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Learning to live with COVID-19 in Norway: Moving from a pandemic to an endemic state



Ingunn Skjesol^a, Gøril Ursin^b, Jonathan Tritter^{c,d,*}

^a Faculty of Nursing and Health Sciences, Nord University, Finn Christiansens veg 1, Namsos 7804, Norway

^b Faculty of Nursing and Health Sciences, Nord University, P.O. Box 1490, Bodo 8049, Norway

^c Faculty of Social Sciences, Nord University, Høgskolevegen 27, Levanger 7600, Norway

^d School of Humanities and Social Sciences, Aston University, Birmingham B4 7ET, Norway

ARTICLE INFO ABSTRACT Keywords: Objectives: To analyze the relationship between the stringency of policies that focus on containment, mitigation Endemic and elimination and practices to change behavior implemented during the COVID-19 pandemic and apparent Covid-19 policies impacts in the Norwegian population and society. In particular, to consider how the escalation and de-escalation Social restrictions of policy stringency relates to both health and non-health societal factors. Vaccination Methods: Observational analysis of publicly available statistics, government documents and media sources. Health service utilization Results: The stringency of policies relating to social containment, mitigation and elimination and practices to change behaviour were linked to infection rates and pressures on the health system until the endemic phase of COVID-19. In the endemic phase all restrictions were removed despite high levels of infection justified on the basis of the success of the vaccination programme. Conclusions: In the Norwegian context containment policies were highly effective in limiting both infections and deaths from COVID-19 and more so than reliance on vaccinations alone despite high levels of public participation. In part this is due to the significant trust in the state apparent in Norway that leads to compliance with even highly restrictive policies. Therefore compliance may be more important than the level of stringency in explaining the consequence of public policies on pandemic outcomes.

Introduction

This article reports the results of a retrospective observational analysis of the response to the COVID-19 Pandemic in Norway and explores the implications that this has for the current endemic state of the virus. The first incidence of COVID-19 was registered on 26 February 2020 following the initiation of testing by the Norwegian Institute of Public Health (NIPH) on 23 January and its specification as a notifiable disease on 31 January. Norway experienced a low number of fatalities, relatively low levels of infection and high compliance with both societal restriction and vaccination; as of 19 March 12,318,248 vaccine doses have been administered [1]. While the first death was reported on 26 February 2020 overall, as of 31 March 2023 the WHO reports only 5317 deaths despite 1481,091 confirmed cases of COVID-19 [1]. Norway experienced some of the lowest levels of infections and deaths from COVID-19 in Europe while only exercising a strict internal lockdown for a relatively short period, this provides an interesting case for evaluating

the relative importance of policy stringency compared to vaccination policies on health and social outcomes.

Initially we describe the characteristics of the Norwegian population and health system before setting out the four key phases of the COVID-19 response and their relationship to the stringency of policies focusing on containment, mitigation and elimination and practices to change behavior. The stringency of public policies aimed to restrict the impact of the COVID-19 has varied between countries [2]. Strict policies include those that impose the full lockdown of schools and businesses, restrict travel both domestically and internationally, require social distancing and compulsory facemask use and severely constrain social interaction both publicly and privately in a population [3]. Drawing on publicly available data from the NIPH, Statistics Norway, the World Health Organization (WHO), European Central Bank and the World Bank, we go on to present the analysis of the impact of the social restrictions associated with public policies and the vaccination program on a range of health, health service and non-health outcomes. The stringency

* Corresponding author at: Faculty of Nursing and Health Sciences, Nord University, Finn Christiansens veg 1, Namsos 7804, Norway. *E-mail address:* Jonathan.Q.Tritter@nord.no (J. Tritter).

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Available online 8 October 2023 2211-8837/© 2023 Fellowship of Postgraduate Medicine. Published by Elsevier Ltd. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/). measures we have adopted are based on the application of the Categorizing Policy & Technology Interventions to a viral outbreak Framework [4] to create a categorical measure of all policies rather than isolating the specific effect of any individual policy. We have visualized the data and the relationships have been assessed using these figures.

Background

Norway operates a universal, national health system funded primarily from general taxation covering the population of 5.3 million. A rich country, with the 9th highest GDP per capita globally in 2021 of \$65,662 [5] and life expectancy at birth of 83.17 years [6], among the highest in Europe with limited health disparities. Despite 82.7 % of the population living in urban settlements, predominantly in the south of the country [7] there is a significant dispersed population and an overall population density of 15 people per square kilometre [8].

The Norwegian health system is decentralized with four regional health centers managing the 20 hospital trusts and employing staff. Municipalities oversee primary and long-term care as well as social service while general practitioners, despite being self-employed are integrated within the health system. Financing is based primarily on general taxation (75.8 %), the national insurance scheme (10 %) and private expenditure/co-payment (13.9 %) which are capped and relates primarily to dental care and outpatient pharmaceuticals, while private health insurance made up only 0.3 % of total health care expenditure [9] In 2021 healthcare expenditure was 10.1 % of GDP or ϵ 7,6007 (7244 NOK) [10].

Phases in the Norwegian response to the pandemic

The response to COVID-19 can be understood in relation to four key phases: Pre-pandemic, Pandemic, Introduction of Vaccinations and Endemic. The First Phase was initiated on 30 January 2020 when the WHO declared that COVID-19 constituted a Public Health Emergency of International Concern. The next day, 31 January, the Norwegian government and the Ministry of Health and Welfare made the Coronavirus a notifiable disease and as an infection disease dangerous to the public. The declaration by the WHO that COVID-19 was a pandemic on the 11 March 2020 marked the beginning of the Second Phase of the Pandemic and led to the introduction of societal restrictions in Norway. Following a government announcement on 12 March a Corona Law on came into force on 18 March extending the authority of the Prime Minister to act during the crisis and closing national borders, schools and nurseries, prohibiting cultural and sports events and establishing quarantine regulations [11].

The national vaccination program was launched with the approval of the first vaccine, Comirnaty from BioNTech and Pfizer, on 21 December 2020 and the administration of the first dose on 27 December 2020 marking the beginning of the Third Phase [12]. After the Government announced the easing of societal restriction measures on 13 January 2022, the NIPH announced on 28 January that there was no longer a duty to report deaths of an individual with COVID-19.

The removal of most societal restrictions took place on 1 February 2022 marking the emergence of the Fourth Phase. By 12 February 2022 the Government stated that it was "removing all regulatory measures against COVID-19, including the requirement to wear a face covering, keep a 1-metre distance, and the duty to go into isolation when people are sick." [13]. Some restrictions were kept for the island of Svalbard but these were eased on 1 March. On 8 April the Government announced a long-term strategy of normalisation, "The pandemic is now in a different phase, but we must continue to live with COVID-19." The Norwegian Government has devised a strategy and emergency preparedness plan for the continued handling of the pandemic, and is closely monitoring the situation. Good monitoring, sound plans, and vaccination are critical factors in living with COVID-19 going ahead [14]. This clearly defines the current endemic phase of COVID-19 in Norway.

In our analysis we have categorized policies between 1 January 2020 and 31 March 2023 based on the Categorizing Policy & Technology Interventions (CPTI) to a viral outbreak Framework [4]. Other scholars have analyzed the policy response to the COVID-19 pandemic based on a structured comparative case design [15] or considered regime type, political system and regulatory practices [16]. We chose instead the CPTI framework as it is specifically intended to consider policies relating to containment, mitigation and elimination as well as those intended to alter behavior and has been adopted by others scholars in this special issue. Policies were rated on a monthly basis on the degree of stringency (no restriction, government recommendation, mandated by law, punishable and severe movement restrictions) and whether the policy was escalating or de-escalating. This analysis (See Fig. 1) reveals that while the policies were initially very significant at the beginning of Phase 2 they de-escalated become less stringent before a stricter policy regime was institute with the roll-out of the vaccination programme in Phase 3. The steady de-escalation of the policy regime followed the introduction of vaccinations in phase 3 but towards the end, in December 2021 increased stringency measures were adopted before the cessation of all containment policies as part of the normalisation at the beginning of the endemic phase (Phase 4). Different policies reflected different levels of stringency and this is particularly apparent in relation to containment policies. At the beginning of Phase 2, the start of the Pandemic extensive containment policies were implemented locking down, educational institutions, work places, public transport and closing national borders. After five weeks the kindergartens re-opened, and gradually the education system re-opened together with restrictions on the size of social gatherings and requirements for social distancing and by June 15 all educational institutions were permitted to provide face to face activity. However border control measures remained strict for far longer: requirements for travellers to provide vaccine certificates, where not lifted until February 12, 2022.

Impact on health outcomes

There have been 1,481,091 confirmed cases of COVID-19 in Norway but only 5317 deaths (see Fig. 2) [1]. The number of people contracting COVID-19 peaked in the week of February 7th 2022 during the endemic Fourth Phase and while the numbers shrank, despite the removal of all societal restrictions a month later on 7 March 2022 there were still more than 43,000 confirmed cases (see Fig. 2). Deaths of people with confirmed COVID-19 is lagged compared to infection numbers but also peaked during the Fourth Phase in the week of 21 March when 202 people died (see Fig. 3). The number of deaths declines with peaks of just over 100 deaths during the weeks of July 18th 2022 and January 9th 2023. For Norway, the majority of confirmed COVID-19 infections and deaths occurred after the end of societal restrictions.

The level of policy stringency tracks the infection rate rather than deaths except in Phase 4. Once again, the highest level of infection and deaths in Norway from COVID-19 occurred after all containment policy restrictions were lifted.

Examining the data for deaths from all causes in Norway (see Fig. 4) the highest number of deaths occurred November 2021 coinciding with the peak in COVID-19 deaths in Phase 3. Overall, however, more people have died from all causes during the endemic phase since the end of policy stringency than during the pandemic.

Impact on health service outcomes

While the policy stringency appears to track the level of COVID-19 infections it is an even better fit for the number of patients hospitalised with the illness (see Fig. 5). The number of infected patients is highly correlated with both those in ICU and on ventilators in Phase 2 and Phase 3. Policies sought to reassure the public, limit the spread of infection but also to safeguard the capacity of the health system. However, entering Phase 4, when policies were no longer stringent the



Fig. 1. Categorising of Norwegian Policies by degree across the four phases of the pandemic (01.20-03.23).



Fig. 2. Number of COVID-19 infections by month across the policy categories during the four phases of the pandemic (01.01.20 - 31.03.23).

number of inpatients with COVID-19 is higher than at any other time in the pandemic. While the number of patients in ICU and on ventilators is no longer as highly correlated there is still evidence of significant impact on the health system.

COVID-19 vaccination

The number of doses of COVID-19 vaccines peaked during Third Phase but has continued during the endemic phase (see Fig. 6). Current advice to the public is for all members of the population over the age of 5 years to have two doses while booster (third dose) (Comirnaty or Spikevax) and a fourth dose are available for specific population deemed at high risk (See Fig. 4). Children from 6 months to 4 years of age can access COVID-19 vaccinations based on a doctor's assessment.

The national vaccination programme now relies on the mRNA the Comirnaty and Spikevax vaccines following the September 2022 European medicine agencies approval of adapted versions of the COVID-19. The Nuvaxovid protein-based vaccine received conditional approval on 20 December 2021 but is currently not available from the NIPH. Both the viral vector vaccines, Vaxzevria and Jcovden (previously the Janssen vaccine) are not available through national vaccination programme. A number of vaccines that are not part of the national Vaccination Programme have been accepted for Norwegian COVID-19 Certification and therefore appear in the registry but in extremely low numbers (see Fig. 7). There is no strong relationship between the degree of policy stringency and number of vaccines administered or population coverage. However the de-escalation of the policy stringency in Phase 3 was justified by the growing vaccination coverage and the cessation of



Fig. 3. Number of deaths from COVID-19 by month across the policy categories during the four phases of the pandemic (01.01.20 - 31.03.23).



Fig. 4. Number of deaths from all causes by month across the policy categories during the four phases of the pandemic (01.01.20–31.03.23) [16].

containment policies in Phase 4 was justified by the existing vaccination-based resistance in the population and therefore a shift to 'normalisation'.

Impact on non-health outcomes

The impact of the pandemic was not solely on the health system or population health but also on the financial health of the nation. The impact of the pandemic on GDP is very apparent (see Fig. 8) with productivity recovering and growing in Phase 3 and Phase 4.

A significant explanatory factor for the change in GDP is employment and policies to support the labour market and the continued viability of businesses were part of the Norwegian response [11]. Unemployment increased during the pandemic from 3.8 % in the final quarter of 2019, dropping slightly in Phase 1 (3.6 %) before peaking in Phase 2 (5.4 % in quarter 3 of 2020) before declining in Phase 4 to initially 3.3 % and the current 3.1 % (see Fig. 9). Unemployment has consistently been higher for men than women but the patterns are very similar.

Two other indicators of the financial state of nation are the Norwegian stock market (the Oslo Børs) and the value of the Norwegian krone. Tracking the former over the course of the pandemic illustrates a similar picture to GDP in Norway with a significant decline on entering lockdown at the start of Phase 2 and a steady recovery through Phase 3 and Phase 4 (see Fig. 10). Examining the exchange rate of the krone against the euro illustrates a different picture in part due to the relative weakness of the latter during Phase 2 (see Fig. 11). The lockdown lasted far longer in Europe than in Norway and the pandemic had a far bigger impact on employment and productivity. As the eurozone recovered the krone moved back to its pre-pandemic levels while the current strength of the currency is likely linked far more to increased oil and gas revenues in the light of the Ukraine crisis. The containment policies, however, do not appear to be associated either to the level of the Norwegian stock market nor the value of the Norwegian currency. However, it is likely that stringent containment policies had a negative effect on GDP and the



Fig. 5. Number of COVID-19 patients in hospital, in ICU and on ventilators by month across the policy categories during the four phases of the pandemic (8.03.20 to 22.03.22) [17].



Fig. 6. Number of vaccines administered, by month, cumulative across the policy categories during the four phases of the pandemic (01.20 – 03.23) [18].

stock market and unemployment.

Discussion

The impact of COVID-19 in Norway was limited with only 972 deaths per million population compared to 2271 in Sweden, 2439 in France or 3208 in Italy as of 24 March 2023(1,25) The national vaccination programme has proved effective. But, the majority of infections and deaths occurred after the end of societal restrictions when the Government announced the need to return to normal and that the population had to "continue to live with COVID-19" [14]. Similarly, the stress on the health system caused by high levels of utilization has also been far greater during the endemic Fourth Phase with no policy restrictions.

However, when we consider deaths from COVID-19 we should be



Fig. 7. Number of vaccines administered, by month, type of vaccine, during the four phases of the pandemic (01.20–03.23) [18].



Fig. 8. GDP Constant prices (2020), seasonally adjusted figures, by month, across the policy categories during the four phases of the pandemic (01.2019 – 03.2023) [19].

somewhat hesitant in accepting that all those who have died while COVID-19 positive are dying 'from' rather than 'with' the illness. As Armstrong notes in relation to the situation in the UK, "The new coding rules ensure that COVID-19 was the underlying cause of death if mentioned anywhere on the Death Certificate. With this procedure, the patient could be moved from the 'diabetes' or 'heart disease' column of causes of death (and thereby reducing the death rate for those diseases) to the COVID-19 one. A patient dying from heart failure or cancer could become a victim of COVID-19 even if just suspected" [23].

This concern with the way that deaths have been recorded during the pandemic has been echoed in a commentary on the number of deaths in Norway by the NIP in 2020 [24]. As Armstrong concludes, "The pandemic has shown that determining why people die is not a simple task. The choice of an 'underlying cause' as specified on the Death Certificate fails to capture the myriad events and co-morbidities that culminate in death. Everyone finally dies from cardiac arrest but attributing this cause to all deaths would be little better than recording every death as a Visitation from God" [23]. In Norway the challenge of interpreting the cause of death during the pandemic has been complicated by the implementation on 1 January 2022 of a new digital mechanism for recording cause of death and this appears to have had an impact on how these data were recorded and deaths attributed although it is too soon to be able to judge the full implications of this change [[24],[25]].

A further challenge in considering whether societal restrictions make a difference to either infection or death rates from COVID-19 is the limited research evidence of the impact of such restrictions. While Wong et al. [26] found that national containment measures lowered the percent of increase in infections within a month, a recent Cochran Review concluded that there was only low to moderate certainty of



Fig. 9. Unemployment (seasonally adjusted) in 1000s by gender, by month, across the policy categories during the four phases of the pandemic (01.2019–03.2023) [20].



Fig. 10. Norwegian stock market (OSEBX.OL), monthly in Norwegian Krone across the policy categories during the four phases of the pandemic (1.1.19 – 28.2.23) [21].

evidence related to masque wearing creating uncertainty as to whether this is associated with a reduction in infection [27]. Therefore, the implications of stringent containment policies requiring masque wearing in public on infection rates are less clear than was previously assumed. Similarly, a recent article by Coccia [28] suggests strict public policy measures do not reduce the number of infections and death associated with COVID-19. It may be that it is not the existence of stringent policies but the compliance of the population with such policies and government advice that is most relevant. Future research should consider compliance with policies rather than policy stringency as a more relevant explanatory factor for pandemic outcomes.

A final complication in the Norwegian context has been the change in the reporting mechanisms as we enter the endemic phase; a change that is apparent in many other countries. It is difficult to judge both the level of infection and deaths with COVID-19 after 23 March 2022 in Norway as the reporting of the daily number of patients hospitalized with COVID-19 ended [29]. The end of the requirement for testing and only recording confirmed COVID-19 when a patient is tested within a health facility results in difficulty in tracking the consequences of the reliance on vaccinations alone in the endemic Fourth phase. Many other countries have also changed systematic reporting of infection rates: within the UK from July 5 2022, only results from tests provided by the National Health Service are reported while in the USA after May 12 2023, there is no longer systematic collection of data on negative SARS-CoV-2 test results.

And yet, examining the data on infection and deaths associated with COVID-19 in Norway makes it difficult to ignore that the period when people were socially distancing, schools were closed and people were seeking to maintain distance was more successful in limiting infections and deaths from COVID-19 than when these restrictions were lifted,



Fig. 11. Norwegian Krone vs Euro, by month, across the policy categories during the four phases of the pandemic (01.19 - 03.23) [22].

despite the availability of vaccines. Norway has the advantage of being a country with a large area and a relatively dispersed population. It is also a rich country and most of the population resides in accommodation with sufficient space to make social distancing possible and acceptable even when not legally mandated.

Conclusions

In Norway the containment policies were a reaction to infection rates rising, or fear of rising infection rates associated with holiday periods when people where likely to gather together or travel. At the extreme, policies did not permit people to use their holiday cabins because these are typically in relatively isolated locations and high levels of infection would have a disproportionate impact on rural health services. The stringency of policy restrictions tracks the infection rate but is even more closely associated with health service utilization and particularly hospitalization of patients with COVID-19. The decision to end policy restrictions was justified on the basis of the success of the vaccination programme but despite this levels of infection continue at a relatively high level and people are still dying from COVID-19.

The impact of the Pandemic on Norwegian society is difficult to discern. Clearly there was an initial financial shock with the Norwegian stock market, currency and GDP experiencing significant drops in the Pre-Pandemic First Phase. Unemployment peaked during the Pandemic Second Phase during the societal restrictions but never exceeded 5.4 % and has returned to just over 3 % in the endemic Fourth Phase. There is no evidence of increased levels of suicide and university enrolment held up well. People trust the government in Norway and this is reflected in high levels of compliance not only with strict policies but also with government recommendations. These together with the population distribution and settlement patterns have implications for both the spread and the impact of the pandemic. That is, it may be that compliance with stringent containment policies as well as recommendations, rather than the existence of such policies are the most telling and the nature of the relationship between citizens and the state makes Norway particularly interesting. This has implications for other countries and future pandemics as trust in the state and the alignment between state authorities and experts is potentially more important than strict enforcement. Just as the police cannot ensure public safety solely through their own efforts but must instead rely on the co-production of public safety through members of the public choosing to obey the law, classically referred to as policing by consent [30] the successful management of a pandemic or endemic requires the active cooperation of the public. The Norwegian experience points to a strategy that is based on encouraging public cooperation through transparency and equality and

an approach intended to generate trust.

The government announced the end of the pandemic and the return of normal life; the shift to the endemic phase of COVID-19. People's behaviour, however, has still not normalised. People still expect, if they feel ill in a way that they associate with COVID-19, to self-isolate and not attend work or school. The advice from the National Public Health Institute does not differentiate COVID-19 from other illnesses but the public still do. COVID-19 is different and Norwegians like people around the world remain wary.

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Declaration of Competing Interest

None declared.

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