



## CAPTAINING A TEAM OF 5 MILLION: NEW ZEALAND BEATS BACK COVID-19, MARCH–JUNE 2020

*This brief draws on an ISS case study of the same title available [here](#). Blair Cameron drafted the full case study based on interviews conducted in Wellington, New Zealand, in July and August 2020. This brief was published in January 2021.*

### BACKGROUND

In January 2020, COVID-19 swept through Wuhan, China, and began spreading to dozens of other countries. Observing the fast spread and high death rate of the infectious disease caused by this particular coronavirus, senior government officials in New Zealand quickly recognized the potential threat the virus posed and began putting together a response team. In early February, Brook Barrington, chief executive of the Department of the Prime Minister and Cabinet, appointed Peter Crabtree, an experienced civil servant at the Ministry of Business, Innovation & Employment, to coordinate the government’s strategy and policy response to COVID-19. Ashley Bloomfield, a physician and the top civil servant at the Ministry of Health, led the health response.

New Zealand confirmed its first COVID-19 case on February 28, and by early March the number of confirmed infections had reached five. Despite the low number of cases, Barrington, Bloomfield, and Crabtree became increasingly worried about the risk the virus posed. In the two countries where New Zealand’s first cases had come from—Italy and Iran—the outbreak had overwhelmed the governments’ capacities to respond.

On March 10, in recognition of the growing threat, Barrington beefed up the response team, which became known as the All-of-Government Response Group. He appointed John Ombler, a highly regarded senior civil servant, to lead the team. In addition to Bloomfield and Crabtree, the other members were Police Commissioner Mike Bush, head of New Zealand’s police service; and Sarah Stuart-Black, head of the National Emergency Management Agency. Crabtree continued to lead the strategy and policy response, and Bush took over operations.

Meanwhile, Jacinda Ardern, New Zealand’s 39-year-old prime minister, formed an ad hoc cabinet committee to deal with the big policy decisions that a pandemic would require. The group included

government ministers as well as the leaders of the two parties that made up the coalition government with Ardern's Labour Party.

As more and more countries around the world appeared to lose control of the outbreak, Ardern and her cabinet tightened border restrictions to block travelers arriving from virus hot spots. In mid-March, Ardern announced that anyone arriving at New Zealand's borders from anywhere in the world would have to self-isolate in one location for 14 days. The virus, however, had already begun spreading quietly within New Zealand's borders.

## KEY CHALLENGES

New Zealand's COVID-19 defense required the government to address significant challenges across multiple fronts.

### *The need for the public's active support*

New Zealand's geographic isolation had largely kept it safe from major outbreaks of new infectious diseases, and residents typically saw such outbreaks as problems that affected densely populated cities in far-flung places. Two of the response team's most important tasks were to persuade New Zealanders that COVID-19 was a serious threat and then to enlist their active participation in quelling the outbreak.

### *Limited resources, weak preparedness*

Compared with other wealthy countries, New Zealand had an underresourced health system. The country had fewer hospital beds per capita than most comparable countries had and just 4.7 intensive-care beds per 100,000 people. In addition, New Zealand ranked poorly on the Global Health Security Index, an assessment system that scored countries based on their preparedness for disease outbreaks.<sup>1</sup>

### *Coordination across the system*

New Zealand's health system was highly decentralized, and oversight posed a significant challenge for the Ministry of Health, even in normal times. Twenty district health boards made up the operational backbone of the healthcare system. Each board was in charge of delivering health services for a specific geographic area. Twelve regional public health units—owned by the district health boards—were in charge of communicable disease control. When COVID-19 began spreading, those units had to begin testing for possible cases of the virus and then tracing the contacts of those who tested positive. Because COVID-19 had the potential to affect nearly every aspect of life in New Zealand, the response team also had to coordinate activities across government agencies and the private sector.

*Scarce equipment and supplies*

District health boards were responsible for procuring and managing their own supplies of personal protective equipment (PPE), including gloves, gowns, masks, disinfectants, and hand sanitizers. Several districts found that their PPE stockpiles had dwindled or passed their use-by dates. When those district boards tried to procure more PPE quickly, they found that the usual suppliers had sold all of their inventory and that other suppliers had increased prices by 10 times or more. In addition to PPE, every country in the world was competing to procure the special swabs and specific reagents required to test for COVID-19.

*Related economic and social fallout*

The response further had to consider economic and social impacts and the ways they might impede the effort to contain the disease. Job losses represented the most-pressing economic concern. New Zealand usually welcomed large numbers of international tourists and international students every year, but with no tourists or foreign students, businesses closed down and employees lost jobs. As the pandemic worsened, other sectors would fare poorly as well.

*The complications of politics*

Ardern faced potential opposition from within her three-party coalition government as well as from opposition parties in parliament. With an election just six months away, political parties were jostling to win public favor. And even though it was important that the opposition hold the government to account, Ardern had to ensure politics didn't get in the way of pandemic response efforts.

## STRATEGY

In its response to the pandemic, the Ministry of Health initially turned to its existing influenza pandemic plan, which was the best playbook it had for ways to respond to a viral pandemic.<sup>2</sup> Throughout the 2000s, the ministry had developed and updated the plan in case a new strain of influenza virus caused a pandemic similar to the one that killed tens of millions globally from 1918 to 1920. The influenza pandemic plan outlined a six-phase strategy: Plan For It (planning and preparedness), Keep It Out (border management), Stamp It Out (cluster control), Manage It (pandemic management), Manage It: Post-Peak (postpandemic management), and Recover From It (recovery). The idea was that the government would shift through the phases as the virus spread through the population.

By mid-March, as clusters of COVID-19 cases began emerging, the team shifted from the Keep It Out strategy to the Stamp It Out strategy and started preparing for a move to the next phase: Manage It. That phase was modeled on 40% of the population's becoming infected over the course of eight weeks and

aimed to limit the impact of those infections. But after seeing how quickly Italy and other countries had run out of capacity to cope with the crisis, the New Zealand response team realized that a shift to the Manage It phase would be catastrophic.

New Zealand's epidemiologists and other experts modeling the spread of the virus advised the government to adapt the strategy outlined in the influenza pandemic plan. The Ministry of Health brought some of those experts together to form a COVID-19 technical advisory group, including University of Otago epidemiologist Michael Baker. "[We] had to turn [the pandemic plan] on its head," Baker said in an interview with *The Independent*, an online news site. "Instead of gradually increasing your controls as a pandemic gets worse, you throw everything at it at the beginning and you extinguish it."<sup>3</sup>

Ardern described her strategy as "going hard and going early." On March 19, she closed the border to nonresidents to stem the tide of people arriving with COVID-19 from abroad. Meanwhile, she asked her response team to devise an alert-level system outlining further measures that might be necessary to protect New Zealanders from the growing outbreak.

Later, after the government's initial strategy began showing signs of success, the response team announced it was pursuing a so-called elimination strategy. Instead of merely aiming to reduce the spread of the virus by flattening the curve, the elimination approach aimed to completely halt the spread of the virus within the community.

## ACTIONS TAKEN

With the number of infections escalating rapidly and the pandemic creating new challenges each day, the response team had to work fast and be flexible.

### *Launching a communications blitz*

To lead the crucial work of persuading all New Zealanders to take active roles in fighting the virus, Barrington seconded John Walsh, director of readiness and response services at Biosecurity New Zealand, an arm of the Ministry for Primary Industries. Walsh, who had an extensive background in operational biosecurity responses as well as communications, put together a team of public-sector-communications experts and hired Clemenger BBDO Wellington—the local branch of a global advertising network—and media agency OMD. The communications team launched a campaign branded Unite against COVID-19 and flooded radio, television, and digital media with advertisements. The campaign initially centered on four elements: wash your hands, cough or sneeze into your elbow, stay home if you're sick, and be kind. The advertisements directed citizens to a government website, [covid19.govt.nz](https://covid19.govt.nz), which Walsh's team had developed to provide detailed, usable, and credible information about the developing situation. Walsh said his team aimed to make the website "the single source of truth" for information on COVID-19 in New Zealand—and on the government's response.

*Introducing the alert-level system*

The response team developed a four-level system that ranged from level 1—in the form of minimal restrictions—to level 4: full lockdown in the form of severe restrictions on citizens’ freedom of movement (image 1: Alert-Level Table).

Ardern announced the alert-level system to the public on May 21 and immediately put the country into level 2. At that level, the government closed public venues and encouraged everyone to stay at least two meters apart at all times. The same day, the Ministry of Health confirmed 13 new cases of COVID-19, bringing the total to 52.

The introduction of the alert-level framework gave New Zealanders the opportunity to learn about the virus and prepare for the likelihood of further restrictions. “The alert-level table was a really simple idea that became very impactful as a piece of risk communications,” said Walsh. “That simple idea was that as we go through this fight against COVID-19 and as the impact of the disease grows, we are going to have to change the way we live. As things get worse, we are going to go up alert levels and have more restrictions placed on us as we unite to fight COVID-19. It was a simple concept to describe a tough situation and really helped people get their heads around the serious nature of the challenge in front of us.”

Image 1: Alert-Level Table

LEVEL	RISK ASSESSMENT	RANGE OF MEASURES (can be applied locally or nationally)
<b>Level 4 - Eliminate</b> Likely that disease is not contained	<ul style="list-style-type: none"> <li>Sustained and intensive transmission</li> <li>Widespread outbreaks</li> </ul>	<ul style="list-style-type: none"> <li>People instructed to stay at home</li> <li>Educational facilities closed</li> <li>Businesses closed except for essential services (e.g. supermarkets, pharmacies, clinics) and lifeline utilities</li> <li>Rationing of supplies and requisitioning of facilities</li> <li>Travel severely limited</li> <li>Major reprioritisation of healthcare services</li> </ul>
<b>Level 3 - Restrict</b> Heightened risk that disease is not contained	<ul style="list-style-type: none"> <li>Community transmission occurring OR</li> <li>Multiple clusters break out</li> </ul>	<ul style="list-style-type: none"> <li>Travel in areas with clusters or community transmission limited</li> <li>Affected educational facilities closed</li> <li>Mass gatherings cancelled</li> <li>Public venues closed (e.g. libraries, museums, cinemas, food courts, gyms, pools, amusement parks)</li> <li>Alternative ways of working required and some non-essential businesses should close</li> <li>Non face-to-face primary care consultations</li> <li>Non acute (elective) services and procedures in hospitals deferred and healthcare staff reprioritised</li> </ul>
<b>Level 2 - Reduce</b> Disease is contained, but risks of community transmission growing	<ul style="list-style-type: none"> <li>High risk of importing COVID-19 OR</li> <li>Increase in imported cases OR</li> <li>Increase in household transmission OR</li> <li>Single or isolated cluster outbreak</li> </ul>	<ul style="list-style-type: none"> <li>Entry border measures maximised</li> <li>Further restrictions on mass gatherings</li> <li>Physical distancing on public transport (e.g. leave the seat next to you empty if you can)</li> <li>Limit non-essential travel around New Zealand</li> <li>Employers start alternative ways of working if possible (e.g. remote working, shift-based working, physical distancing within the workplace, staggering meal breaks, flexible leave arrangements)</li> <li>Business continuity plans activated</li> <li>High-risk people advised to remain at home (e.g. those over 70 or those with other existing medical conditions)</li> </ul>
<b>Level 1 - Prepare</b> Disease is contained	<ul style="list-style-type: none"> <li>Heightened risk of importing COVID-19 OR</li> <li>Sporadic imported cases OR</li> <li>Isolated household transmission associated with imported cases</li> </ul>	<ul style="list-style-type: none"> <li>Border entry measures to minimise risk of importing COVID-19 cases applied</li> <li>Contact tracing</li> <li>Stringent self-isolation and quarantine</li> <li>Intensive testing for COVID-19</li> <li>Physical distancing encouraged</li> <li>Mass gatherings over 500 cancelled</li> <li>Stay home if you're sick, report flu-like symptoms</li> <li>Wash and dry hands, cough into elbow, don't touch your face</li> </ul>

### *Implementing a strict lockdown*

On March 23, the health ministry confirmed 36 new cases of COVID-19, bringing the total number of confirmed cases to 102, 5 of whom were hospitalized. Despite the low number of hospitalizations, it was clear that the outbreak was escalating. Ardern announced that the country would immediately move to level 3 and at the same time, announced that in two days, the country would move to level 4. She told the public that the level 4 lockdown would remain in force for at least four weeks. When the level 4 lockdown began just before midnight on March 25, all nonessential businesses had to close, and everyone had to stay in their homes unless they had a valid reason to go out—for example, to exercise near their home or to buy groceries. That day, the Ministry of Health announced 50 new cases of COVID-19, and the total number of cases topped 200.

Ardern and Director General of Health Bloomfield were the public faces of the government's response. Every day at 1 p.m. throughout the level 4 lockdown, Bloomfield—usually accompanied by Ardern—updated New Zealanders on numbers of cases and details about the government's response. The briefings were carried live online and on radio and television. The pair repeated simple, easy-to-understand messages every day: “Be kind,” “Stick to your bubble,” “Stay home, save lives,” and “Act like you have the virus.”

The government partnered with local organizations that worked with vulnerable communities to provide housing and basic necessities for those who would find it difficult to comply with the lockdown, such as homeless people. A wide-ranging economic package provided support for citizens who likely would suffer economically and socially during the lockdown. In addition, the government subsidized wages for employees at businesses that lost revenue because of the pandemic.

Although the success of the lockdown depended on a high level of public compliance, Police Commissioner Bush, who was in charge of enforcement, stressed that he focused on avoiding having to deal with violators. “Our operating model as police is prevention first,” he said. The police strategy revolved around four E's, and the fourth of them—*enforce*—was a last resort. “We [mainly] used three E's: engage, encourage, and educate,” Bush said. “It was only when people were persistent, serious, repeat offenders that we would use enforcement powers.”

During the lockdown, police reported about 4,000 breaches of level 4 restrictions across the country, of which about 400 were prosecuted.<sup>4</sup> Bush said the high rates of compliance were due largely to strong leadership and effective communication. “People knew why” the lockdown was necessary, he said. “The messaging from the top was very much, ‘If you do this, you will save lives.’ It was simple messaging that people really understood.”

### *Governing in a crisis*

A cross-party committee agreed to adjourn parliament when the lockdown began. To ensure that opposition parties could still provide oversight and

participate in policy making during the lockdown, parliament set up an Epidemic Response Committee, which met three days a week to debate policy, using videoconferencing platform Zoom to communicate. The committee gave opposition politicians the opportunity to get details from the government and to point out perceived shortcomings in the response effort.

To complement Crabtree's policy team, Bush set up an operations command center "to operationalize the government's decisions." The center, which Bush described as "a problem-solving coordination facility," focused on specific work streams for key problem areas, with each work stream following a plan that aimed to achieve specific goals. "We would identify an issue, work out the agencies that needed to be involved, put the governance around it, put a plan in place, and then execute that plan across those agencies," Bush said.

Alongside the all-of-government team, officials in key government ministries and agencies searched for innovative solutions so their sectors could continue functioning as well as possible. The Ministry of Transport, for example, had to determine how to support airlines in order to ensure the airlines could keep moving critical freight even when there were no passengers on planes. Ardern's COVID-19 cabinet committee met regularly to consider proposals for clearing bottlenecks caused by the lockdown. The transport ministry, for instance, sought cabinet approval to subsidize flights carrying critical cargo when the lack of passengers made flying unprofitable.

#### *Procuring critical supplies*

Public health units relied on local laboratories to conduct COVID-19 tests, and each lab was responsible for its own supply chain. In late March, New Zealand's labs were able to conduct only about 1,500 COVID-19 tests per day and had only 10 days' supplies on hand. "We knew that was not going to be enough" said Kelvin Watson, an operations management consultant whom the Ministry of Health hired on March 21 to manage health supply chains during the pandemic.

The Ministry of Health stepped in, acting as an intermediary between the labs and the suppliers. Watson's team established relationships with the main suppliers of test components and made the case for New Zealand's need for more supplies to increase testing capacity. Because demand for tests increased at a rate similar to test supplies, building a stockpile of testing supplies took several weeks. "For a long time, we had 12 to 20 days of supply," said Watson. "When we really got the supply chains humming, we got up to 30 days' supply, and it went up from there."

The Ministry of Health also stepped in to help district health boards procure PPE because the usual suppliers were unavailable and there was no time to follow standard procurement procedures. "It was a situation of buy or miss out," said Watson. Beginning on April 1, district health boards as well as organizations outside the health system could apply to the ministry for PPE they needed. The ministry then allocated PPE based on how much stock was on hand and how urgent each applicant's needs were.

### *Testing and contact tracing*

To get a test, New Zealanders could contact their doctors or call Healthline, a long-standing phone service funded by the health ministry. Healthline staff directed callers to community-based testing centers, set up by district health boards. After people got tested at their local centers at assigned times, their samples were sent to a laboratory where lab staff ran tests, analyzed the results, and uploaded data to the Ministry of Health's disease surveillance database. Officials from the local public health unit called patients and patients' doctors to report results. When a patient tested positive, the labor-intensive process of contact tracing began. Officials interviewed at length those infected, identified their close contacts, advised those contacts to isolate themselves, and organized tests for them.

By the time New Zealand was entering level 4 in late March, contact tracers were already overwhelmed. During the first week of lockdown, 58 to 85 new confirmed cases of COVID-19 were being reported every day. With low staffing, public health units were unable to trace the contacts of more than a handful of infected people. In addition, there was no standard format for recording, storing, and sharing data between the regional units and the Ministry of Health.

To build capacity, the Ministry of Health set up a national contact-tracing center and recruited about 200 staff, who worked in two shifts. The ministry also introduced a cloud-based platform to better store and manage data on COVID-19 cases and on the close contacts of those infected. On April 9, an audit of the contact-tracing system identified further weaknesses, and the ministry began building a stronger contact-tracing system that could cope with future outbreaks of COVID-19—even if the government succeeded in its elimination strategy and the lockdown got lifted.<sup>5</sup>

At the end of May, the Ministry of Health released NZ COVID Tracer, a mobile phone application to complement the findings of the ministry's contact-tracing team. Users could scan QR (quick-response) codes with their phones, and the app saved in the user's phone a record of the locations scanned. Businesses could download unique QR codes from the government's COVID-19 website to display on their premises.

Fortunately, high compliance with level 4 restrictions meant that most of those infected with COVID-19 throughout April and May had only a few close contacts to trace—mainly people in their own households. As a result, the initially weak contact-tracing system did not cripple the elimination strategy, and the lockdown bought the Ministry of Health time to improve its contact-tracing system.

### *Transitioning out of lockdown*

Throughout the lockdown period, the All-of-Government Response Group worked on a plan to transition the country out of level 4, even though any such plan depended on an unclear outlook for success in eliminating community spread of the virus. Crabtree and his team worked hard to emphasize the

economic and health risks of lifting lockdown restrictions too early. “Some people were saying another week in lockdown is going to break business,” said Crabtree. “We were saying another week is better for business, because then we will have certainty that we are on top of this thing, and we won’t see cases bounce back.”

After a month under level 4 restrictions, Ardern shifted the country to alert level 3—on April 27. Easing the lockdown required constant public communication to ensure citizens understood and complied with restrictions at more-permissive alert levels. Restrictions at level 3 were very similar to those at level 4: schools, public facilities, and most businesses remained closed. However, restaurants and cafés could reopen for take-out or delivery services.

Daily case numbers kept dropping, and on May 4, the Ministry of Health reported the first day with no new infections. A week later, Ardern announced that on May 13, the country would move to alert level 2, which meant businesses could reopen—with strict requirements to ensure physical distancing.

On June 8, Ardern announced that the country would move to alert level 1. It had been 17 days since the last case had been reported, suggesting the country had conquered the virus—or at least brought it to heel. At level 1, all businesses and schools could operate normally again, and crowd sizes no longer had limits. The border, however, remained closed to non–New Zealand residents.

#### *Border defense*

Eliminating the threat of community transmission required strict controls on new arrivals into the country. If officials could isolate anyone infected with COVID-19 before the person entered, they could stop the virus from breaching New Zealand’s borders. On April 10, the response team introduced a managed-isolation system: The government rented out hotels—which were largely vacant due to reduced tourism—and set them up as managed-isolation facilities. New arrivals were transported directly from the airport to the facilities and were required to stay in isolation for 14 days. The managed-isolation system cost the government an estimated 5,700 New Zealand dollars (about US\$3,800) per person, and the total cost of the system was expected to reach NZ\$500 million (about US\$320 million) by the end of 2020.

## RESULTS

After April 5, when the Ministry of Health reported 89 confirmed new cases of COVID-19, the daily number of new cases dropped off quickly. The level 4 lockdown worked. From April 13 on, no more than 20 new cases were reported each day. Throughout May, most days saw zero new cases added to New Zealand’s total, and in early June, Ardern declared that there were no active cases of COVID-19 in New Zealand. The country had stamped out the virus—at least for the time being.

After the quelling of the virus within New Zealand’s borders, keeping it out remained an ongoing challenge. Despite efforts to plug gaps in the border system, an August outbreak in Auckland, New Zealand’s largest city, was

evidence that not all gaps had been filled. When health officials were unable to determine the source of the new infections, Ardern immediately reintroduced level 3 restrictions for the city and level 2 restrictions for the rest of the country.

Fortunately, the Ministry of Health used the country's 102 days with no cases of COVID-19 in the community to prepare for a resurgence. From May to August, the ministry built a stockpile of testing supplies and PPE and substantially boosted its contact-tracing capacity. The new outbreak, which grew to more than 150 cases, got contained, and the country returned to level 1 in October. Moving forward, the government aimed to avoid lockdowns by increasing the routine testing of those vulnerable to infection—such as staff in managed-isolation facilities—and quickly deploying contact tracers when anyone tested positive.

New Zealand's success in taming the spread of COVID-19 stood in stark contrast to the rest of the world. By late 2020, more than 75 million people worldwide had become infected with the virus, and more than 1.5 million had died. By that time, New Zealand had reported about 2,000 cases and just 25 fatalities.

Although the COVID-19 pandemic pushed the whole globe into an economic recession, businesses in New Zealand were able to reopen at full capacity and citizens could travel domestically with no significant risk of becoming infected. In many other countries at the time, the ongoing risk of infection saw consumers unwilling to venture out, with many businesses forced to close or to operate at reduced capacity. But continued challenges meant the relative success of New Zealand's response—and its full impact on the local economy—remained an unanswered question as the pandemic continued to play out around the world toward the end of 2020.

## LESSONS LEARNED

Even though New Zealand's small size and geographic isolation played roles in protecting the country from the devastation that the pandemic wreaked on many countries throughout 2020, several widely applicable lessons could be drawn from New Zealand's response.

### *Talk with the public clearly, honestly, and often*

Consistent communication and simple, easy-to-understand messages were critical in convincing New Zealanders—whom Prime Minister Ardern referred to as “the team of 5 million”—to comply with public health directives. Strong leaders played major roles in the successful communications. Walsh, who headed the communications effort, described Bloomfield, the director general of health, as “a remarkable communicator.”

“In Dr. Bloomfield, New Zealanders saw someone they trusted, someone they could relate to, and someone they could have confidence in,” Walsh said.

*Heed the experience of others*

Because COVID-19 took longer to reach New Zealand, the government had more time to learn from other countries' responses. For example, New Zealand's response team saw how China's lockdown in Wuhan was effective at stopping the spread of the virus. Seeing case numbers rapidly decline in Wuhan "was illustrative," said Crabtree, who coordinated the government's strategy against the pandemic and its policy response to it. "Lockdown worked in Wuhan; we were really lucky that we could see how the Chinese response went."

*Listen to the experts*

Crucially, Ardern chose to elevate the role of scientists during the pandemic. She relied heavily on her science advisers, epidemiologists, and infectious disease experts and deferred to them for policy recommendations. "The science was clear, and she was always very clear that her decisions would be based on the evidence," said Juliet Gerrard, the prime minister's chief science adviser, in a podcast interview.<sup>6</sup>

*Make decisions quickly and look ahead*

Ardern and her response team acted quickly throughout the response effort, adopting the mantra "Go hard and go early" to guide their decision making. "We were constantly thinking, What do we need to do in two weeks' time?—and then we did it that day," Bloomfield said during the 1 p.m. public briefing on April 29.

*Long term, cultivate social capital and public trust*

New Zealand's small size and strong ties between the individuals working on all aspects of the response meant the government could adapt quickly to fast-shifting situations. "The New Zealand civil service has a very strong sense of service and ethics, a very strong cadre of people who have moved around and worked together, and a very strong sense of trust," said Crabtree. "Social capital is deep. Our response was successful because social capital enabled us to adapt and work outside our systems. If we had stuck to the pandemic plan or stuck to our individual agencies, we would not have achieved what we did."

*Be prepared*

Sir David Skegg, an epidemiologist at the University of Otago, told the Epidemic Response Committee that the New Zealand health system had been "neglected for decades" and suffered "chronic underfunding."<sup>7</sup> Because of resource constraints, the health sector operated using antiquated systems that had to be urgently updated during the early months of the pandemic. If the health sector had been better prepared—for example, by having well-organized stockpiles of essential supplies and a strong contact-tracing system in place—the country may have been able to avoid lockdowns altogether.

## References

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<sup>1</sup> The Global Health Security Index is a joint effort of the Nuclear Threat Initiative and the Johns Hopkins Center for Health Security in conjunction with the Economist Intelligence Unit; <https://www.ghsindex.org>.

<sup>2</sup> *New Zealand Influenza Pandemic Plan: A Framework for Action*. Ministry of Health, 2017; <https://www.health.govt.nz/system/files/documents/publications/influenza-pandemic-plan-framework-action-2nd-edn-aug17.pdf>.

<sup>3</sup> Kate Ng, “Too early for UK to lift lockdown, warns New Zealand expert after country declared Covid-free.” *Independent*, June 10, 2020; <https://www.independent.co.uk/news/uk/home-news/coronavirus-lockdown-uk-new-zealand-jacinda-ardern-michael-baker-public-health-a9558936.html>.

<sup>4</sup> Harriet Robinson, “Almost 4000 people breached Covid-19 lockdown — police.” Radio New Zealand, April 22, 2020; <https://www.rnz.co.nz/news/national/414816/almost-4000-people-breached-covid-19-lockdown-police>.

<sup>5</sup> Ayesha Verrall, *Rapid Audit of Contact Tracing for Covid-19 in New Zealand*. April 10, 2020; [https://www.health.govt.nz/system/files/documents/publications/contact\\_tracing\\_report\\_verrall.pdf](https://www.health.govt.nz/system/files/documents/publications/contact_tracing_report_verrall.pdf).

<sup>6</sup> Adam Dudding and Eugene Bingham, “Coronavirus NZ podcast: What does the chief say? Extended interview with PM’s chief science advisor.” *Stuff*, May 28, 2020; <https://www.stuff.co.nz/national/health/coronavirus/300022860/coronavirus-nz-podcast-what-does-the-chief-say-extended-interview-with-pms-chief-science-advisor>.

<sup>7</sup> Amelia Wade, “Covid 19 coronavirus: ‘Decades of neglect’ of the health system have caused Covid-19 breakdown issues.” *nzherald.co.nz*, April 22, 2020; [https://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=12326814](https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12326814).

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