COVID-19 RESPONSE AND MAINTENANCE OF ESSENTIAL HEALTH SERVICES IN SRI LANKA

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Sri Lanka's public health system is historically known for delivering high-quality care equitably and efficiently to its population. See how the country acted to contain early waves of the COVID-19 pandemic and mitigate the pandemic's effects on essential health service delivery.

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EXEMPLARS IN GLOBAL HEALTH

KEY INSIGHTS

EARLY IN THE COVID-19 PANDEMIC, FROM JANUARY THROUGH JUNE OF 2020, SRI LANKA ACTED QUICKLY to keep the novel coronavirus from entering the country and prevent local transmission. After some early successes in the pandemic, insufficient expansion of testing and surveillance eventually led to sustained, undetected community transmission. Subsequent pandemic waves, including the wave driven by the delta variant from July to October of 2021, resulted in increased infections and disruption to the delivery of essential health services. Sri Lanka's experience demonstrates that gaining control of transmission is a key factor in avoiding disruptions to essential health services during a pandemic, but that this must be sustained over time. At the same time, a well-managed health system like Sri Lanka's, that prioritizes equitable access to care, will be more resilient in the face of major disruptions such as the COVID-19 pandemic.

Health officials wearing protective face masks receive numbers for their turn during a simulation exercise for the coronavirus disease (COVID-19) vaccination in the Piliyandala suburb, south of Colombo, Sri Lanka January 23, 2021.
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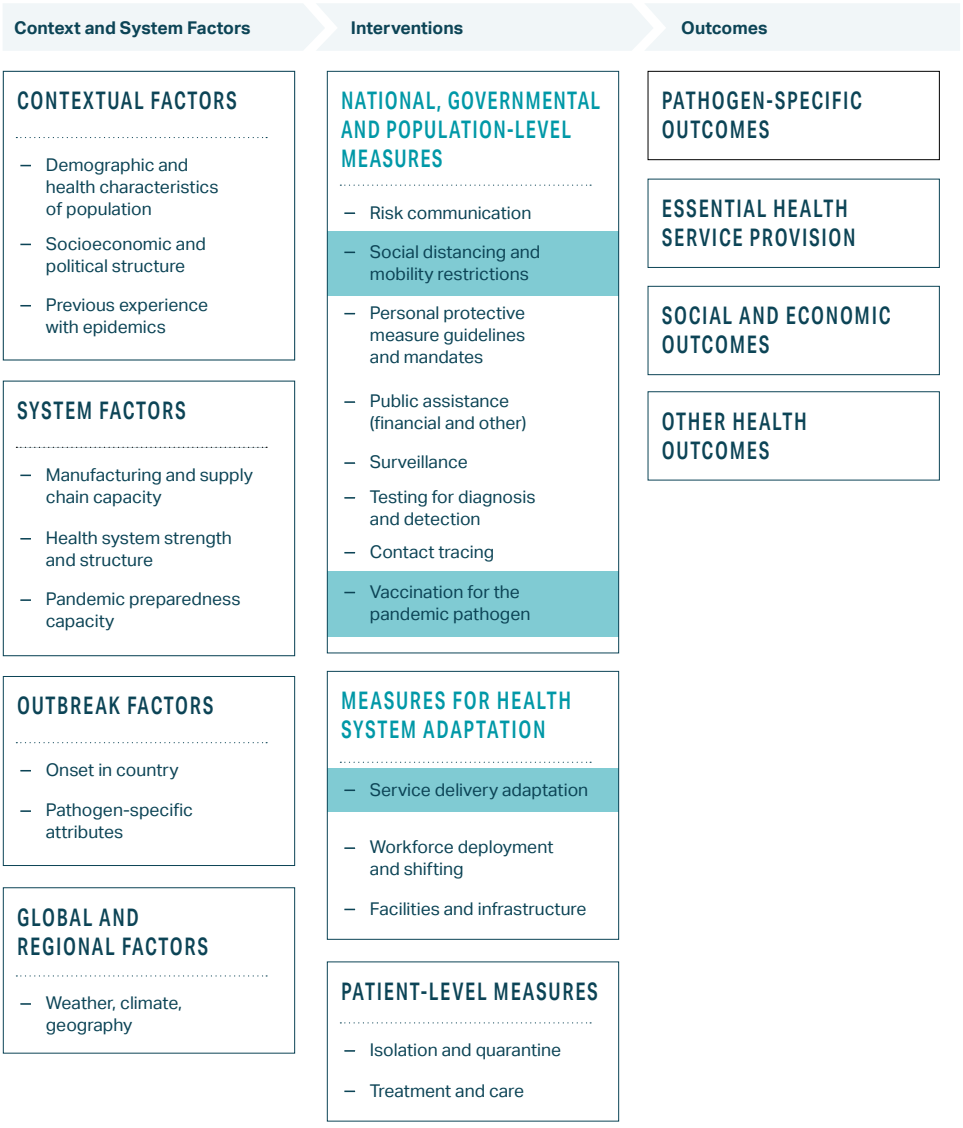
DRIVERS OF SUCCESSFUL PANDEMIC RESPONSE

The World Health Organization (WHO) and Global Health Security Agenda have developed useful frameworks for assessing epidemic and pandemic preparedness and response, which we have adapted for this research. Through the Exemplars in COVID-19 Response work, we aim to derive lessons learned about the drivers of a successful response and have developed a conceptual framework that breaks down the drivers into three groups: context and system factors, interventions, and outcomes. The following sections Sri Lanka's response to COVID-19 and the maintenance of EHS are organized according to this framework.

FIGURE 1

Exemplars in COVID-19 conceptual framework for assessing epidemic preparedness and response



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Mobility restrictions

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Contact tracing

WHAT WERE THE MOST SIGNIFICANT ELEMENTS OF SRI LANKA'S COVID-19 RESPONSE?

National, governmental, and population-level measures: social distancing and mobility restrictions

Suppressing COVID-19 transmission in the early part of the pandemic

Early in the COVID-19 pandemic, Sri Lankan authorities built on the health system's strengths to respond to the health emergency. From March to September 2020, through a mixture of border closures, isolation, and intensive contact tracing and quarantine, Sri Lanka was relatively successful at suppressing local transmission of COVID-19. However, the country was unable to sustain this aggressive strategy and experienced widespread community transmission by late 2020.

Health officials use swabs to collect test samples from people at a main market, amid concerns about the spread of the coronavirus disease (COVID-19), in Colombo, Sri Lanka, August 28, 2020. © REUTERS/Dinuka Liyanawatte

National, governmental, and population-level measures: vaccination for the pandemic pathogen

Building on the health system's existing strengths to deliver COVID-19 vaccines

High vaccination rates and high levels of public trust in vaccines is a long-standing strength of the Sri Lankan health system. These strengths enabled authorities, who also mobilized the military, to act quickly and equitably to vaccinate the country's adult population in 2021—with no substantial disparities in coverage or the speed of uptake between people of different socioeconomic levels, ethnicity, or gender. This equitable distribution of COVID-19 vaccines throughout the country was a unique strength of the Sri Lankan vaccination program enabled by public financing and delivery of the vaccines, as well as by the mobilization of military support in expanding coverage. Over 60% of the total population had been fully vaccinated (i.e., had received all doses prescribed by initial vaccination protocol) by December 31, 2021. Although uptake of booster vaccinations was slower in 2022, it was still relatively strong.

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Vaccination

An elderly woman receives a dose of Sinopharm vaccine at her home from the Sri Lanka Army mobile vaccination unit against the coronavirus disease (COVID-19) in Colombo, Sri Lanka, September 14, 2021. © REUTERS/Dinuka Liyanawatte

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Service delivery adaptation

Response measures at the health system level: service delivery adaptation

Innovating for COVID-19 response and essential health services maintenance

During the first lockdown, senior health officials took proactive measures to maintain the supply of medicines for patients with chronic diseases (such as multimonth drug dispensing and home delivery of medicines) and introduced protocols to minimize COVID-19 transmission in health facilities. The pandemic also led to the expanded adoption of existing telehealth technologies, for remote consultations, both in private and public care settings. These service delivery innovations and adaptations enabled the system to continue delivering key health services through the end of 2020.

Workers check protective chambers with gloves attached made for hospitals at a workshop, during the curfew imposed by the government amid concerns over the spread of coronavirus disease (COVID-19), in Colombo, Sri Lanka, April 15, 2020. © REUTERS/Dinuka Liyanawatte

WHY WAS SRI LANKA SELECTED?

EXECUTIVE SUMMARY

When the COVID-19 pandemic began, Sri Lanka had a strong initial response, with health authorities acting quickly to keep the novel coronavirus from spreading. They screened and quarantined travelers from abroad and implemented intensive contact tracing and isolation for all suspected patients to prevent local outbreaks.[1] For months, the country avoided sustained local transmission and protected its health services from substantial disruption. However, without adequate ramping up of surveillance—including high levels of testing for symptomatic individuals in the community—local transmission went undetected for too long, enabling widespread transmission.

Sri Lanka's experience illustrates two key lessons. First, limiting transmission of the pandemic pathogen is essential to avoid disruption to essential health services during an epidemic. Second, a well-managed health system like Sri Lanka's, that prioritizes equitable access to care, will be more resilient in the face of major disruptions such as the COVID-19 pandemic.

HOW DID WE SELECT THE COUNTRIES WE STUDIED?

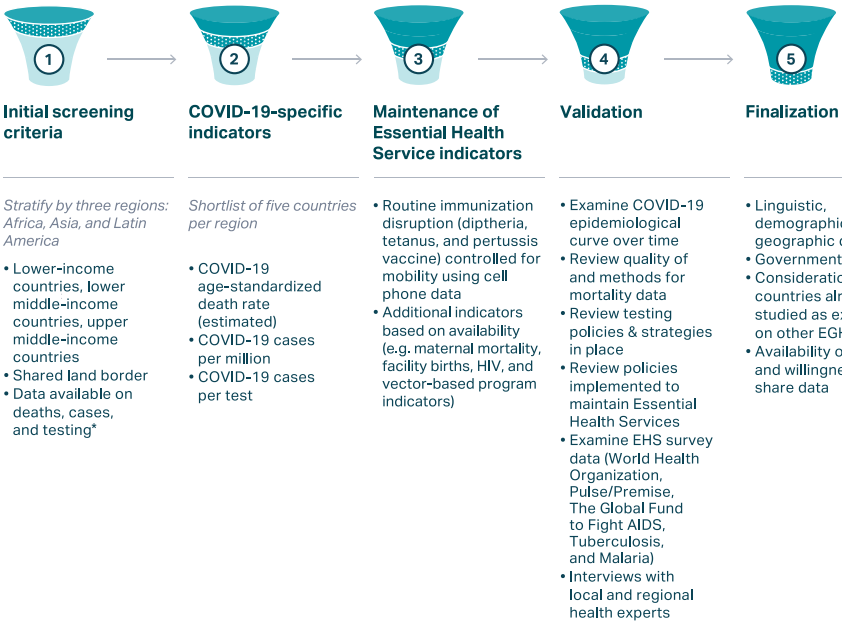
Differences in testing, surveillance capacities, and reporting criteria[2] have made it difficult to quantify[3] and compare the impact of COVID-19 in countries around the world. Yet some countries were able to strengthen and sustain health system capacity, maintain essential health services, and target public health and social measures to mitigate the overall impact of the COVID-19 pandemic. Identifying the strategies, policies, and practices that enabled these successes can give us a better understanding of health system resilience, adaptive health policies, and emergency response strategies that could be applied to other countries and future infectious disease outbreaks.

To select positive outlier countries with transferable lessons for pandemic preparedness and health system resilience, we used data from March 2020 through the end of 2020 to identify countries with best-practice responses to the early phases of the pandemic. This snapshot in time does not account for subsequent waves of the pandemic, nor for the later availability of COVID-19 vaccines in the selected countries.

The six countries were selected by evaluating COVID-19 indicators (including age-standardized deaths, cases, and testing) and essential health services indicators (including disruption to routine immunization) after screening for the availability of high-quality data and the transferability of the findings. After identifying potential Exemplar countries, we completed validation research including an examination of the COVID-19 epidemiological curve over time, testing policies and strategies, interventions to maintain essential health services, survey data, and interviews with local and regional health experts. The final six countries were selected after considering linguistic, demographic, and geographic diversity as well as government structure and data availability (see figure below).

FIGURE 2

Country Selection Methodology



For Sri Lanka and the other five selected countries (Costa Rica, Dominican Republic, Ghana, Thailand, and Uganda), we conducted a literature and policy review, key informant interviews, qualitative analysis, and quantitative analysis. We synthesized findings to develop key recommendations on health system resilience and pandemic preparedness. This country selection process reviewed indicators through the end of 2020, but the Exemplars research itself covers the time period through the end of 2021. It is important to note that the performance of the selected proxy indicators does not reflect the entire health system's performance.

Several key interventions, summarized below and detailed in the following sections, contributed to Sri Lanka emerging as a positive outlier in the COVID-19 response and the maintenance of essential health services.

Quick early action

Early in the COVID-19 pandemic, from March to September 2020, Sri Lankan authorities suppressed transmission in the community by enforcing quarantine and screening procedures at border points of entry, and implementing aggressive contact tracing and isolation for detected local cases. The success of this kind of elimination strategy, however, depends on high levels of symptomatic testing, and the Sri Lankan health system did not invest in strengthening its testing capacity in time to block sustained viral transmission in 2021.

A health official uses a thermometer to take the temperature of a healthcare worker during a simulation exercise for the coronavirus disease (COVID-19) vaccination in the Piliyandala suburb, south of Colombo, Sri Lanka January 23, 2021. © REUTERS/Dinuka Liyanawatte

Rapid and equitable vaccine delivery

Sri Lankan health authorities built on existing strengths of the country's health system—high vaccination rates and high levels of public trust in vaccines—and acted quickly to vaccinate the country's adult population in 2021, assisted by mobilizing support from the military for logistics and delivery. This rapid vaccination campaign began by purchasing large volumes of vaccines from India and then China, and was slowed only by limited vaccine stocks and was highly equitable, with no substantial disparities in coverage or speed of uptake between people of different socioeconomic status, ethnicity, or gender. This equitable distribution of COVID-19 vaccines throughout the country was a unique strength of the Sri Lankan vaccination program enabled by public financing and delivery of the vaccines, as well as by the mobilization of military support in expanding coverage. Uptake of boosters has been relatively slower, however, as of December 2021.[4]

Service delivery adaptations

From the first lockdown in March of 2020, Sri Lanka's health officials took proactive measures to maintain the supply of medicines for patients with chronic diseases, introduced protocols to minimize COVID-19 transmission in health facilities, and found new uses for existing telehealth technologies.[5]

Challenges

Sri Lanka faced challenges in maintaining its local elimination strategy in 2020 primarily because it did not invest in strengthening capacity for COVID-19 testing at the primary care level. This may be attributed to a wider phenomenon of "groupthink" (conformity and consensus in decision-making) observed among official decision-making bodies, which prevented consideration of alternative views on testing and disregarded technical expertise from outside the government. Other factors that contributed to the spread of COVID-19 in 2021 included complacency following the initial success of the strategy, a medical culture that was generally averse to testing in clinical practice, and an environment of fiscal scarcity (exacerbated by tax cuts in 2020). Additionally, given the political unrest and economic instability throughout the pandemic and through 2022, public distrust in the government likely exacerbated these issues.

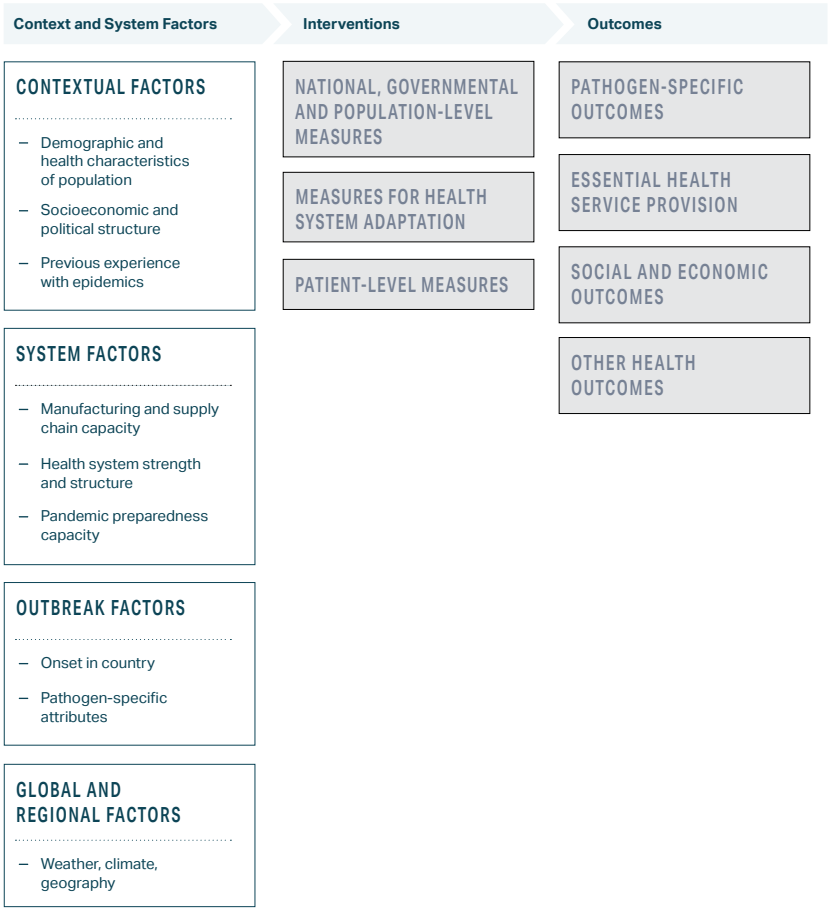
CONTEXT

THE EXEMPLARS IN COVID-19 CONCEPTUAL FRAMEWORK OUTLINES KEY FACTORS THAT COULD HELP explain countries' COVID-19 burden and outcomes. These key factors are divided into two categories: (1) contextual and system factors (i.e., demographic, geographic, or environmental) and (2) policies and interventions. Contextual and system factors cannot easily be influenced in the near term, whereas policies and interventions factors can.

Although our research focuses primarily on the policy choices made by officials during the early phases of the pandemic, a country's ability to limit COVID-19 transmission and related deaths could also be attributed to contextual factors, including those below.

FIGURE 3

Exemplars in COVID-19 conceptual framework for assessing epidemic preparedness and response

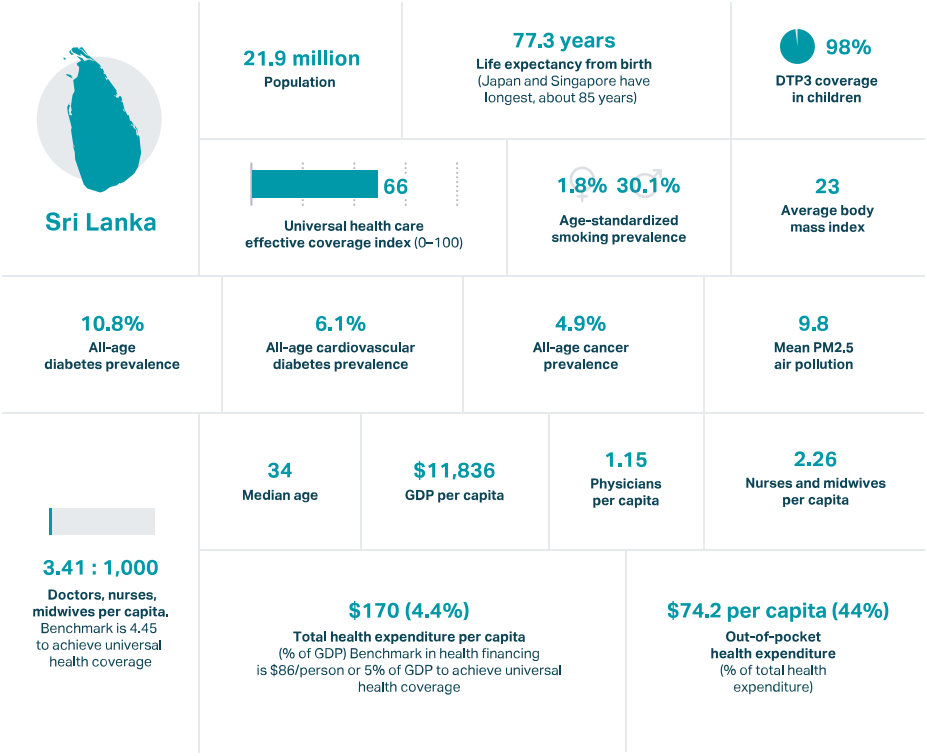


CONTEXTUAL FACTORS

Demographic and health characteristics of population

FIGURE 4

Demographic and health characteristics of population



Source: IHME, World Bank

Underlying population-level health characteristics that shaped Sri Lanka's experience in the early months of the COVID-19 pandemic include the following.

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Lancet – Pandemic preparedness and Covid-19

Age structure

Sri Lanka's population is aging—in 2011, more than 25% of Sri Lankans were 0 to 14 years of age, 67% were 15 to 64, and nearly 8% were 65 and older (compared with just 4% in that age group in the 1960s and 1970s). In 2021, about 23% of Sri Lankans were 0 to 14 years of age, 65% were 15 to 64, and nearly 12% were 65 and older.[6,7] Researchers expect the shares of the population 65 and older and 85 and older to increase to 20% and 3%, respectively, by 2050.

Elderly adults are significantly more likely to die from COVID-19 than younger adults and children.[8] Countries around the world vary widely in their age structures: in some African countries, fewer than 2 percent of the population is 70 years or older, while in some European countries that share is more than 15 percent.[9] Some research suggests that accounting for variation in age structure between countries may explain nearly 50 percent of the variation in COVID-19 mortality.[10]

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Sri Lanka – Institute of Health Metrics and Evaluation

Chronic health conditions

Since the 1960s, Sri Lanka's disease burden has shifted away from infectious diseases and maternal and child health conditions. By the 1990s, noncommunicable diseases accounted for much of the country's disease burden, although age-specific mortality rates for several of these have been declining since the 2010s. Sri Lanka has eliminated several major infectious diseases, including polio (in 1993) and malaria (in 2016); others, such as HIV/AIDS and tuberculosis, are at low levels of prevalence. The infectious disease of most notable public concern is dengue, which is endemic in Sri Lanka (as in much of Southeast Asia). Cardiovascular disease and diabetes are the leading causes of death: the prevalence of adults with diabetes (23%) is among the highest in the world, and 28% of adults suffer from hypertension.[11]

A variety of chronic health conditions like high blood pressure, diabetes, and cardiovascular disease are associated with greater rates of mortality from COVID-19.[8] HIV can make individuals susceptible to infectious diseases because of how it impacts the immune system. Similarly, cancer and cancer treatments like chemotherapy frequently disrupt the immune system, leaving individuals vulnerable to severe infection.[12]

Smoking prevalence and ambient air pollution

According to the World Health Organization, there were 2.1 million tobacco users in Sri Lanka in 2018. Nearly half of all men between the ages of 18 and 69 used tobacco (29% were smokers, and 26% used smokeless tobacco) compared with just 5% of women (nearly all of whom used smokeless tobacco). About 24% of adults and 13% of children were exposed to secondhand smoke at home.[13] In Sri Lanka, smokers tend to be less educated, lower income, and more rural than their nonsmoking counterparts.[14]

Sri Lanka's air is moderately polluted (the average annual concentration of PM2.5 was 25.2 μg/m^3 in 2019). Experts attribute the country's air pollution to emissions from older vehicles, agricultural by-products, and petroleum refining.[15]

Fine particulate matter, especially matter small enough to reach the deepest part of the lungs, causes chronic pulmonary injury and inflammation.[8,16] Individuals exposed to these particles may be more likely to be infected with respiratory pathogens and to have more severe outcomes.

Socioeconomic and political structure

Sri Lanka is a multiethnic, multilinguistic, and multireligious lower-middle-income country dominated by its Sinhalese Buddhist majority. In 1931, when Sri Lanka was a British colony known as Ceylon, the Donoughmore Constitution provided for self-rule with universal adult suffrage making it the first predominantly nonwhite colony to achieve self-rule on this basis.[17] In 1948, Ceylon gained independence as the Dominion of Ceylon within the British Commonwealth and adopted the Soulbury Constitution. This constitution provided for minority rights but fatally undermined them by adopting a system that did not have proportional representation—which made it relatively easy for political parties to achieve parliamentary supermajorities and encouraged pursuit of ethnic majoritarianism. This led to growing ethnic tensions in the 1950s and open conflict and terrorism in the 1970s. Subsequent constitutional reforms in the 1980s—proportional representation in elections,

devolution, and official language status for both Sinhala and Tamil—came too late to prevent the growing unrest. Since the 1950s, political power in Sri Lanka has alternated between two major parties that have shared a practical commitment to promoting the interests of the Sinhala Buddhist majority.[18]

Sri Lanka's military has played a crucial role in the country's political history, defeating three insurgencies against the country's democratic system, while always remaining subservient to Sri Lanka's elected civilian leaders. It stopped two insurrections (in 1971 and in 1987–1989) by the predominantly Sinhala and Maoist Janatha Vimukthi Peramuna, and the decades-long violent campaign (1975–2009) by the Liberation Tigers of Tamil Eelam for a separate Tamil ethnic state.[19]

Much of the differences in social, health, and development outcomes between Sri Lanka and the rest of South Asia can be traced to Sri Lanka's long history of self-governance and democracy. From the 1930s, the country has prioritized health and education, establishing an extensive network of free hospitals and clinics that delivered curative and preventive care.[20]

During the British occupation, Ceylon was a major exporter of tea, rubber, and other plantation crops,[21] and taxes on these goods helped finance its initial investment in health and other social infrastructure. From the 1970s to the 1990s, Sri Lanka expanded the production and export of manufactured goods.[22] Since the 1990s, tourism and remittances from people who travel abroad to work have also become substantial economic engines.[23,24]

Since the 1970s, Sri Lankan policymakers have reduced tax revenues as a share of national income, relying instead on deficit spending and foreign borrowing.[25] According to the World Bank, tax revenue was 19% of Sri Lanka's gross domestic product (GDP) in 1990 and just 8% of GDP in 2020.[26]

After the elections in 2019, the new government cut taxes further: it reduced the VAT from 15% to 8% and abolished others altogether, including a 2% Nation Building Tax on businesses. These tax cuts came even though the Sri Lanka Health and Ageing Study Wave 1 survey in late 2019 found that just 4% of respondents thought taxes were too high, and most supported tax increases to pay for higher social spending.[27] As a result, Sri Lanka's credit rating was downgraded, and it lost access to the international financial markets it relied on. In 2020, the government started dipping into its foreign reserves to meet debt obligations.[28,29]

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WHO certifies Sri Lanka malaria-free

Previous experience with epidemics

Sri Lanka has a long history of experience managing infectious disease. During the British occupation through 1948, colonial health authorities developed systems for quarantine and surveillance reporting to prevent the importation and spread of infections, especially among plantation laborers.[30]

For centuries, and through the first decade of the 20th century, malaria was a major cause of death in Sri Lanka. In the 1930s, a major malaria epidemic killed hundreds of thousands of people and shaped Sri Lanka's official commitment to establishing an extensive network of free public health facilities, particularly in rural areas.[31] After a century-long campaign of disease surveillance, reporting, and health education, which shifted from large-scale vector control to intensive case detection—and in spite of the three-decade civil war—in 2016 the World Health Organization declared that Sri Lanka had eliminated malaria.[32,33] Since then, the Anti-Malaria Campaign has maintained an effective apparatus for surveillance and rapid response, which has kept imported cases from leading to local transmission.[34,35]

Sri Lanka has successfully eliminated other major communicable diseases, including lymphatic filariasis and maternal and neonatal tetanus.[36] Since the 2000s, however, the country has experienced large-scale dengue outbreaks every few years. The most recent, in 2017, resulted in more than 186,000 reported cases and 440 deaths.[37,38] Sri Lanka was relatively less affected by Ebola, SARS, MERS-CoV, and influenza A.

SYSTEM FACTORS

Beyond policy interventions, other modifiable factors under the short-term control of countries and governments that can help shape countries' pandemic outcomes (such as testing strategies, disease surveillance, laboratory capacities, contact tracing programs, case management, mobility restrictions, and surge response coordination), it is also important to consider preexisting system factors, such as the strength and structure of a country's health care system and supply chains, in any analysis of a country's COVID-19 preparedness and response.

Manufacturing and supply chain capacity

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World Bank – Health Care in Sri Lanka: What Can the Private Health Sector Offer?

Sri Lanka's strong capacity for securing and distributing medicines, vaccines, and medical supplies predated the COVID-19 pandemic.[39] Its centralized public sector procures these goods in bulk via the State Pharmaceutical Corporation, typically for much lower prices than private importers pay, and distributes items to government patients free of charge through Ministry of Health care facilities.[40] The private sector also imports medicines and other key supplies, which it distributes through private retailers and medical providers.[41] This combined public–private system achieves a high level of supply of medicines at a relatively low cost to government and individuals.

Typically, Sri Lanka imports about 85% of its medicines.[42] The rest are locally produced, typically by formulating imported active pharmaceutical ingredients, by the Sri Lanka State Pharmaceutical Manufacturing Corporation and sold to the State Pharmaceutical Corporation and private distributors.[43] Sri Lanka lacks substantial local vaccine manufacturing capacity, requiring them to procure vaccines from outside of the country.

Sri Lanka has a large and cost-competitive garment-manufacturing sector, which means it had substantial capacity to produce masks and medical clothing from the start of the pandemic.[44,45] Medical supplies donated from other countries require two separate approval processes: regulatory approval if the item is not licensed for medical use in Sri Lanka, and a separate approval for exemption from customs taxes. According to key informant interviews, this is a key weakness in Sri Lanka's supply chain for pandemic preparedness because it causes delays in accepting and distributing critical medical donations in emergency situations.

Health system strength and structure

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Sri Lanka has two parallel health systems that are largely independent from one another. The taxpayer-funded public health system, managed by the Ministry of Health and provincial departments of health, is an integrated system that delivers a comprehensive range of services including preventive care, maternal and child health care, heart surgery, and even liver transplants (although access to costly treatments may be limited and rationed by waiting lists). Services in this public health system are essentially free to all. Underfunding is most apparent in the supply of medicines and laboratory tests; high-income patients often buy these from private pharmacies or providers.[46]

All Sri Lankans have universal access to public facilities, but high-income patients often seek care in private hospitals and clinics on a fee-for-service basis.[46] Private insurance in the formal sector accounted for 10% of overall private spending in 2019.[47] Government doctors are permitted to engage in private practice outside their duty hours.[48]

Sri Lanka's public delivery system achieves high levels of access, efficiency, and quality of care despite relatively low spending (perhaps due to intense physician training among other factors).[49,50] Consequently, use of medical services by the average Sri Lankan is comparable to that of Organisation for Economic Co-operation and Development (OECD) countries.[51] It is also generally equal across income levels. In 2019, the public sector accounted for 55% of outpatient and 96% of inpatient episodes, half of all medicines supply, and almost all preventive care.[46]

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Ministry of Health - Sri Lanka Essential Health Services Package

For decades, Sri Lanka has achieved exemplary universal health care outcomes: high life expectancy, a low under-five mortality rate, and utilization rates for medical care that match OECD countries.[52] In 2019, Sri Lanka's Ministry of Health released the Sri Lanka Essential Health Service Package,[53] a list of services typically provided by lower-level primary care facilities, as a planning tool to expand coverage and guide investment.

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GBD 2019 Universal Health Coverage Collaborators – Measuring universal health coverage in 204 countries and territories, a systematic analysis for the Global Burden of Disease Study 2019

FIGURE 5

Universal Health Care Coverage Index for Sri Lankan health services

	UHC Index	Met need	Antenatal care	Maternal mortality	Measles vaccine	DTP3 vaccine	Diarrhea treatment	LRI treatment	ART treatment	TB treatment	ALL treatment	Breast cancer treatment	Uterine cancer treatment	Cervical cancer treatment	Colon and rectal cancer treatment	IHD treatment	Stroke treatment	Diabetes treatment	CKD treatment	COPD treatment	Asthma treatment	Epilepsy treatment	Appendicitis treatment	Paralytic ileus and intestinal obstruction treatment
Sri Lanka	66	66	68	52	92	98	100	97	74	90	35	72	69	83	68	46	64	41	47	70	36	68	99	99

Source: GBD 2019 Universal Health Coverage Collaborators

Most public facilities provide a comprehensive list of essential health services, including almost all preventive services; family planning; facility-based childbirth; maternal and child care; and nonspecialized treatment of infections including tuberculosis and HIV/AIDS, and common noncommunicable diseases such as diabetes, hypertension, and accidents.[46]

HEALTH CARE FINANCING IN SRI LANKA

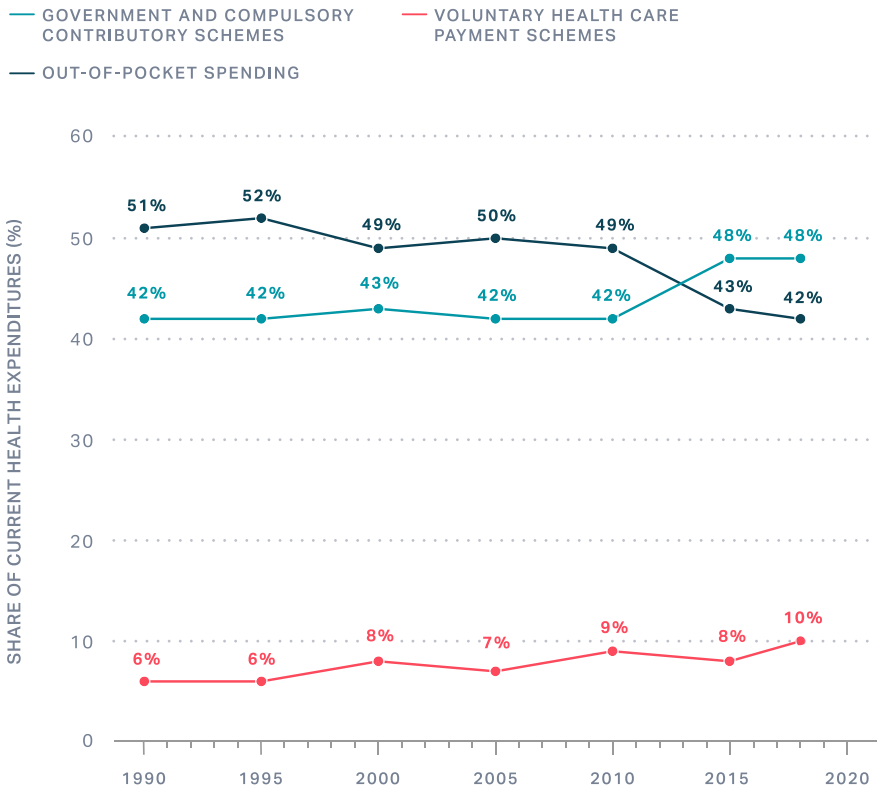
The two major sources of health financing in Sri Lanka are the government budget and out-of-pocket payments. In 2018, out-of-pocket spending accounted for 42% of current health expenditure, government spending 48%, employer spending 5%, and voluntary health insurance 4%.[54]

In Sri Lanka, contributions by nonprofit institutions or nongovernmental organizations to health care is minimal (1% of total spending). External development assistance accounted for only 0.2% of total health care spending in 2019. Most of this money was channeled to the public sector.[54]

In 2018, Sri Lanka's total health expenditure per capita was US$170, or 4.4% of GDP.[55] Although total health expenditure is the standard metric for global health spending comparisons, Sri Lanka shifted to using current expenditure on health, according to the Organisation for Economic Co-operation and Development System of Health Accounts 2011 revision.[56] In 2018, Sri Lanka's per capita current expenditure on health was US$122, or 2.9% of GDP.[54] This is relatively low compared with countries of the same income level.[47]

FIGURE 6

Current Expenditure on Health (CEH) across sources of financing, 1990-2018



Source: Institute for Health Policy analysis

In theory, all services provided at public facilities are free to patients. However, public-sector patients can be directed to private pharmacies and diagnostic services to obtain medicines and laboratory tests if they are not available in a public facility.

Shifting the burden of out-of-pocket spending to higher-income people who choose to use private services minimizes that spending for those who use free public services. This was accomplished through policy changes that have ultimately increased financial protection for lower income populations.

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Institute for Health Policy – The Sri Lankan Model of Public Hospital Governance

Pandemic preparedness capacity

Even before the COVID-19 pandemic began, Sri Lanka's strong health system had substantial experience and competency in disease surveillance, contact tracing, and handling of infectious disease outbreaks, honed from over a century of experience in eliminating malaria and other diseases.[49] In addition, it has a technically competent, efficient national immunization program that achieved coverage levels for child immunization better than most high-income countries. Its system of hierarchical control and management of public health services facilitated rapid, uniform response across the whole island. Finally, close alignment at the district management level between preventive health services and the public sector's curative services dates back to health reforms in the 1960s.

The health system also enjoyed high levels of public trust. Doctors, ministries of health, and the overall health system have high favorability ratings compared with other countries, in part because health services have high rates of contact with the population: more than 90% of mothers use public-sector maternal and child health services, and 97% of adults report using a public-sector health facility in the past year.[11,57,58,59,60] The World Health Organization's 2017 Joint External Evaluation of Sri Lanka's International Health Regulations

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WHO – Joint External Evaluation of IHR Core Capacities of the Democratic Socialist Republic of Sri Lanka

core capacities found that Sri Lanka had strengthened its capacities in laboratory testing, surveillance systems, and human resources for health—all of which would be essential to the country's response to the COVID-19 pandemic.[61] However, Sri Lanka struggled to sufficiently ramp up its testing capacity to adequately match increasing demand in COVID-19 waves past mid-2020.

Key recommendations from the Joint External Evaluation for Sri Lanka include:

- Fostering a true One Health approach through increased multisectoral engagement
- Establishing integrated surveillance across animal and human health sectors, and across all levels of government
- Ensuring improved documentation of national plans, memoranda of understanding, and standard operating procedures to ensure sustainable and scalable health security

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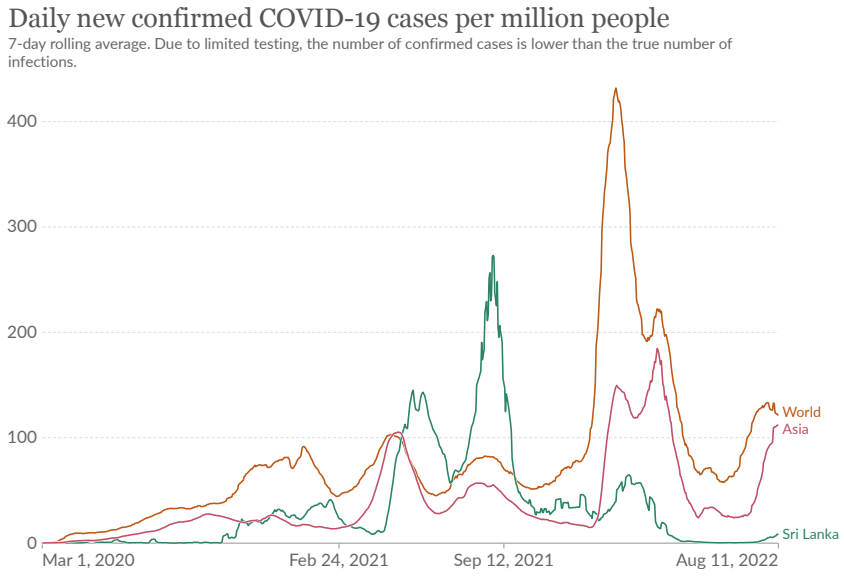
Global Health Security Index – 2021
GHS Index country profile for Sri Lanka

Sri Lanka's 2021 Global Health Security Index score ranked 105th out of 195 countries.[62] However, research by Sri Lankan investigators and others has shown that the Global Health Security Index measure performed poorly in predicting performance in controlling COVID 19.[63,31]

OUTBREAK FACTORS

FIGURE 7

Daily new confirmed COVID-19 cases per million people in Sri Lanka, Asia and the World



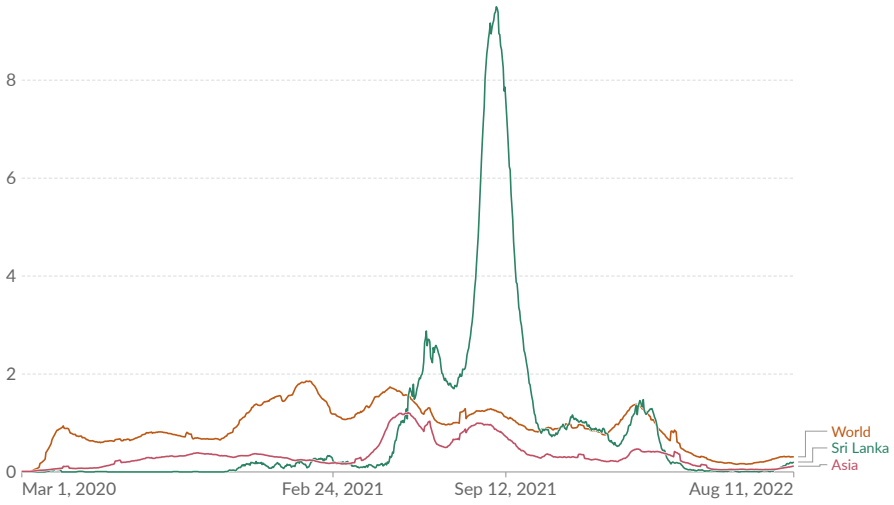
Source: Our World in Data

FIGURE 8

Time series of COVID-19 mortality rate in Sri Lanka, Asia and the World

Daily new confirmed COVID-19 deaths per million people

7-day rolling average. Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.



Source: Our World in Data

Onset in country

The COVID-19 pandemic in Sri Lanka had five phases:

Phase 1: Initial Outbreaks (January–June 2020)

In the first phase, sustained local transmission was prevented and the government pursued a successful zero-COVID strategy.

Sri Lanka quickly set up border screening of arrivals from China and PCR testing facilities after China shared the SARS-CoV-2 genetic sequence and the World Health Organization announced the possibility of human-to-human transmission in January 2020. On January 27, 2020, PCR testing confirmed the country's first case: a Chinese tourist who had come to the country two weeks earlier. This first case was isolated and did not lead to further transmission.

No new cases were detected that February, and travel restrictions, screening, and mandatory quarantine of arrivals were intensified in early March. Temperature and symptom screening were imposed on all arrivals, but restrictions focused on arrivals with a travel history to Italy, Korea, and Iran. Health authorities were slow to react to information in early March that COVID-19 transmission in Europe—Sri Lanka's major tourist market—and the United States was higher than in China. The first case of local transmission, a tour guide working with Italian tourists, was confirmed on March 11. Other case detections in the community followed. It was only after public and private appeals by the Government Medical Officers Association, Institute for Health Policy, and others[64] that Sri Lankan officials took steps to secure the country's borders. All passenger arrivals by air were suspended on March 19, and arrivals by sea were suspended on March 22.

From March to September 2020, the spread of COVID-19 was controlled by the mix of border closures, quarantine, and intensive contact tracing and isolation following detection of new cases in the community. This response was relatively successful in suppressing local transmission except for repeated, localized outbreaks seeded by the initial virus entry in March 2020. The government also imposed an island-wide lockdown in March and April 2020, which was followed by several localized lockdowns in response to new outbreaks.

READ MORE
StratNews Global – Combatting Covid-19: The Sri Lankan approach

Phase 2: Continuous Local Transmission (July–December 2020)

This phase marks the start of sustained local transmission, which for several months remained undetected, but eventually manifested in rising case numbers.

As the initial outbreaks were controlled and new local case detection fell to zero, the government adopted a zero-COVID strategy.[65,66] This strategy resembled the approach adopted by China, Taiwan, Australia, and New Zealand. The philosophy was to minimize entry of the virus through effective border security, and to take aggressive actions to stop any new local outbreaks so that transmission was brought to manageable levels—effectively zero cases—and citizens could live their normal lives.

From April to October 2020, the government's approach appeared to be effective: much of the country was able to function for long periods of time without lockdowns or fear of infection. The strategy faltered as early as June 2020, however, when (according to subsequent genomic and epidemiological analyses) the virus entered the country and began a chain of continuous local transmission.[67] This transmission remained undetected until October 2020, when it emerged as a large outbreak, known as the Brandix cluster, in and around a garment factory on the outskirts of Colombo. From that point on, Sri Lanka experienced continuous, visible local transmission of the virus.

Phase 3: The Alpha Wave and the Start of Vaccination (January–June 2021)

The national strategy unraveled as health authorities effectively gave up trying to prevent local transmission and attention switched to vaccination and opening borders in response to business interests.

In late 2020, the Sri Lankan government implicitly abandoned its original COVID-19 strategy. Borders were reopened to tourists from the end of 2020.

In early 2021, as evidence grew that this was leading to entry of the more infectious COVID-19 alpha variant, the government ignored calls by health officials and other experts to tighten border security, to intensify other public health and social measures, and to step up genomic sequencing to track the new variant. At this point, the interests of the tourism industry seemed to have taken precedence, and government ministers increasingly discussed the need to live with COVID-19.

Phase 4: Delta Wave (July–December 2021)

The country was hit by the delta variant, which resulted in the most severe wave of infections with thousands of deaths and eventually forced a two-month national lockdown.

Starting in January 2021, the official strategy shifted to mass vaccination and reliance on herd immunity[68]; efforts to control viral transmission through border security, testing and isolation, and other public health and social measures waned, as did efforts to use testing and isolation to control transmission.

The delta variant entered Sri Lanka in January 2021 and displaced the alpha variant in July. This led to a new surge in case numbers and the fourth delta wave from July to October 2021.[69] This wave was much more serious than the preceding alpha wave: confirmed deaths peaked at more than 200 a day in early September. From August 16 through October 1, officials imposed a nationwide lockdown—although surveys showed that most of the public (66%), and especially lower-income Sri Lankans, thought the lockdown was too late.[70] In fact, many had voluntarily curtailed their mobility before the lockdown was imposed. However, there was no effort to ramp up testing to help control the virus. Officially, the delta wave caused 11,588 deaths between July 9 and December 31, but researchers believe these deaths were substantially undercounted because of limited PCR testing.

Phase 5: Omicron (January 2022–Ongoing)

The country has been hit by successive, lower-mortality omicron waves and attention has shifted to the consequences of economic collapse.

As the delta wave subsided in September 2022, the nationwide lockdown was lifted, and the economy gradually shifted back to normal until the arrival of the omicron variant started a series of waves that continued into the middle of 2022. The combination of immunity from previous natural infection and vaccination largely blunted the worst effects of this wave, and limited testing further reduced the number of official deaths. By this point, anxiety about and fear of COVID-19 had dissipated.[71] From the beginning of 2022, a growing economic crisis stole much of the public's attention.

As shown in the figure below, based on reported data from Our World in Data, which are influenced by low levels of testing and changing testing strategies, the COVID-19 pandemic resulted in 587,245 cases and 14,979 deaths by December 31, 2021.[72] It is likely that most Sri Lankans had been infected at least once by early 2022, and actual deaths were more than 20,000 by the end of 2021. According to projections from the Institute for Health Metrics and Evaluation, excess mortality due to COVID-19 from January 1, 2020, to December 31, 2021, was 12,900 in Sri Lanka.[73]

Pathogen-specific attributes

The relative importance of the drivers of outcomes of interest during an epidemic or pandemic will depend on the nature of the specific pathogen. In the case of the COVID-19 pandemic, the SARS-CoV-2 virus is characterized by respiratory transmission by both symptomatic and asymptomatic individuals. The virus disproportionately impacts older adults and those with compromised immune systems and comorbidities. Although vaccines and therapies to reduce severe disease and fatal outcomes from SARS-Cov-2 were developed relatively quickly, this is not always the case for other pathogens with epidemic and pandemic potential.

For more information, please see How Does COVID-19 Compare with Past Epidemics and Pandemics?

GLOBAL AND REGIONAL FACTORS

Sri Lanka is an island nation, which means its COVID-19 response benefited from relatively easy border control.[74] About 99% of all arrivals to the island came through the international airport in Colombo.[75]

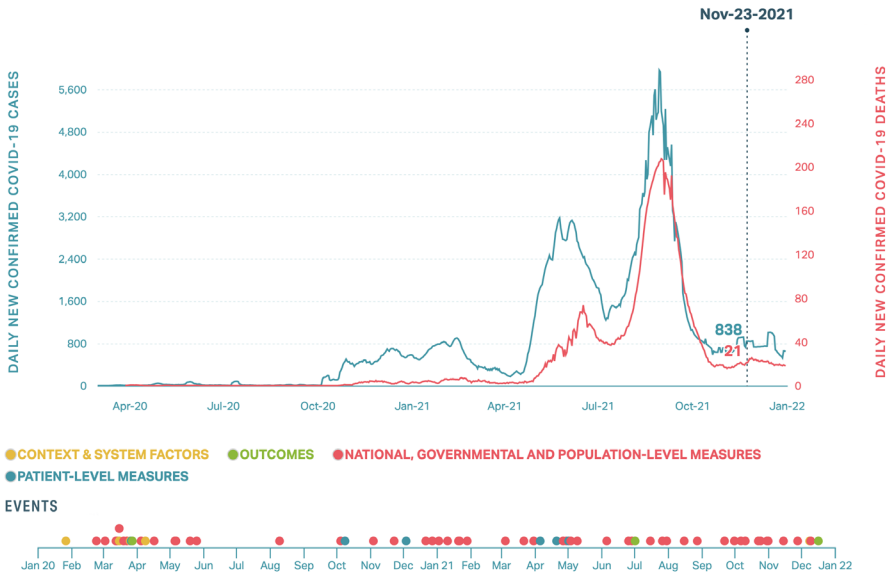
Sri Lanka has one of the highest average temperatures in the world, with two main seasons centered around the northeast monsoon season from September to March and the southwest monsoon season from May to August.[76] While the majority of Sri Lanka's topography is flat, there is a mountainous region in the southcentral region of the island, which affect patterns of rainfall and relative humidity throughout. It is not possible to conclude whether any of the above played a role in the spread of COVID-19 in Sri Lanka.

Respiratory viruses spread more easily through thin, dry air (and consequently at higher elevations) than through humid air.[77] In different climates, outdoor temperature ranges can lead to increased congregating in climate-controlled indoor settings that can increase viral transmission potential.[8] All these factors may influence how rapidly COVID-19 spreads in different countries and at different times of the year.

As climate change worsens, the risk of infectious disease outbreaks has increased, with climatic conditions becoming increasingly fertile ground for pathogenic transmission.[78] Research has shown that many infectious diseases are susceptible to climate variability, flooding, droughts, and the animal and human migratory impact of a changing climate, leading to a rise in vector, food, and water-borne illness.[79]

MILESTONES

FIGURE 9



» **JANUARY 2020**

First confirmed positive case in Sri Lanka

A Chinese tourist who arrived two weeks earlier tested positive for COVID-19; the tourist was isolated and admitted to the National Institute of Infectious Diseases (NIID); no further transmission was detected

» **FEBRUARY 2020**

Screening of some inbound travelers begins

The Ministry of Health ordered the Public Health Inspectors (PHIs) to monitor travelers returning from China, South Korea and Italy, where outbreaks had been detected, for 14 days; travelers were advised, but not required, to wear masks and stay away from public places

» **MARCH 2020**

Border security measures are ramped up

Cruise ship passengers were not permitted to disembark and people returning from South Korea, Iran, and Italy will be required to quarantine for 14 days once facilities are set up

Schools and other educational institutions are closed

The Ministry of Education closed all public schools from March 13-April 20; all Catholic schools and Buddhist Damma schools closed shortly after

Public events and gatherings are cancelled for two weeks

National Operations Centre for Prevention of COVID-19 Outbreak (NOCPCO) is established

NOCPCO, headed by the army commander, coordinated all preventive, control, quarantine and other pandemic-related operations

Mobility is further restricted

NOCPCO banned all domestic leisure travel indefinitely; violators could lose their driver's license and their vehicles seized; pubs, clubs and betting centers were also closed

Island-wide curfews are instated
Night-time curfews were instated across the country for three days; subsequent curfews were imposed over the coming months in areas that were deemed high risk

The COVID-19 Healthcare and Social Security Fund is established
The fund's objective was to collect local donations that would help control the management of COVID-19 and boost social-welfare programs

Presidential task force for COVID-19 response is established
The Presidential Task Force was formed to "direct, coordinate and monitor delivery of continuous services and for the sustenance of overall community life"

The Ministry of Health (MOH) endorses chloroquine and hydroxychloroquine as a COVID-19 treatment
The MOH recommended anti-malarial drugs to be used to treat hospitalized COVID-19 patients, and also informed the public that it was not a preventive drug so urged the public from hoarding or self-administering the drug

First COVID-19 death in Sri Lanka is reported

» **APRIL 2020**

COVID-19 Hotline is launched
As case numbers rose, the government launched a COVID-19 hotline, manned by 100 doctors, to help people with COVID-19-like symptoms to seek medical advice from reliable sources

The US and the EU provide funds to help fight COVID-19 and prop up economy
The US donated 1.3 million USD, through USAID, to help manage the virus's spread by funding efforts that include boost testing surveillance, infection prevention, and increased technical expertise; the EU also gave a 22 million EUR grant to provide economic support for the health, agriculture and tourism industries

Workplace safety guidelines are issued
The MOH published workplace safety guidelines on how to identify and prevent the spread of COVID-19, though non-essential workplaces had yet to reopen; the MOH recommended regular temperature checks, hand washing, social distancing and on-site quarantine facilities in the event someone appeared symptomatic

» **MAY 2020**

Select businesses are allowed to resume some travel
Certain businesses, including furniture manufacturing, electrical distribution, supermarket and food services, were permitted to travel within districts and between districts in areas that do not have curfews imposed

Asian Development Bank provides $25 million trade loan
The funds provided through the trade loan were to be used to purchase medical supplies that had been in short supply, such as masks and medicine to treat COVID-19 patients; ADB's Trade Finance Program guaranteed 85% of the trade loan

Ministry of Health issues guidelines on public safety measures
The MOH recommended the public to engage in social distancing, hand washing and mask-wearing, but due to limited supplies, the public was encouraged to wear cloth masks instead of N95 or surgical masks

Curfew restrictions are loosened
The government relaxed curfew restrictions across the country, including Colombo and Gampaha districts where a curfew had been in place for over two months because they had been designated high-risk zones

» **AUGUST 2020**

All schools reopen in Sri Lanka

Schools resumed in-person classes; students were allowed to return for 1-5 days a week, depending on the student's grade and size of school

» **OCTOBER 2020**

Schools closed

Schools closed due to the sharp rise in COVID-19 cases

Indigenous medicine introduced to treat COVID-19

The government introduced medication made entirely of local herbs to prevent COVID-19 available in powder form or as an "immunizing drink"

» **NOVEMBER 2020**

Relief funds earmarked for families in need

Over 7.3 billion rupees was allocated to provide support to families quarantined at home; relief allowance of 5,000 rupees was also set aside for low-income families in areas where a quarantine curfew had been enforced

» **DECEMBER 2020**

Mandatory 14-day quarantine imposed for all overseas travelers

All overseas travelers subjected to 14-day mandatory quarantine in a government facility

Flights from UK banned

Sri Lanka bans all flights from the UK as omicron starts to spread

Foreign tourists allowed to enter Sri Lanka

Foreign tourists were welcomed for the first time since March 2020 as the country tries to restart its tourism industry

» **JANUARY 2021**

Schools reopened for grade 2 and above

Students in grades 2 and above could return to school, except for those in the Western Provice and isolated areas

Airports reopened for all commercial flights

After a 10-month closure, the country's two main airports resumed commercial flight operation

First COVID-19 vaccine is approved

The National Medicines Regulatory Authority (NMRA) approved the emergency use of the Oxford-AstraZeneca vaccine, the first batch of which—about 500,000 vials—arrived from India on January 28

First doses of COVID-19 vaccine administered

About 150,000 health care workers, 120,000 Tri-Forces, police and security forces are given priority to receive the first batch of COVID-19 vaccines available in Sri Lanka

» **MARCH 2021**

First COVAX shipment arrives

First COVAX shipment containing 264,000 doses arrived in Sri Lanka to be administered to vulnerable individuals above 60 years of age; the 1.44 million doses from COVAX to be delivered was expected to vaccinate about 20 percent of the population

Surveillance measures strengthened

Key government hospitals made into sentinel sites for COVID-19 surveillance ordered to test all patients exhibiting COVID-19 symptoms

First Sinopharm shipment arrives

The 600,000 Sinopharm vaccines donated by China arrive; Chinese nationals living in Sri Lanka were given first priority to receive the vaccine

» **APRIL 2021**

Quarantine measures for inbound travelers ease
All arrivals required to provide pre-departure negative PCR test; fully vaccinated passengers with negative PCR tests on arrival no longer have to quarantine

Private laboratories approved to conduct PCR testing
Nine private-sector labs permitted to conduct PCR tests

All schools closed
The Ministry of Education temporarily closed all schools amid a surge in infections following the Sinhala and Tamil New Year celebrations the previous week; the country reported 997 confirmed cases the day before, setting a record daily number of COVID-19 infections

Isolation and public gathering restrictions imposed
Several areas throughout the country were placed under isolation orders; weddings, public gatherings and social events were banned until at least May 20

» **MAY 2021**

Ayurveda hospitals allowed to treat COVID-19 patients
Hospitals specializing in Ayurveda, a type of holistic medicine that uses natural, indigenous therapies, are permitted to treat COVID-19 patients

First Sputnik V shipment arrives
About 15,000 doses of the Russian-developed COVID-19 vaccine arrived; Sri Lanka purchased a total of 13 million Sputnik V doses

More areas placed under isolation
Sixteen areas across five districts were put under immediate isolation orders; on May 12, thirteen more police areas in six districts, including Colombo and Gampaha, were also ordered to isolate

» **JUNE 2021**

Domestic travel restrictions lifted
Island-wide travel restrictions were eased, except for inter-provincial travel

Public hospitals utilized as vaccination centers
Vaccination centers were set up at public hospitals, prioritizing people aged 60 years and above

Sri Lanka Air Force mobilized to help with vaccination data entry
The Sri Lankan Air Force was deployed to maintain COVID-19 immunization data entry in to the national immunization tracker amid a growing backlog

» **JULY 2021**

Restrictions placed on foreign remittances
The Central Bank of Sri Lanka placed six-month restrictions on outward remittances in order to preserve foreign currency reserves

First Moderna shipment arrives
1.5 million doses of the Moderna COVID-19 vaccine donated by the US through COVAX arrived in Sri Lanka

More Sinopharm vaccines arrive
China donated another 1.6 million doses of its Sinopharm COVID-19 vaccine (until that point, about 72% of the COVID-19 vaccines used in Sri Lanka was Sinopharm); the latest batch targeted people over the age of 40 in the Northern and Eastern provinces

National COVID-19 surveillance system is launched
The National COVID Health Information System (NCHIS) was introduced in an attempt to systematize COVID-19 data with the objective of helping authorities, armed with real-time comprehensive COVID-19 patient data, to make targeted and data-informed strategic decisions

» **AUGUST 2021**

Island-wide curfews are reinstated

The curfew, enforced between 10pm-4am, restricted people's movements, except for those working in essential services

US donates Pfizer-BioNTech COVID-19 vaccines

Through COVAX, the US donated over 100,000 doses of the Pfizer-BioNTech COVID-19 vaccine

» **SEPTEMBER 2021**

World Bank provides loan for COVID-19 vaccines

The World Bank loaned 100 million USD to allow the government to purchase 14 million doses of the Pfizer-BioNTech COVID-19 vaccine

» **OCTOBER 2021**

Island-wide curfew is lifted

The island-wide curfew, which had been in place since mid-August, was lifted with daytime activities to gradually open up; restaurants, workplaces, gyms, salons, and pre-schools were allowed to slowly reopen with limited capacity, while movie theaters remained closed and parties were still prohibited

Pregnant teens approved for COVID-19 vaccine

The MOH expanded COVID-19 vaccine eligibility to pregnant teenagers above 12 years of age

University students and 18-19 year-olds eligible for vaccine

Sinopharm campaign to vaccinate university students launched and Pfizer / BioNTech vaccinations began for 18-19 year-olds

Public gathering guidelines are released

A maximum of 50 people were allowed to gather in religious settings, separated one meter apart; capacity at restaurants, weddings and other meetings or events were capped at one-third of its usual accommodation, and not to exceed 75, 100 and 150 people, respectively; liquor was prohibited at weddings

Primary schools reopen

Primary school students returned to classrooms six months after school buildings were closed

Inter-provincial travel resumes

Inter-provincial travel restrictions were lifted, allowing people to cross provincial borders for the first time in six months; inter-provincial passenger bus and train services were resumed on November 1; the restriction was lifted given the MOH cited 70% of the population – primarily those above 30 years of age — had received the COVID-19 vaccine

» **NOVEMBER 2021**

Booster doses are administered

Sri Lanka began administering booster doses, or the third dose, as its inoculation campaign had covered a large portion of its population; health care workers and military personnel were the first to receive the boosters, followed by travel industry workers, and then the elderly

Molnupiravir is approved for COVID-19 treatment

The National Medicines Regulatory Authority (NMRA) approved usage of Merck and Ridgeback Therapeutics' COVID-19 antiviral Molnupiravir

Entry ban on travelers from six southern African countries

Sri Lanka barred travelers arriving from South Africa, Botswana, Lesotho, Namibia, Zimbabwe, and Eswatini from entering the country over concerns about the new omicron variant

» **DECEMBER 2021**

National center managing pandemic dissolves

National Operations Centre for Prevention of COVID-19 Outbreak (NOCPCO) stopped operations, and was converted into the Operations Center for Green Agriculture

Entry ban on travelers from six southern African countries is lifted

Travel ban from South Africa, Botswana, Lesotho, Namibia, Zimbabwe, and Eswatini is lifted

Fitch Ratings downgrades Sri Lanka's long-term foreign-currency issuer default rating

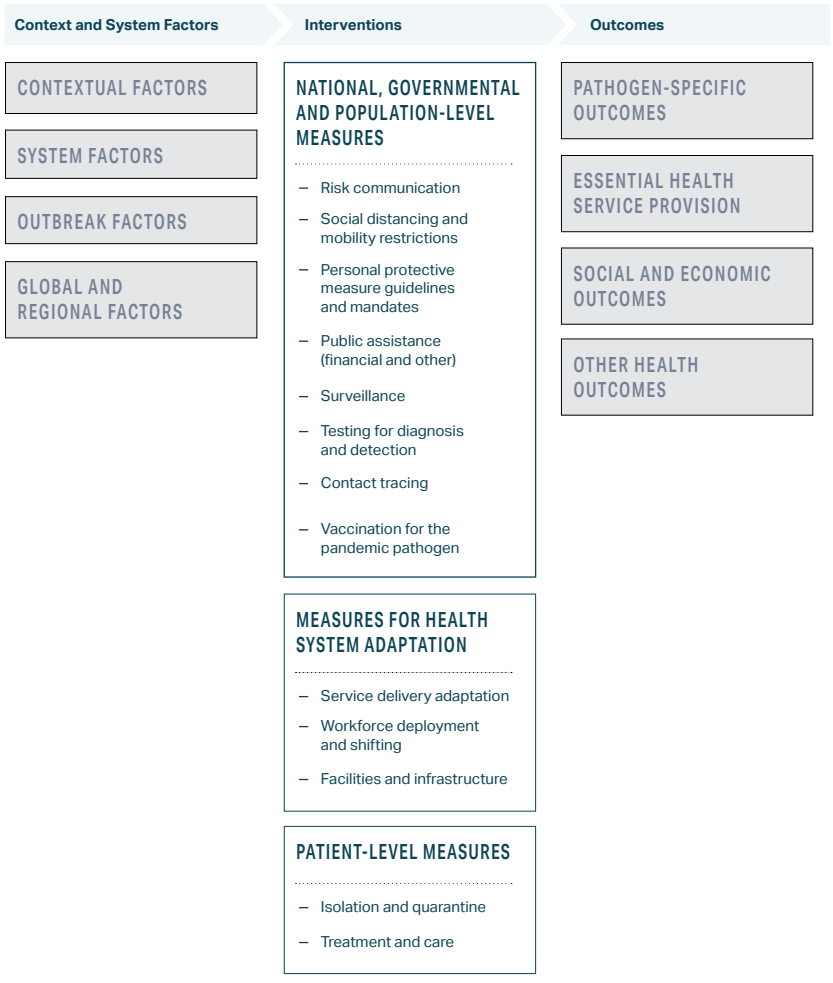
Sri Lanka's long-term foreign-currency issuer default rating was downgraded to 'CC' from 'CCC' amid the growing probability the country would default because of its worsening liquidity, drop in foreign exchange reserves, high external debt payments, and limited financing inflows

HOW DID SRI LANKA RESPOND TO THE COVID-19 PANDEMIC?

THE FOLLOWING SECTION COVERS THE INTERVENTIONS THAT WERE DEPLOYED IN SRI LANKA TO RESPOND to COVID-19 and maintain essential health services (EHS). Unlike context and systems factors which cannot easily be changed when an outbreak occurs, policies or interventions can. Interventions during the early months of the coronavirus pandemic in Sri Lanka fell into three main categories: national, governmental, and population-level measures, health system-level measures, and patient-level measures.

FIGURE 10

Exemplars in COVID-19 conceptual framework for assessing epidemic preparedness and response



In early 2020, Sri Lanka's authorities officially adopted a zero-COVID strategy,[80] which had two prongs:

» Reducing risk of entry of the novel coronavirus via effective border security

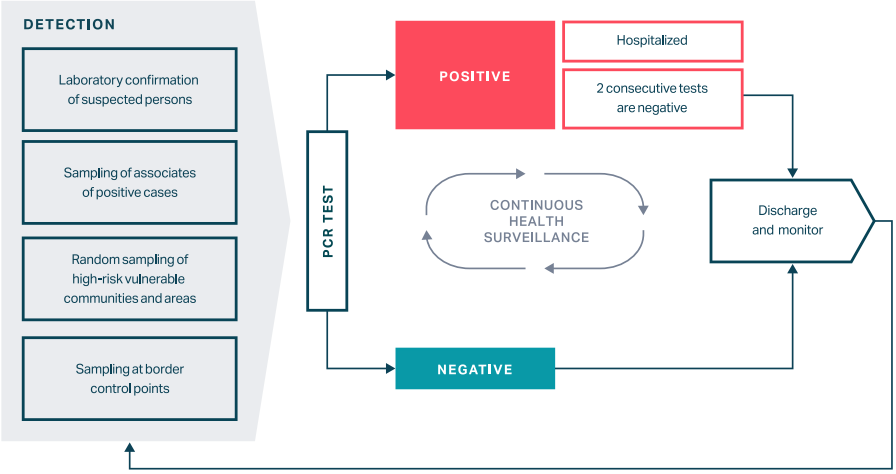
» Acting aggressively to stop any local outbreaks by implementing strict contact tracing and isolation

The goal of the strategy was to bring local transmission to zero, enabling communities to return to normal life behind protected borders.[81]

READ MORE
State Intelligence Service – Combatting COVID-19: Sri Lankan Approach

FIGURE 11

Sri Lanka's Strategy for Eliminating COVID-19 at the Population and Patient Levels



Source: Sri Lanka State Intelligence Service

READ MORE
WHO – COVID-19 Health System Response Monitor: Sri Lanka

Without high levels of PCR testing for symptomatic people in local health facilities, however, lapses in adherence to isolation policies led to widespread community transmission that went undetected for months.[82] By the end of 2020, this transmission overwhelmed the country's capacity for testing, tracing, and isolation. Soon it was clear that the testing rates necessary to sustain the COVID-19 elimination strategy would be impossible to attain (especially because the country's testing approach did not include pooled or saliva testing).[83] In the face of this impossibility, political and health authorities implicitly abandoned the pandemic elimination strategy. They lifted border controls and slowed efforts to detect new cases and contacts.[84]

Sri Lanka's COVID-19 response was coordinated from the top down. On March 16, 2020, the president established a National Operations Centre for Prevention of COVID-19 Outbreak, headed by Army Commander General Shavendra Silva, to "coordinate preventive and management measures to ensure that health care and other services are well-geared to serve the general public."[85,86] Shortly thereafter, the president established a Presidential Task Force for the COVID-19 response to "direct, coordinate and monitor delivery of continuous services and for the sustenance of overall community life."[87]

READ MORE
Centre for Policy Alternatives – Statement on the Presidential Task Forces

Nongovernmental entities and civil society organizations were not involved in Sri Lanka's COVID-19 response.[87] One exception was the nongovernmental organization (NGO) Sarvodaya, which coordinated and managed a collective of civil society organizations providing food security and meeting the hygiene and medical needs of vulnerable groups (in homes for children and older adults, rehabilitation centers, safe houses for women, and probation centers).[88] It also mobilized and trained community and religious leaders on COVID-19 prevention and control. In general, however, the government did not seek, and often did not recognize, civil society contributions to the country's pandemic response.

> "THE GOVERNMENT DIDN'T WANT TO INVOLVE CIVIL SOCIETY ORGANIZATIONS, NO ONE WAS INVITED TO BE PART OF THE RESPONSE. NONE OF THE COMMITTEES THAT WERE APPOINTED INCLUDING PRESIDENTIAL TASK FORCE INCLUDED ANY CIVIL SOCIETY ORGANIZATIONS."
>
> – KEY INFORMANT

FINANCING SRI LANKA'S COVID-19 RESPONSE

Because of Sri Lanka's ballooning deficit and limited ability to borrow internationally, its pandemic response spending was relatively low.

It did receive some international loans and donations:

- In mid-March 2020, China loaned Sri Lanka US$500 million to spend on COVID-19 control efforts.[89]
- That April, the European Union provided 22 million euros to boost the health, agriculture, and tourism sectors[90] and Japan provided US$1.2 million through the United Nations Children's Fund, the International Organization for Migration, and the International Federation of Red Cross and Red Crescent Societies.[91] By May, the United States had committed more than US$5.8 million.[92]
- The "Sri Lanka COVID-19 emergency response and health systems preparedness project," an April 2020 grant from the World Bank, provided US$128.6 million in funding for preventing, detecting, and responding to the pandemic and strengthening national systems for public health preparedness.[93,94] The World Bank later provided an additional US$80.5 million to fund vaccine access and distribution.[95]
- Emergency funding from the Asian Development Bank (US$110 million) strengthened public health services in the face of pandemic challenges.[96] The Asian Development Bank also loaned Sri Lanka an additional US$150 million to buy vaccines as part of the Asia Pacific Vaccine Access Facility.[97]
- India donated a half-million doses of AstraZeneca vaccine at the end of January 2021; China donated 1.6 million doses of Sinopharm vaccine in July 2021[98]; and the first batch of vaccines from COVAX (264,000 doses) arrived in early March of that year. These were followed by 1.5 million doses in mid-July and a further 728,000 doses from Japan at the end of that month.[99-101]

Sri Lanka's president also established the "ITUKAMA – COVID 19 Healthcare and Social Security Fund" in March 2020 to collect local donations aimed at controlling COVID-19 and boosting social welfare programs.[102] However, spending from this fund was limited. By September 2021, it had collected about US$10 million from organizations and individuals for advocacy, PCR testing, vaccines, quarantine facilities, and intensive care unit beds.[103]

READ MORE
World Bank - Sri Lanka COVID-19 Emergency Response and Health Systems Preparedness Project

READ MORE
Asian Development Bank - $150 million loan to help Sri Lanka purchase COVID-19 vaccines

Interventions to limit the spread of COVID-19 and maintain essential health services during the early months of the pandemic in Sri Lanka fell into three main categories:

- National, governmental, and population-level measures
- Health system–level measures
- Patient-level measures

READ MORE
South China Morning Post – Sri Lankan health minister demoted for promoting magic potions to prevent Covid-19

NATIONAL, GOVERNMENTAL, AND POPULATION-LEVEL MEASURES

Risk communication

Building on its existing National Risk Communication Plan for Avian Influenza, Sri Lanka's Health Promotion Bureau began to develop a risk communication plan for COVID-19 in early January 2020.[82]

Daily official briefings delivered by the director-general of health services, the army commander general, and a police spokesperson updated the public on Sri Lanka's COVID-19 response. These briefings were widely covered by television, radio, and the print and social media, and they were the primary source of information for most of the media and public.[82]

Many of these government representatives had no public health training or expertise and some minimized the dangers of COVID-19 in their public briefings. The Sri Lanka Health and Ageing Study Wave 2 data also indicated that the public supported more aggressive pandemic interventions that could have reduced case counts and deaths.[104]

The Sri Lanka Health and Ageing Study (SLHAS) is an ongoing national phone survey that has monitored information on population-level behavior and changes since 2019. The SLHAS is a Ministry of Health-approved, national longitudinal cohort study with two nationally representative sample surveys: Wave 1, which included data from 2018 and 2019 just before the pandemic started, and Wave 2, which included dec from 2021 and 2022. The SLHAS provided crucial data on topics including the use of health services, health care access, public opinion, and vaccine uptake.

SOCIAL DISTANCING AND MOBILITY RESTRICTIONS

Social distancing

From the beginning of the COVID-19 pandemic until early 2022, Sri Lanka's government employed a range of social distancing measures to reduce transmission of the novel coronavirus. These measures included school and university closures and limitations on gatherings such as weddings.[105] Officials also imposed a nationwide curfew on March 20, 2020, although they did not declare a state of emergency. Over the next few months, officials eased and adjusted the curfew from place to place according to risk.[106]

Public messaging—via video, leaflets, stickers, posters, and pictograms in Sinhala, Tamil, and English—also emphasized the importance of maintaining distance from others in public spaces.[82]

When curfews and lockdowns were lifted, officials released guidelines on safety in workplaces and on public transport. Working with the World Health Organization (WHO), they devised a marketing campaign called DReAM:

- D – Distancing
- Re – Respiratory etiquette (cough/sneeze using the inner side of your elbow and not directly in front of you)
- A – Aseptic techniques (handwashing, using hand sanitizer, avoiding touching your face)
- M – Mask (proper wearing of a face mask and its proper disposal)[82]

School closures

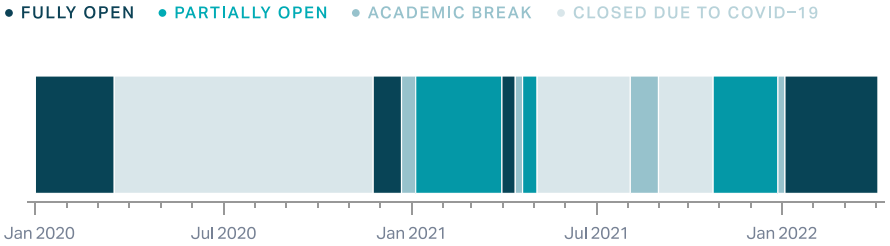
Schools, universities, and other training facilities were closed from mid-March to August 2020, and twice during the pandemic waves in 2021.[82] Schools reopened in January 2022, but fuel shortages and power outages associated with economic crisis soon closed them again.[107,108]

During these school closures, efforts were made to continue education through special television programs and the internet, but these would have had limited reach for lower-income students without internet connections and other key supplies. A 2020 survey showed that only 48% of households with children had a computer or smartphone and only 34% had an internet connection. Among the lowest-income group, only 21% had an internet connection.[82]

At some private schools, typically attended by children from high-income families, children benefited from relatively well-organized internet-based teaching during most shutdowns.[109]

FIGURE 12

School Closures in Sri Lanka from March 2020 to March 2022



Source: Institute for Health Policy

READ MORE
Erandi et al. – Effectiveness of the strategies implemented in Sri Lanka for controlling the COVID–19 outbreak

Other social distancing measures limited the maximum number of people allowed to congregate in public and at large gatherings such as weddings and funerals.[110] These limits were relaxed or tightened throughout 2021 depending on case counts across the country.[82] Efforts were also made to encourage public- and private-sector office workers to work from home, particularly during the delta wave, but most of Sri Lanka's workers are not office workers and could not work from home.

In general, these efforts waned as the pandemic continued. For example, efforts to maintain social distancing in public transport were often undermined by efforts to save money and boost efficiency by reducing the number of buses and trains in service at one time.[111] Additionally, many offices were exempt from the delta wave lockdowns, including public offices.[112] Enforcement of social distancing regulations, which critics claimed were sometimes selectively enforced against minority populations such as Muslims and Tamils, also became less intensive over time.[113]

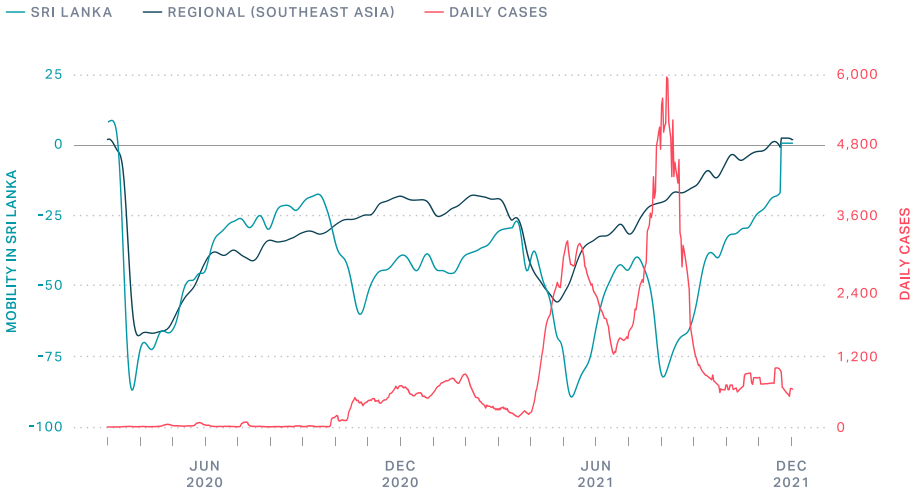
Lockdowns

Lockdowns also reduced population mobility in Sri Lanka. In March 2020, officials imposed seven weeks of lockdown, enforced by the military and police, that required everyone in the country except essential workers to stay home.[82] This early lockdown successfully reduced population mobility in most places; however, residents of low-income, high-density urban settlements sometimes struggled to comply, making it difficult to eliminate local transmission in those areas.

As sustained local transmission began in July 2020, health authorities attempted to control the spread of the novel coronavirus by establishing local lockdowns in which travel across district borders was often prohibited.[82]

FIGURE 13

Mobility in Sri Lanka from March 2020 to December 2021



Source: IHME COVID-19 Projections

Political authorities concerned about the perceived economic and political costs of national lockdowns, particularly among low-income households who depended on daily wage labor, pushed health officials to avoid subsequent national lockdowns. Two additional national lockdowns were imposed, from May–June 2021 and August–October 2021; however, large numbers of exemptions appear to have undermined their effectiveness in reducing mobility.[114] The Sri Lanka Health and Ageing Study Wave 2 survey during the August–September 2021 lockdown found that the public—including low-income respondents—strongly supported the lockdown and believed it should have been imposed earlier and more stringently.[104]

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Ministry of Health – General Guidance for the Public on COVID-19 Prevention

Personal protective measures

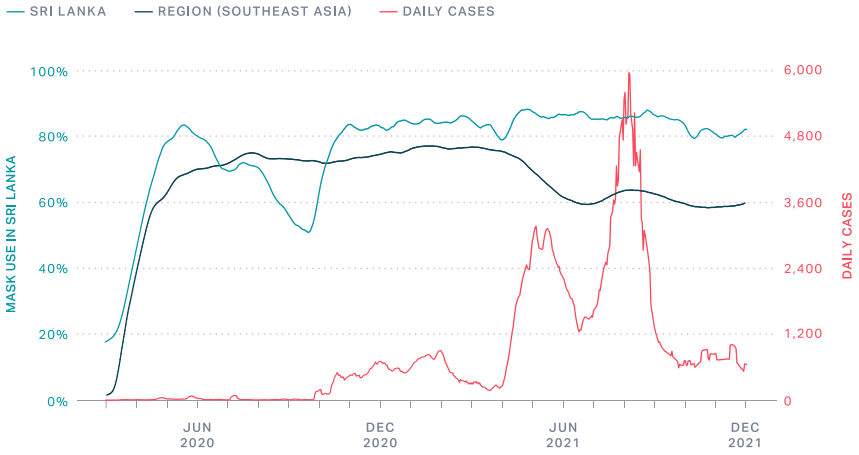
At the beginning of the pandemic, health authorities recommended that people wear masks when in public. Because supplies were limited, however, health authorities initially avoided imposing a mask mandate.[115]

According to key informant interviews, the government provided guidance on when to wear face masks in 2020, requiring them in public settings where a minimum of about 3 feet (1 meter) of physical distancing is difficult to maintain, on public transport, and for those at high risk of severe illness from COVID-19.

Starting in October 2020, mask wearing in public was mandated.[116] The mandate was lifted in June 2022.[117] Facebook survey data suggested high public compliance with the mandate. However, people often wore masks incorrectly, reducing or even eliminating their protective effect—despite an investments in explanatory television and radio advertisements sponsored by governmental authorities; online webinars organized by community organizations; and billboards, posters, and stickers displayed at public places and transportation modes.[118,119]

FIGURE 14

Mask Use in Sri Lanka from March 2020 to December 2021



Source: IHME COVID-19 Projections

PUBLIC ASSISTANCE

ECONOMIC IMPACT OF THE COVID-19 PANDEMIC IN SRI LANKA

The economic effects of the COVID-19 pandemic in Sri Lanka were widespread: agriculture, forestry, fishing, industry, and the services sector all contracted in 2020 from the previous year, and unemployment increased from 4.8% in 2019 to 5.5% in 2020.[120] Experts believe these effects were due, in part, to the curfews and lockdowns officials imposed to halt the spread of COVID-19.[121]

These measures, especially lockdowns and border closures, harmed Sri Lanka's tourist economy. In 2019, some 1.8 million people arrived in the country, compared with 508,000 in 2020, a 73.5% decline. As a result, the tourism sector comprised only 3.3% of total foreign exchange earnings (profits from services exchanged in a global marketplace), compared with 13.7% in 2019.[122]

Remittances from migrant workers, which are Sri Lanka's largest single source of foreign exchange, fell during the first year of the pandemic, and factory closures slowed textile and garment exports.

The COVID-19 pandemic exacerbated economic struggles that had been mounting from previous government policies, such as large tax cuts, and in December 2021 Fitch Ratings downgraded Sri Lanka's long-term foreign currency issuer default rating.[123] Although GDP growth improved in 2021, public debt rose to 119% of GDP, inflation rose, and the foreign currency shortage continued.[124]

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Institute of Policy Studies of Sri Lanka – Equity in recovery: addressing Sri Lanka's social protection and food security needs

Social and economic support was a key part of Sri Lanka's pandemic response from the beginning of 2020. In fact, the presidential vision strategy issued in May 2020 explicitly named it as one of four key domains of action.[80] A range of economic and social support measures were targeted at both businesses and households—but even so, overall public spending on pandemic-related economic support was comparatively low. Among the primary reasons for this low spending may have been the lack of fiscal capacity stemming from the tax cuts implemented at the start of the pandemic and the high levels of public debt, which constrained the government's ability to borrow.

Aid to businesses

Businesses received tax subsidies in the form of exemptions, waived penalty fees, and extended deadlines for tax payments; tax exemptions on imports of pharmaceutical and medical goods and personal protective equipment; and pauses on loan repayments.[125] The Central Bank also relaxed prudential requirements for banks and developed a refinancing facility to provide small and medium enterprises with concessional working-capital loans. The government did not implement measures that would have helped workers maintain their employment, such as direct subsidies to firms to pay wages or increase government spending to maintain domestic demand.[82]

Aid to households

Support measures for households primarily consisted of cash grants, including one-off or monthly grants of 5,000 Sri Lankan rupees (US$27) to low-income earners, older adults, and households most affected by COVID-19 or lockdown from April through December 2020 [82,126] ; 10,000 Sri Lankan rupees (US$55) interest-free advances to some welfare (Samurdhi) recipients[127]; and dry ration packs for some families.[128] Officials also waived fees for late credit card payments[129] and increased insurance benefits for health care workers, police, the military, and other government employees.[130] Several NGOs, such as Sarvodaya, also organized relief efforts to assist households in isolation or lockdown.[88]

Cash transfers to households in response to COVID-19 was small in comparison with other Asian developing countries,131 amounting to only 0.5% of GDP in 2020 and 0.1% of GDP in 2021.[124]

Data from the Sri Lanka Health and Ageing Study Wave 2 in mid-2022 indicates that only 5.4% of households received any cash or food assistance because of COVID-19 from the start of the pandemic, and only 2.9% of these reported receiving food or cash assistance from NGOs.[131] However, government assistance benefited low-income households more than high-income households, whereas most of the NGO assistance appears to have benefited more high-income households. This may reflect barriers NGOs face in reaching the lowest-income community members and the greater intensity of NGO activity in areas of higher social capital.

Despite these interventions, in 2021 the World Bank estimated that 500,000 Sri Lankans fell into poverty during the COVID-19 pandemic.[128]

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Ministry of Health – Progress Report of COVID-19 Immunization

Surveillance

Hospitals shared all COVID-19 statistics with the Ministry of Health coordinator in charge of COVID 19 operations, who then shares them with the Epidemiology Unit. The Epidemiology Unit, in turn, publicly shares the data (including a daily situation report, epidemiological summary, vaccination summary, and confirmed deaths weekly analysis) on its website.[132]

Since March 2020, the Department of Government Information also released daily press announcements on case counts and deaths.[133] The Health Promotion Bureau likewise provides a daily dashboard of key COVID-19 statistics on its website, including confirmed cases, deaths, recoveries, PCR and antigen test numbers, fatality and recovery rates, and comparisons with other countries.[134]

Nevertheless, key informants reported some controversy around data transparency, accessibility, and validity.[135] For example, because the official methodology for identifying and counting pandemic deaths changed over time,[136,137] it is possible that deaths from COVID-19 were underreported.

Testing for diagnosis and detection

While the 2017 Joint External Evaluation showed that Sri Lanka had strengthened its testing capacity, some researchers argue Sri Lanka had insufficient testing capacity that limited its ability to detect and eliminate community transmission of the novel coronavirus. At the beginning of the pandemic, Sri Lankan health authorities increased PCR testing to under 250 tests per million a day[138] but did not invest in ramping up testing capacity or implementing a system for symptomatic testing at the primary care level.

Between March and June 2020, health authorities rejected offers by private donors and suppliers to obtain the larger testing machines required to sustain testing at the high levels necessary for the success of their elimination strategy. They also resisted implementing widespread symptomatic testing of patients with acute respiratory infection symptoms, focusing instead on symptomatic testing of hospital patients and random testing in the community, according to key informant interviews.

According to key informants, including political officials and high-level members of the COVID-19 Task Force, the task force was never advised that the level of testing was inadequate to maintain the declared strategy. Other local experts—including many of the most senior members of Sri Lankan's medical profession—repeatedly raised the need to increase testing, but officials rejected these calls.[139]

Several factors likely contributed to these problems. First, key decision makers had a sense of complacency due to Sri Lanka's early success at containing the virus and did not act on outside experts' calls to take testing more seriously; instead "groupthink" was reinforced by not incorporating alternate viewpoints and advice from WHO and other international agencies. Second, health authorities did not seek to determine how much testing it should be doing, despite that many researchers outside the government had the capacity to conduct such an analysis. Third, the deteriorating fiscal environment following the 2020 tax cuts may have bolstered the widely held belief that testing was a waste of money. Fourth, according to key informant interviews, Sri Lankan medical culture was inherently resistant to spending more on laboratory testing, an attitude that served Sri Lanka well in keeping health care costs low during nonpandemic times, but not when faced with COVID-19.

Consequently, although Sri Lanka's Ministry of Health (MOH) established PCR testing capacity for COVID-19 within two weeks of China's release of the SARS-CoV-2 genome, the country was slow to expand its testing capacity. Sri Lanka's testing capacity in terms of monthly PCR tests per 1,000 people at the end of early 2021 was equivalent to testing capacity in other lower-middle-income countries, but substantially lower than in upper-middle-income countries. These testing limitations subsequently became the major factor constraining the country's efforts to control pandemic transmission.

The initial expansion of PCR testing for COVID-19 involved repurposing an existing pool of PCR machines, many of which were part of the national tuberculosis program. In April 2020, private laboratories were also authorized to undertake PCR testing for paying patients, according to key informant interviews. Antigen testing was introduced in December 2020 to supplement PCR testing, mainly for clinically suspected cases. To help control transmission inside hospitals and other health facilities, hospitals also started testing all inpatients and some outpatients using antigen tests. In June 2021, MOH guidance instructed clinicians to reduce the use of scarce PCR tests and rely instead on rapid diagnostic tests.[140] Rapid diagnostic tests became the main method for testing contacts, and PCR tests were reserved for symptomatic first contacts with negative antigen tests.

Rapid diagnostic tests were not licensed for sale directly to consumers, but large private-sector employers such as factories were encouraged to use rapid diagnostic tests for routine testing. In October 2021, this routine asymptomatic testing at workplaces was discontinued.[141]

Officials established a system to coordinate Sri Lanka's testing laboratories, transfer samples to different laboratories based on need, and report daily results to the MOH, according to key informants. It also set up a centralized procurement system for purchasing and distributing reagents and supplies to all government laboratories. Private laboratories, on the other hand, purchased PCR test kits (approved by the National Medicines Regulatory Authority, or NMRA) from suppliers on their own and established their own teams of sample collectors and vehicles to transport samples from any location on the island while maintaining cold chain conditions.

Some public health authorities were initially reluctant to involve the private sector in testing, but the overwhelming need to expand testing capacity in 2020 changed their minds. Private laboratories were used for testing travelers and handling samples from workplace screening; between March 2020 and December 2021, they handled about 40% of all PCR tests. To improve access, the MOH imposed a price ceiling on private-sector PCR tests, set at 6,500 Sri Lankan rupees in August 2021 (equivalent to US$33 at the time).[142] Even so, survey data suggests that lower-income people were less likely to get tested than their higher-income counterparts, especially in the private sector, indicating that making test access depending on ability to pay worsened inequity.[104]

Due to concerns about private laboratories abusing sample pooling to save costs, the MOH eventually prohibited sample pooling at private laboratories altogether, although it could have helped expand overall testing capacity considerably. MOH laboratories were authorized to do limited sample pooling, but they never adopted it (or saliva testing) on a scale large enough to reduce barriers to outpatient testing.[104]

Further limiting capacity in Sri Lanka was that most testing was done using small- and medium-sized machines with laboratory staff manually extracting and preparing samples. Although donors had offered to help the MOH fund the purchase of large, automated testing systems, officials believed Sri Lanka's testing capacity was adequate, as confirmed by key informant interviews, and repeatedly turned down donor offers. This belief may have been due to Sri Lanka's early success in building out testing capacity in January 2020, a wider phenomenon of "groupthink" (conformity and consensus in decision-making) observed among official decision-making bodies, which prevented consideration of alternative views on testing and disregarded technical expertise from outside the government. Additionally, the assessment from the 2017 Joint External Evaluation also suggested that the country had strong preexisting testing and surveillance capacity, which may have led to a false sense of security.

For all these reasons, Sri Lanka's testing capacity continued to fall behind.

Contact tracing

Building on its strong preexisting competencies in infectious disease control, particularly for malaria, and with the support of the military and state intelligence services, Sri Lanka maintained an unusually aggressive contact tracing and isolation strategy from the start of the pandemic until early 2021.[143] As health authorities gradually gave up the idea of stopping local transmission (even though it remained the country's official strategic goal), contact tracing was relaxed until it resembled practices in other countries that had never pursued a COVID-19 elimination strategy.

Sri Lanka's early contact tracing and isolation efforts were supervised and coordinated by the MOH Epidemiology Unit.[144] More than 3,000 public health inspectors across the island performed the actual contact tracing with the help of the police.[145] They also managed quarantine facilities for identified cases.

From the beginning of the pandemic until January 2021, Sri Lanka's contact tracing strategy was to trace all first- and second-level downstream and upstream contacts of each identified case.[81] Through most of 2020, public health inspectors placed all identified cases and contacts into institutional isolation or quarantine. In October 2020, this policy changed

to allow home quarantine of contacts for 14 days with supervision by village committees and public health inspectors.[146] Institutional quarantine only applied to vulnerable individuals, those living in boarding places, and airline crew.[147]

Contact tracing relied on traditional face-to-face interviews supported by state intelligence services who used "big data"—including location data from mobile-phone towers—to identify and locate additional contacts.[148] Additionally, the Information and Communication Technology Agency launched a mobile-phone app, MyHealth Sri Lanka, that checked individuals in and out of public places and alerted others who had been in those locations at the same time.[149]

> "DURING THE FIRST WAVE, WE HAD TIGHT CONTACT TRACING. WE HAD THE SUPPORT OF THE TRI-FORCES [THE UNIFIED MILITARY ENCOMPASSING THE SRI LANKA ARMY, THE SRI LANKA NAVY, AND THE SRI LANKA AIR FORCE], POLICE, AND CID [CRIMINAL INVESTIGATION DEPARTMENT] FOR THIS. WE SUPERVISED THE QUARANTINE PROCESS, AND THIS WAS GOING SMOOTHLY AS WELL. IT WAS ALL GOING WELL AT THE START. TOWARDS THE MIDDLE, HOWEVER, IT BECAME A LITTLE LENIENT. WE STARTED DOING PCR AND RAPID ANTIGEN TESTS FOR SCREENING IN OUR OFFICES BY THEN. WE IDENTIFIED A LARGE NUMBER OF PATIENTS TO [QUARANTINE], AND THIS WAS TOO MUCH FOR THE HEALTH SYSTEM TO HANDLE."
>
> – KEY INFORMANT

By August 2021, key informants reported that contact tracing and isolation efforts had essentially stopped. Health authorities relied mostly on vaccination to mitigate the impact of infections.

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Ministry of Health – COVID-19 Sri Lanka Strategic Preparedness and Response Plan 2021

Vaccination for the pandemic pathogen

The Sri Lankan government initiated its COVID-19 vaccination campaign in January 2021.[97,150] The campaign's goals were to minimize illness and death, slow viral transmission, and boost the economy.[151] Epidemiologists outside Sri Lanka began to conclude by early 2021 that herd immunity was unachievable with available COVID-19 vaccines because they had a limited ability to block transmission of the pandemic pathogen.[152] Despite this, key informants reported that Sri Lankan health authorities' political and media messaging focused on achieving herd immunity through vaccination into 2022.

Initially, Sri Lanka's targets for vaccine coverage were based on WHO global guidance and expected supplies from COVAX.[99] In November 2020, the MOH established the National Coordination Committee for COVID-19 Vaccines, whose membership included MOH officials, health experts from the public sector (such as the College of Community Physicians of Sri Lanka), and partner organizations such as WHO, the United Nations Children's Fund, Asian Development Bank, and the World Bank.[153] The committee's role was to design the country's vaccination campaign, and it issued a detailed national plan in January 2021[154] covering regulation, financing, vaccine prioritization (of health care workers, border security and frontline essential workers, and older adults), and service delivery.

When COVID-19 vaccines began to be available for purchase on the global market, health officials in the new State Ministry of Primary Health Care, Epidemics and COVID Disease Control[155] pivoted to a more aggressive strategy: purchasing enough vaccines, first from India and then from China, to vaccinate the entire adult population as soon as possible. The World Bank and the Asian Development Bank eventually provided grants and loans, but the Sri Lankan government also spent substantial funds of its own on vaccine procurement:

through 2021, the government spent US$328 million,[156] or 0.4% of the GDP, on COVID-19 vaccines.[124] By late 2021, most adult Sri Lankans had been vaccinated and focus shifted to vaccinating children and covering the adult population with boosters.[157]

Timeline of eligibility for COVID-19 vaccination:

- January 2021: Health care workers
- March 2021: Ages 60 years and older
- May 2021: Ages 30–59 years
- September 2021: Ages 20–29 years
- October 2021: Ages 15–19 years
- January 2022: Ages 12–14 years

Sri Lankan army members wait to receive a dose of AstraZeneca's COVID-19 vaccine manufactured by the Serum Institute of India, at army hospital in Colombo, Sri Lanka January 29, 2021. REUTERS/Dinuka Liyanawatte

Sri Lanka started its COVID-19 vaccination campaign in late January 2021 by inoculating frontline health care workers with Covishield shots from India.[97,150] After large supplies of Sinopharm vaccines became available in July 2021, Sri Lanka's vaccination coverage rapidly increased, with over 60% of the total population fully vaccinated (i.e., receiving all doses prescribed by the initial vaccination protocol) by December 31, 2021.[158]

VACCINE PROCUREMENT CHALLENGES IN SRI LANKA

In Sri Lanka, procurement regulations prevented officials from ordering vaccines until the National Medicines Regulatory Authority had given local approval for each one—a process which key informants report effectively delayed the procurement of vaccines from China and Russia.[159] WHO's Emergency Use Listing process, which only enabled Western regulatory agencies to fast-track approval, caused additional delays.160 When the delta wave paused the supply of Covishield (AstraZeneca vaccine produced at the Serum Institute of India) vaccines from India in mid-2021, political authorities pressured the National Medicines Regulatory Authority to speed up its approval process for Chinese vaccines.161 Eventually, Sinopharm and Sputnik vaccines were approved for use in Sri Lanka,162 and the government purchased a large supply of Sinopharm from China using World Bank funds in 2021.159 Officials later supplemented this supply with directly purchased Pfizer vaccines and Moderna vaccines obtained through COVAX.[159]

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WHO – Putting women and children first: immunization resumes in Sri Lanka amidst the COVID-19 pandemic

Vaccination centers, managed with logistical support from the military,[163] were set up at government hospitals, clinics, and eventually large workplaces such as garment factories, religious institutions, schools, and other public spaces.[163]

Vaccination was typically given on demand if the individual met the eligibility criteria, but online and other systems were eventually set up to enable people to prebook appointments.[164] Mobile vaccination drives targeted individuals who were unable to travel to vaccination centers.[165]

The COVID-19 vaccination campaign benefited from Sri Lanka's preexisting and extremely well-organized immunization services, as well as high levels of public acceptability for vaccination in general. However, it also exposed a neglected area of development in Sri Lanka's routine immunization program: the MOH's information system was built for health service managers to track vaccine delivery by public-sector providers, not for individual citizens to use as an electronic vaccine registry. Eventually, army personnel developed a digital system[166] to track COVID-19 vaccination at the individual level: military personnel entered data at vaccination sites or from paper records generated by MOH staff. In the future, this immunization system could be modernized to track all vaccinations for individual users.[167-169]

ADDRESSING VACCINE HESITANCY IN SRI LANKA

Despite the quick and comprehensive rollout of vaccine coverage among the eligible adult population, health officials and mass-media reports (possibly influenced by policy debates in other countries) anticipated high levels of vaccine hesitancy among young people and some religious groups. Survey data, however, showed comparatively negligible opposition to COVID-19 vaccines in Sri Lanka, and less opposition among younger people than older people. Most hesitancy was associated with a strong public preference for the Pfizer shot, which only became available at volume in late 2021.[170]

The belief that difference vaccines varied in quality was treated as a problem of misinformation by some health officials who felt that a stronger public communications effort should have eradicated it, according to a key informant interview. On the other hand, there was some evidence that Pfizer vaccines were more effective, so the official reaction was somewhat unwarranted.

Researchers found in late 2021 that unvaccinated adults accounted for a disproportionate share of COVID-19 deaths, leading to intensified efforts to reach unvaccinated adults. However, these efforts did not include making vaccines widely available through the private sector, which might have increased the number of delivery points accessible to the population.

In late 2021, as concerns grew over the omicron wave, Sri Lankan officials decided to offer booster vaccinations—first to older adults, then to all adults who requested it. Lower rates of booster uptake may have reflected reduced public anxiety about COVID-19 after November 2021.[171]

Based on an analysis of the Sri Lanka Health and Ageing Study data, Sri Lanka's COVID-19 vaccine rollout was highly—and unusually—equitable in its reach.[104] Controlling for differences in eligibility dates, which were mostly related to age or district, researchers found negligible differences in coverage associated with gender, ethnicity, urban or rural residence, or socioeconomic status. This equitable distribution of COVID-19 vaccines throughout the country was a unique strength of the Sri Lankan vaccination program enabled by public financing and delivery of the vaccines, as well as by the mobilization of military support in expanding coverage.

HEALTH SYSTEM–LEVEL RESPONSE MEASURES

In the early months of the pandemic, Sri Lanka's response measures at the health system level fell into two main categories: direct responses to COVID-19 and interventions for the maintenance of essential health services despite pandemic-related disruptions.

Essential health service maintenance in Sri Lanka during the COVID-19 pandemic

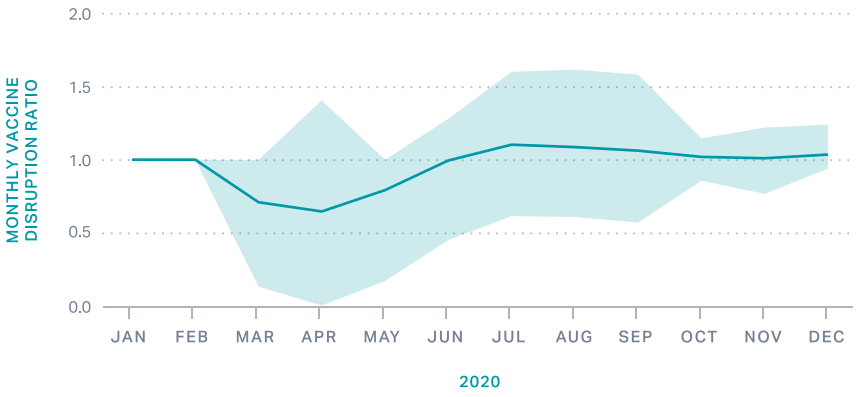
In many countries around the world, the COVID-19 pandemic and efforts to mitigate it caused supply- and demand-side barriers to essential health service delivery. In Sri Lanka, the pandemic did not have a major effect on essential health services until 2021, when sustained local pandemic transmission overwhelmed the COVID-19 elimination strategy and undermined access to routine care across the board. Data show that unmet health care need in late 2021 was two to three times higher than before the pandemic.[172]

It is also plausible that later pandemic waves have left a long-term burden for Sri Lanka's health services—in the form of an increased prevalence of noncommunicable diseases such as diabetes and cardiovascular disease, as well as long COVID—but researchers do not yet have the data they would need to assess this.

In terms of routine vaccination, there was a decline in routine immunization coverage early in the pandemic (from March to May 2020), but it recovered to pre-pandemic levels by June 2020. The figure below shows the ratio of the monthly number of doses of DTP3 vaccine (third dose of diphtheria, tetanus, and pertussis vaccine) given to children younger than one year old in 2020 as it compares with the same month in 2019. A value of 1 represents no change and values less than 1 indicate delivery disruption.

FIGURE 15

Disruption in DTP3 vaccines doses in Sri Lanka



Source: IHME

READ MORE
Arambepola et al – Sri Lanka's early success in the containment of COVID-19 through its rapid response

Effect on essential health service delivery in Sri Lanka: Phases 1 and 2 (2020)

Early in the pandemic, Sri Lanka's effective control of COVID-19 transmission ensured that most health institutions were not overburdened or overwhelmed.[81]

The island-wide lockdown and disruption of transportation services during Phase 1 affected the delivery of some routine health services, mainly by making it more difficult for both health care workers and the public to reach health facilities. Authorities minimized the impact by announcing in March 2020 that all public clinics would continue to deliver routine health services in addition to COVID-19 care.[173] Health care workers and people seeking medical care were exempted from the lockdown, registered clinic patients were allowed to use their clinic records as a curfew pass, and special transportation arrangements were provided for many health care workers. These policies were extended in April 2020 to allow health care workers and patients to cross district borders.[174]

Testing all inpatient admissions became routine to address worries about potential transmission in health care facilities. To mitigate impacts on access and eliminate delays to urgent care, the MOH issued guidelines in late May 2020 for testing elective and surgical emergency patients.[175]

Recognizing the potential for disruption, the MOH took proactive measures to ensure maintenance of maternal and child health services. Officials instructed all clinics to remain open and revised procedures with this goal in mind.[176] They also introduced COVID-19 safety protocols to enable home visits to continue.

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Ministry of Health – National supplementary guideline for Mithuru Piyasa / Natpu Nilayam staff to be adopted during COVID-19 pandemic

When concerns arose about escalating domestic violence during the lockdown, the MOH issued guidelines for hospitals to expand availability of Mithuru Piyasa, friendly havens for survivors of gender-based violence, which operated during hospitals' usual working hours.[177] Additional guidance was issued in May 2020 for the proprietors of safe homes for survivors of gender based violence.[178]

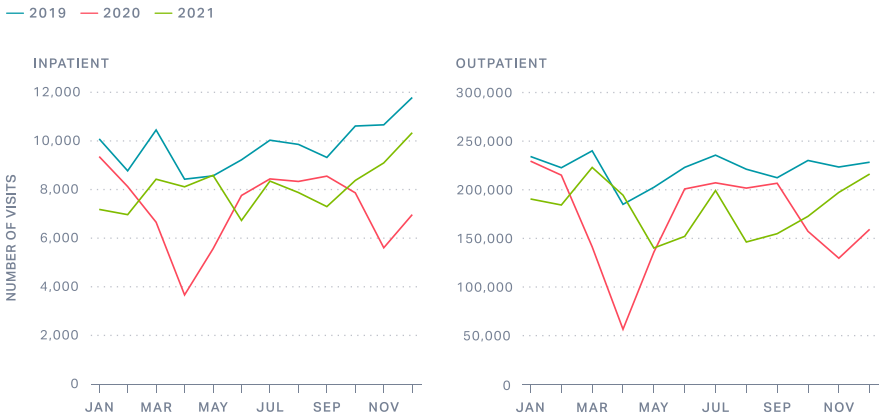
As the country emerged from the first lockdown, the MOH issued guidelines to restart suspended maternal and child health services, such as vaccinations in May 2020 and school dental services in September 2020.[179]

Effect on essential health service delivery in Sri Lanka: Phases 3 and 4 (2021)

Increased local transmission of the virus had a substantial impact on the provision of routine health services. During the delta wave in particular, pressure on routine health services was acute and at times overwhelming, leading to the suspension of many routine services and nonemergency care. Large numbers of health workers were also infected during this period.[180] Data from the Institute for Health Policy's regular private hospital survey in 2022 indicates that there was a 20% to 25% reduction in both inpatient and outpatient service delivery at private hospitals during the two waves in 2021, compared with 2019.[181]

FIGURE 16

Inpatient and Outpatient Visits in Sri Lanka Pre-Pandemic and During the COVID-19 Pandemic



Source: Institute for Health Policy

In addition, increasing numbers of adults did not access services in the previous 12 months. Adults who did not access needed medical care increased from 4% to 17%, dental care 4% to 14%, and medicines 5% to 20%, between 2019 and 2022.[172]

Analysis of the Sri Lanka Health and Ageing Study Wave 2 data indicates that the end of the August–October 2021 lockdown and the waning of the delta wave led to rapid improvements in unmet need for medical care.[104]

Except during the delta wave, the main drivers of reduced health care access in Sri Lanka were not supply constraints, but demand-side factors—especially public fear of catching or being diagnosed with COVID-19 and mobility restrictions and transport barriers during lockdowns.[104]

Although some adults who reported unmet need for care cited cost as a major barrier, lower-income Sri Lankans reported smaller increases in unmet need (higher-income people were more likely to avoid seeking care because they were afraid of contracting COVID-19 in health facilities). On the other hand, patients with chronic noncommunicable diseases were much more likely to report unmet need, indicating that efforts to improve the distribution of medicines were not completely successful.[172] *(For further information, read more in section on service delivery adaptations made for the delivery of medicines for noncommunicable diseases during the pandemic).*

Service delivery adaptation

Sri Lanka's health authorities acted quickly to enable the maintenance of routine service delivery. The service delivery adaptations they introduced proved especially necessary in 2021, when severe pandemic waves caused large numbers of deaths, increased hospital admissions, overwhelmed health facilities and staff, and disrupted health service delivery across the country.

READ MORE
Wickramasighe et al – Web-based mechanism for door-step delivery of medicines to patients with Non-Communicable Diseases (NCDs) using the state and private pharmacy network during the COVID-19 outbreak in Sri Lanka

Maintaining access to medicines

Starting in March 2020, senior health officials began to implement service delivery adaptations aimed at maintaining access to necessary medicines for patients with noncommunicable diseases during lockdowns. In the public sector, service providers revised regulations to extend the duration of prescriptions from one month to two months. They also organized home delivery of medicines via mail and courier.[182] This system was formalized during the October 2020 COVID-19 outbreak in factory workers at the apparel manufacturer Brandix.[183] Health officials, the police, and the postal service arranged to deliver up to two months of routine medications to patients in public clinics in the Western Province and Kurunegala districts.[184] Additionally, officials allowed patients to make appointments to pick up their medication from pharmacies and health facilities, minimizing contact with others. Starting in November 2020, noncommunicable disease patients in the private sector were allowed to get their medications from government hospitals if necessary.[185]

Health officials also worked with the private sector, including private pharmaceutical firms, importers, distributors, and retailers, to troubleshoot and maintain key supplies of medicines. For instance, they relaxed regulations to enable pharmacies to accept digital prescriptions and deliver medicines directly to patients' homes.[186]

Public awareness of (and uptake for) these new distribution mechanisms was high. Estimates using the Sri Lanka Health and Ageing Study Wave 2 data (August 2021–August 2022) indicate that of the 30% of adults who needed a regular medication refill, 85% were aware of the MOH program to deliver medicines by mail and 33% of them had used it.[104] About 90% of users reported being satisfied with the service. Smaller numbers of people knew of and used other MOH arrangements, such as scheduling medication pickups at government hospitals and alternative locations such as government offices or public health inspector and maternal and child health offices. Awareness of the liberalized private-sector delivery options was also high. An estimated 40% of adults who needed regular prescription refills were aware that private pharmacies could deliver medicines to their doorstep, although just 5% of them had used this option.

Most people who used these novel arrangements did so during the lockdown periods. According to survey data, rates of uptake for government medication-delivery innovations declined after the end of the last national lockdown.[104] Approximately 10% of the lowest-income tertile of adults reported having used these services, compared with just 5% of the highest-income tertile.

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Primary Health Care Performance Initiative – Ensuring access to routine and essential services during COVID-19 through utilizing telehealth in Sri Lanka

Telehealth

In both the public and private sectors, clinicians substantially expanded their use of remote consultations. New MOH guidelines supported telephone consultations, even for remote screening of possible COVID-19 cases.[187] Primary care doctors at the University of Kelaniya developed a system to facilitate teleconsultations by phone and WhatsApp, which other public-sector facilities later adopted.[82,187] Public facilities also made efforts to increase their internet bandwidth to support teleconsultations, according to key informants.

The better-resourced private hospital sector expanded access to teleconsultation services: patients were able to consult most specialists through video or audio consultations, and many private hospitals invested in additional hardware to facilitate this remote care.

According to key informants, telecommunication providers also took several initiatives to support the health sector by providing equipment and additional bandwidth to public-sector institutions.

> "DIALOG [THE LARGEST TELECOMMUNICATIONS PROVIDER] DONATED MOBILE PHONES AND BROADBAND ROUTERS TO 40 GOVERNMENT HOSPITALS TO BE USED FOR COORDINATING PATIENT TREATMENT AND QUARANTINE CENTERS. DIALOG ALSO PROVIDED 27 VIDEO-BASED TELEMEDICINE UNITS IN 20 GOVERNMENT HOSPITALS. TO SUPPORT THE NATIONAL CHILD PROTECTION AUTHORITY'S REMOTE NATIONAL PSYCHO-SOCIAL SUPPORT SERVICE, DIALOG ALSO PROVIDED THE NECESSARY DEVICES AND CONNECTIVITY. THIS SERVICE GREATLY IMPROVED EFFICIENCY AND HELPED IN SAVING MONEY, TIME, AND RESOURCES."
>
> – KEY INFORMANT

Many patients took advantage of these options for remote consultation, especially during the national lockdowns. The MOH does not collect data on remote consultations, so public-sector statistics are not available, but key informants indicated that teleconsultations booked through their platforms grew from essentially zero before the pandemic, peaked at 35% of all consultations in March 2020, and subsequently averaged 5% to 10% of consultations from October 2020 to October 2021. Key informants from private hospitals suggested that teleconsultations accounted for about 10% of consultations during 2020–2021 and dropped off after the July–September 2021 lockdown. In the private sector, teleconsultations were used mainly for postsurgical follow-ups after cesarean sections and other procedures. According to survey data, 7% of all outpatient visits were remote consultations between September 2021 and August 2022.[104]

Surprisingly, given that rates of internet access increase with income, both public and private consultations were equally likely to involve remote methods and there was no evidence of any socioeconomic gradient in their use. Lower-income adults made more use of public-sector remote consultations, and higher-income adults used mostly private-sector remote consultations.[104]

Workforce deployment and task shifting

Much of the task shifting and additional workforce deployment was in support of the COVID-19 vaccination effort. In Sri Lanka, the military played a uniquely crucial role in supporting the vaccination effort. Although the country's strong immunization system typically delivers routine vaccinations to more than 97% of children, the scale and pace of the push for COVID-19 vaccinations overwhelmed this preexisting capacity. The need to deploy staff at health facilities to vaccination duties resulted in them being pulled from testing and contact tracing work and other preventive work such as dengue control. As the vaccination campaign expanded, the military increased its support, assisting public vaccination clinics and setting up and running its own clinics for the public. Some of these were open 24 hours a day in the early part of the vaccination campaign, and some had drive-through facilities. According to key informants, by the end of 2021, military-operated vaccination centers had delivered 2.4 million doses with a total deployment of 5,200 personnel.

The military also set up mobile vaccine units that went from house to house in some regions, targeting people in the community with restricted mobility, such as older adults or disabled community members. The National Operational Centre for Prevention of COVID-19 Outbreak established a number to text and an email address for the public to arrange this service.[188]

Facilities and infrastructure

At first, Sri Lanka's MOH prohibited the private sector from managing COVID-19 patients,[173] and only three hospitals—the National Infectious Disease Hospital, Colombo East Base Hospital, and the Welikanda Base Hospital—were designated as COVID-19 treatment facilities. In April 2020, authorities designated the Kotelawala Defence University as a treatment center and turned other public hospitals and health facilities into pandemic isolation and treatment centers.[173]

As case counts increased and hospital beds were filled in November and December 2020, authorities moved to enable facilities in the private sector to care for stable and asymptomatic COVID-19 patients and establish intermediate-care centers, often in hotels, to manage mildly symptomatic cases. Private hospitals and intermediate-care centers charged patients directly for their care and shared revenue with the hotel operators. The military also established intermediate-care centers for patients in the public sector and organized patient transportation from hospitals to intermediate-care centers.[119]

As COVID-19 became more prevalent in Sri Lanka, officials and clinicians introduced a range of protocols to minimize COVID-19 infection in health care settings, including requiring antigen testing for inpatients. The MOH also issued and regularly updated a range of clinical guidelines for managing patients that were developed through expert consultations and the experience of clinicians at facilities such as the National Hospital for Infectious Diseases.[189]

PATIENT-LEVEL MEASURES

Isolation and quarantine

From March 2020 until the end of that year, Sri Lanka enforced a mandatory 14-day quarantine and PCR testing for people entering the country to minimize COVID-19 transmission.[190] At the end of 2020, authorities boosted the struggling tourist industry by lifting border controls. Tourists were allowed to visit Sri Lanka if they began their trip by isolating at approved hotels before traveling to other approved hotels, without direct contact with the public.[191] These were known as "bio-bubbles."[192] The country piloted the project in late 2020 with a group of Ukrainian tourists, then expanded it to all entering travelers the next month.[193]

Between April and June 2021, border controls for nontourists were incrementally relaxed, starting with residents traveling on official business.[194] New policies reduced the length of quarantine and substituted home isolation for quarantine for arrivals who were vaccinated and had negative PCR tests on arrival. Eventually, in mid-October 2021, officials lifted rules for quarantine and isolation completely for arrivals who were vaccinated with two doses and had a negative PCR test just before arrival.[195]

A Sri Lanka Air Force member, along with police officers, controls a drone camera to monitor and apprehend quarantine regulation violators in a highly populated residential area, during a lockdown due to the increasing numbers of daily coronavirus disease (COVID-19) cases, in Colombo, Sri Lanka May 23, 2021. © REUTERS/Dinuka Liyanawatte

CHALLENGES

SRI LANKA FACES MANY PRESSING POLITICAL CONCERNS THAT HAVE LIMITED THE RESOURCES AVAILABLE for sustaining pandemic prevention and response interventions. Challenges associated with the country's COVID-19 response include the following.

KEY CHALLENGES

Limited testing capacity affected the efficacy of Sri Lanka's COVID-19 elimination strategy

Sri Lankan health authorities adopted a COVID-19 elimination strategy that echoed Australia's and New Zealand's.[196,197] However, it focused on the first two elements—effective border control and intensive contact tracing, and isolation in response to outbreaks—without enough attention to the third element, high levels of symptomatic testing at the primary care level. Starting in April 2020, the country did not invest in strengthening its testing capacity or setting up a systematic effort to test acute respiratory infection symptoms in the community.

Low levels of testing meant that sustained local transmission went undetected for months in mid-2020. By that time, community transmission was so extensive in relation to the country's test-and-trace capacity that health authorities were unable to stop transmission.[198] Instead of tightening control measures, authorities gradually reopened borders and reduced efforts to detect new cases or trace and isolate contacts of confirmed cases. Successive COVID-19 waves resulted in high infection rates and substantial disruption to essential health services in 2021.

Because the country did not invest more aggressively in expanding PCR testing capacity, despite World Bank funds for testing equipment and supplies becoming available in May 2020, it could not sustain necessary levels of daily testing even as cases mounted in the second half of 2020 and into 2021. Consequently, and ironically, many health officials and experts rejected calls for increasing testing as a tool to control transmission. Health authorities did not communicate the need for increased testing to political authorities, in part because of the "groupthink" observed in key decision-making bodies. This desire for conformity and consensus led to alternative views on testing not being seriously considered, failure to seek technical expertise from scientists outside the government, complacency following the initial success at controlling COVID-19, a medical culture that was generally averse to testing in clinical practice, and an environment of fiscal scarcity that worsened in 2020 following substantial tax cuts.

Some routine preventive services were disrupted

In Sri Lanka, routine preventive public health activities were disrupted from the start of the pandemic, typically because core public health staff were mobilized as frontline workers—first to contain COVID-19 transmission, then to provide vaccinations. Routine surveillance for other infections, such as leptospirosis and dengue, was most affected.

Mosquito control activities, which are crucial for preventing dengue, were undermined by the diversion of field staff for COVID-19 control, COVID-19 safety regulations prohibiting field staff from undertaking routine inspections of house interiors, and shortages of chemicals for fogging. Reduced mobility, social distancing, and masks reduced the transmission of many infectious diseases during the first two years of the pandemic—likely including dengue, which fell to one-quarter of predicted levels between March 2020 and April 2021 despite the pause in dengue control activities.[199] Dengue vector breeding sites are also concentrated in workplaces—such as factories, construction sites, and schools—and not households.[200] As mobility increased and other public health and social measures were relaxed, there was a surge in dengue cases beginning in December 2021.

Trust in government communication deteriorated

As COVID-19 transmission increased, especially during the delta wave from August to December 2021, data from the Sri Lanka Health and Ageing Study (SLHAS) Wave 2 suggested considerable distrust in the government's reporting on the pandemic.[197,200] Inconsistent and inaccurate messaging about risk may have reduced the effectiveness of official communication. As the government reopened borders and reduced mitigation efforts, health officials increasingly understated the risk of COVID-19. For example, the MOH insisted there was no community transmission in early 2021, despite evidence that local transmission was both well-established and increasing. This message was rationalized based on a narrow World Health Organization definition of community transmission, but it did not correctly communicate the true situation and led many to question the credibility of health officials. It is unclear whether this messaging reflected the beliefs of health officials or whether it was an effort to align with the official desire to open borders, give up attempts to control the virus, and persuade the public to adjust to living with COVID-19.

Health officials were inadequately trained in public communication during a health crisis of the scale and nature of COVID-19. They often resorted to lecturing the public without conveying what they did not know or the underlying uncertainties given the novel and evolving nature of the pandemic. Health officials also often failed to communicate risks and uncertainties to political authorities, and at times suppressed information-sharing despite statutory obligations for transparency.

In 2022, Sri Lanka underwent a political and economic crisis, which likely further eroded public trust in the government.[201] The president of Sri Lanka resigned following protests on July 9, 2022, and the Ministry of Health experienced continuous turnover throughout the year. The World Bank estimated that the poverty rate in the country doubled between 2021 and 2022.[202]

Official underestimation of local transmission and overestimation of the benefits of vaccination may have contributed to reduced uptake of boosters.

Throughout 2021, health officials and political authorities conveyed the message that vaccination would protect people and largely end the problem of COVID-19, without accurately conveying the inability of the vaccines to prevent most transmission or to prevent all serious morbidity. Uptake of the initial first two doses was high, but the public did not rush to get booster vaccinations when they were provided—a possible consequence of the earlier miscommunication of risks and benefits.

METHODOLOGY

The study team collected data from multiple sources, including a desk review of gray literature, key informant interviews, and empirical analysis of available data. We conducted a desk review of gray literature, including news articles, government documents and websites, circulars, and social media posts, to piece together the publicly available data on how the COVID-19 pandemic unfolded, the timeline of key responses, and the response of the health system in managing COVID-19 and essential health services delivery in Sri Lanka. We obtained additional documents and reports from colleagues within the health sector, sometimes after key informant interviews. Government websites and social media sites maintained by the Ministry of Health, Epidemiology Unit, and Health Promotion Bureau, were reviewed to obtain documents related to COVID-19 such as situation reports, guidelines, and data. As many COVID-19 updates were given on social media by the media and government departments, we used Facebook and Twitter to find specific information on key events.

The study team identified key informants involved in the COVID-19 response, including officials, politicians, health care workers, business and union representatives, and other experts. Some interviews were conducted later to clarify any discrepancies that arose as the study progressed. An interview guide was developed to inform the development of interview scripts. It grouped questions into the following key categories: essential health service maintenance; pharmaceuticals; public-sector hospitals; private-sector hospitals; vaccinations; testing, tracing, and isolation; quarantine processes; COVID-19 data and statistics; funding; and ambulance services. Questions were extracted from the interview guide and used to create guidelines for each informant based on their background and role. All informants were asked common questions relating to the challenges faced during the pandemic, the successes and failures, and their personal views on overall responses and strategies adopted during the pandemic.

Finally, the study team used existing data sets at the Institute for Health Policy, including COVID-19 metrics, processed mobility data, data from a private hospital survey, and an ongoing national phone survey—the Sri Lanka Health and Ageing Study (SLHAS) Wave 2—to provide supporting information. Data sets were compiled including data on COVID-19 cases, testing, mobility as tracked by Google and Facebook, mask wearing, and lockdown measures. The SLHAS was a critical primary data source providing information on population-level behavior and changes since 2019. The SLHAS is a Ministry of Health-approved, national longitudinal cohort study with two nationally representative sample surveys: Wave 1, which included data from 2018 and 2019 just before the pandemic started, and Wave 2, which included data from 2021 and 2022. The SLHAS provided crucial data on topics including the use of health services, health care access, public opinion, and vaccine uptake. Other data were sought from government agencies and the military, and the Institute for Health Policy Private Hospitals Survey 2022 was modified to collect additional data on COVID-19 activities from surveyed hospitals.

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