

New Zealand's COVID-19 response strategy: lessons learnt

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Abstract *This study analyzed the characteristics of the health system, surveillance system, and the measures adopted to face the COVID-19 pandemic in New Zealand between March 2020 and December 2021. 29 fully read articles from an integrative literature review were included, and the websites of the WHO, the World Bank, the “Stringency Index” of “ourworldindata” were consulted to collect data on the socio-demographic situation, economic indicators of the country, as well as tests, deaths, vaccines and new cases. The data were imported in CSV format and the graphs elaborated in RStudio software. The evidence points out that New Zealand can be considered a success story regarding the nationwide response to the COVID-19 pandemic, it being one of the countries with the lowest number of deaths from the disease in the world. This success was the result of a health system organization with fast internal action, high testing capacity, and contact tracing, without causing the collapse of the health system. In turn, it also pointed out that the population adhered to the confinement conditions, and faithfully followed the authorities’ instructions, even with low community participation in government decisions. Important lessons can be learnt leading to useful recommendations for a potential new epidemic with an unknown virus or similar.*

Key words COVID-19, New Zealand, Epidemic

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Introduction

The world faced a pandemic involving a new corona virus discovered in December 2019 in Wuhan province, China, causing COVID-19¹ disease. In March 2020, the WHO declared a worldwide public health emergency, generating a set of measures for containment of the propagation of the virus, which varied from compulsory wearing of masks and social isolation to complete closure of services and borders, based on evidence from previous epidemics¹⁻⁶. Regarding these measures, some countries, including Vietnam, Taiwan, South Korea, China and New Zealand⁷⁻⁹, were outstanding for their severe stance, maintaining operation of only the essential services for limited periods of the day. Studies have sought to identify the degree of effectiveness of the containment measures - mitigation - virus suppression on the evidence that the closure of services and schools, and home stay were effective in reducing the transmission of SARS-CoV-2, despite the damage caused to economies and general health^{10,11}.

At the very beginning of the pandemic in 2020, New Zealand adopted a virus suppression strategy, called “COVID-Zero”, seeking to zero community transmission in the country by implementation of a series of measures on a scale ranging from level 1 to 4¹². The higher the level, the more severe and more complete the closure of ports of entry and non-essential services¹². However, as of September 2021, since the aim of total elimination became unsustainable, the country began to adopt a virus coexistence and control policy, investing in actions coupled with incentives for vaccination, contact monitoring, and even asymptomatic testing¹³.

Throughout the pandemic period, March 2020 to July 2022, that claimed the lives of nearly 6 million worldwide, New Zealand recorded 1,628 deaths, and slightly more than 1.4 million infections. It is important to note that, until December 2021, the analysis period of this study, 51 deaths and 420,000 cases of infection had been registered¹⁴. Faced with the severity of the pandemic and the magnitude of the data across the world, analyzing the experience in New Zealand's response to the pandemic in the 2020s and 2021 can aid understanding of how the measures interfered with the course of the pandemic since the initial “COVID-Zero” control strategy and led to the subsequent relaxation of the measures.

Given the above, this study seeks to answer how New Zealand became a success story in

COVID-19 control, and what was the contribution of its health system and surveillance model to this performance? Indeed, the objective of the study was to analyze the characteristics of the health system, the surveillance system and the measures adopted in the combat of the disease there.

Methodology

A case study was conducted through an integrative literature review focused on New Zealand's response to COVID-19¹⁵. For identification of the studies, data were gathered through consultation of the CAPES periodicals portal: <https://www.periodicos.capes.gov.br/> - PubMed Central, Science Direct, Web of Science, and Scopus. The searches in these bases were performed by title, summary and keywords, using as strategy the descriptors: “health system”, “surveillance” and “nationwide response” associated with the terms “COVID-19” and the name of the country in English. The period for inclusion of publications was from March 2020 to December 2021, including the largest number of texts that portrayed the characteristics of the New Zealand health system, the response to COVID-19 with emphasis on the surveillance and control strategies adopted.

There were 92 articles that underwent an identification process, removal of duplicates, and double-blind selection through Rayyan between two researchers, thus leaving 34 articles read in full. Of the latter, articles that did not deal with the country's health system response, or were journal editorials or opinionative, were excluded. In the end, 29 articles were included (see the list in Table 1). These referred to one or more of the five categories or dimensions analyzed (characteristics of the country, government and the health system; evolution of the epidemic; measures adopted; governance; adhesion of the population; and health care).

The WHO website (<https://COVID-19.who.int/table>) and that of the New Zealand government (<https://www.health.govt.nz/COVID-19>) were also consulted, and, for data collection on the country's socio-demographic situation and economic indicators, the site <https://www.nz.gov> was accessed. The information regarding deaths, vaccines, new cases and the Stringency Index were extracted from ourworldindata, <https://ourworldindata.org/>. The data were imported in CSV format, the graphics devised in the RStudio software, and the measurements included in the graphics by means of PowerPoint.

Chart 1. Articles selected about the New Zealand government's response to COVID-19, March 2020 to December 2021 (n = 29).

Authors	Title	Year, journal, volume, number and pages
Fouda <i>et al.</i> ¹⁷	The COVID-19 pandemic in Greece, Iceland, New Zealand, and Singapore: health policies and lessons learned.	<i>Health Policy and Technology</i> 2020; 9(4):510-524.
Sharma <i>et al.</i> ²⁸	Social determinants of health influencing the New Zealand COVID-19 response and recovery: a scoping review and causal loop diagram.	<i>Systems</i> 2021; 9(3):52.
Sokołowski ²⁹	Regulation in the COVID-19 pandemic and post-pandemic times: day-watchman tackling the novel coronavirus.	<i>Transforming Government: People, Process and Policy</i> 2020; 15(2):206-218.
Collins <i>et al.</i> ³¹	Rethinking the COVID-19 pandemic: back to public health.	<i>Annals of Global Health</i> 2020; 86(1):133
Chaple and Lekakis ³²	La pandemia de COVID-19, estudio de casos: Australia, Nueva Zelanda y Cuba.	<i>Revista Habanera de Ciencias Médicas</i> 2020; 19(6):e3657.
Parag <i>et al.</i> ³³	Deciphering early-warning signals of SARS-CoV-2 elimination and resurgence from limited data at multiple scales.	<i>Journal of the Royal Society Interface</i> 2021; 18(185):20210569.
Mazey and Richardson ³⁴	Lesson-Drawing from New Zealand and Covid-19: The Need for Anticipatory Policy Making	<i>Political Quarterly</i> 2020; 91(3):561-570.
Douglas <i>et al.</i> ³⁵	Phylogenetics reveals the role of human travel and contact tracing in controlling the first wave of COVID-19 in four island nations.	<i>Virus Evolution</i> 2021; 7(2):veab052.
Smith <i>et al.</i> ³⁶	Inequities and perspectives from the COVID-Delta outbreak: The imperative for strengthening the Pacific nursing workforce in Aotearoa New Zealand.	<i>Nursing Praxis in Aotearoa New Zealand</i> 2021; 37(3):94-103.
Sakib <i>et al.</i> ³⁸	Considerations for an individual-level population notification system for pandemic response: a review and prototype.	<i>Journal of medical Internet research</i> 2020; 22(6):19930.
Baker <i>et al.</i> ³⁹	New Zealand's COVID-19 elimination strategy.	<i>Medical Journal of Australia</i> 2021; 213(5):198-200.
Steyn <i>et al.</i> ⁴⁰	Managing the risk of a COVID-19 outbreak from border arrivals.	<i>Journal of the Royal Society Interface</i> 2021; 18(177):2021006.
Desforges <i>et al.</i> ⁴¹	Uncertainty around the long-term implications of COVID-19.	<i>Pathogens</i> 2021; 10(10):1010-1267.
Huang <i>et al.</i> ⁴²	Impact of the COVID-19 nonpharmaceutical interventions on influenza and other respiratory viral infections in New Zealand	<i>Nature Communications</i> 2021; 12(1):1-7.
Lee <i>et al.</i> ⁴³	Should countries aim for elimination in the covid-19 pandemic?	<i>BMJ</i> 2020; 370:m3410.
Wilson <i>et al.</i> ⁴⁴	Navigating the health system during COVID-19: primary care perspectives on delayed patient care.	<i>New Zealand Medical Journal</i> 2021; 134(1546):17-27.

it continues

This study was developed within the scope of a research project entitled "Comparative Analysis of Health Systems in Response to COVID-19", pursuant to a CNPq notice called MCTIC/CNPq/FNDCT/MS/SCTIE/DECIT number 07/2020. The CNPq Process No. Was 401744/2020-5. It is part of a broader project called "Analysis of COVID-19 Pandemic Health Surveillance Models and Strategies (2020-2022)".

Results and discussion

From the documents and articles selected (Table 1) it was possible to characterize the country's situation regarding its health system and process of organizing COVID-19 combat in five dimensions: (1) the characteristics of the country, government and health system; (2) evolution of the epidemic; (3) measures adopted in response to the pandem-

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Authors	Title	Year, journal, volume, number and pages
Cook and Gray ⁴⁵	Official statistics in the search for solutions for living with COVID-19 and its consequences.	<i>Statistical Journal of the IAOS</i> 2020; 36(2):253-278.
Deckert <i>et al.</i> ⁴⁷	'Safer communities... together'? Plural policing and COVID-19 public health interventions in Aotearoa New Zealand.	<i>Policing and Society</i> 2021; 31(5):621-637.
Chen and Assefa ⁴⁸	The heterogeneity of the COVID-19 pandemic and national responses: an explanatory mixed-methods study.	<i>BMC Public Health</i> 2021; 21(1):835.
Dada <i>et al.</i> ⁴⁹	Words matter: political and gender analysis of speeches made by heads of government during the COVID-19 pandemic.	<i>BMJ Global Health</i> 2021; 6(1):003910.
Han <i>et al.</i> ⁵²	Lessons learnt from easing COVID-19 restrictions: an analysis of countries and regions in Asia Pacific and Europe.	<i>The Lancet</i> 2020; 396(10261):1525-1534.
Berger ⁵³	Encounters with uncertainty and complexity: Reflecting on infection prevention and control nursing in Aotearoa during the COVID-19 pandemic.	<i>Nursing Praxis in Aotearoa New Zealand</i> 2021; 37(3):15-19.
Panda <i>et al.</i> ⁵⁴	Redeployment of health care workers in the COVID-19 pandemic: a qualitative study of health system leaders' strategies.	<i>Journal of Patient Safety</i> 2021; 17(4):256-263.
Toh <i>et al.</i> ⁵⁵	COVID-19 response by New Zealand general surgical departments in tertiary metropolitan hospitals.	<i>ANZ Journal of Surgery</i> 2021; 91(7-8):1352-1357
Duncanson <i>et al.</i> ⁵⁶	Delayed access to care and late presentations in children during the COVID-19 pandemic New Zealand-wide lockdown: a New Zealand Paediatric Surveillance Unit study.	<i>Journal of Paediatrics and Child Health</i> 2021; 57(10):1600-1604.
Imlach <i>et al.</i> ⁵⁷	Seeking healthcare during lockdown: challenges, opportunities and lessons for the future.	<i>International Journal of Health Policy and Management</i> 2021; 11(8):1316-1324.
Nixon <i>et al.</i> ⁵⁸	Exploring the response to the COVID-19 pandemic at the rural hospital-base hospital interface: experiences of New Zealand rural hospital doctors.	<i>The New Zealand Medical Journal</i> 2021; 134(1545):11-21.
McBride <i>et al.</i> ⁵⁹	Using REACH, a new modelling and forecasting tool, to understand the delay and backlog effects of COVID-19 on New Zealand's health system.	<i>The New Zealand Medical Journal</i> 2021; 134(1544):159-168
Gonzenbach <i>et al.</i> ⁶⁰	Impact of nonpharmaceutical interventions on ICU admissions during lockdown for coronavirus disease 2019 in New Zealand: a retrospective cohort study.	<i>Critical Care Medicine</i> 2021; 49(10):1749-1756

Source: Authors.

ic; (4) governance and the population's adhesion to the measures; and (5) health care.

Characteristics of the country, government and health system

New Zealand is an insular country, located in Oceania, with a territory of 268,838 square kilometers, and an estimated population of 4.917 million in 2021. The population is composed of approximately 16% Maori indigenous people, 7% Pacific peoples, 15% Asians and 62% Europeans and others^{16,17}. The official language is English,

recognized as the mother tongue by about 76% of the population¹⁸.

The New Zealand government is a parliamentary monarchy with a democratic, capitalist regime. It is a unitary state with highly centralized power in the national government. The English monarchy acts as head of the country, represented locally by a governor-general, whose powers cover appointment of ministers and ambassadors. In turn, the Prime Minister is in charge of the decision-making¹⁸.

It has high level social indicators, the human development index (HDI) in 2021 being 0.91,

and the Gini Index, 0.44 in 2020. The unemployment rate varied close to 4% between December 2019 and September 2020. In 2021, the average life expectancy was 81.6, one of the longest in the world. About 99% of the population aged 15 and over is literate^{16,17,19}. Around 88% of the population is reported to enjoy good health, and have illness profiles compatible with those in other developed countries, neoplasms being the main cause of death, the population of Maori origin presenting the greatest mortality and illness rates²⁰.

Through a universal health coverage system, all permanent residents have access to hospitalization, outpatient care, preventive medicine, mental health care, and pharmaceutical services, which can be provided by both public and private entities. According to the analysis undertaken, the health system is characterized by a Beveridge-based social protection system²¹.

The structure of the “New Zealand health and deficiency system” consists of 20 Basic Health Districts responsible for providing and financing their local health services. Part of these support services for people with disabilities and some health services are financed and acquired nationally by the Ministry of Health²². In turn, there are regional services provided by 12 public health units (PHUs) belonging to Basic Health Districts (BHDs), and which may have participation of non-governmental organizations. Public Health Units (PHUs) act in environmental health, transmissible disease control, tobacco control and health promotion programs. Non-governmental organizations (NGOs) may receive funding from the Ministry of Health and district health councils (DHCs) to provide services to the population, and these can be in private hospitals, laboratories, imagery clinics, primary health care (APS), with general practitioners and nurses, among other staff²³.

Regarding the service infrastructure, in 2019, the country had 2.6 beds per 1,000 inhabitants, with a distribution ratio of doctors and nurses of 3.5/1,000 and 11.1/1,000, respectively in 2018^{24,25}. The country had 3.6 ICU beds/1 million inhabitants, less than the OECD average of 12 beds^{13,26}.

New Zealand is seen as a country with a strong social policy, including action aimed at unemployment insurance – job seeker support, support for carers of children, the elderly and people with disabilities – “Supported Living Payment, and an invalidity allowance, that is, a weekly payment to help with regular and continuous costs, such as visits to the doctor or hospi-

tal, medication²⁷. Studies reveal the government concern in the form of established social support measures during the pandemic and afterwards through support to entities and individuals affected by negative consequences, such as reduction or stoppage of businesses^{28,29}.

Following the 2005 avian flu epidemic, New Zealand developed plans to cope with influenza, involving adoption of measures aimed at mobilizing resources to respond to such sanitary crises. These plans included DHCs and PHUs that must maintain regional plans in their coverage areas that describe how services should be structured and provided during response to health emergencies³⁰. However, there was also reference to the difficulties in preparing the country to face a pandemic, and the importance of work prior to sanitary crises, long-term investments, seeking to strengthen the capacity of the health system³¹.

Evolution of the epidemic in the country

New Zealand reported its first case of COVID-19 on 28th February, 2020. In mid-March 2020, with 20 cases, the New Zealand government introduced the first restrictive measures, and on the 25th implemented a nationwide lockdown, which remained in force for almost a month (Table 2). Given that no new cases were registered, in late May, some measures were relaxed, thus there was a return to Level 2. Then, in June, the measures were suspended, returning to Level 1^{12,32,33}. However, as new cases were detected in early August in Auckland, new contact restrictions and work at home were rapidly promulgated¹² (Figure 1 and Table 2).

Research conducted by Jefferies et al.¹⁶ (2020) described the impact of New Zealand’s nationwide response to COVID-19 transmission. The authors found that much of the transmission had begun through cases imported by young people. The cases reached the elderly of lower socio-economic status and more likely to suffer severe consequences¹⁶. However, the transmission hit the entire country, the highest incidence being in popular tourist areas and in large gatherings, such as marriages, thus spreading transmission to a broader range of age groups³⁴. Although there were no significant differences regarding the severity of cases among the ethnic groups during the first year of the pandemic, in the subsequent year, due to short-term regional restrictive/blocking measures, a greater number of cases were found, concentrated in economically disadvantaged geographical areas^{16,28,32}.

Chart 2. Main measures adopted by the New Zealand government to control COVID-19 in 2020 and 2021.

Periods	Actions	Levels
2nd February to 15th March, 2020	Travel restrictions; prohibition of arrivals from mainland China, Iran, northern Italy and South Korea; prohibition of all cruise ships	Level 1
16th to 25th March, 2020	Non-pharmacological interventions, such as isolation for 14 days for all foreign tourists; prohibition of public gatherings with over 500 people; closure of ports of entry, except for returning citizens/residents; level 3 alert (state of emergency declared on March 25).	Level 2
26th March to 10th April, 2020	Establishment of a blockade with a recommendation to stay at home; improvement of contact tracking, testing, quarantine, including implementation of quarantine facilities managed for returning residents who could not isolate themselves safely; compulsory quarantine for all returning travelers.	Level 3
11th to 27th April, 2020	Intensification of the national blockade	Level 4
May – June, 2020	Resumption and reopening of services while maintaining restrictions on entry of foreigners	Level 1
August, 2020	New outbreak in Auckland – closure of some services, restrictions on size of gatherings, and orders to work at home.	Levels 2 and 3
September, 2020 to August, 2021	Opening of all services in the country.	Without restriction
October, 2021	Abandonment of the Covid-Zero strategy.	Restrictions in specific places
November, 2021	New plan with a strategy to minimize and protect, with 3 colors indicating the action level: red, orange and green.	Country at orange level till July 2022
December, 2021	Arrival of the Omicron variant.	

* Organized based on an integrative review and official and press documents.

Source: Authors.

The power of the measures can be seen in the study by Douglas et al.³⁵ (2021), which revealed a dramatic reduction from 7.5 cases/per million inhabitants on the day the blockade started to 0.4 25 days later³⁵.

In 2021, there were 26 deaths. By the end of the year, the total accumulated since the start of the pandemic was 51, one of the lowest mortality rates among the OECD¹⁴ countries (Figure 2). There had been almost 18,000 infections. From the point of view of the variants, the first case of Delta occurred in August 2021, and, by September, there were 1,249, of which 818 (65%) occurred in people from the Pacific region, in one of the District Health Council areas³⁶. With the increase in cases, in October 2021, the government announced the abandonment of the “COVID-Zero” strategy, and proposed a modification to its pandemic confrontation scheme, consisting of a new protection system at three, more flexible levels, replacing, as of December

2021, the alert levels by a new configuration in three colors: red, orange and green. In July 2022, the situation in New Zealand was ranked orange³⁷.

The arrival of the Omicron variant in late 2021 led to an explosion of cases in 2022, leading to over 151 deaths between January and March, 70 of which occurred between 10th and 17th¹⁴. Nevertheless, in 2022, the country achieved vaccination coverage of 95% of the population in the primary scheme, and, since August 2021, maintained its rate above 80%¹⁴. According to the Stringency Index (SI), it was possible to observe that NZ reached high rigidity values in the execution of its measures, peaking as high as 96.3% in some of the months analyzed (Figures 1 and 2). There was also greater strictness in the enforcement of the measures from June to August 2020, which proved to be important for the overall pandemic control¹⁴. In August 2021, when new cases arose, it was clear that the measures assumed

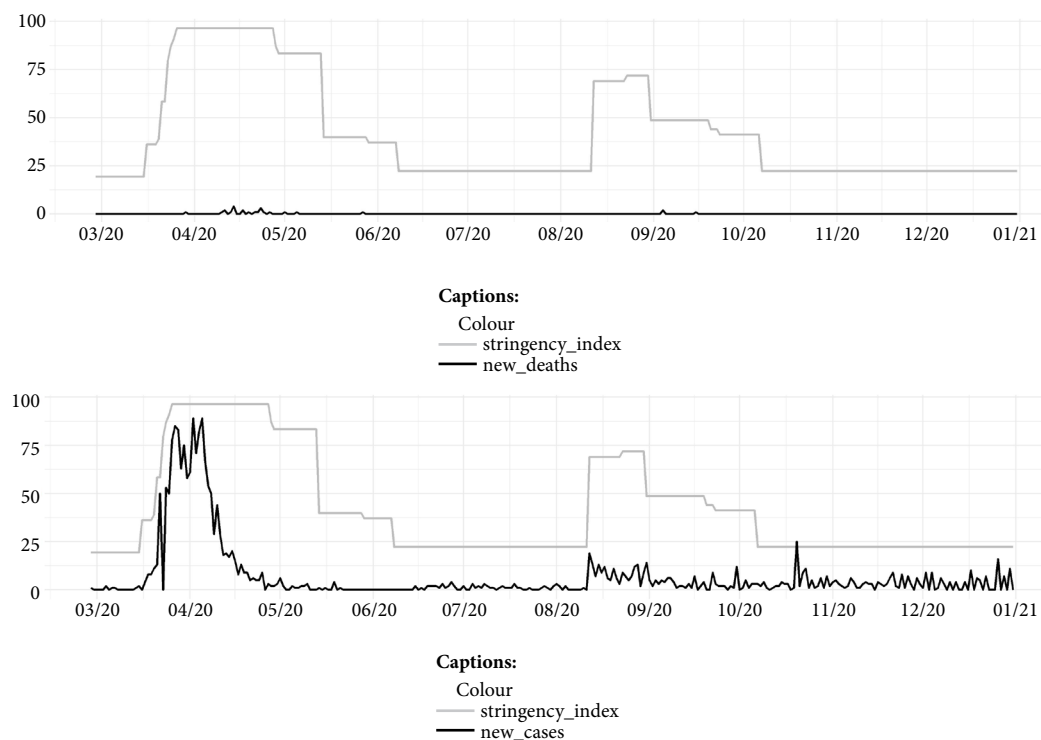


Figure 1. Number of deaths, COVID-19 cases and stringency index (SI) in New Zealand in 2020.

Source: <https://ourworldindata.org/>.

greater severity, as indicated by the SI returning to 96.3% (Figures 1 and 2; Table 2).

Measures adopted in response to the COVID-19 pandemic

The policy adopted by New Zealand in 2020 was guided by their COVID-Zero strategy, based on the proposal to suppress the circulation of the virus, to the point where the case curve would be flattened, community transmission of the virus having ceased. Pursuing this process, NZ succeeded in temporarily eliminating the circulation of the virus. Until August 2020, no cases had been registered for 101 days.

Throughout the COVID-19 pandemic, the emphasis of the actions taken in New Zealand were focused on: a) PCR tests among priority populations; b) Registration of all symptomatic people in the My COVID Record or through 0800 222 478; c) Quick tests available in various locations; and d) Quick tests for asymptomatic

medical care staff, and case confirmation among workers¹².

In this process, the government expressly recommended closure of schools and non-essential services, prohibition of social gatherings, mandatory quarantine for travelers, and border closure, except for residents³⁸. Being insular, there was a great movement to reduce the risk of contamination from abroad, creating structures to apply to all incoming travelers, keeping them in compulsory quarantine^{16,33,39-41}.

The first wave, the implementation of the measures effectively eliminated community transmission of COVID-19, there being no detection of new cases from 14th May to 9th June 2020^{14,42,43}. Thus, studies show that the success in NZ's pandemic control was largely due to the strength and severity of the measures^{16,44}.

There was relatively early recognition by New Zealand of the vital importance of epidemiological modeling in the monitoring of COVID-19 behavior, by means of statistical tests in which

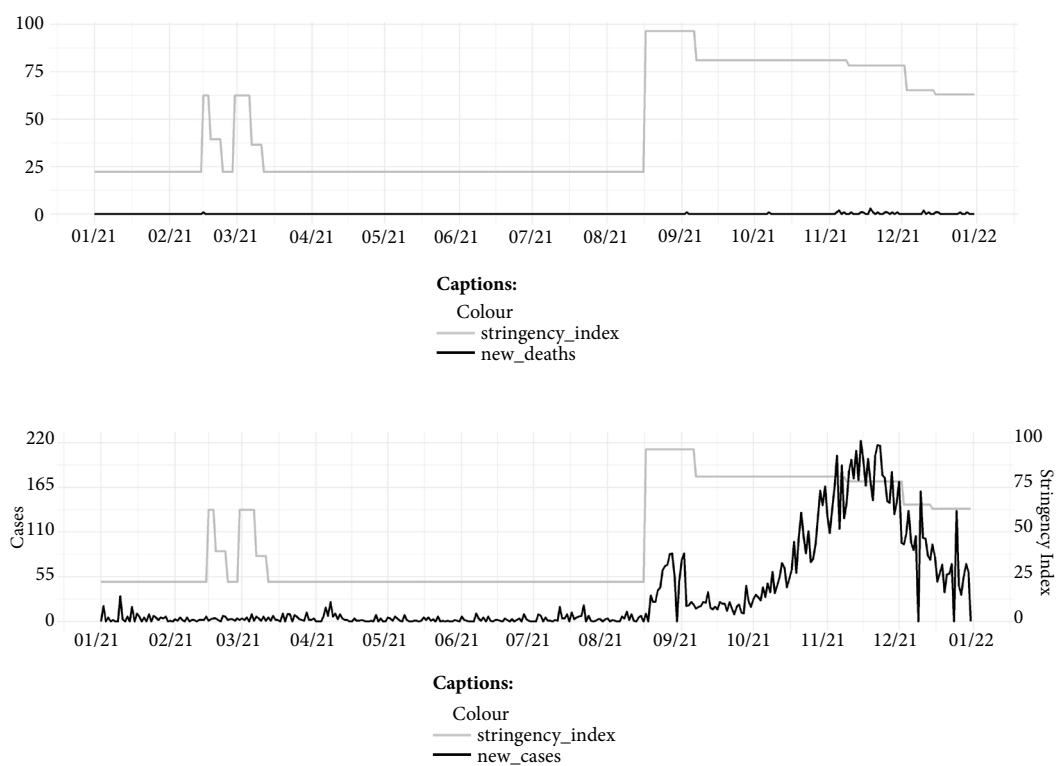


Figure 2. Number of deaths, COVID-19 cases and stringency index (SI) in New Zealand in 2021.

Source: <https://ourworldindata.org/>.

there was no blockade. It is estimated that, in 2020, more than 14,000 deaths would have occurred in the country, if the measures had not been adopted⁴⁵. The strategy also included provision of free COVID-19 tests, and treatment for anyone with symptoms¹⁴.

A study by Chaple & Gillies-Lekakis³² (2021), comparing Cuba, Australia and New Zealand, countries that combated the pandemic with more drastic measures, listed social distancing, border closure and isolation of cities, provinces or states as measures that contributed to the control in the first year³².

What was unique in NZ was the establishment of control posts for the circulation of people in the rural areas, led by Maori/Iwi communities as a form of humanitarian, cultural and community response to COVID-19⁴⁶. These communities contributed to the policing at some of the control posts, operated later in conjunction with the official police service^{46,47}.

It is noteworthy that the restrictions on entry to the country were implemented before the

WHO recommendation. They were imposed as of the very first case in the country, which was on 28th January, 2020. The National Center for Health Co-ordination, in response to the epidemic, remained active throughout the entire period.

The gradual relaxation of the blockade began in June 2020, with flexibility regarding certain restrictions, such as allowing small gatherings of up to 10 people.

New Zealand complemented the traditional approaches to the pandemic with new tools, such as digital technology through a mobile application called “NZ COVID Tracer” for location and registration of all new cases³². New Zealand also introduced a testing policy, which advanced from taking tests of anyone with symptoms in 2020 as a major posture, to the inclusion and testing of everyone, irrespective of symptoms, as of 2021¹⁴. In a similar manner, the tracking policy included all cases characterized as comprehensive tracing (all cases) in the two years under analysis¹⁴.

Governance in conducting the pandemic and adherence of the population to the measures

The co-ordination of the pandemic response in New Zealand was related to the strength and leadership of the Prime Minister, Jacinda Arden, who conducted the entire pandemic control strategy alongside the Director General of Public Health, Ashley Robin Bloomfield. The latter had followed a professional career at the Ministry of Health since 2004, held a master's degree in Public Health, and was a specialist in non-transmissible diseases.

The New Zealand Prime Minister was acknowledged for establishing the “gold standard” of pandemic management, the proactivity of which placed the country at the top of the COVID-19 performance index ranking. A study conducted by Porchen & Assefa⁴⁸ (2021), comparing nine countries with different income levels, found that she had conveyed clear, consistent messages, which had inspired confidence and security, contributing to even greater adherence on the part of the population^{48,49}. The government published daily briefings about the corona virus situation and promoted social media campaigns ever since the start in January 2020⁴⁸. It was pointed out that the Prime Minister had adopted what the authors called the “ethical care approach”, in which, for six months, all ministers and executives working in government agencies accepted a 20% cut in salary to express their solidarity with those who had lost their jobs or suffered cuts in income⁴⁸. Another research work that analyzed the discourses of 20 heads of state around the world, including New Zealand, stressed that female leaders more often addressed the impact at the individual level, and extended their concerns to the risks of developing mental health problems and domestic violence⁴⁹.

An important fact in the case of New Zealand was the population's adherence to the isolation measures, respecting, in an exemplary and disciplined manner, the confinement conditions, as well as faithfully following all the authorities' other instructions and recommendations³². On the other hand, studies also revealed criticism of the process of including traditional communities in the health system, and also of the adequacy of guidelines in the different languages, especially for the Maoris and refugees for whom language represented an obstacle to understanding the measures, disseminated mostly in English⁵⁰. In spite of such evidence, they also cited the exis-

tence of care actions benefiting these communities, including telephone numbers managed by volunteers helping the blockade, digital screening of services rendered by churches and their work with local organizations in the distribution of food packages⁵¹.

New Zealand also pioneered a social bubble model that allowed a particular group of people to maintain close physical contact with each other while practicing physical distancing rules with others outside the group⁵².

The role of indigenous peoples in monitoring mobility or the effects of language, along with the role of the government, raised questions in understanding the special nature of New Zealand's response. It can be suggested that its success was achieved because politics and science in this democracy spoke with the same coherent voice, and the government and communities implemented the program carefully. No false choice between economics and COVID was required, and discordant voices kept relatively silent. However, the latter did not happen in Brazil or the United States^{6,43}.

Health care

In spite of the degree of organization of the care based on the existence of the DHCs and their areas of expertise, situations were identified that revealed deficiencies in the process of reference and articulation between primary care and other levels of care, mainly in rural areas.

A significant aspect of the New Zealand health system was referred to in Berger et al.¹⁷, 2021, namely the small number of nurses specialized in the prevention and control of infections at national level, which required adjustment to the new pace and ways of working in the face of the situation⁵³. To overcome such limitations, the anticipation of actions was viewed as positive, and different strategies were implemented to rationalize hospital resources and minimize the risk of staff exposure

In the hospitals, centers had to adapt routines and restructure existing staff teams. Hospital leaders were called upon to think about reorganization strategies in order, in many cases, to deal with a lack of staff. Non-urgent operations, endoscopies and clinical consultations were postponed due to the allocation of operating rooms to COVID-19^{54,55}.

All the centers adopted the telemedicine strategy as the main means of communication among the doctors and for medical-patient con-

sultations. This raised the issue of the applicability of telemedicine in health care in the future⁵⁵.

However, low articulation among the various health services⁵⁶⁻⁵⁸ was also in evidence. It is referred to in the work by Duncanson et al.⁵⁶ (2021). Reduced access to primary and secondary care during the pandemic generated potential health care deficiencies for children, particularly the newborn. A study carried out by Imlach⁵⁷ (2020) revealed that, due to excessive focus on COVID-19 and the difficulties in contacting the normal hospital services, more than half of the interviewees postponed seeking health care during the blockade, indicating low integration of the health services. From the point of view of primary care, there were difficulties related to the use of new technologies, new forms of work and environmental safety. For individuals it was the fear of infection, the recognition of service overload, deficient management and low screening capacity⁵⁷.

The work by Nixon⁵⁸ (2021) mentioned a good local response from rural hospitals, but a lack of understanding on the part of the DHCs about these hospitals, leading to uncertainty about the transfer of COVID-19⁵⁸ patients in a grave condition.

Seeking to overcome such deficiencies, McBride's⁵⁹ work revealed the testing of a tool to identify waiting list delays and elective consultations in order to understand the effects of these backlogs on COVID-19 and avoid future problems.

In any case, Gozenbach⁶⁰ (2021) revealed in his study that non-pharmaceutical interventions were associated with a significant decrease in the elective and acute ICU admissions, and the use of ICU⁶⁰ resources.

Final considerations

The evidence of this integrative review points out that New Zealand can be considered a success case regarding the nationwide response to the COVID-19 pandemic, indeed one of the countries with fewer deaths from the disease. The alliance between government leadership, population adherence and the existence of compensatory policies and community transmission reduction strategies resulted in pandemic control until the entry of the Omicron variant at the end of 2021.

As for the relevance of the strategy, New Zealand was the only country to be able to zero the transmission of COVID-19 for a period of more than 100 days. In fact, three aspects considered important in comparative studies among countries⁶¹ were observed in the New Zealand case: 1) a great density of governance and national co-ordination strategies; 2) comprehensive pandemic containment and mitigation measures, with control actions, physical distancing, wearing of masks, among others associated with vulnerable group protective action; and 3) good health system response capacity, with safeguards for identification, testing and health care. In contrast, the Brazilian case was emblematic because, from the point of view of governance, there was denial by the national leadership, fragmented response and little articulation between legal and normative measures at the federal, state and municipal levels, along with divergent information and lack of communication with the public⁶¹.

New Zealand's success was the result of organization of a rapid-response internal health system, which was able to reduce the effects of the pandemic without collapse of the system. In turn, the extensive economic package released by the government contributed to reducing and alleviating problems arising from the intense blockade in the first two years. However, this was not without damage from the economic point of view, mainly because tourism is a major source of revenue.

It is concluded that the early, proactive, rigid intervention, along with applying previous experience in disease transmission and the evolution of test strategies, were important lessons that may be recommended as useful for potential new epidemics of unknown viruses or similar pandemics.

It is worth mentioning the importance of following the analysis of New Zealand's experience in facing the COVID-19 pandemic, mainly from 2022 when the highest incidence and mortality occurred, and its implications for the organization of the health system and the return to economic and social activities, including reopening the country to foreign tourism. Furthermore, it is relevant to analyze in subsequent studies the role of pre-existing social policies and those implemented during the pandemic, especially for the traditional communities and more vulnerable social groups.

Collaborations

AB Oliveira contributed substantially to the conception of the research project; the collection, analysis and interpretation of the data; and the writing of the manuscript. SCL Chaves contributed to the collection, analysis and interpretation of the data; and the writing and review of the manuscript.

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