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## The Norwegian way: COVID-19 vaccination policy and practice

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### ABSTRACT

**Objectives:** To describe the evolution of the national vaccination programme in Norway and how changes in national policy informed by risk and equity shaped international vaccine debates, public trust and vaccine hesitancy.

**Methods:** Documentary analysis of publicly available statistics, government documents and media sources.

**Results:** Process equity founded on social solidarity was central to the approach taken to vaccination in Norway but within the context of a very low level of COVID-19 Infection.

**Conclusions:** In the context of Norway with very low levels of infection, the risks associated with vaccine side effects were of a similar order to the risk of infection which led to an early decision to exclude the AstraZeneca vaccine and limit access to the Janssen vaccine. Public trust in the way the state managed the changes in the vaccination programme resulted in very limited public resistance to the vaccine programme, high levels of vaccine uptake and an acceptance of delays associated with the exclusion of two approved vaccines. Vaccination rates among Norwegian residents born in Eastern Europe were significantly lower than both foreign born and Norwegian born residents.

### Introduction

This article describes the vaccination response to the COVID-19 epidemic in Norway. The Norwegian Institute of Public Health (NIPH) started testing for COVID-19 on January 23, 2020, was first listed as a notifiable disease on January 31, 2020, registered the first incidence on February 26, 2020 and the first death caused by COVID-19 on March 12, 2020. As of March 24, 2022 in Norway there were a total of 1393,058 reported cases of COVID-19, 11,098 people had been admitted to hospital and of these, 1835 went on to be treated in ICU and 2339 have died [1].

The Norwegian context provides a number of distinctive elements that make it an interesting case. Norway has experienced very low levels of infection and death due to COVID-19, it has relied on municipalities as the primary organizational unit for the implementation of COVID-19 monitoring and vaccination and it was the first country to identify and react to rare blood clotting side effects associated with the AstraZeneca vaccine. Norway has a special relationship with the other Nordic countries (Denmark, Finland, Iceland and Sweden) including significant policy transfer and favourable treatment on a range of issues and this has

shaped its response to COVID-19. While operating a Beveridgean publicly funded national health system, the dispersed population of Norway creates particular challenges in terms of travel, health provision and access. In common with the other Nordic countries, the Norwegian population maintains significant trust in the state which operates within a consensual form of policy making and this has implications for vaccination rates and low levels of vaccination hesitancy [2]. The objective of this article is to consider how the Norwegian government approach to vaccination policy framed risk, generated trust and shaped the response of the public.

Initially we describe the characteristics of Norway and its population before considering the policy responses to COVID-19 vaccination and reflecting on the implications of global and domestic issues that have shaped the evolution of the vaccination programme and policies, and distinctive aspects of the Norwegian policy response. In particular, we consider the implementation of a vaccination programme in a country with very low levels of infection and the implications this has for individual, local and national calculations of the relative risk of vaccine side effects.

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### The Norwegian population and health system

Norway is a prosperous country with a population of 5.4 million and a GDP per capita of €43,900. It is a high tax economy with the third highest life expectancy in the EU at 82.7 years [3] and limited health disparities. Most of the population is concentrated in the south of the country and 83% live in urban areas but there are significant dispersed populations resulting in an overall population density in 2020 of 15 people per square kilometre of land area [4].

Like other Nordic countries and the United Kingdom, Spain, Italy and New Zealand, Norway has a publicly financed national healthcare system (a Bevriddgean system) providing universal coverage for all residents funded through general taxation (74%), the national insurance scheme (11%) and private expenditure (15%) while private health insurance is marginal covering less than 5% of elective services [3]. Co-payment is capped but relates primarily to dental care and outpatient pharmaceuticals. In 2020, Norway spent 11.3% of GDP on health or €6853 per capita [5].

A decentralised system, the government owns the four regional health authorities that manage hospital services and employ staff. The municipalities manage primary care, long-term care and social services and general practitioners are self-employed but integrated into the public system via contracts. The for-profit hospital sector is tiny providing less than 0.2% of hospital stays and 7% of daytime stays [3]. Prior to the Pandemic there were 2.9 physicians, 3.9 hospital beds and 18.2 nurses and midwives per 1000 population [6]. In 2010, Norway had approximately 300 ICU beds [7].

### The COVID-19 vaccination programme: doing it the Norwegian way

The Norwegian Government Coronavirus Immunisation Programme provides free vaccines, on a voluntary basis, for all those resident in Norway including foreign nationals; free vaccinations are not provided to Norwegian citizens living abroad. The distribution of vaccines was premised both on equity and that prioritization would relate to individual risk with the sole exception being to vaccinate frontline healthcare workers. The supply of vaccine dosages was based on EU vaccine agreements and as a full participant in the EU's procurement cooperation this was on an equal basis with EU member states [8]. Within this agreement if a country does not need the doses they are offered these doses are divided, based on population size, between the states that express an interest.

Due to the limited number of available vaccine doses, centrally defined priorities determined a weekly allocation to the 428 individual municipalities in Norway. The municipalities had the responsibility for planning and administering vaccinations in a way that was most suitable to achieve high participation rates in their locality. This local leadership lead to variations in the vaccination process. Each of the three control points defining the administration of vaccinations – EU procurement, national policy, municipality practice – had a degree of unpredictability and generated variation in access for the population. The number of vaccine doses made available to Norway was difficult to forecast, prioritisation by national government of those who should be vaccinated shifted and each municipality determined their particular approach to vaccine administration.

The first available CORONA-19 vaccine, from BioNTech & Pfizer, was approved for the Norwegian Coronavirus Immunisation Programme on the December 21, 2020 [10] (See Table 1 for the dates of approval for the different vaccines). The number of doses distributed within Norway was based on advice from the Norwegian Public Health Institute. Initially highest priority was assigned to residents in nursing homes and the older elderly (over 85), followed by those over 65 and people between 18 and 64 with one or more conditions associated with high risk of severe COVID-19 illness (for a full list of the conditions see [11]). Initially the distribution of vaccines to municipalities was determined by the percentage of residents in a municipality over the age of 85. The

**Table 1**

Coronavirus vaccines with Norwegian marketing authorisation and approval by European and Norwegian Medicines Agencies.

Vaccine	Manufacturer	Type of vaccine	Conditional approval	Suspended from Vaccination Programme
Pfizer	BioNTech & Pfizer	mRNA	December 21, 2020	
Moderna	Moderna	mRNA	January 6, 2021	
Vaxzevria	AstraZeneca	Viral vector	January 29, 2021	March 11, 2021
Janssen	Janssen-Cilag	Viral vector	March 11, 2021	April 15, 2021
Nuvaxovid	Novavax	Subunit	December 20, 2021	

Source: NIPH [9].

government estimated that there were approximately 1.3 million people at risk, who were either over the age of 65 or who already had one or more serious diseases [12]. The first vaccine dose was administered on December 27, 2021 to a resident of a nursing home.

Healthcare professionals with patient contact and deemed essential, or capacity critical, were also assigned the highest priority [13]. Healthcare personnel with patient contact constituted about 340,000 individuals. Actual prioritization within hospital trusts was undertaken by the trust while vaccination of health personnel in the community was managed by the municipalities. Hospital trusts received a 'significant allocation' of doses in weeks 22 and 23 of 2021 that was intended to be sufficient until after all adults had been offered an initial vaccine [14]. Municipalities were told that only 10% of a given weekly allocation of vaccine doses could be used for community-based health personnel.

### Making vaccination waves globally

The AstraZeneca vaccine was approved for people over 18 in the EU and Norway [15]. However, on March 11, 2021 the NIPH paused the use of the AstraZeneca (AZ) vaccine to review the evidence of significant side effects [16]. This suspension was linked to similar actions in eight other countries due to reports of blood clots resulting in the death of a 60-year-old woman in Denmark. During the pause, there were also reports of other similar cases and four deaths in Norway. A joint registry study in Norway and Denmark examining the side effects within 28 days of vaccination reported a "slightly higher rates of thrombocytopenia/coagulation disorders and bleeding...the absolute risks of venous thromboembolic events were, however, small." [17]. The AZ vaccine had been administered primarily to healthcare workers following the initial approval on January 29, 2021. However, on April 15, 2021 the NIPH recommended that the AZ vaccine be removed from the national vaccination programme and that the use of the Janssen (Johnson & Johnson) vaccine, also a viral vector vaccine, be paused due to limited knowledge of its potential side effects [18]. The government responded by establishing an expert committee, the Vorland Committee, to examine the consequences of using, or not using, these vaccines in the Norwegian national vaccination programme [19].

Prior to the Vorland Committee reporting, the NIPH on May 9, 2021 recommended that the Janssen vaccine also be excluded from the national vaccination program [20]. The following day, May 10, the Vorland Committee concluded that it,

"does not recommend the inclusion of vaccines based on adenoviral vectors in the national vaccination program. Confidence in the national vaccination program must be given great weight so that immunity can be achieved in the population through possible several rounds of vaccination in the years ahead." [21]

Instead, the Vorland committed recommended "that vaccines based on adenoviral vectors" (e.g. from AstraZeneca and Janssen) should be made available outside the vaccination program [21]. The government

decision two days later on May 12, was to remove both vaccines from the national vaccination programme. The Janssen vaccine was stockpiled while the government considered how to make it available outside the national vaccination programme [22]. The Minister for Health and Care Services announced,

"The Norwegian Government has decided not to use the AstraZeneca vaccine in Norway, not even on a voluntary basis. The rare but serious side effects we have seen in Norway indicate that the risks do not outweigh the benefits. This is particularly true as we expect a considerably higher number of mRNA vaccines in the future, and the interval between the first and the second dose of the vaccine has been extended, so that more people will be vaccinated more quickly"(22)

As the Director of the Division of Infection Control and Environmental Health at the NIPH put it, "Since there are few people who die from COVID-19 in Norway, the risk of dying after vaccination with the AstraZeneca vaccine would be higher than the risk of dying from the disease, particularly for younger people"(22). The removal of the AZ vaccine, the NIPH estimated, would delay the national vaccination programme by two weeks [23]. Despite not wanting to use the AZ vaccine in Norway, the government was happy to send 200,000 doses to Sweden and 16,000 to Iceland that would have expired in June and July 2021 [24].

Almost a month later, after much media and public debate, the Norwegian Government announced on June 9, 2021 that from June 15, people would be able to book an appointment for an assessment by a doctor in private practice, a vaccination clinic, or with a general practitioner who offers the vaccine. Doctors would then decide whether a patient should receive the Janssen vaccine or not [25]. This decision by the government to make the Janssen available outside the national vaccine programme on an individual basis based on a decision by physicians who chose to prescribe it went against the recommendation from the NIPH, [26]. As the Minister of Health and Care Services explained, "Doctors are not required to offer the Janssen vaccine, but the Norwegian Government has established a scheme to allow general practitioners, doctors in private practice, and travel vaccination clinics to prescribe the vaccine if they want to. Each doctor will perform a concrete assessment of the medical justifications for offering the vaccine to those who want it" [26].

The Norwegian Medical Association advised its members not to participate in making the Janssen vaccine available. The president of the association said "We are of the opinion that doctors should not

participate in this." The vast majority of physicians in Norway chose not to prescribe this vaccine. At the time, Norway had 72,000 doses and had ordered a total of 3.77 million doses [22]. The removal of the Janssen vaccine, the NIPH estimated, would delay the national vaccination programme by up to seven weeks for some age groups [16]. Overall the recorded administered doses of the four initially approved vaccines (see Fig. 1 and Table 2) illustrates the dominance of the Pfizer vaccine, the limited take-up of the Janssen and the consequences of the stoppage of the AZ vaccine. The dominance of the Pfizer vaccine is, in part, explained by it being the only vaccine approved for the 5–11 year age group; 133,240 doses of the Pfizer vaccine have been administered to those in this age group.

*The evolution of the Norwegian vaccination programme*

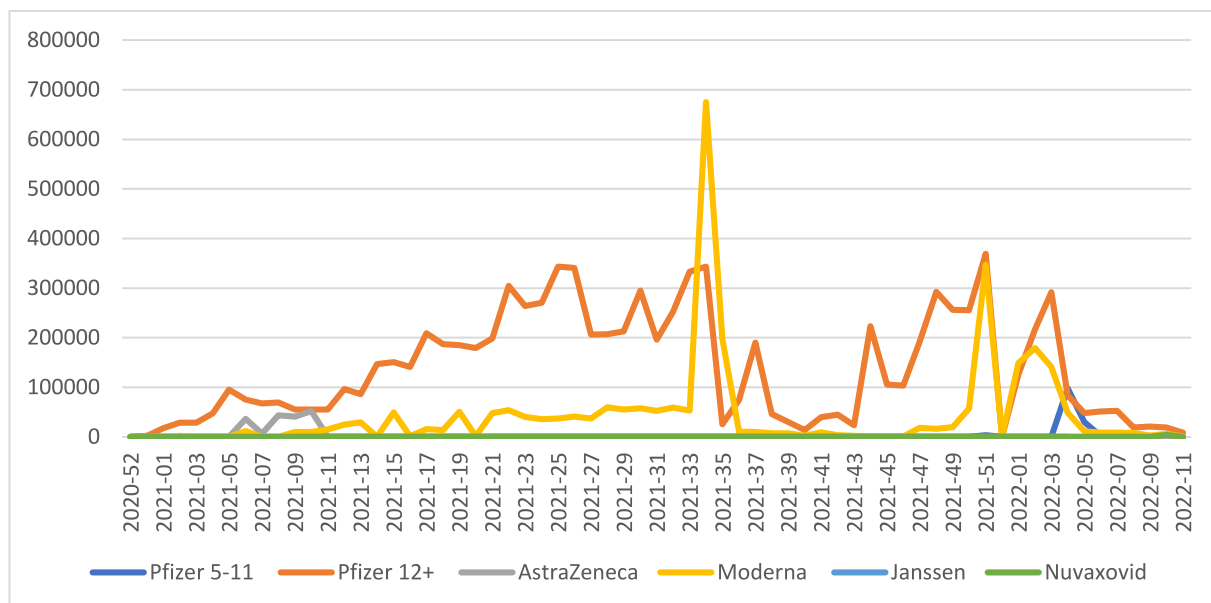
Decisions about the distribution of available vaccine doses by central government was a dynamic process where priorities changed in relation to the amount of infection, the particular strain of the virus, efficacy of particular vaccines for particular age groups and the extent to which particular vaccines prevented transmission [11] (see Fig. 2). The agreement by Poland to send 1.8 million doses of the Moderna vaccine to Norway was announced on August 13, 2021 and ensured that the entire Norwegian population could be vaccinated two or three weeks earlier than planned and this is apparent in the spike in vaccinations administered in week 34 [27].

The first change in vaccine strategy was a redistribution of doses between municipalities. Initially doses had been made available to municipalities on the basis of the number of local residents over 85. On March 2, 2021 this was altered to provide more doses to municipalities with the largest populations [28]. This was further modified on March 9, 2021, following recommendations from the NIPH, when vaccines doses

**Table 2**  
Number of recorded doses of approved vaccines distributed up to March 20, 2022.

Janssen (Janssen-Cilag AS)	Vaxzevria (AstraZeneca)	Moderna (Moderna)	Pfizer (BioNTech & Pfizer)	Nuvaxovid (Novavax)
8905	179,200	2,812,790	9,101,376	4380

Source: Norwegian Immunisation Registry SYSVAK [46].



**Fig. 1.** Number and type of vaccines recorded per week up to March 20, 2022 Source: Norwegian Immunisation Registry SYSVAK [46].

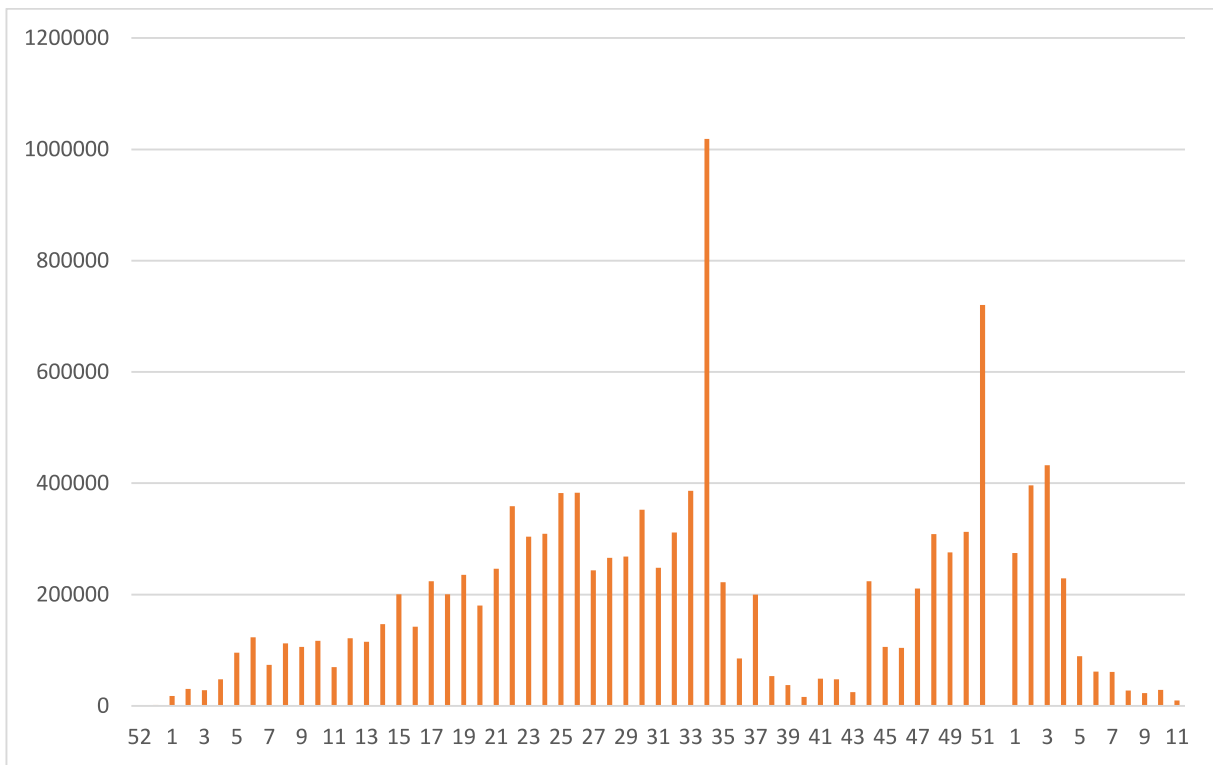


Fig. 2. Number of vaccine doses distributed to municipalities by week, up to March 20, 2022 Source: Norwegian Immunisation Registry SYSVAK [46].

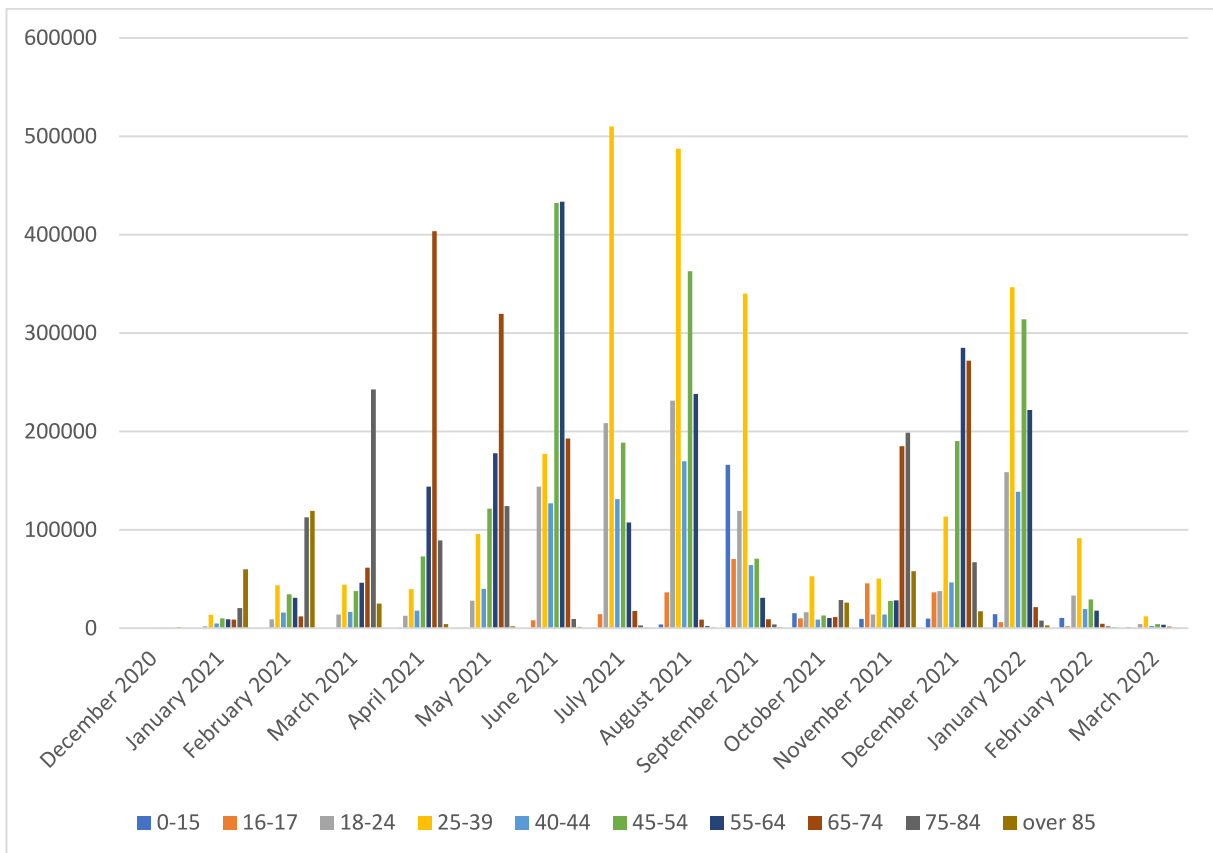


Fig. 3. Number of vaccines administered by age group 01.12.22- 24.03.2022 Source: Norwegian Immunisation Registry SYSVAK [46].

were prioritised for six districts in Oslo and four municipalities in Eastern Norway which exhibited persistently high rates of infection [29].

This change vaccine priorities created one of a number of challenges for municipalities relating not only to the size of the local population and the level of infection but the impact of a policy that is based on a particular notion of equity. The three largest municipalities close to the capital had the highest number of COVID-19 cases, while six other municipalities reported no confirmed cases. One of these municipalities, Utsira, is Norway’s smallest with an estimated 190 inhabitants, but also had the highest level of vaccination; 93.6% of the population over 18 has received their first dose of vaccine and 64.3% their 2nd. But population size alone does not explain vaccination rates. In Tydal, another small municipality, with a population of 766 only 62.5% of the population over 18 had received their first dose and 34.2% their second [30].

The decision to vary the distribution of vaccine doses created a lack of predictability and particular problems for small municipalities. Utsira received only one to two vials each containing seven doses of vaccine a week. The consequence of this drip feed, premised on equity defined by the population size of municipalities and the level infection, resulted in a huge amount of administration for an extended period even if the total number of people being vaccinated was very small [31]. One of the municipalities that was given fewer vaccines following the geographical redistribution was Hammerfest, a municipality in the far north of Norway. The municipality got the news of the redistribution (May 19, 2021) at the same time as experiencing an outbreak of COVID-19. Both the Mayor and the Director of Public Health were highly critical of the redistribution. At the time, Hammerfest was still vaccinating people in the ‘at risk’ groups [32] while Oslo had started vaccinating 18–25 year olds on June 8, 2021 [33].

A second significant change to prioritisation was announced on May 13, 2021 moving young people ahead in the queue. Residents aged 18–24 were offered a vaccine at the same time as those between 40 and 44 years of age. Those aged 25–39 were offered a vaccine after this group (see Fig. 3). The Prime Minister said that

“Throughout the pandemic, the Norwegian Government has prioritised children and adolescents first. Even though we have attempted to protect them as much as possible, many young people have nonetheless suffered under the measures. It is very important that young people can have more contact with other people and live freer lives, and vaccinating young people first will also help limit the spread of infection.” [34]

This prioritisation created an additional challenge for municipalities in relation to university students. Students who started the academic year in mid-August 2021 were expected to have their first vaccine in their home municipality but be able to access their second dose through the municipality where they were studying. This created a significant logistical and administrative challenge for the municipalities.

One of the changes implemented was to increase the interval between the 1st and 2nd dose with vaccine for those under 65 with no additional risks [29]. On April 30, 2021 the interval between the first and second dose of the vaccine was extended from six to twelve weeks in order to accelerate the vaccination programme. The NIPH assessed the workload associated with changing all the appointments as excessive and therefore did not recommend the interval change between dose one and two be applied retroactively [35]. Therefore those people who had received their first dose and received an appointment for their second dose kept their scheduled appointment [36]. This change in policy is apparent in the distribution of first and second doses as the vast majority of the doses available in the weeks 18–21 were second doses creating a drop in number of first vaccines administered in this period (see Fig. 4). Inequality in central allocation decisions and then differences in municipality approach had implications for vaccinations during the holiday period (decline in weeks 27–30). We observe a steady decline in vaccination administration from week 35 after the majority of the population had received both doses and before the government announcing a third booster dose would be offered to health personnel from November 4, 2021 [37] and this was extended to all adults from November 15 2021, [38]; the vaccine rate started to climb in week 45.

Social solidarity has been central to Norwegian society [39]. This ideological touchstone underpinned the approach to the national vaccination programme which, apart from staff with direct patient contact, treated all Norwegian residents in the same way. Individuals with higher risk of serious consequences of COVID-19, either due to age or comorbidities, were given priority, as were residents of geographical areas with higher levels of infection, but apart from these exceptions people were expected to wait their turn. There had been discussions in government and the media on whether teachers and kindergarten staff should be prioritised to ensure educational institutions could remain open. Indeed on May 12, 2021 the Prime Minister referred to an assessment by the NIPH on whether some groups of workers should be prioritised but concluded that no prioritisation of any group of workers was appropriate [40]. This changed on May 20, 2021 when the Prime

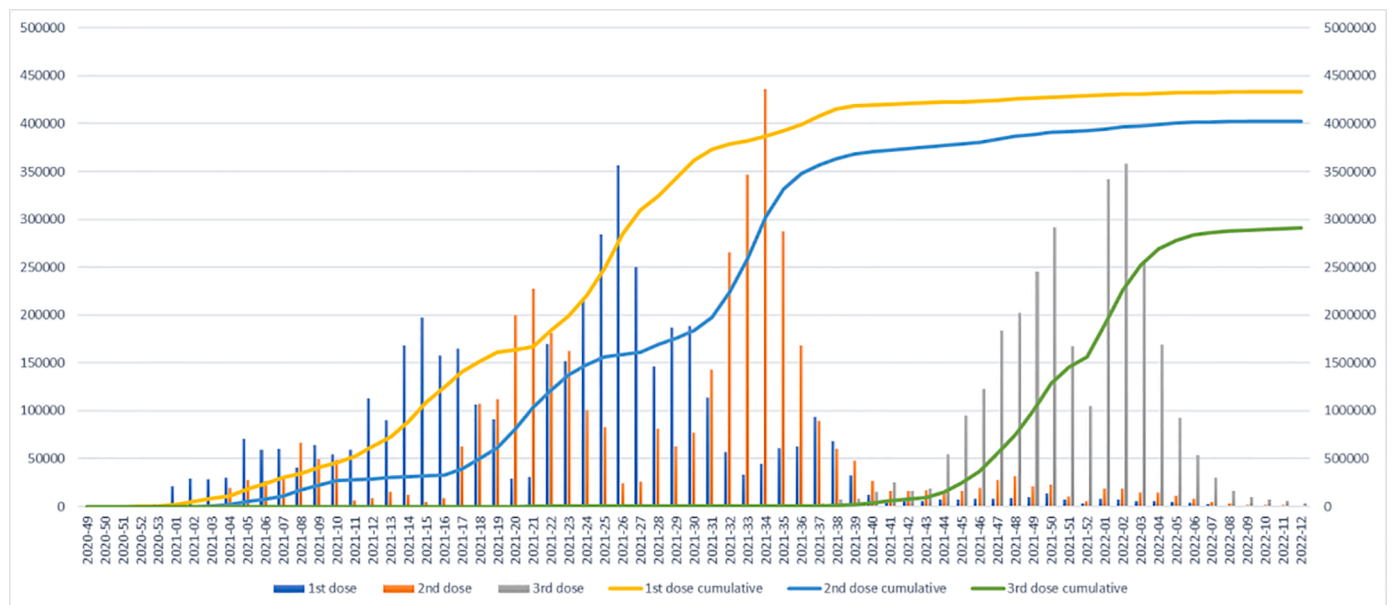


Fig. 4. Number of first and second doses administered per week up to March 20, 2022 Source: Norwegian Immunisation Registry SYSVAK [46].



Minister announced in a CORONA-19 press conference that 500 people in essential positions would be offered a vaccine the following week. Essential positions included members of Government Ministries, the Parliament, Supreme court, the NIPH, the Norwegian Directorate of Health, the Norwegian Directorate for Civil Protection as well as the Royal Palace [41].

The announcement was met with a massive critique as this was seen as running counter to the scientifically justified approach to responding to levels of infection and protecting individuals at risk of serious illness from COVID-19 but even more as a breach of trust in the underlying commitment that “we are all in this together. Several of the politicians offered a vaccine declined, including the health minister who explained,

“I am going to decline...I have been asked this question since January, and I have said the whole time that I am going to get my vaccine at the time when it is my turn in the queue in my home in Stavanger (the municipality where he is a formal resident)” [42].

While the leader of one of the opposition parties said,

“I have come to the conclusion that I do not have a good enough reason to accept the vaccine at this point. There is nothing in my situation that indicates that I cannot wait like the other people born the same year as me...We find it strange that this offer comes at this point, and that ‘Stortinget’ (the parliament) were not consulted beforehand. I understand that other groups in more exposed professions have reacted to the government’s decision.” [43]

The Norwegian government commitment to children and young people, however, has been reflected in policy throughout the COVID-19 pandemic ([44, 45]). This commitment was also reflected in the reprioritisation of vaccinations moving up 18–24 year olds. On July 5, 2021 the NIPH recommended that 16 and 17-year-olds be offered a vaccine and this was agreed on August 20, 2021 following the sourcing of 1.8 million additional doses of the Moderna vaccine from Poland ([47, 48]). Children aged from 12 to 15 were offered a vaccine from September 3, 2021 and this policy shift is apparent in the increased rate of vaccinations (see Figs. 3 and 4). The vaccination of younger children was seen as more sensitive. The government announced on January 14, 2022 that “A vaccine will be offered to children aged 5–11 if so requested by their parents or guardians. This vaccination is provided on a voluntary basis, and there is no general recommendation to vaccinate all children in this age group.” [49].

The changes in the approach to vaccination for children and young people was linked to a broader public debate on how to ensure kindergartens, schools and universities could operate as normally as possible in the autumn. On June 22, 2021 the government announced that due to the delay in vaccine deliveries, municipalities could choose to prioritise staff at schools and in kindergartens. As the Minister of Education and Integration explained,

“It is important that we get as near a normal and good start after the summer holidays as possible. Kindergartens, schools and after-school clubs are planning for a green level, with fewer infection control measures. The delayed vaccine delivery means that we are now adjusting the priorities to ensure that as many of the employees as possible are protected.” [50]

This meant that the responsibility for assessing the situation and deciding if prioritisation should change was placed on the municipalities at a challenging time very close to the summer vacation. For many municipalities this was problematic, especially for small municipalities that had not yet been able to provide vaccines for all health personnel [51]. It was also a challenge to the underlying assumption that ‘we are all in this together’, but one that became a municipality rather than central government problem.

#### *Rational choice rather than vaccine hesitancy*

Overall the take-up of the vaccines has been good with few people refusing the invitation to be vaccinated. As of March 24, 2022, 4331,117 Norwegian residents (93.1% of those 18 and older) have had one dose,

4026,205 (90.6% of those 18 and older) have had two doses and 2907,501 (65.3% of those 18 and older) have had three doses [1]. There is very little evidence of vaccine hesitancy among the general population related, in part, to the trust in the approach taken by the government and particularly how the relative safety of the vaccines was framed in relation to the individual risk of getting COVID-19. This was explicit in decisions about both the AZ and Janssen vaccines, which, as the Research Director at the NIPH explained, took account of the situation in Norway and the risks of the vaccine compared to the risk of side effects [52]. Norwegian government rhetoric, some scholars have suggested, was particularly successful in demonstrating trustworthiness, competency and empathy with the public [53].

But vaccination rates vary significantly between those born in Norway and those born elsewhere (see Table 3). In particular, Norwegian residents from Eastern Europe, Africa and West Asia have a far lower take up of vaccines across all age cohorts [54]. The results of a recent study of registry data found that “94% of Norwegian-born individuals with Norwegian-born parents had received at least one vaccine dose, compared with 73% of foreign-born individuals and 82% of Norwegian-born individuals with foreign-born parents” [54]. Norway has 819,356 immigrants and an additional 205,189 people born in Norway to immigrant parents representing 18.9% of the total Norwegian population. Of these the largest group is from Poland (121,406, 2.2% of the Norwegian population) while there significant immigrant populations from Lithuania (49,703, 0.9% of the Norwegian population), Iraq (35,047, 0.6% of the Norwegian population) and Somalia (43,616, 0.8% of the Norwegian population) [55]. Typically, although not always, vaccine uptake is lower in less affluent groups, and ethnic minorities usually have lower uptake than native populations [56]. In May 2021 the NIPH published data on vaccination coverage by country of birth demonstrating differences in coverage amongst some immigrant groups. They found that the proportion vaccinated in the 75 years and older age group was highest among people born in Norway, Sweden and Denmark (over 90%), and lowest among people born in Iraq (51%) and Somalia (34%) [57]. Patterns changed over time and higher rates of vaccination are apparent among older people born in Iraq although younger people are still low as are those from Somalia and Eritrea although not as low as those from Eastern Europe and particularly from Poland and Lithuania. There is little consensus on the reasons for lower vaccination rates in some immigrants groups, but language and other practical barriers provide a partial explanation ([57, 58]).

A literature review from June 2021 [59] showed that immigrants and ethnic minorities were generally more sceptical about taking the COVID-19 vaccine than members of the majority population in Norway, other countries in Europe and the USA. The reasons given were mainly fear that they would experience unknown side effects. It seems that many wanted to delay their vaccination until others had taken it. There is also some suggestion that hesitation is linked to the effectiveness of the vaccine in the group of immigrants and ethnic minorities, this combined with a fear of side effects might lead to fewer vaccinations in these groups [59].

The largest non-Nordic immigrant population in Norway is from Poland and evidence from both Norway [60] and other European countries highlights that such immigrants often return to Poland for specialist clinical appointments and diagnostic testing, sometimes referred to as ‘Ryanair Medicine’ [61]. This is in part due to an unfamiliarity and lack of trust of general practitioners and a desire for treatment from specialist doctors, a finding consistent with studies of the Polish immigrant population in the UK [62].

#### **Conclusions**

Overall the take up of vaccines across Norway has been good and there has been significant public support for the approach adopted by the government; as long as the approach was seen as fair and consistent with Norwegian social solidarity. The government commitment to

**Table 3**

Number of first and second vaccine doses administered by country of birth, total number and percentages as of March 13, 2022.

Country of Birth	18–44 years			Over 45 years		
	Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
Norway	1,342,304 93%	1,291,806 89%	742,450 51%	1,745,981 96%	1,733,109 95%	1,548,799 85%
Sweden	19,038 86%	18,229 82%	10,255 46%	21,746 94%	21,514 93%	18,777 81%
Denmark	6031 80%	5752 76%	3299 44%	14,112 94%	13,955 93%	12,410 82%
Poland	27,703 45%	24,453 40%	8290 14%	20,602 54%	19,219 50%	11,107 29%
Lithuania	13,637 49%	12,142 44%	3264 12%	6409 55%	5972 52%	2 46 23%
Latvia	3587 48%	3264 44%	1047 14%	1830 54%	1713 50%	858 25%
Eritrea	11,627 74%	9507 60%	1876 12%	4032 91%	3701 83%	1679 38%
Iraq	9896 81%	8507 70%	2837 23%	8421 87%	7794 81%	4190 43%
Syria	15,857 79%	13,465 67%	3341 17%	4840 88%	4442 81%	1972 36%
Somalia	12,571 72%	9705 55%	1822 10%	6146 81%	5370 71%	2020 26%

Source: NIPH [9].

process equity sometimes had unintended consequences that created inequitable outcomes, particularly in small municipalities. Greater consideration of such unintended consequences and a more nuanced approach to equity would be both fairer and more efficient. The transparency around judgements of the relative risk of side effects compared to the risk of infection also generated public support; the public accepted that excluding the AZ and Janssen vaccines would slow down the vaccination programme. The explicit sharing of such risk calculations is an example of transparency in policy making that might be usefully adopted in other sectors. The prioritisation of children and young people made explicit in Norwegian government rhetoric and policy also generated public support and acknowledged the particularly high social cost to young people of COVID-19 regulations that have compromised their education and social interaction. But this consensus and public support was challenged both by government action to allow queue-jumping by central government politicians and officials and also by some immigrants. Some immigrant communities have less fully internalised a Norwegian or Nordic sensibility as is apparent in both their attention to COVID-19 regulations and take-up of the vaccine [44]. This presents a challenge for the Norwegian government as we may all be in this together but some of us are presented as having a legitimate reason for jumping the vaccination queue and others do not feel they are with 'us'.

### Public interest summary

Norway responded very early to the side effects associated with some of the COVID-19 vaccines and excluded the AstraZeneca and Janssen vaccines from the national vaccination programme. This slowed the rollout of the vaccination programme but increased public trust in the process. While most people living in Norway willingly accepted vaccines when offered, residents from Eastern Europe had lower uptake of the free, publicly offered vaccines.

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### Patient consent

Not required

### Declaration of Competing Interest

None

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