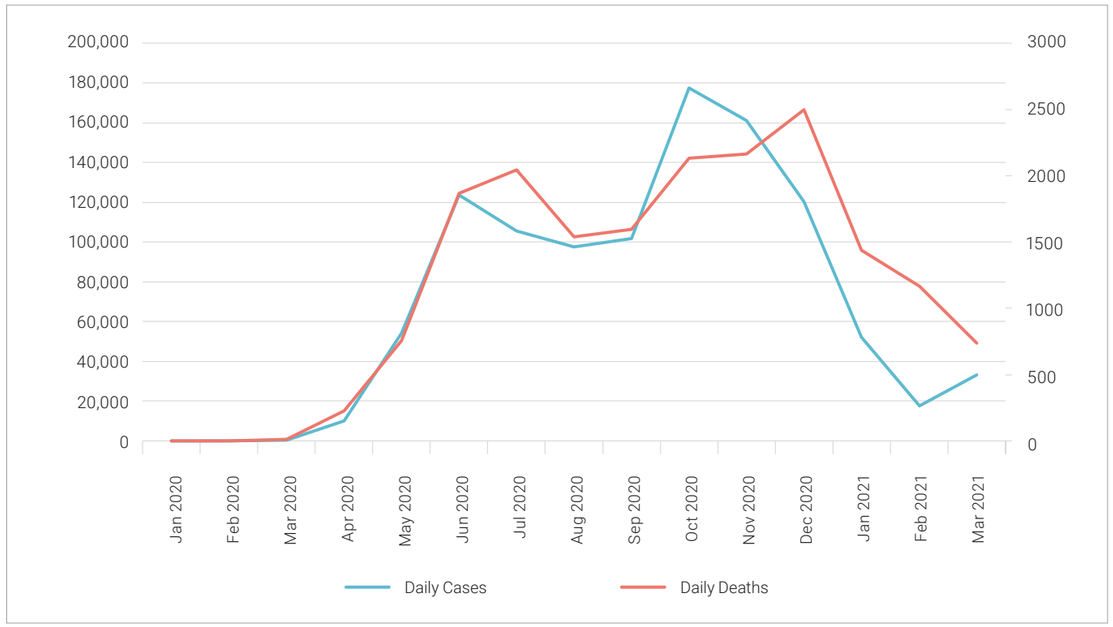
There is no doubt that the LDCs were by far in the worst possible conditions to face a health and socio-economic shock such as the one brought by COVID-19. When the virus hit them, they were already lagging far behind on all SDGs. For instance, on average, two thirds of LDCs' urban population live in slums and access to basic sanitation services remains very low, in particular in rural areas.

It is against this backdrop that LDCs began to report COVID-19 epidemics of different intensities. At the outset it should also be noted that insufficient testing capacity may lead to underestimating the level of true infections in many of the LDCs (Hulland, 2020). In addition, data collected over such a wide range of countries and geographical areas will inevitably be of variable quality.

By 25 March 2021, in the Pacific region, only Solomon Islands had reported 18 cases – all except one in the month of October 2020 – while Vanuatu[4] recorded its first 'border' case in early November and another two cases on 8 March. No deaths from COVID-19 were reported by any of the Pacific LDCs.

The number of cases and fatalities varies greatly in Asia (see figure A.3 for trends and table A.2 for country details). After steadily declining since October 2020, infections have been rising again starting in February 2021. For instance, Lao People's Democratic Republic reported only 49 confirmed cases and no death. Timor-Leste has been recording a steep increase since late January 2021, from 64 to 372 in late March. Bangladesh, the most populous among the LDCs, reported over five hundred and seventy thousand cases or more than three thousand four hundred cases per 1 million people. COVID-19 has claimed the lives of well over eight thousand Bangladeshi. The highest per capita values were recorded by Nepal, a landlocked, mountainous LDC and the first LDC to detect a case of COVID-19 infection back on 23 January 2020 in a patient who had returned from Wuhan, China (Panthee, 2020). Nepal experienced a sharp increase in cases and deaths during the last three months of 2020.

Figure A.3: Evolution of COVID-19 cases and deaths in Asia Pacific Least Developed Countries and Yemen from January 2020 to March 2021



Source: UN-OHRLLS calculations based on data from WHO (https://covid19.who.int/) accessed on 25 March 2021.

[4] Vanuatu graduated from the LDC category on 4 December 2020.

Table A.2: COVID-19 cumulative cases and deaths, and vaccine doses administered, total and per 1 million people in Asian LDCs (as of 25 March 2021)

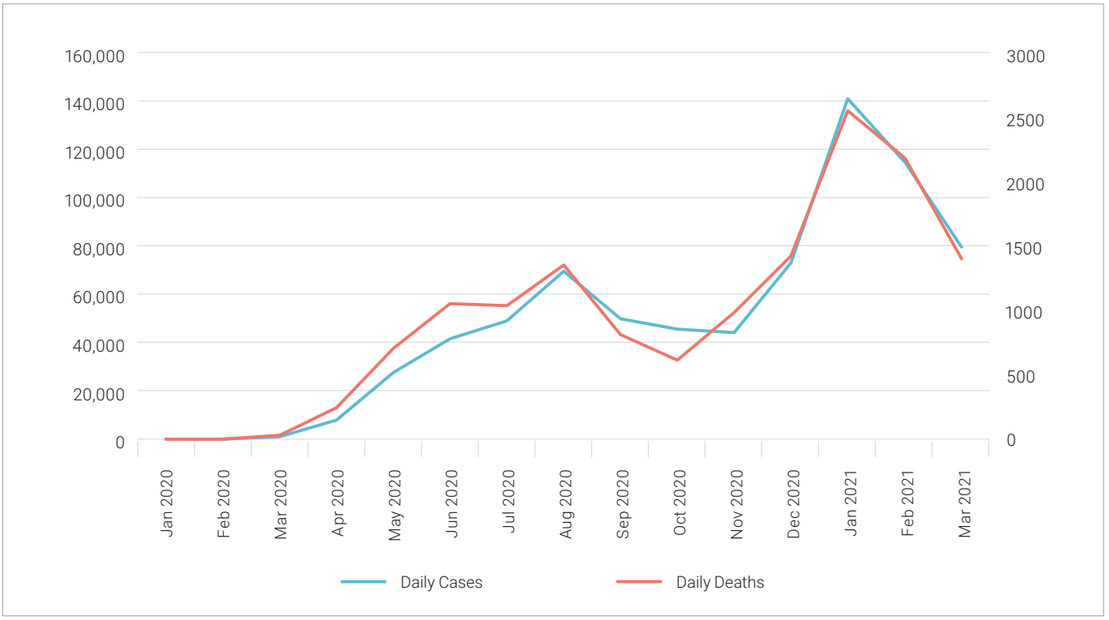
LDCS	CASES – TOTAL	CASES – PER 1M POPULATION	DEATHS – TOTAL	DEATHS – PER 1M POPULATION	VACCINE DOSES ADMINISTERED	VACCINES – PER 1M POPULATION
Afghanistan	56,177	1,443	2,466	63	34,743	892
Bangladesh	573,687	3,483	8,720	53	4,990,232	30,301
Bhutan	869	1,126	1	1	244,133-	316,393
Cambodia	1,792	107	4	0.2	328,526	19,650
Lao PDR	49	7	0	0	3,341	459
Myanmar	142,246	2,614	3,204	59	105,490	1,939
Nepal	276,056	9,474	3,019	104	1,634,903	56,111
Timor-Leste	335	254	0	0	-	-
Yemen	3,520	118	772	26	-	-
Total	**1,054,731**	**3,074**	**18,186**	**53**	**7,341,368**	**21,399**

Source: Data from WHO (https://covid19.who.int) accessed on 25 March 2021. Data on vaccine doses administered for Bhutan from Ministry of Health (http://www.moh.gov.bt).

In Haiti, the only LDCs in the Americas, a total of over a thousand cases per 1 million people have been reported with 251 deaths or about 22 deaths per 1 million people.

The 33 Sub-Saharan African LDCs reported a total of just under five hundred thousand cases, which is less than the total cases in Bangladesh alone, and an average mortality rate that is less than a third of their Asian counterparts. In general, the African region remains among the least affected worldwide. In 2020, following increases in infections and deaths from May to July, COVID-19 cases declined in August and September, before plateauing in October and steadily increasing again starting in November with a peak reached in mid-January 2021 (see Figure A.4).

Figure A.4: Evolution of COVID-19 cases and deaths in African Least Developed Countries and Haiti from January 2020 to March 2021



Source: UN-OHRLLS calculations based on data from WHO (https://covid19.who.int/) accessed on 25 March 2021.

Just as in the Asian region, the situation in the African continent is highly heterogeneous and progress varies considerably (see table A.3 for country-by-country data).

Sao Tome and Principe, a small island LDC in the Gulf of Guinea with a population of barely 220,000, recorded 2,174 cases and 17 deaths. In table A.3, because of its small population count, it appears as one of the countries with the highest rates of infection and mortality in relative terms. Djibouti and Comoros are countries with populations slightly less than 1 million and also feature among those most affected.

Among larger African LDCs, Mauritania, The Gambia and Lesotho experienced over 50 deaths per million inhabitants. It is indeed concerning that, since late November 2020, steeper increases have been observed in most Sub-Saharan African LDCs, with notable signs of reduced adherence to public health and social measures. Many of these countries may soon reach critical levels given their low hospital capacities.

Strengthening the testing and surveillance capacity in LDCs remain remains of high priority. The analysis of the detected cases, severity and outcomes of the cases within a country is crucial if health experts and policy maker can have a clear picture of where the pandemic is heading and what measures should be taken to curb the infection before it becomes uncontrollable. In some LDCs there is insufficient or no data available on testing to know how much is being done.[5] Even when infrastructure is available, a country's ability to detect the spread of the virus requires dedicated medical equipment, trained human resources and the availability of reagents to perform COVID-19 Polymerase chain reaction (PCR) tests. The WHO has been providing reagents to a large number of laboratories in Africa, as part of the influenza virological surveillance network. Synergies among Africa's Center for Disease Control and Prevention (CDC), the WHO and the West Africa Health Organization led to the increase in COVID-19 testing laboratories in Africa from 2 to 43 between February and March 2020.

Some LDCs with manufacturing capacity, such as Senegal and Bangladesh, repurposed industrial facilities to produce much needed medical goods such as face masks, hand sanitizers and personal protective equipment (PPE). In Uganda, a collaborative effort between Makarere University, Kiira Motors Corporation–a local car manufacturer–and the Ministry of Science, Technology and Innovation led to the production of low-cost ventilators.

[5] See testing rates per country at Our World in Data, a UK-based project that collates COVID-19 information, available at https://ourworldindata.org/coronavirus.

Table A.3: COVID-19 cumulative cases and deaths, and vaccine doses administered, total and per 1 million in African LDCs (as of 25 March 2021)

LDCS	CASES – TOTAL	CASES – PER 1M POPULATION	DEATHS – TOTAL	DEATHS – PER 1M POPULATION	VACCINE DOSES ADMINISTERED
Angola	21,757	662	530	16	70,612
Benin	6,818	562	90	7	-
Burkina Faso	12,559	601	145	7	-
Burundi	2,628	221	6	1	-
Central African Rep.	5,087	1,053	64	13	-
Chad	4,427	270	157	10	-
Comoros	3,666	4,216	146	168	-
Congo, Dem. Rep.	27,571	308	726	8	-
Djibouti	6,658	6,739	64	65	60
Eritrea	3,118	879	7	2	-
Ethiopia	188,902	1,643	2,674	23	Data pending
Gambia, The	5,255	2,174	161	67	691
Guinea	18,945	1,443	113	9	34,178
Guinea-Bissau	3,568	1,813	55	28	-
Lesotho	10,538	4,919	309	144	13,369
Liberia	2,042	404	85	17	-
Madagascar	22,616	817	355	13	-
Malawi	33,270	1,739	1,098	57	38,707
Mali	9,330	461	361	18	-
Mauritania	17,630	3,792	447	96	-
Mozambique	66,306	2,121	747	24	70,000
Niger	4,918	203	185	8	-
Rwanda	20,896	1,613	292	23	345,723
Sao Tome and Principe	2,157	9,842	34	155	6,027
Senegal	37,920	2,265	1,016	61	207,618
Sierra Leone	3,948	495	79	10	681
Somalia	10,214	643	441	28	1,910
South Sudan	9,890	884	106	9	-
Sudan	31,147	710	1,986	45	270
Tanzania, United Republic of	509	9	21	0	-
Togo	8,960	1,082	104	13	39,237
Uganda	40,687	890	339	7	28,761
Zambia	86,535	4,707	1,182	64	-
Total	**730,472**	**1,041**	**14,125**	**20**	

Source: Data from WHO (https://covid19.who.int) accessed on 25 March 2021.

A.2 EARLY EFFECTIVE PUBLIC HEALTH RESPONSES, DEMOGRAPHICS AND OTHER FACTORS

At the outset of the pandemic, often before their first cases were identified, many LDCs adopted early public health responses and social measures, building on previous experiences with infectious diseases like human immunodeficiency virus (HIV), drug-resistant tuberculosis and Ebola. These measures ranged from recommendations to avoid handshakes and increase handwashing, social distancing and wearing of face masks to more restrictive measures, such as government-enforced school closures and cancellation of sports matches and religious gatherings.

The African Union (AU) acted swiftly, endorsing in March 2020 a joint continental strategy for COVID-19 outbreak in conjunction with the WHO. "The continent of Africa reacted aggressively", John Nkengasong, the director of the Africa Centres for Disease Control and Prevention, stated (Moore, 2020).[6] The African CDC opened in January 2017 as the first continent-wide health agency. It was created on the heels of the 2014-2016 Ebola outbreak, which had claimed the lives of over 11,000 people in West Africa. It has been playing a central role in the response to the pandemic in the continent. The disease caused by the novel coronavirus is different, of course, from Ebola but the structure to respond to it, such as the incident-management system, rapid-response teams, trained contact tracers, logistics routes, and other public-health tools and protocols were already in place and just needed to be adapted to respond to the coronavirus.

By the end of March 2020, most countries had imposed travel bans on most affected Asian and European countries and had instituted mandatory quarantine periods for most travelers. LDCs closed their borders, allowing only cargo, freight and the expatriation of foreign nationals.

Airport staff from Sierra Leone to Uganda were wearing masks, taking temperatures and contact details long before their United States (US) and European counterparts took such precautions. Sierra Leone repurposed disease-tracking protocols that had been established in the wake of the Ebola outbreak in 2014, in which almost 4,000 people died in the country. The government set up emergency operations centers in every district and recruited 14,000 community health workers, 1,500 of whom were trained as contact tracers.

Senegal recorded its first case in late February 2020, the second confirmed case in Sub-Saharan Africa at the time. There were justified fears that the country lacked equipment for the treatment of coronavirus as there were just 12 beds with limited oxygen supplies. Based on previous Ebola and Cholera experiences, it was clear that the country needed to act quickly to contain the pandemic. Senegal's Institute Pasteur was one of only two laboratories in Africa able to test for COVID-19 at the onset of the pandemic in early 2020. Just like Rwanda, Senegal closed its borders and announced curfews when there were still very few confirmed cases. Health ministries began contact tracing early. After lifting its national lockdown in April, Rwanda focused on controlling local transmission by imposing local lockdowns in high burden areas of Kigali. In addition, to minimize contact time with confirmed cases and therefore reducing the risk of contamination of health professionals in COVID-19 treatment centers in Kigali City, robots were deployed in May 2020. The 5 human-size robots are programmed to perform temperature screening, take readings of vitals, deliver video messages, and detect people not wearing masks then instruct them to wear masks properly.[7]

Uganda and Ethiopia also responded to their first cases with aggressive contact tracing and isolation and put considerable resources into checking their work. In early May 2020, Uganda completed its first rapid-assessment survey, a randomized sampling of 20,000 people; it uncovered only two new local cases. The Ugandan health authorities also tested around 1,000 truck drivers a day, coming from neighboring countries that had not been monitoring COVID-19 spread as aggressively. Ethiopia completed a door-to-door survey of its capital, Addis Ababa, in just three weeks, documenting symptoms and travel history for its five million residents, and testing anyone who was found to be at risk for the disease or symptomatic.

Lesotho declared a state of emergency, closed schools on 18 March 2020 and went into a three-week lockdown about 10 days later in unison with many other southern African neighbors. Only days after the lockdown was lifted–in early May–did the first cases get confirmed.

Like many other LDCs, Cambodia, with a weak and under funded health care system, could risk a devasting death toll if the COVID-19 disease took hold. Thanks to strict entry and quarantine requirements, the country has been able to keep

[6] https://www.newyorker.com/news/news-desk/what-african-nations-are-teaching-the-west-about-fighting-the-coronavirus; https://www.francetvinfo.fr/sante/maladie/coronavirus/video-covid-19-une-epidemie-comme-ca-il-faut-lui-sauter-a-la-gorge-un-microbiologiste-francais-explique-pourquoi-l-asies-en-sort-mieux_4178323.html; https://www.banquemondiale.org/fr/news/feature/2020/04/03/in-the-face-of-coronavirus-african-countries-apply-lessons-from-ebola-response .

[7] https://www.afro.who.int/news/robots-use-rwanda-fight-against-covid-19

the number of cases to just 307 with zero deaths. Schools across much of the country reopened with a phased approach only in early November.

Timor-Leste has been fighting two infectious diseases simultaneously: dengue amid COVID-19 pandemic. It was assessed that the country' expertise in managing dengue helped to respond to the pandemic, as the public health response relied on some of the same principles. Timor-Leste's strategy relied on early intervention and a mandatory quarantine with particular attention given to Timorese returning from overseas and reinforced security and surveillance at the borders. All cases were identified before reaching the community. However, while Timor-Leste's testing and tracing measures in response to COVID-19 have been praised by experts, the country's low capacity of hospital services, raises concerns in terms of a potential second wave of the virus that could affect the country's ability to respond to both diseases simultaneously, compounded with serious risks of hunger, as Timor-Leste is heavily dependent on food imports (Neves, 2020).[8]

Demographic factors, such as the proportion of young population–more resilient in case of infection–in LDCs compared to other countries, could also partly explain the lesser impact of COVID-19 in LDCs. Lower population density in some of the LDCs, especially in rural areas in Africa, may be another factor. Asian LDCs have comparatively higher population densities which favoured the spread of the pandemic. Poor households, who constitute the largest proportion of the population in least developed countries, are likely to be hit the hardest by COVID-19 since the majority live in crowded conditions implying that the infection rate, or the average number of people that each infected case will infect, in such crowded conditions is likely to far above estimates in high-income countries. Serious efforts are needed to interrupt the spread to these vulnerable communities.

In addition, the application of large-scale prevention measures that have worked in other countries such as frequent handwashing, limiting movement and social distancing face important barriers in least developed countries, including large informal settlements, lack of appropriate water and sanitation and high concentrations of marginalized communities, including millions of forcibly displaced people and refugees. According to UNICEF (2020, October), nearly three quarters of the people in the LDCs lack basic handwashing facilities at home, and 7 out of 10 schools have no place for children to wash their hands with water and soap. Furthermore, in LDCs about 22 percent of healthcare facilities lack access to improved water and improved sanitation services (IFC, 2020).

Therefore, it is imperative that response measures be contextualized to address underlying individual and structural factors in LDCs that are likely to complicate a strategic response. Interventions also must be balanced with the need to maintain individual livelihoods and social cohesion. Governments are beginning to relax these interventions given the discussion that such interventions may cause more deaths from hunger and other diseases than the coronavirus itself. A careful application of interventions and lockdowns is still required to slow down the rate of transmission to levels which health systems can handle, while at the same time avoiding excessive lockdowns that may hurt the poorest.

For instance, workers who lose their jobs in urban areas due to economic lockdowns are likely to move back home to rural areas where large elderly populations reside, heightening health risks. Consequently, measures such as the provision of adequate water and sanitation subsidies, reliable food distribution and targeted restrictions of movement (e.g. from urban to rural) could be useful in mitigating the spread. Targeted social protection schemes are also extremely important. For example, Togo's social protection program, Novissi, has been using insights from artificial intelligence (AI) and big data, in an experiment to identify the poor in greatest need for cash transfer delivery.[9]

A.3 COVID-19 IMPACT ON OTHER DISEASES OR MEDICAL TREATMENTS

Secondary effects of the pandemic stem from the severe interruptions of social and economic activities adopted by LDCs and discussed in the following sections of this report, as well as from the potentially devastating effects of reduced delivery of other health services, including routine vaccination and malaria, Tuberculosis and HIV control programs.

In the context of poorly funded health care systems in LDCs, the supply and demand for other health services, not related to COVID-19 treatment, has also been affected, disproportionately impacting the poor (WHO, 2020c; Shadmi et. al, 2020). On the supply side, with so much effort concentrated on the fight

[8] https://www.abc.net.au/radio-australia/programs/pacificbeat/timor-dengue-fixed/12360020; https://thediplomat.com/2020/06/timor-lestes-covid-19-response/; https://e-global.pt/noticias/lusofonia/timor-leste/timor-leste-lu-olo-e-governo-analisam-seguranca-fronteirica/

[9] See https://cega.berkeley.edu/impact/togo-cash-transfers/

against COVID-19, other conditions are bound to be neglected, such as malaria, maternal and child health conditions, and tuberculosis which account for some of the highest death rates among the poor and account for a substantial share of the disease burden. Previous studies have shown that during pandemics, all-cause mortality rises substantially (Nogueira et. al, 2020; Sinnathamby et. al, 2020; Michellozzi et al., 2020; Vestergaard et. al., 2020; Kraindler et. al., 2020). Since the burden of these conditions is already disproportionally borne by the poor, the pandemic is likely to reinforce these inequalities. On the demand side, people are likely to shun or forego care. This is likely due to the fear of contracting coronavirus in health facilities or a result of perceived reduction in the quality of health services as health resources are being concentrated towards the fight against the pandemic.

As COVID-19 causes substantial disruptions to health services, due to cases overburdening the health system or response measures limiting usual programmatic activities, many areas, notably countries in sub-Saharan Africa are facing increasing obstacles and challenges to sustaining the continuum of HIV and TB treatment in high-burden HIV/TB countries. The intersecting coronavirus, TB and HIV epidemics in countries where HIV and TB have the highest prevalence and incidence pose many challenges from the point of view of diagnostics, clinical management and post-COVID-19 epidemic TB incidence as COVID-19 pulmonary fibrosis may rapidly increase TB incidence (CDC, 2020; Hogan et al., 2020; Jiang et. al., 2020; Gralinsky and Baric, 2015). The combination of COVID-19 with the high prevalence of other diseases hampers the delivery of appropriate care and prevention. Sudan was facing the re-emergence of polio after previously being declared polio-free, and malaria has reached the epidemic-level in 11 out of its 18 states. Furthermore, it is estimated that there was a 15 percent drop in the use of Measles-containing-vaccines (MCVs) during the first quarter of 2020 as compared to the same period the year prior.[10] Most activities foreseen in the Integrated Management of Childhood Illnesses (IMCI) plan were canceled and there was a 65 percent decrease in measles vaccination coverage among children under five years of age. In Yemen, thousands of people could be dying from undetected cases of cholera because COVID-19 has overwhelmed the country's health facilities (Oxfam, 2020).

Changes in the health services due to COVID-19 also affected neglected tropical disease (NTD) programmes. Due to the risks, surgeries for trichiasis and hydrocele have been suspended, as well as community-directed treatments and school-based distribution strategies. Mass Drugs Administration (MDA) are delayed with potential impact on transmission (Molyneux et al., 2020). Furthermore, the consequential mental health morbidity and suicidal ideations will place an increased burden on already overstretched services, against the background of mental illness being the world's leading cause of morbidity (Molyneux et al., 2020). For instance, Bhutan mobilized a National Mental Health Response Team, comprising psychiatrists, clinical psychologists and counselors, involved in developing awareness and advocacy materials on mental health in times of COVID-19 (UNCT, 2020).

Fragile Settings

Among the LDCs most affected in their national health consequences, many are countries which compounded the COVID-19 crisis with an already critical political situation. Suffering from violent conflict often exacerbates the spread of infectious diseases, as seen in the recent resurgence of polio in Syria, cholera outbreaks in the conflict zones in Yemen, and the persistence of Ebola in insecure eastern regions of the Democratic Republic of the Congo (Bousquet & Fernandez-Taranco, 2020). On the one hand, the delivery of aid is hampered together with an appropriate response of a healthcare system already weakened (sometimes almost annihilated), but also often signifies a fairly widespread absence of trust in public institutions (Minoletti & Hein, 2020). The latter creates a climate where misinformation about actions to prevent the spread of the virus circulate, as well as situations where people presenting symptoms would not seek treatment, as they would believe they would not be treated adequately.

Additionally, in areas affected by armed conflict and violence, physical isolation is often not a possibility for those living in temporary shelters, camps, and crowded places, such as refugees and displaced persons, which are among the most vulnerable to the virus. Furthermore, the pandemic can in some cases catalyze existing tensions, with effects such as the risk of rise in acts of violence in the event of tensions between the population and government officials; the risk of the current crisis being instrumentalized by armed groups and that of xenophobic violence (AFD, 2020).

[10] https://www.who.int/health-cluster/news-and-events/news/Multiple-emergencies-Sudan/en/

A.4 POLICY RECOMMENDATIONS AND PROGRESS TOWARDS ENSURING EQUITABLE DISTRIBUTION OF EFFECTIVE VACCINES TO THE LDCs

The continuing COVID-19 pandemic and its multifaceted consequences have laid bare structural inequalities among and within countries. Inadequate health care systems have suffered a devastating blow. As we enter the second year of the pandemic, at the forefront of public policy worldwide should be the importance of strengthening health systems, emergency preparedness and the resilience of people in its broad sense.

Long ignored risks, such as the underinvestment in health and gaps in social safety nets, have heightened vulnerabilities that are costing the global economies hundreds of billion dollars. For example, handwashing is one of the cheapest, easiest and most effective ways to prevent the spread of the coronavirus, but in 2017 only 28 percent of people in LDCs had basic handwashing facilities with soap and water at home. Closing the gaps in water, sanitation and hygiene are critical to containing the spread of COVID-19 and other diseases.

Clear steps can be taken by all countries to stop the pandemic and implement recovery plans to address structural weaknesses and invest in more resilient societies. In its October 2020 Policy Brief, the UN Secretary General outlined a clear plan of action that has its core the quest for universal health coverage, as part of the Sustainable Development Goals (UN, 2020).

The most urgent action remains to control any further transmission of the COVID-19 virus. WHO has provided comprehensive guidance on effective public health measures. For public health policy in LDCs, testing, isolating and contact tracing all need to be increased. It will be crucial to ensure that flexible responses are driven by high quality real-time data. Understanding the factors that accelerate and those that mitigate the spread and mortality of COVID-19, while accounting for local realities, is fundamental for sound public health measures to tackle this pandemic. Vulnerable groups should be clearly identified so they can be properly and equitably supported during this long crisis. At a time of a pandemic, no single community should be marginalized.

LDCs' health care systems must be strengthened and better funded. The delivery of essential health services must be protected to avoid disruptions to other priority health services that should instead be assured even during acute phases of the pandemic.

Adequate, affordable, and rapid access to new rapid diagnostics and treatments should be ensured in support of pandemic responses and recovery efforts by LDC Governments.

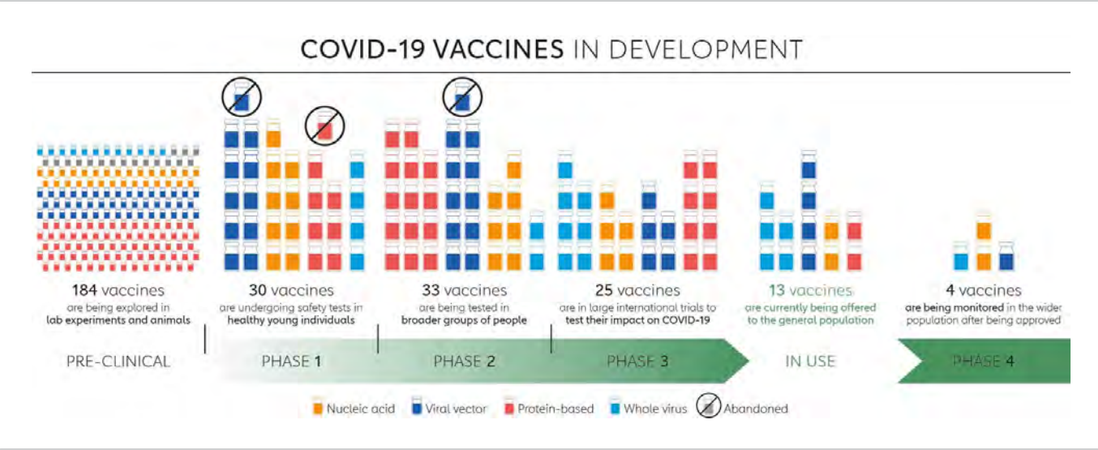
Perhaps most importantly of all, effective COVID-19 vaccines should be global public goods and their equitable access must be ensured for everyone, everywhere through the full funding of the COVID-19 Vaccines Global Access (COVAX) Facility. Led by the World Health Organization, Gavi, the Vaccine Alliance (GAVI) and Coalition for Epidemic Preparedness Innovations (CEPI), COVAX aims to accelerate the development and manufacture of COVID-19 vaccines, and to guarantee fair and equitable access for every country in the world. All 46 LDCs are included under the COVAX plans.

As shown in Figure A.5, many companies around the world have been working on the development of more than 180 vaccines that could be used as a preventive measure against the disease. Since the announcements in November 2020 of promising vaccines from BioNTech/Pfizer, Moderna and AstraZeneca, a light started shining at the end of the pandemic tunnel. More than ten vaccines have so far been approved for general use in people 18-years and older. The development of safe and extremely effective COVID-19 vaccines in such a short time is something close to a medical miracle and portends an end to the global crisis that dominated 2020 and still continues to ravage the world in early 2021.

BioNTech/Pfizer has already agreed to sell the vast majority of the 1.3 billon doses it aims to produce in 2021 to the US, EU, Canada, Japan and UK. Furthermore, its vaccine needs ultra-cold chain distribution, requiring transportation and storage temperatures at minus 70 degrees Celsius. Few facilities in the developing world are equipped to handle this delivery and storage infrastructure requirement. Moderna's vaccine has easier storage requirements and is part of the COVAX portfolio of vaccines. Both BioNTech/Pfizer and Moderna require two doses. The Johnson & Johnson vaccine, which received the US FDA emergency authorization on 27 February 2021, requires only a single dose.

The Oxford-AstraZeneca vaccine, which was approved in late December 2020 for emergency supply in the UK, could

Figure A.5: COVID-19 vaccines in development



Source: GAVI: https://www.gavi.org/vaccineswork/covid-19-vaccine-race (accessed 25 March 2021) where a full list of all vaccines in development is made available.

be produced at many sites around the world as the company has partnerships with suppliers in India, Latin America, Russia and Thailand. The Serum Institute of India, the world's largest vaccine producer, has been manufacturing AstraZeneca Plc's Covishield and another formulation developed by Novavax Inc. The AstraZeneca vaccine is also part of the COVAX portfolio and can be stored in a domestic fridge. Based on a viral vector, it is also cheaper (around US$4) than BioNTech/Pfizer and Moderna's mRNA vaccines–around US$20and $33, respectively. AstraZeneca has also made a "no profit pledge".

At the global level, while more than 200 million doses have already been administered worldwide, the global roll out so far has highlighted vast inequalities. With many higher income countries securing deals directly with pharmaceutical companies, many lower income countries will rely on COVAX to gain access to Covid-19 vaccines. In support of its mission to expedite early availability of vaccines to lower-income countries, COVAX exercised an option via an existing agreement with the Serum Institute of India to receive its first 100 million doses of the Covishield vaccine manufactured by the Indian producer.[11] WHO, UNICEF, GAVI and many other partners have been working together to support countries in preparing for COVID-19 vaccine introduction, by providing resources and training for national and subnational focal points and health workers to equip them with the necessary knowledge and skills. Countries are also asked to prepare national deployment and vaccination plans to ensure preparedness. By late February – early March 2021, campaigns had begun in both Africa and Asia with several LDCs, such as Rwanda, Sao Tome and Principe, Sudan and Cambodia, receiving deliveries of hundreds of thousands of doses of the Covishield vaccine.[12] While COVAX is on track to deliver at least 1.3 billion doses to 92 lower income economies in the GAVI COVAX Advance Market Commitment (AMC) by the end of the year, it is clear that further funding by development partners will be needed if COVAX is to fulfill its mission. In order to achieve its target of vaccinating a fifth of people in lower-income countries in 2021, COVAX needs US$4.9 billion on top of the US$2.1 billion already in its coffers. The initiative has so far received financial support by the UK and the EU. The former has pledged over US$700 million for COVAX, and the EU has so far allocated over US$1 billion to the effort. In addition, the Bill & Melinda Gates Foundation has committed US$156 million.

In late January 2021, India's Prime Minister Narendra Modi announced that India's vaccine production and delivery capacity would be used for the benefit of all around the world in fighting the coronavirus crisis. Consignments of domestically produced coronavirus vaccines were sent under grant assistance to Bhutan, the Maldives, Nepal, Bangladesh, Myanmar, Mauritius and Seychelles.[13] However, just at the time of writing, a soaring level of infections has led the Indian government to temporarily restrict exports of the national vaccine production, triggering setbacks for vaccination drives in many other countries. Covax announced that it had told its beneficiary countries that nearly 100 million doses expected in March and April would face delays because of "increased demand for Covid-19 vaccines in India."

The African Union secured a provisional 270 million COVID-19 vaccine doses for Africa through its COVID-19 African Vaccine Acquisition Task Team (AVATT).[14] Based on that, the Africa Medical Supplies Platform (AMSP), on behalf of the Africa Centres for Disease Control and Prevention, opened pre-orders, offering an equitable access of COVID-19 vaccines doses for 55 African Union member states. Afreximbank was expected to facilitate payments by providing advance procurement commitment guarantees of up to US$2 billion to the manufacturers on behalf of the African Union member states.

The Africa Centers for Disease Control and Prevention started discussing with the Africa Union and partners about the need to create a ''continental capacity'' to produce COVID-19 vaccines, especially in view of the potential, in a few years, for regular, additional vaccination or boosting. Senegal is among the five African countries identified as having the necessary capacity.[15]

Important promises for equitable vaccine distribution have been made which is a great start in the right direction. However, vaccinating the world will entail complex obstacles of politics, cold-chain logistics and human behaviour at a scale never faced before. Diplomatic conversations are now underway to determine whether and how wealthy countries that purchased more doses than they need would be able to donate the surplus into COVAX. With the new US administration re-joining the WHO, there is hope that the United States will become an important partner in support of this globally crucial scheme.

It is a moral responsibility of the global community to go beyond nationalistic interests and maintain focus on its poorest, most vulnerable members since the pandemic won't be under control until it has been stamped out everywhere.

[11] https://www.who.int/news/item/22-01-2021-covax-announces-new-agreement-plans-for-first-deliveries

[12] The vaccine was granted Emergency Use Listing by the World Health Organization on 15 February https://www.who.int/news/item/01-03-2021-first-covid-19-covax-vaccine-doses-administered-in-africa

[13] https://www.tribuneindia.com/news/nation/us-applauds-true-friend-india-for-gifting-covid-vaccine-to-several-countries-202513

[14] https://www.afreximbank.com/amsp-opens-covid-19-vaccines-pre-orders-for-55-african-union-member-states/

[15] See https://www.africanews.com/2021/03/11/africa-seeks-continental-capacity-to-produce-vaccines/

REFERENCES

ABC Radio Australia. (2020). Timor-Leste: Fighting dengue during COVID-19. 16 June 2020. https://www.abc.net.au/radio-australia/programs/pacificbeat/timor-dengue-fixed/12360020

AFD (2020). COVID-19 and countries in conflict: Serious social and economic impact. May 2020. https://www.afd.fr/en/actualites/covid-19-and-countries-conflict-serious-social-and-economic-impact

Bousquet, F., & Fernandez-Taranco, O. (2020). COVID-19 in Fragile Settings: Ensuring a Conflict-Sensitive Response. https://www.un.org/en/un-coronavirus-communications-team/covid-19-fragile-settings-ensuring-conflict-sensitive-response

Centers for Disease Control and Prevention. (2020). Global TB Programs and COVID-19 Key Considerations and Resources. June 2020. https://www.cdc.gov/globalhivtb/who-we-are/about-us/globaltb/globaltbandcovid19.html

E-Global Notícias em Português (2020). Timor-Leste: Lu-Olo e Governo analisam segurança fronteiriça. 11 September 2020. https://e-global.pt/noticias/lusofonia/timor-leste/timor-leste-lu-olo-e-governo-analisam-seguranca-fronteirica/

IFC (2020). The impact of COVID-19 on the water and sanitation sector. June 2020. https://www.ifc.org/wps/wcm/connect/126b1a18-23d9-46f3-beb7-047c20885bf6/The+Impact+of+COVID_Water%26Sanitation_final_web.pdf?MOD=AJPERES&CVID=ncaG-hA

France Info. (2020). Le Covid-19 mieux géré en Asie: «Une épidémie comme ça, il faut lui sauter à la gorge», explique un microbiologiste. 12 November 2020. https://www.francetvinfo.fr/sante/maladie/coronavirus/video-covid-19-une-epidemie-comme-ca-il-faut-lui-sauter-a-la-gorge-un-microbiologiste-francais-explique-pourquoi-l-asie-s-en-sort-mieux_4178323.html

Geldsetzer, P., Reinmuth, M., Ouma, P., et al. (2020). Mapping physical access to healthcare for older adults in sub-Saharan Africa and implications for the COVID-19 response: a cross sectional analysis. The Lancet Healthy Longevity.

Hogan, A. B., Jewell, B. L., Sherrard-Smith, E., Vesga, J. F., Watson, O. J., Whittaker, C., & Baguelin, M. (2020). Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: a modelling study. The Lancet Global Health, 8(9), e1132-e1141.

Hulland, E. (2020). COVID-19 and health care inaccessibility in sub-Saharan Africa. The Lancet Healthy Longevity, 1(1).

Juran, S., Broer, P., Klug, S., et al. (2018). Geospatial mapping of access to timely essential surgery in sub-Saharan Africa. BMJ Global Health.

Kraindler, J., Barclay, C., & Tallack, C. (2020). Understanding changes to mortality during the pandemic. The Health Foundation. August 2020. https://www.health.org.uk/news-and-comment/charts-and-infographics/understanding-changes-to-all-mortality-during-the-pandemic

Michelozzi P, de'Donato F, Scortichini M, De Sario M, Noccioli F, Rossi P, et al. (2020). Mortality impacts of the coronavirus disease (COVID-19) outbreak by sex and age: rapid mortality surveillance system, Italy, 1 February to 18 April 2020. Euro Surveill.

Minoletti, P., & Hein, A. (2020). Coronavirus policy response needs and options for Myanmar (Rep.). International Growth Center, London. https://www.theigc.org/wp-content/uploads/2020/04/Hein-2020-coronavirus-report.pdf

Molyneux, D., Aboe, A., Isiyaku, S., & Bush, S. (2020). COVID-19 and neglected tropical diseases in Africa: impacts, interactions, consequences. International Health, Volume 12, Issue 5, Pages 367–372. https://doi.org/10.1093/inthealth/ihaa040.

Moore, J (2020). What African Nations Are Teaching the West About Fighting the Coronavirus. The New Yorker. 15 May 2020. https://www.newyorker.com/news/news-desk/what-african-nations-are-teaching-the-west-about-fighting-the-coronavirus

Neves, G (2020). Timor Leste's COVID-19 Response. The Diplomat. 03 June 2020. https://thediplomat.com/2020/06/timor-lestes-covid-19-response/

Nogueira PJ, Nobre MA, Nicola PJ, Furtado C, Vaz Carneiro A. (2020). Excess mortality estimation during the COVID-19 pandemic: preliminary data from Portugal. Acta Med Port.

Oxfam (2020). Yemen facing hidden cholera crisis as COVID cases set to peak in coming weeks. 29 July 2020. https://www.oxfam.org/en/press-releases/yemen-facing-hidden-cholera-crisis-covid-cases-set-peak-coming-weeks-oxfam

Panthee, B. et al. (2020). COVID-19: the current situation in Nepal. New Microbes and New Infections, Volume 37, 2020. http://www.sciencedirect.com/science/article/pii/S2052297520300895

Sinnathamby MA, Whitaker H, Coughlan L, Lopez Bernal J, Ramsay M, Andrews N. (2020). All-cause excess mortality observed by age group and regions in the first wave of the COVID-19 pandemic in England. Euro Surveill.

Shadmi, E., et al. (2020). Health equity and COVID-19: global perspectives. International Journal for Equity and Health.19(1), 1-16.

UNCT (2020). Inspiring story: Caring for the mental wellbeing of Bhutan. https://www.unct.org.bt/we-care-we-share-inspiring-story-caring-for-the-mental-wellbeing-of-bhutan/

UNICEF (2020). Fact sheet: Lack of handwashing with soap puts millions at increased risk to COVID-19 and other infectious diseases. 14 October 2020. https://www.unicef.org/press-releases/fact-sheet-lack-handwashing-soap-puts-millions-increased-risk-covid-19-and-other

UN (2020). Covid-19 and Universal Health Coverage, Policy Brief, October 2020. https://www.un.org/sites/un2.un.org/files/sg_policy_brief_on_universal_health_coverage.pdf

Vestergaard LS, Nielsen J, Richter L, Schmid D, Bustos N, Braeye T, et al. (2020). Excess all-cause mortality during the COVID-19 pandemic in Europe—preliminary pooled estimates from the Euro MOMO network, March to April 2020. Euro Surveill.

WHO (2020a). Responding to multiple emergencies in Sudan. 07 October 2020. https://www.who.int/health-cluster/news-and-events/news/Multiple-emergencies-Sudan/en/

WHO (2020b). WHO Coronavirus Disease (COVID-19) Dashboard. https://covid19.who.int

WHO (2020c). COVID-19 significantly impacts health services for noncommunicable diseases. June 2020. https://www.who.int/news/item/01-06-2020-covid-19-significantly-impacts-health-services-for-noncommunicable-diseases

World Bank Group (2020). In the Face of Coronavirus, African Countries Apply Lessons from Ebola Response. 03 April 2020. https://www.worldbank.org/en/news/feature/2020/04/03/in-the-face-of-coronavirus-african-countries-apply-lessons-from-ebola-response

World Population Review (2020). https://worldpopulationreview.com/countries/

B. THE CONSEQUENCES OF COVID-19 ON WELLBEING

The COVID-19 pandemic has brought about significant disruption in everyday life, with wider socio-economic implications globally. This section will focus on the following aspects to assess the consequences of COVID-19 on wellbeing in LDCs, which are closely related to several SDGs: poverty measurements; employment (including in the informal economy); and access to education, given the limited digital and Internet connectivity. For an assessment of the impact of COVID-19 on other well-being measures such as health and food security, see sections A and C. of this report, respectively.

B.1 IMPACT OF COVID-19 ON POVERTY

LDCs have generally lagged behind on SDG 1 (poverty eradication), with the number of people living in extreme poverty in the LDCs rising from 340 million in 2010 to 349 million in 2018 (Akiwumi and Valensisi, 2020). Due to the challenges arising from conducting household surveys, there is often a lag of a few years in poverty estimates. World Bank pre-COVID data on poverty shows that the rate of extreme poverty in the LDCs, measured as the population living below US$1.90 per day was about 35.1 percent in 2018 (see Figure B.1). While this shows modest reduction in poverty rates of approximately 5 percentage points since 2010, SDG 1 of eradicating poverty in LDCs is still far-fetched. Indications from the impact of COVID-19 on poverty show an upward trend, wiping out years of progress made in alleviating poverty. UN Women forecasts show that by 2030, poverty rates among females and males are expected to be at 32.7 percent and 32.2 percent, respectively (UN Women, 2020).

The figure also shows that reduction in the poverty gap, which reflects both the depth of poverty and its incidence, slowed down between 2010 and 2018, when it declined by only two percentage points[16].

Recent projections by the World Bank[17] suggest that COVID-19 has led to an increase in extreme poverty globally by between 119 million and 124 million people, the largest increase in extreme poverty since 1990. While extreme poverty was predominantly rural before COVID-19, the World Bank projections

Modest progress in poverty reduction in LDCs is reversed

Recent projections by the World Bank[17] suggest that COVID-19 has led to an increase in extreme poverty globally between

119-124 MILLION PEOPLE

the largest increase in extreme poverty since 1990.

[16] The squared poverty gap, which puts more weight the further a poor person's observed income falls below the poverty line remained constant during this time period.

[17] https://blogs.worldbank.org/opendata/updated-estimates-impact-covid-19-global-poverty-looking-back-2020-and-outlook-2021