1-2021

Sweden and Norway in the management of a public health response to the COVID-19 pandemic: a failed "experiment" in public good provision without state coercion

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Citizenship, Rights, and Cultural Belonging

WORKING PAPER SERIES

No. 108 | January 2021

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Abstract:

The COVID-19 pandemic has served as a major challenge for political incumbents to design and implement a public policy response to track and contain the virus. This essay compares the public health strategies of Norway and Sweden to examine the failure of the non-coercive strategy of the Swedish government in the initial months of the pandemic, which led to higher case fatality and death rates per 100,000 in a population. The findings of this study represent the *tragedy of the commons* in health when institutions allow for individually rational behavior amidst the effort to contain and control infection.

Key words: COVID-19, public health, policy response, COVID testing, Sweden, Norway

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1. Introduction

The tragedy of the commons is a theoretical framework shaping much of a conversation on public health. Imagine a pasture that is open to all herdsmen and their cattle for grazing (Hardin, 1968). In the situation that ensues, each person acts rationally to maximize their individual gain and packs as many cattle onto the field as possible (Hardin, 1968). But after a certain number of cattle, the quality of the field starts to deteriorate and eventually becomes no longer usable for any of the cattle to graze on (Hardin, 1968). The "tragedy" occurs because each person acts in his or her own self-interest, and the commodity becomes diminished (Hardin, 1968).

Health, especially during a global pandemic, represents a unique tragedy of the commons. The World Health Organization defines health as, "…a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." (WHO, n.d.). A collective state of health is both similar and different to the pasture in the example of the tragedy of the commons. Similar to the pasture's much sought-after grazing space, health resources are scarce (Fuchs and Zeckhauser, 1987). For example, there are only so many ventilators that can be given to COVID-19 patients at one time, which limits the resources available to care for critically ill patients within a given timeframe. On the contrary, health cannot be traded (Fuchs and Zeckhauser, 1987). If a woman tests positive for COVID-19, her husband cannot voluntarily trade her illness for his own health, but if that same woman was herding cattle in the pasture in the example of the commons, her husband could take her place if he wanted to. In addition,

health hazards in a pandemic are truly non-excludable, and misbehavior of one can dramatically harm many in a community.

Perhaps the starkest difference between the nature of health as a good and that of most other public goods that are politically debated is that health is a priceless commodity (Fuchs and Zeckhauser, 1987). It is not possible to produce life years directly or to sell them in a market-setting (Fuchs and Zeckhauser, 1987). And in life-or-death circumstances, people will do anything to afford health. Like in the tragedy of the commons, people will act selfishly when it comes to public health matters as long as the institutions allow for that behavior, and when it comes to communicable diseases like COVID-19, this can spell disaster for a given population's state of health. When a few herdsmen decide to act in self-interest and allow their cows to over-graze, it ruins the field. And similarly, when a few citizens decide to act in self-interest and avoid taking proper social distancing precautions during a pandemic, it can ruin the state of health for the entire community.

On February 11, 2020 the World Health Organization (WHO) officially titled the novel coronavirus SARS-CoV2 which originated in Wuhan, China in the final months of 2019 "COVID-19." (Vergnaud, 2020). In the months that followed, the virus ravaged through the world, killing hundreds of thousands in its path. As of the 11th of November 2020, data indicates that there are as many as 1,448,890 dead of the virus, with the United States reporting the highest number of fatalities with 265,720 dead (JHU, n.d.). Symptoms of the virus, which can present themselves between two and fourteen days after exposure, include fever, sore throat, loss of taste, and difficulty breathing, but many never present with no symptoms at all yet become contagious (Maragakis, 2020). The devastating effects of this global health crisis have left many countries grappling with how to develop strategies to combat this deadly pandemic. Leaders

whose job it is to shape public health policy during a pandemic are faced with a unique challenge to prevent "a commons" situation from ensuing. In order to prevent the spread of infection, political incumbents have been tasked with managing shutdowns of schools, workplaces and entertainment venues to incentivize proper social distancing measures. One important aspect of public health policy during a pandemic as it relates to the tragedy of the commons is the implementation, or lack thereof, of an infection testing and tracking strategy. Here I focus on this set of public health measures as an indicator of incumbents' pandemic strategy.

2. The goal of this study

This work examines Norway and Sweden between the months of March and June 2020 and the ways in which both countries responded to the COVID-19 pandemic at the national level. Norway's early testing strategy, travel guidelines, and closing of public venues in March 2020 recognized the tragedy of the commons as a problem in health. Norway's response was implemented early on in the pandemic, was aggressive in nature and was highly coordinated at the national level, and because of this Norway was able to relax regulations during the months of May and June. On the contrary, Sweden lacked the same highly coordinated response and was less successful than Norway at containing the spread of the virus during these months, which allowed the tragedy of the commons to ensue as a result of Sweden's failure to implement a public health strategy to slow the spread of the virus.

3. Public health strategy

From the very first days of the world's response to the spread of the pandemic, Norway implemented an aggressive strategy to track and contain the virus. On March 12, Norway closed most schools, issued a 14-day quarantine for anyone who had travelled since 27 February, whether travelers were showing symptoms or not, and shut its borders to all non-Nordic countries (Brzozowski, 2020). In addition to the new lockdown on foreign travel, authorities in

the Northern part of the country also implemented a mandatory quarantine for all those traveling domestically from South to North (Brzozowski, 2020). During this time period, officials were also actively working to import medical equipment from China and working on the development of an app that would track the spread of the virus (Brzozowski, 2020). The app, named *Smittestopp*, uses location services to track the spread of the virus as people move from place to place, and citizens were strongly encouraged by Prime Minister Erna Solberg to download it onto their devices, despite security concerns (Nikel, 2020). Of the 5.5 million population size of Norway, 1.4 million people had downloaded the app as of April 25, 2020 (Nikel, 2020). The app is representative of Norway's innovative, hands-on approach to tackling the spread of the virus on a national level.

In addition to this aggressive infection tracking mechanism, Norway also had a very aggressive testing strategy that was implemented in mid-April ("Norway's government announced on 7 April…", 2020). The plan, which was announced on April 24th, planned to test about 270,000 people every week ("Norway's government announced on 7 April…", 2020). In theory, this would allow the Norwegian government to test its entire population in about two months (Nikel, 2020). While this was the plan, in actuality the numbers ended up being considerably lower, due to a variety of reasons including the limited reliability and availability of tests (Nikel, 2020; "Norway's government announced on 7 April…", 2020). In practice, by mid-May, about 20,000 people were being tested each week ("Norway's government announced on 7 April…", 2020).

Whether the Norwegian testing strategy was implemented as intended or not, the mere existence of such a strategy proved useful in the months and years to come because of the advanced investment in nationwide infrastructure. As of November 2020, Pfizer has

manufactured, and begun to distribute, a vaccine for COVID-19 ("Pfizer-BioNTech COVID-19", 2020). But in order to get enough people vaccinated so that case numbers to begin to fall significantly and to get countries to ease their pandemic-related public health policies, there needs to be some mechanism of distribution in place to get the vaccine to enough people in as short a timeframe as possible. An added component to this problem is that Pfizer's vaccine has very specific shipping and handling conditions that must be met in order to be able to use the vaccination ("Pfizer-BioNTech COVID-19", 2020). For example, once delivered to a distribution facility, the vaccine cannot be stored for longer than five days under 2-8°C in a refrigerator to be useful in a clinical setting, and there also exists GPS-enabled thermal sensors keeping temperatures at -70±10°C that are required for shipment ("Pfizer-BioNTech COVID-19", 2020). So, if a country is not equipped with the kind of planning it takes to distribute a vaccine of this type and of this magnitude, more people will contract the virus as time is wasted trying to implement a complex distribution strategy. The ability of the Norwegian pandemic response infrastructure to support such a coordinated response has the potential to save time, and lives in the long-run.

In contrast to Norway's highly coordinated and proactive response in the earliest months of the pandemic, Sweden's response was very different. Instead of coordinated lockdown measures and travel restrictions, Sweden's national government relied on a system of 'trust-based' measures that were mostly voluntary, that is to say, it expected the public good of pandemic protection to be provided via the voluntary efforts of its citizens (Paterlini, 2020). The Swedish government advised people to avoid non-essential travel, work from home if possible, and advised older adults to limit social contact (Paterlini, 2020). Additionally, Sweden's borders, most schools for students under 16 years of age, non-essential businesses, bars and restaurants

remained open through this time frame (Paterlini, 2020). While some governments opted to impose national standards for mask-wearing and other facial coverings to help slow the spread of infection in the early months of the pandemic, the Swedish government did not (Farr, 2020). In fact, Dr. Cheng Xu, a physician in Sweden, reported that while traveling to Asia in January he witnessed most people wearing masks and stated that this was not the case in Sweden and that most Swedish citizens do not wear face coverings in public (Farr, 2020).

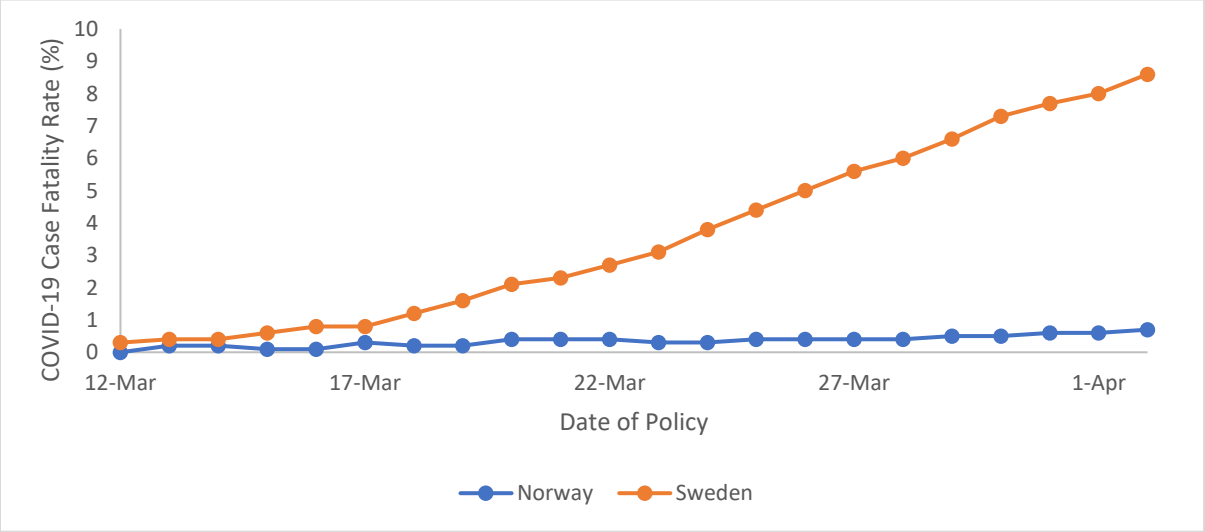
The negative externalities of Sweden's approach to public health policy during this pandemic are seen clearly in the problems many Swedish patients have encountered while trying to track and test for the infection. While Norway made plans to implement robust testing strategy, Sweden initially planned to test only doctors and healthcare workers, but there are reports that even doctors and healthcare workers were not able to be tested for some time (Bendix and Baker, 2020). It was not until 19 May 2020 that Sweden announced that it would begin testing patients with symptoms (Bendix and Baker, 2020). Not only was testing insufficiently implemented, but tracking was as well. Reports from epidemiologists indicate that they were unable to gather basic data about the spread of infection in schools as they remained open in Sweden in order to properly gauge the rate of transmission of the virus (Farr, 2020). As time rolled on, by May Norway started to roll-back some of the policies it had implemented back in March. On 8 May 2020, the Norwegian government implemented a large set of rollbacks that put things slightly more 'back to normal' for many citizens. Rollbacks included in this policy package included permitting sports gatherings for up to 20 people, events for up to 50 people in public spaces, and the foreign travel prohibition for healthcare professionals was lifted, as well (Oesterud, 2020). Additionally, amusement parks, gyms and fitness centers, and public pools and

waterparks were all scheduled to reopen, with the announcement that all schools for all grade levels would open on 15 May 2020 (Oesterud, 2020).

4. Findings

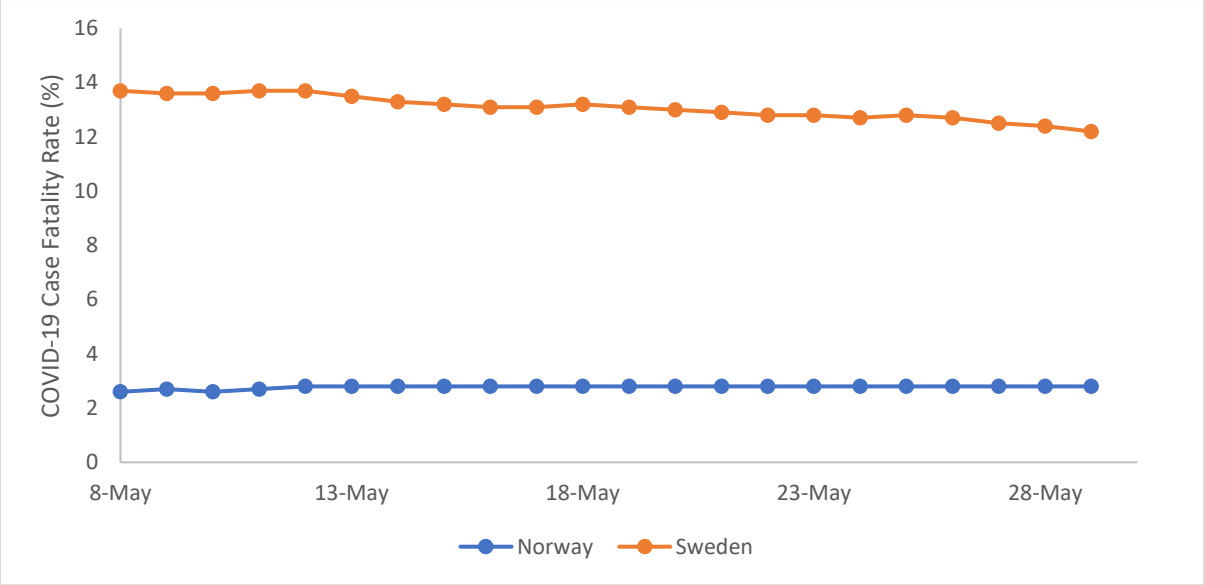
The data presented in Figure 1 represents the COVID-19 case fatality rate in Norway and Sweden during the time period of 12 March- 2 April (JHU CSSE, 2020). Case fatality rate is a ratio of the number of confirmed deaths to the number of confirmed cases of COVID-19 in a particular day (JHU CSSE, 2020). As shown in Figures 1 and 2, data was analyzed from two distinct time periods, the first starting on 12 March, which was the day of the first round of COVID-19 related public health policies released by the Norwegian national government, and the second time period (8 May 2020- 29 May 2020) represents a second round of COVID-19 related public health policies, mainly rollbacks, as instituted by the Norwegian national government.

Figure 1. COVID-19 Case Fatality Rate 12 March- 2 April 2020



Source: John's Hopkins University as presented by ourworldindata.org

Figure 2. COVID-19 Case Fatality Rate 8 May- 29 May 2020



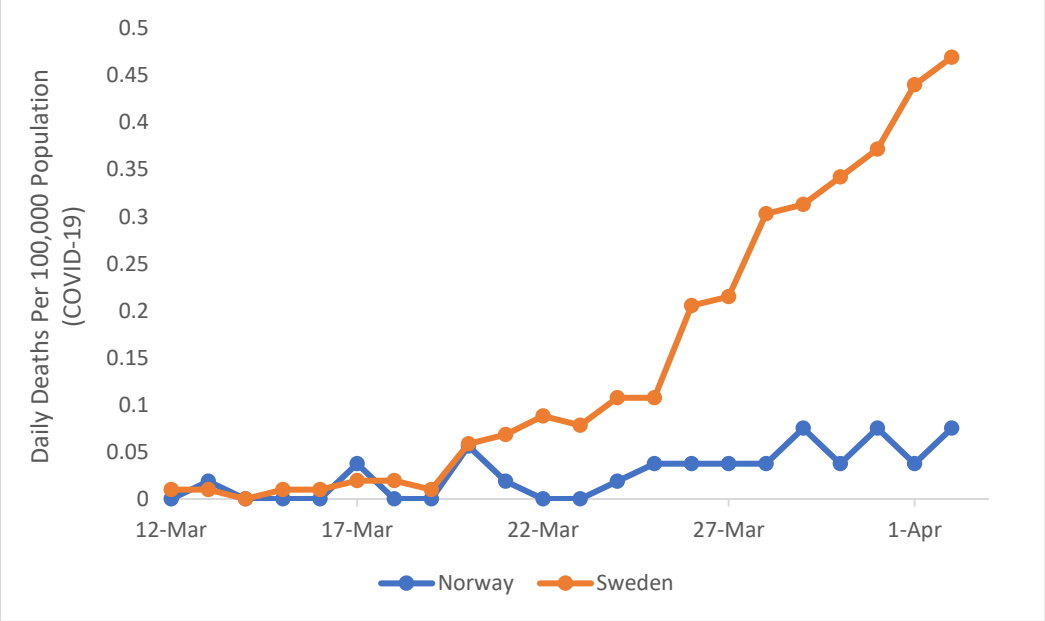
Source: John's Hopkins University as presented by ourworldindata.org

As the data presented in Figure 1 indicates, on 12 March, Sweden and Norway had very similar case fatality numbers, with Norway averaging 0 percent of confirmed deaths from confirmed cases of the virus, and Sweden averaging 0.3 percent. Then in the days that followed as Norway implemented its coordinated and robust plan of lockdown, testing, and tracking measures, the numbers stabilized and never surpassed 0.7 percent for this time frame. In those same few days, as Sweden failed to implement an aggressive approach to containing the virus, the ratio of confirmed deaths to confirmed cases skyrocketed, reaching a maximum value of 8.6 percent in this timeframe.

The next time frame (8 May 2020- 29 May 2020) told a very similar story, as the data in Figure 2 indicates. Although the case fatality rate in Norway had risen slightly between 2 April - 8 May, with the new highest rate reporting at 2.8 percent, these results are remarkable given the actions taken by the Norwegian government during this time frame. During this time frame, lockdowns were eased, schools were opened, and the strict policy measures taken during March

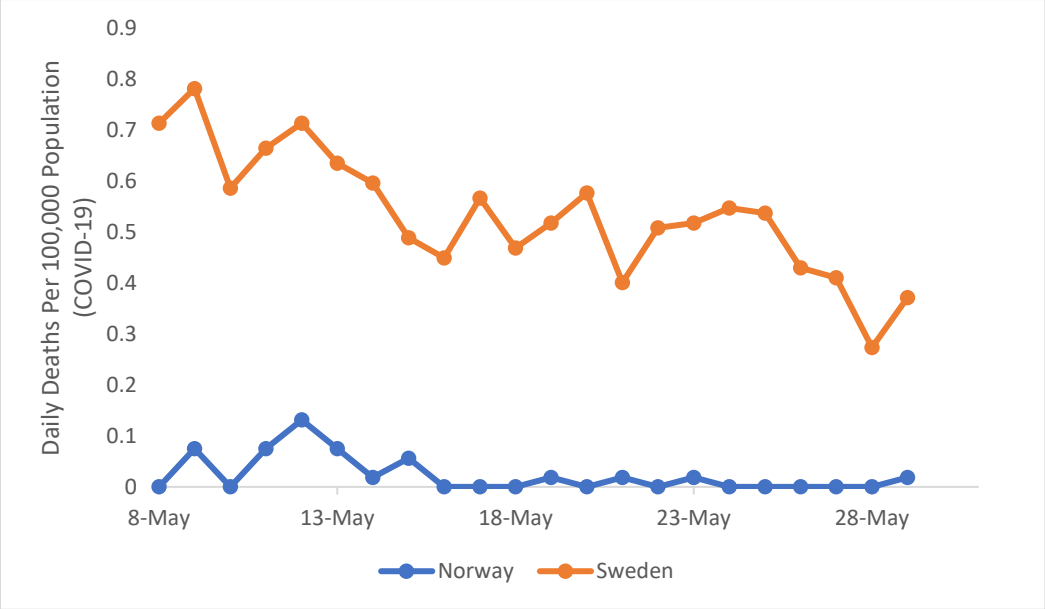
were starting to rollback, and still, from 12 May- 29 May, the case fatality rate in Norway maintained a steady 2.8 percent. On the other hand, Sweden's case fatality rate was considerably higher than Norway's during this same time frame, with 13.7 percent of all confirmed positive COVID-19 cases resulting in fatality. Throughout the course of this three-week time frame, Sweden's fatality rate dropped 1.5 percent, starting from 13.7 percent on 12 May and ending at 12.2 percent on 29 May. But one note on this data, while it seems promising that these numbers are trending downward meaning a fewer number of COVID-19 confirmed cases resulting in death for Sweden, there was a note on the data as it was reported on ourworldindata.org that there was reason to believe that Sweden at underreported deaths in the data collection process. So, while these numbers do represent a slight downward trend in case fatality rate in Sweden, those numbers could be misleading.

Figure 3. Daily deaths per 100,000 due to covid-19: 12-March- 2-April



Source: The World Health Organization

Figure 4. Daily deaths per 100,000 due to covid-19: 8 may - 29 May



Source: The World Health Organization

Figures 3 and 4 represent the daily number of deaths due to COVID-19 per 100,000 in a given population. These rates were calculated by dividing the daily number of confirmed deaths due to COVID-19, as reported by the World Health Organization, by the given population size of that particular country and multiplying by 100,000. In both time frames analyzed in this study, 12 March- 2 April and 8-May- 29 May, Sweden's daily death rate far exceeded that of Norway. On 2 April, Sweden topped .47 in comparison to Norway's .08. In Figure 3, Sweden's death toll steadily rises to far exceed Norway's, and then in Figure 4, Norway's death rate remains a steady almost-zero pace while Sweden's decreases slightly, but still remains above .26 for that three-week period.

5. Discussion

The data in Figures 1 and 2 clearly show that Norway and Sweden both took very different approaches to handling the current global pandemic, and a fewer percentage of COVID-19 patients died in Norway than in Sweden during the early months of the pandemic. This

number is representative of the severe under-testing on behalf of Sweden because the case fatality rate is based on how many COVID-19 patients died as a function of the number of confirmed cases. And even though Sweden undertested, their numbers still remained higher than the case fatality rate in Norway, which stabilized in the first several weeks. And even as Norway eased its public health restrictions and social distancing requirements in the beginning of May, case fatality rates stabilized, which is representative of the effects of an early and aggressive strategy to contain the virus, as was implemented in Norway. One would expect the case fatality ratio to increase as policy rollbacks were instituted, but this was not the case in Norway.

Daily death rate per 100,000 in a population was used as a measure of policy outcomes in this study because it not only controlled for population size (as Norway's is roughly half the size of Sweden's) but also this measure is not influenced by Sweden's undertesting. Sweden's national public health response to the virus in the early months may have influenced the confirmed case numbers during this timeframe, but it is much more difficult to influence confirmed deaths via undertesting. The results clearly show that the two countries' starkly different public health strategies during this pandemic lead to a greater daily death rate for Sweden, which skyrocketed in the first several weeks of March and maintained almost steady, decreasing slightly through May. Norway, on the other hand, was able to stabilize its daily death rate, keeping it close to 0% for many days, even during the timeframe it rolled back many of its strict social distancing laws in early May.

Norway's public health response, which allowed for a coordinated strategy to combat the spread of COVID-19, acknowledged the tragedy of the commons in health as a potential outcome in this crisis and acted accordingly. While Sweden left its social distancing and work-from-home measures up to the discretion of its people, Norway recognized that when left up to

the choice between protecting others' interests and protecting their own, human beings often choose the latter. Norway's strategy made strict lockdown measures early on to prevent one "herdsman" from "taking the field for himself" and leaving the other cows to perish. Norway implemented strict lockdown, testing and tracking strategies that ultimately helped keep their daily death rate far below Sweden's in the early months of the pandemic as illustrated in Figures 3 and 4.

The tragedy of the commons is a viable potential outcome during a public health crisis like COVID-19 if policy effort is insufficient, and its indications are evident in Sweden. Put quite simply, Norway's tactical approach preserved the 'pasture of health' for all the 'herdsmen' because it made for fewer opportunities for Norwegians to ignore their own responsibilities to slow the spread and act in their own self-interest. As a result, Norway's daily death toll was far less than Sweden's in the early months, and Norway was able to rollback some of its strict policy measures by the beginning of May, while Sweden was still struggling to get control of the virus in that same month.

6. Conclusion

The approaches of Sweden and Norway in public health policy during the early months of the COVID-19 pandemic represent the dynamics of the 'tragedy of the commons' in health. Norway put forth a strict lockdown in the early months, which stabilized the case fatality rate to much lower than that of Sweden, which took a very different approach which did not include a national lockdown in the early months. Because of the lockdown and related policies, Norway was able to construct a methodical, coordinated approach to containing the virus early on, while Sweden's strategy ignored the potential for a tragedy of the commons to ensue and left public health policy up to citizens without formal lockdown procedures. Similar to what happens in the

tragedy of the commons, the ‘pasture of health’ deteriorated in Sweden far more than it did in Norway.

The next step in containing the spread of COVID-19 is the manufacturing and distribution of a vaccine in the coming years. As was previously discussed, this process will require immense coordination not just on behalf of the distributors of the vaccine, but also of the recipients. Norway’s ability to plan for and implement coordinated mechanisms of COVID-19 testing and tracking will serve advantageous in the coming years as the world prepares for the vaccine. But, for countries like Sweden, I fear that it may be a more complicated story. The Norwegian strategy for handling the spread of COVID-19 and keeping case fatality rates and daily death rates consistently lower than its neighboring country serves as an important model for not only the distribution of the COVID-19 vaccine, but also for future public health crises.

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