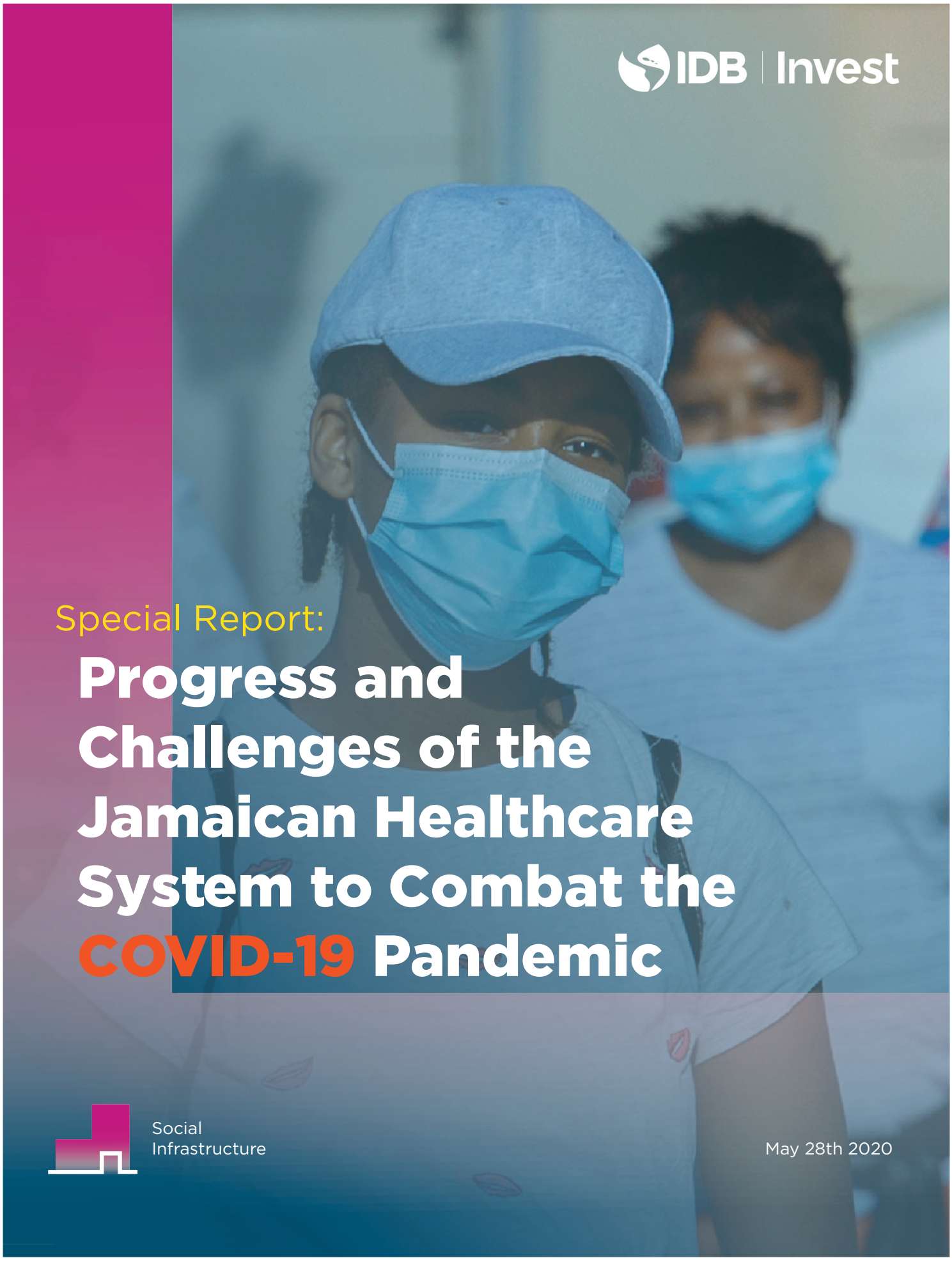


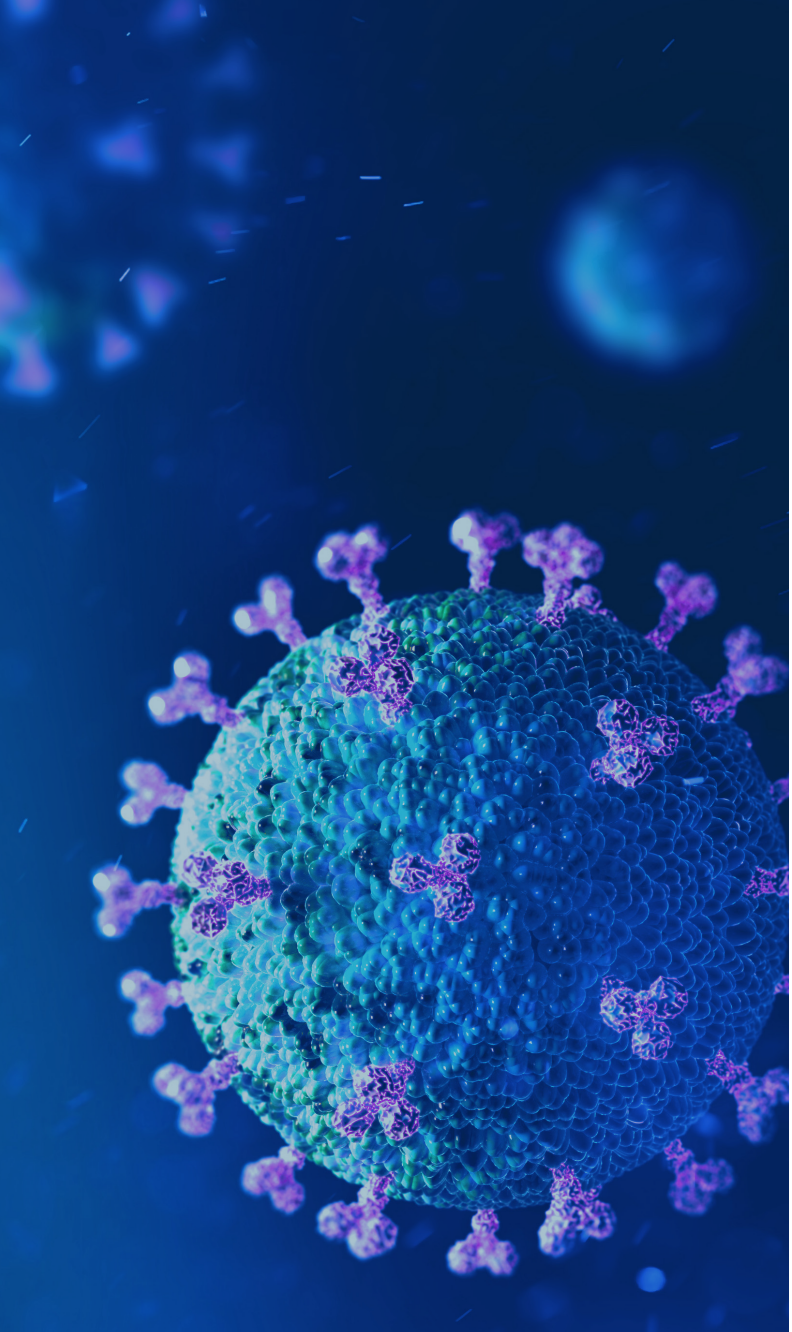
IDB | Invest

Special Report:

Progress and Challenges of the Jamaican Healthcare System to Combat the COVID-19 Pandemic

Social Infrastructure

May 28th 2020



Authors:

Paloma Alonso Cuesta
(MD, External Consultant, Chief Executive Officer and Advisor Globesalud)

Ricardo Pérez Cuevas
(Health Senior Specialist, Division of Social Protection and Health, Jamaica Country Office, IDB)

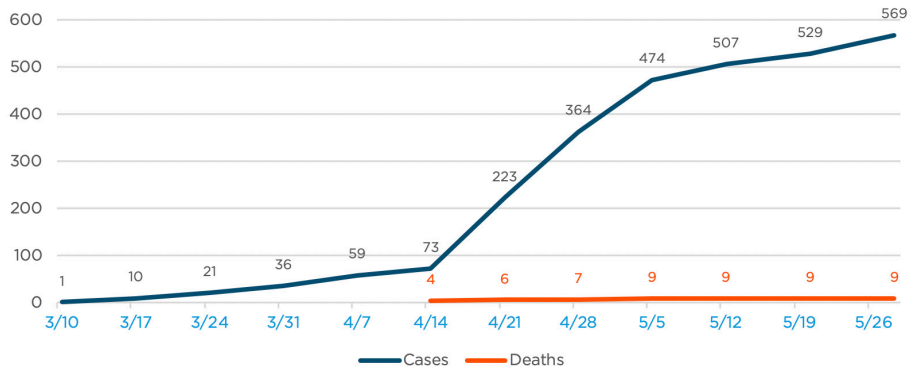
Adriana M. Valencia Jaramillo
(Officer in the Strategic Planning and Knowledge Division, Department of Strategy and Development, IDB Invest)

Editorial design: David Peña Blanco

On March 11, 2020, the World Health Organization (WHO) declared the novel coronavirus (COVID-19) a pandemic. Prior to this date, WHO considered the outbreak as a Public Health Emergency of International Concern. Since January 2020, Jamaica began preparations to minimize the health impacts of COVID-19 on its population. In February, the MOHW reported the training of 329 employees at the Norman Manley International and Sangster's International Airports to identify potentially infectious persons and implement appropriate interventions.

Jamaica reported its first case on March 10, and at the time of this publication, Jamaica registered 569 cases: 234 men (41%) and 335 women (59%), and nine deaths: 6 men (66%) and 3 women (33%). The Parishes of St Catherine (305 cases, 54%) and Kingston St Andrew (133 cases, 23%) reported the highest toll. Although Jamaica has the highest number of cases among English speaking Caribbean countries, the number of COVID-19 cases per 100,000 people is higher in Barbados (32) and The Bahamas (25.5), while in Jamaica this number is 19.2. Furthermore, the Dominican Republic, a neighboring Spanish speaking country, has 145 cases per 100,000 people. Jamaica also has the lowest death toll of reported cases, with 1.6 deaths per 100 COVID-19 cases, whereas Barbados has 7.6 and The Bahamas 11.

Number of COVID-19 cases and reported deaths in Jamaica (March-May 2020)



Source: Prepared by the authors with data from MOHW.

We use the MOHW application and Eight Pillars of the WHO Preparedness and Response Plan to analyze the current progress and challenges facing the Jamaican healthcare system to combat the COVID-19 pandemic.

1. Country-level coordination, planning, and monitoring.

The Government of Jamaica (GoJ) integrated a National Coordinating Committee that comprised members of the government, industry and civil society. This intersectoral effort helped to define, follow up and assess the implementation of the public policies and activities. Also, the GoJ and the Ministry of Health and Wellness (MOHW) assessed the country preparedness for COVID-19 and strengthened the supply capacity to combat the pandemic and mitigate its effect on the health of the population.

The private sector in Jamaica, under the exclusive jurisdiction of the MOHW, also plays an important role in ensuring the health system's resilience. While 94% of hospital beds belong to the public sector, 78% of advanced biomedical technology is in the private sector. These resources, which include healthcare services, facilities, labs, transport logistics capacity, staffing, information systems, technology and equipment— including crucial equipment such as ventilators—can be made readily available to surge the capacity of the health system. Coordinated reorganization of public and private health services is essential to assess and test people timely, treat patients effectively, and protect hospitals and health personnel.

2. Risk communication and community engagement.

The Prime Minister and the MOHW published press releases, a dashboard, a call-center, web portals and social media (Twitter and Facebook) to disseminate information, educational messages and update the status of the pandemic. These actions have allowed systematic community information and feedback mechanism, dialogue, and consultation with the public and stakeholders.

3. Surveillance, rapid response teams, and case investigation.

The MOHW implemented an aggressive strategy for case-finding, identification and follow-up of contacts, quarantine and isolation measures. It trained the rapid response teams to investigate cases and clusters in a timely manner. For example, it designated and equipped quarantine and isolation facilities in several health care settings. Epidemiological reports were published periodically with information on the number of cases, gender and location. At first, there was scant information on the number of tests performed. The results of these activities resulted in critical decisions, such as the lockdown of the communities of Seven and Eight Miles, Bull Bay and Saint Andrew, the implementation of island-wide curfew hours, and the closing of schools and public places, such as bars and restaurants. Authorities are conducting contact tracing. As of May 17, 3,725 named contacts of the confirmed cases had been traced (PBC Jamaica, 2020).

4. Points of entry.

Jamaica is within the group of ten Caribbean countries with a high volume of incoming tourists and travelers from abroad. The initial interventions therefore focused on airports and seaports, where personnel in these facilities received training to identify travelers with symptoms. Moreover, since January 30th, 2020, the GoJ issued a ban on travelers coming from China, and those with landing privileges were quarantined. Also, the GoJ issued interim guidelines for cruise ships visiting Jamaica. The travel restrictions were additionally expanded to travelers from UK, Iran, Singapore, France, Germany, Italy and Spain, and in March 21st the country closed seaports and airports to incoming ships and planes, only allowing cargo shipments. To the date of this publication, the country is still closed to commercial flights and incoming cruise ships.

5. National Laboratories.

Increase testing capacity and test all suspected cases of COVID-19 whenever possible, while continuing to encourage self-quarantine for people with COVID-19 related symptoms. Testing shortage is a key element preventing authorities from measuring the true extent of the spread of COVID-19. The anticipative and aggressive testing strategies of countries such as Germany and South Korea, which have tested 4,719 and 1,694 per 100,000 people, respectively, have helped to reduce mortality rates.

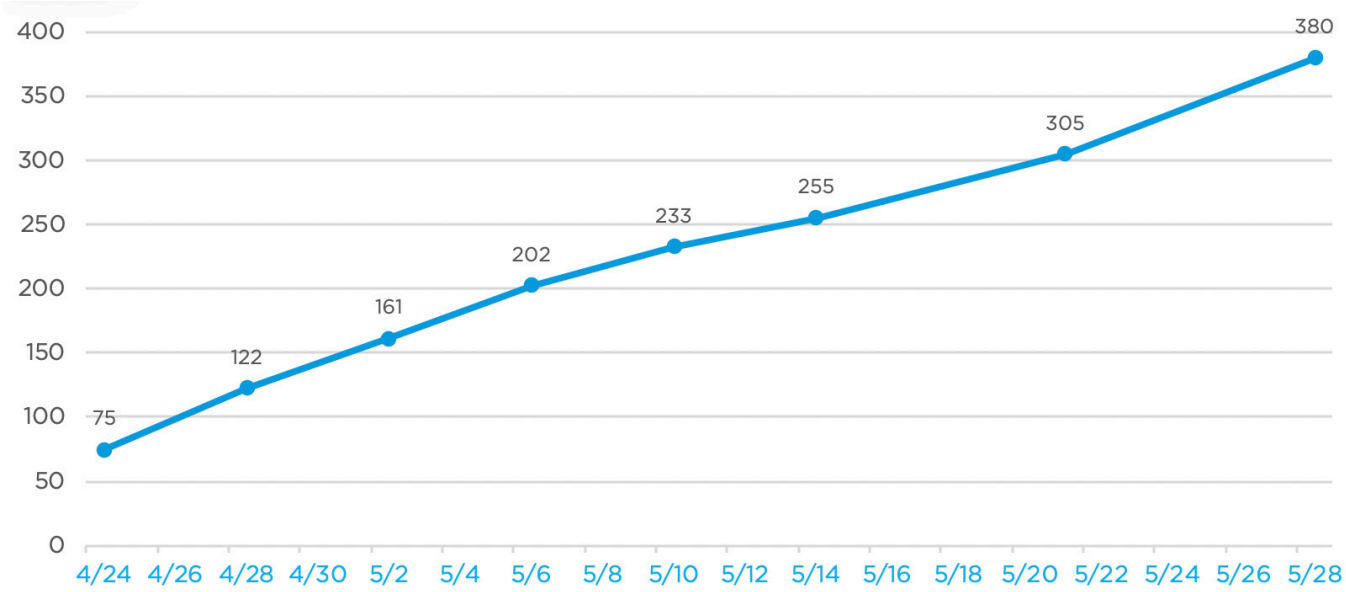
a. The MOHW progressively expanded its capacity to test Covid-19 cases. Early into the pandemic, the National Influenza Centre processed the samples that were sent overseas to CARPHA or the CDC for testing. On March 4th, 2020, the MOHW made public the effort to develop the local capacity to test for the virus, and by March 29th, there was an increase in the testing capacity to process more than 100 samples per day and use Polymerase Chain Reaction (PCR) testing machines. The

> “Testing shortage is a key element preventing authorities from measuring the true extent of the spread of COVID-19”

National Influenza Centre, located at The University Hospital of the West Indies, and the National Public Health Laboratory now have the capacity to do PCR testing, at a rate of 2,000 tests per day, working 24 hours. However, infrastructure limitations and supply shortages are limiting testing capacity to levels below the growing demand. While it would be advisable to do extensive screening, with the existing limitations PCR testing should prioritize health professionals, risk groups (patients with heart disease over 50 years, residents in social health centers) and for confirmation of cases presenting symptoms.

b. The capacity of testing equipment in Jamaica increased from 77 to 380 tests per 100,000 people. Still, the number is low when compared with other countries such as Chile and Peru, which process more than 2,000 samples per 100,000 people.

Cumulative Number of COVID-19 Tests Per 100,000 People



6. Infection Prevention and Control.

Infection prevention and control practices in communities and health facilities serve to prepare treatment of patients with Covid-19.

a. Protect and reorganize health human resources. Human resources may be drained by the overwhelming extent of the epidemic and associated workload, together with losses by contamination, isolation, sickness or mortality among health care workers, or the potential migration of health personnel seeking opportunities offered abroad. Jamaica has a significant resource deficit of health professionals, due to migration to other countries. There are more than 4,500 nurses and more than 3,000 doctors working in Jamaica. Annual attrition of nurses by migration ranges from 300-500. However, there are health professionals who have arrived to assist, adding more than 200 health care professionals, including 90 nurses, 46 doctors, and 4 specialists from Cuba. To cope with the potential lack of health professionals in the country it is recommended that any non-urgent activity (consultations, examinations, surgical interventions) should be temporarily decreased or delayed in relation to the increase of confirmed delicate COVID-19 cases. Personnel released in from these non-urgent procedures can free anesthetists and nurses for critical areas. These professionals are aware of the use of anesthesia machines that can be used as ventilators and monitors and, if necessary, could take quick online training courses that are being offered by different hospitals around the world.

b. In March and April, the MOHW informed of a public private partnership initiative to provide care to non-COVID-19 patients, potentially retrofitting the National Arena as a field Hospital with 72 beds, and agreement with Andrews Memorial Hospital as an overflow ward for the Kingston Public Hospital. The University Hospital of West Indians became the tertiary care center to manage critically ill COVID-19 patients.

7. Case management.

This is the ability of healthcare facilities to prepare for a large number of suspected COVID-19 cases. Jamaican authorities have been preparing for this potential increase; however, previous analyses identified important shortages of medical equipment.

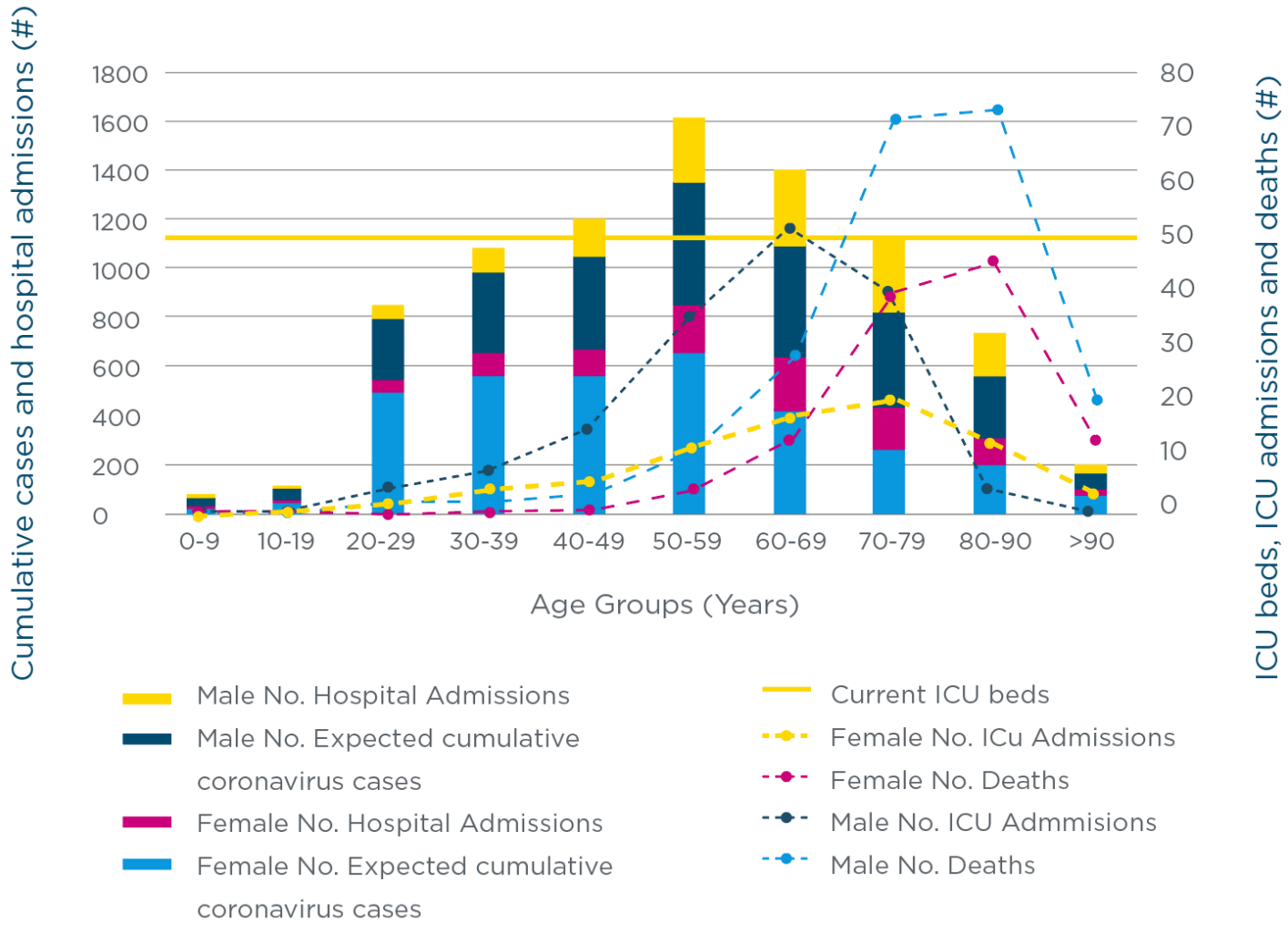
a. It seems imperative to sharply increase the number of Intensive Care Units (ICU) in Jamaica.

Before the coronavirus pandemic, studies by the MOHW indicated that, at the very least, 140 critical care beds were needed to meet patient care demands. Recent review indicated that there are were 40 functional ICU public beds in Jamaica, including those at the University Hospital West Indies, Kingston Public Hospital, Cornwall Regional, and Bustamante Children's Hospital. Meanwhile, in the private hospitals there were 11 ICU beds: 5 at the Montego Bay Hospital and 6 beds at the Cardiac Intensive Care Unit dedicated of the Heart Institute of the Caribbean. In late May, the MOHW reported the addition of 41 ICU beds. However, it is expected that COVID-19 cases will significantly increase in Jamaica and that the number of ICU beds needed will surpass current capacity. While Jamaica should fare better with appropriate and timely measures, authorities should also prepare and consider a worst-case scenario.

b. There is a gap between hospital capacity and the potential need for medical services.

Using the ratios of hospitalizations, ICU beds needed, and deaths experienced in Spain—which the United Kingdom[1] Canada[3] and the United States[3] are also using to assess potential cases—the following table shows a potential scenario at the peak of contagion Jamaica, that is, at the end of the acceleration phase.

Potential COVID-19 Contagion Scenario in Jamaica



[1] *Lacasa, L., Challen, R., Brooks-Pollock, E., & Danon, L. (2020). A flexible load sharing system optimising ICU demand in the context of COVID-19 pandemic. medRxiv.*

[2] *Tuite, A. R., Fisman, D. N., & Greer, A. L. (2020). Mathematical modelling of COVID-19 transmission and mitigation strategies in the population of Ontario, Canada. CMAJ.*

[3] *Eryarsoy, E., & Delen, D. (2020). Cross-Country Age Disparities in COVID-19 Cases with Hospitalization, ICU Usage, and Morbidity. arXiv preprint arXiv:2004.06532.*

Cases are age-stratified using Spanish age-aggregate distributions and applied to the number of people in each age group of Jamaica[4] . The analysis shows a large gap between the available hospital capacity and the expected need for services, especially for hospitalizations and ICU beds. The simulation is also differentiated by gender. COVID-19 has had a higher incidence in women, yet more men are dying from the disease (currently 67% of deaths in Jamaica are men). If Spanish trends are used for the Jamaica case, the mortality rate would be nearly double for men versus female patients.

Age Group	Total Population (Men and Women)	Nº Expected cumulative coronavirus cases	Nº Hospital Admissions	Nº UCI Admissions	Nº Deaths
0-9	465,000	48	18	1	0
10-19	467,000	74	15	1	0
20-29	515,000	731	104	5	2
30-39	443,000	894	180	12	2
40-49	358,000	925	269	20	5
50-59	320,000	1164	449	46	14
60-69	214,000	894	513	69	42
70-79	120,000	670	485	61	111
80-90	50,000	446	278	14	119
> 90	8200	130	59	3	34
Total	2,960,200	5,975	2,372	233	329

Source: Prepared by the authors. Note: This is a hypothetical scenario, which is not intended to represent actual projections or best estimates of future growth. Cases could be fewer, or increasingly more if a scenario of infections double every 2-3 days.

C. It is urgent to replace or perform comprehensive maintenance of medical equipment that may be out of use due to obsolescence and which may be required during this health emergency.

The assessment shows that 221 devices need urgent maintenance, while 104 devices need to be fully replaced/purchased. The following table provides information on the need for hospital equipment maintenance, purchases, and an indication of investment necessary to purchase biomedical equipment related with coronavirus, in

[4] *The estimation uses a ratio of cumulative cases at the peak of coronavirus and assumes a constant occurrence by age group, which is then adjusted for local demography, as well as gender. So far, the majority of cases in Jamaica have been found in younger populations (55% of cases are ages 20-39) (MOHW, 2020).*

Hospital Unit	Device	Devices Needing Maintenance (#) (A)	Devices Needing Replacement (B)	Average Cost of Replacement (US$)	Total Investment Cost for Device Purchase	Cost of Comprehensive Maintenance per Device Type (% of equipment cost)	Annual Cost of Comprehensive Maintenance for Devices (A&B) (US$)
Emergency	Defibrillator	17	9	10,500	94,500	3	8,190
Emergency	Stretcher	21	36	1,350	48,600	3	2,309
ICU	Infusion pump	36	4	Buy per consumable			
ICU	Patient Monitor	82	20	3,500 Non-invasive parameters; 12,000 invasive	240,000	6	73,440
ICU	Ventilator (automatic)	18	9	44,000	396,000	7	83,160
Image	Radiographic unit, Mobile, Digital, Full Dicom	5	4	101,000	404,000	12	109,080
Laboratory	Biological safety cabinet, Class II	2	3	14,650	43,950	6	4,395
OP	Anesthesia machine	10	10	44,000	440,000	8	70,400
Sterilization	Autoclave	18	7	64,000	448,000	4	64,000
Ward & ICU	Bed (electric)	11	2	6,800	13,600	4	3,536
Total		220	104		**2,128,650**		**418,510**

Source: Prepared by the authors based on UNOPS hospital inventory equipment list.

five Jamaican public hospitals[5]. It is estimated that aninvestment of over US$2 million is required to purchase biomedical equipment, and that additional resources, in the order of US$418,000, should be allocated to the maintenance of 304 devices. These devices and a contract for their maintenance are urgently needed, preparing for a scenario of at least 100 patients requiring ICU beds and equipment simultaneously, and as presented in the graphic above, there is account of just 51 ICU beds.

d. There are at least 27 ventilators that will need to either be replaced or maintained, as listed above.

The MOHW reports that the public health system has 25-60 ventilators and the goal is to increase this capacity to 90-100 by May, aided in part with donations from the European Union. With the right preparation, Jamaica will ideally avoid a lack of

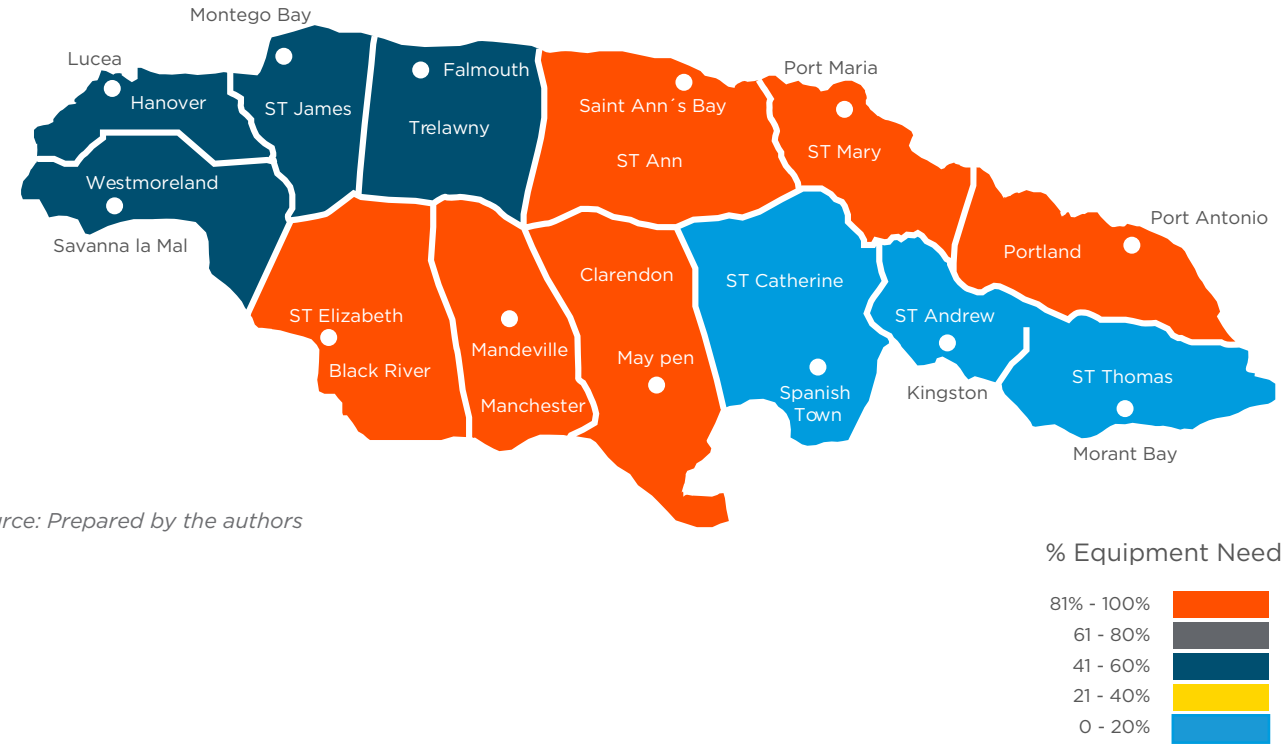
[5] *UNOPS: Public Hospital Inventory Equipment List. (2019). Inventory analysis of the state of the medical equipment – Urgent equipment purchase and maintenance needs of the 5 hospitals: Spanish Town Hospital, Kingston Public Hospital, Mandeville Regional Hospital, May Pen Hospital and St. Ann's Bay Regional Hospital. Technical Assistance to the Ministry of Health*

ventilators to deal with the COVID-19 pandemic. It should be noted that, while there is ongoing debate about the use of ventilators, and there is more information on the when and how to use them, data from countries such as Spain reveal that about 70% of COVID-19 patients need mechanical ventilation with ICU-level ventilators. Since ventilators require more specialized procedures and may be insufficient for all those who need them, a way of reducing demand for ventilators is the use of non-invasive devices, such as sleep apnea or nasal cannulas, or CPAP devices, and leave the ventilators for more critical patients, with important caveats.

e. Computerized tomography (CT) scanner technology has the highest priority for the medical equipment needed, as it is essential to diagnose certain prevalent pathologies that require urgent attention, such as polytraumas.

In the current context these devices are important to assess the severity of certain patients with coronavirus[6]. A map of Jamaica is used to graphically show the resulting

Need for CT Scanner by Region



Source: Prepared by the authors

[6] *Jin, Y. H., Cai, L., Cheng, Z. S., Cheng, H., Deng, T., Fan, Y. P., ... & Han, Y. (2020). A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). Military Medical Research, 7(1), 4. Note that the imaging findings vary with the patient's age, immunity status, disease stage at the time of scanning, underlying diseases, and drug interventions.*

Regions	CT Scanner	Equipment per Region			Jamaica CT GAP		Jamaica CT GAP Equipment	
		No.	Ratio per million	% Public	Ratio OECD (c)	Ratio recommended (D)	A - C	A - D
		A	B2		6.21	7		
NE Health Regions	402,932	1	0.34	0.0%	10.56	6.85	-9.56	-5.85
S Health Region	641,101	1	0.34	0.0%	16.80	10.90	-15.80	-9.90
SE Health Region	1,399,460	20	6.75	11.1%	36.67	23.79	-16.67	-3.79
W Health Region	517,687	3	1.01	50.0%	13.56	8.80	-10.56	-5.80
Total2	,961,180	25	8.44	12.0%	77.58	50.34	-52.58	-25.34

Source: Prepared by the authors

CT gap in each region of the country. The colors show how much equipment is needed: orange represents the largest gap, while light blue is the lowest.

f. Consider tele-radiology and telemedicine for interpreting CT scanner results.

Since CT scanners use digital imaging, the medical interpretation of these studies can be done remotely by tele-radiology and telemedicine. This presents an advantage since these systems allow a "hub and spoke" model to centralize the reading and interpretation of the image or of remote support to smaller units while the physical examination is carried out closer to the patient. Hence the importance of having a system for storing digital images in real time and with guaranteed quality (PACS-RIS). Another noteworthy aspect is the existence of mobile equipment that allows the performance of this type of diagnostic examinations to be brought closer to the population. This solution has been adopted in various countries with geographical characteristics that make it difficult for patients to receive this diagnosis.

8. Operational support and logistics.

This pillar refers to logistical support, including procurement. It would be advisable to create a virtual purchasing center to acquire or lease personal protective equipment as well as biomedical devices for emergencies, intensive care, imaging or sterilization, considering a Public-Private Partnership procurement modality. Under this contract, the private sector partner is hired to provide comprehensive, long-term equipment service. The private partner is responsible for supplying, maintaining, updating and refurbishing or replacing the equipment while the contract is in effect. With one purchasing center, ideally joining forces through several CARICOM countries, economies of scale can be achieved to lower costs.

The term of the contract would preferably cover the entire life cycle of the equipment (usually ten years), with the possibility of renewal. The purchasing center would carry out a logistical work of identification and registration of all the possible suppliers to expedite devices acquisition. A series of technical requirements and specifications must be established for any equipment acquisition, especially in the case of refurbished devices to guarantee equipment safety.

Next steps.

Seroepidemiological surveillance (SE) has the potential to inform on public health decisions. Jamaica is in a unique position to conduct SE, as implemented by several European countries. The SE would help to measure the percentage of the population that is developing immunity for COVID-19 (herd immunity). The SE would also allow the MOHW to learn about the actual scope of the pandemic in the Jamaican population and to facilitate targeting public health interventions to control the spread of the virus.

Positive outlook.

Jamaica made remarkable progress in containing the COVID-19 pandemic, and it is in a better position to increase the resilience of the health care system. Four main advantages position the country to fight this pandemic: i) Jamaica has the experience in contracting with the private health sector and has a strong record of institutionalizing Public-Private Partnerships. According to the 2019 Infrascope Report, Jamaica scores 4th out of 21 countries in enabling environments for this modality; ii) Jamaica is familiar with the use of new information and communication technologies to improve health; iii) Jamaica has experience in collaborating with Caribbean countries in sharing scarce health resources; and iv) Furthermore, Jamaica has shown to have very talented and innovative individuals at all levels, including at the MOHW.

There have been various very successful initiatives in the health sector that can be used as examples of how partnerships with the public and the private sector, various institutions, and even the Caribbean region can work towards common goals to achieve targeted positive health results. Remarkable examples include: a) the Sick Kids Initiative, which is improving the outcome and livelihood of children with cancer in six Caribbean countries through partnerships and telemedicine training; and b) The Public-Private Pharmacy Partnership for Outpatient Pharmacy Services Program in Jamaica, which the National Health Fund, in collaboration with the private sector, is implementing to be able to overcome a shortage of pharmaceuticals, shorten wait times for medicine (an important issue for people with critical conditions), and increase customer satisfaction.