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Review article

Virology

# Fighting Covid-19 Pandemic: Analysis of the Swedish Model vs. Lockdown Model

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**Abstract:** Many countries resorted to the lockdown model that includes shutting down all non-essential activities to avoid the spread of COVID-19. Comparatively, Sweden applied the herd immunity model. The aim of this study is to analyze the Swedish model compared to the lockdown model based in other countries to understand the impact of these models on public health, health economics and overall economy of the respective countries. Based on the findings, the paper aims to shed light on which model proves to be more effective to cope with the pandemic and provide recommendations for other countries to follow accordingly. Our methodology was a narrative review that synthesizes current literature obtained from searches on various databases, authoritative texts, and hand searches. While it is too early to determine the long term effects of both models, it seems that Sweden's herd immunity model is more effective considering aspects of overall public health, health economic factors, and the overall economy. The major cons of the Swedish model was a failure in controlling infection spread in elderly nursing homes, as half the death toll comprises individuals belonging to this community. While Sweden was able to soften the effect of COVID-19 impact on its economy without a lockdown, the manufacturing industry was impacted due to lack of availability of required parts to be supplied by other countries. Thus from our review , we found that Herd-immunity model is more effective, but it depends on other factors of the country such as population density, as it is not plausible for countries such as Spain, the US or Germany, which need to expose high numbers of people to COVID-19 to attain herd immunity.

**Keywords:** COVID-19, SARS-CoV-2, Herd Immunity, Health Economics, Public Health, Economy, Lockdown, Social Distancing.

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## 1. INTRODUCTION

Coronavirus disease of 19 (COVID-19) has emerged as the largest and most destructive pandemic that has affected 210 countries with around 5,103,006 confirmed cases and a death toll of 333,401 as of May 23, 2020.[1] COVID-19 is an infectious disease resulting from a new strain of the coronavirus for which a specific medicine and vaccination is yet to be developed.[2] It is found that this new strain is closely associated with severe acute respiratory syndrome (SARS). COVID-19 new strain is derived from bats, possess 79% genetic similarity with SARS, and 50% similarity with Middle East respiratory syndrome (MERS).[2] As such, it is understood that COVID-19 is a mutated form of the above two, based on which Food and Drug Administration (FDA) and World Health Organization (WHO) have recommended drugs such as Lopinavir/Ritonavir, Azithromycin amongst few others for current treatment until development of a specific drug for COVID-19.[3] Considering the lack of specialized medicine to treat COVID-19 and the lack of vaccine availability to prevent the virus spread, international organizations such as WHO and governments of different countries have recommended the importance of social distancing, wearing face masks, and maintaining hygiene.[4] Since coronavirus is transmitted through droplets when an infected individual coughs, sneezes or comes in physical contact with another person, it was declared that limited face-to-face contact could help reduce its spread. Therefore, as per WHO's guidelines, several governments implemented social distancing or physical distancing that meant maintaining at least 6 feet from other people, avoiding group and mass gatherings, and staying away from crowded places.[5] While these guidelines can help, some countries including the United States (US), United Kingdom (UK), France, Spain, Italy, and Germany resorted to the lockdown model that includes shutting down of all non-essential activities including work, socio-cultural activities, international and national travel and imposing strict home isolation for all citizens.[6,7] Comparatively, countries such as Sweden applied the herd immunity model which required at least 50-60% of the nation's population to be immune through uncontrolled natural infection and controlled natural infection, and vaccination.[4] Several scholars examined the impact of total lockdown by measuring changes in COVID-19 infection rate (number of cases) through predictive models.[8-13] On the other hand, many newspapers reported that total lockdown was not effective in controlling COVID-19 infections.[14-16] A previous report indicated that there was no proof of discontinuity in the reproduction or growth rate of COVID-19 before and after the implementation of total lockdowns in the UK, Italy, Spain, and France.[17] In addition, countries such as Sweden that had implemented more flexible policies had similar trends to nations that had enforced full lockdowns.[17] A previous study reported that in order to attain the objective of protecting the lives of people and the economy, a combination of the herd immunity model and the lockdown model is recommended.[18] People who are active economically and less vulnerable to COVID-19 can adopt herd immunity model, whereas those who are more susceptible should self-isolate and follow the lockdown model. The implementation of both models can capitalize on the advantages of either or negate the disadvantages thereof, ultimately reducing the impact of the COVID-19 virus.[19] Therefore, it is critical to understand the impact of these models on public health, health economics, and the overall economy of the respective countries. The findings from the highlighted studies and reports8-19 provide the rationale of conducting a review study to compare the herd immunity model implemented in Sweden with the lockdown model adopted in the US, UK, France, Spain, Italy, and Germany. This paper analyzes the Swedish model compared to the lockdown model based on the aforementioned countries to understand the impact of these models on public health, health economics and the overall economy of the respective countries. Based on the findings, the aim of this study is to shed light on which model proves to be more effective to cope with the pandemic, and provide recommendations for other countries to follow accordingly.

## 2. METHODS

This paper employs the narrative review methodology, which is described as a focused and critical analysis of latest knowledge related to a particular topic at hand.[20] Through using of narrative review, this paper aims to identify current studies that describe and provide detailed context into the impact of lockdown model implemented in the six countries of interest (US, UK, France, Spain, Italy, and Germany), compared to Sweden's herd immunity model. Narrative reviews generally synthesize current literature obtained from searches on various computerized databases, authoritative texts, and hand searches.[21] Preliminary research was conducted on Google to obtain background information regarding the two models to combat COVID-19. Additionally, the researcher also used databases such as PubMed, Europe PMC, NCBI Virus' COVID-2019 data hub and Public Health Genomics and Precision Health Knowledge Base, which are open-access databases. On the other hand, databases requiring authorized access such as EMBASE, Cochrane Library, CINAHL, and Science Direct were also used. Furthermore, the researchers also used Google to obtain newspaper and magazine sources, which also provided additional information regarding lockdown models in addition to peer-reviewed journal articles. The main keywords used to aid the search were the "*Swedish model against COVID-19, lockdown model against coronavirus, impact of lockdown model on public health and economy, lockdown model pros and cons",* etc.

## 3. RESULTS

### *3.1 The Swedish Model in Response to COVID-19*

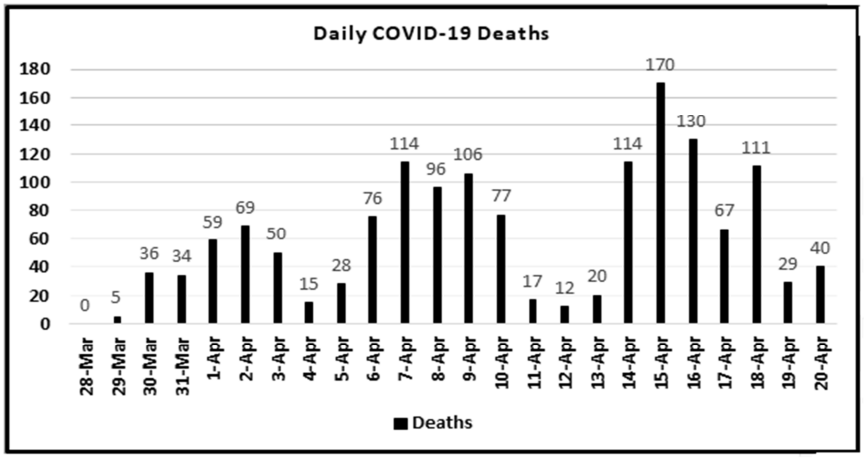
Sweden's response to the COVID-19 pandemic appears counter intuitive and controversial, as the nation had rejected major guidelines such as the mass lockdown put forth by the WHO. The alternative model adopted by Sweden, known as the herd immunity strategy, aimed to allow the causal virus (COVID-19) to spread within the population to increase the population herd immunity while simultaneously concentrating efforts to protect the elderly who possess multiple comorbidities.[22] This alternative strategy was developed keeping in mind that hard lockdown does not help protect frail and old citizens living in nursing care homes, which was a key population to be protected at the heart of the lockdown strategy.[23] Additionally, the lockdown also did not help reduce mortality from COVID-19 when considering the UK's experience with the situation in other European countries.[23] It is important to analyze the pros and cons of the Swedish model to investigate its effectiveness as a response to the COVID-19 pandemic.

### *3.2 Pros & Cons of the Swedish Model*

The main assumption underlying the herd immunity model is that individuals under the age of 65 who contact the coronavirus would either experience a tough flu or asymptomatically, and provide a context such that the number of individuals who require hospitalization would be less compared to the number of beds available for care provision.[24] Thus, the focus is on protecting and sheltering those above 65 years of age who have serious pre-existing conditions such as heart or lung-related diseases, while exposing 60% of the remaining population to contact with the virus and develop natural immunity against the virus.[24] According to critics of this model, one major con is that it results in the country are sacrificing its elderly citizens to attain herd immunity.[23] Comparing Sweden with its Scandinavian neighbours, it is seen that the country has 10 million people, which is double the size of its neighbouring countries.[24] For example, Sweden's death toll due to COVID-19 was 2,274 that was about five times more than Denmark and 11 times higher than Norway.[24] Additionally, it was found that over a third of these deaths were attributable to elderly residents in nursing homes.[24] However, an advantage considering the same aspect and statistics is that the herd immunity model has proved to be still better than several countries that imposed strict lockdowns.[25] For example, Sweden's death rate is 27% more than normal during the outbreak compared to UK that witnessed deaths, 67% higher than normal, and shows the largest increase in Western Europe despite its lockdown model.[25] Additionally, another advantage of this strategy is that the economy does not suffer a significant hit compared to the lockdown strategy, as there is no suppression of business or other economic and employment activities. It is also the case (in other countries) that as the population has not developed immunity, they remain vulnerable to coronavirus and potential second wave when the lockdown would be lifted.[26] In Sweden, it is seen that the country's restaurants, hairdressers, and hotel businesses have not suffered compared to those countries that implemented strict lockdown.[26]

### *3.3 Impact of the Swedish Model on Public Health*

Considering the context of public health, Sweden with its 10 million residents currently remains amongst the top 20 globally in terms of the total number of cases despite only testing people that show severe symptoms.[27] To understand the impact of the Swedish model on public health, the daily coronavirus deaths in the country is a good indicator. As shown in Fig.1, daily deaths from coronavirus increased from under 50 during the last week of March to around 100 in the first two weeks of April, after which the deaths further declined towards the third week of April (Figure 1).[27] In the case of Sweden, Stockholm is considered the epicenter, and the cases have reached a plateau with space left in intensive care units, and a new field hospital remaining unused.[28]




**Information is derived from BBC News.*[27]

**Fig 1. Daily Deaths due to COVID-19 in Sweden**

In terms of Scandinavian countries, Sweden has a total of 3,220 deaths, which represents triple the number of neighboring countries of Norway, Finland, and Denmark.[29] Compared to Sweden's mortality rate of 311 persons who died per million people, Norway's toll was marked at 40 deaths per million.[29] Few studies have conducted predictive analyses, and estimated that the Swedish model would lead to peak intensive care unit (ICU) load by the end of May with a capacity exceeding by more than 40 fold compared to pre-pandemic rate, and a median mortality of 96,000.[30] Additionally, it is predicted that due to the impact of COVID-19, 15.8% of Swedish healthcare professionals will not be able to work during this pandemic peak.[30] As the model continues to test only those with severe symptoms, the Swedish Public Health Agency stated that it is still too early to determine how the asymptomatic infection rates would affect protection efforts towards the general population.[27]

### 3.4 *Impact of the Swedish Model on Health Economics*

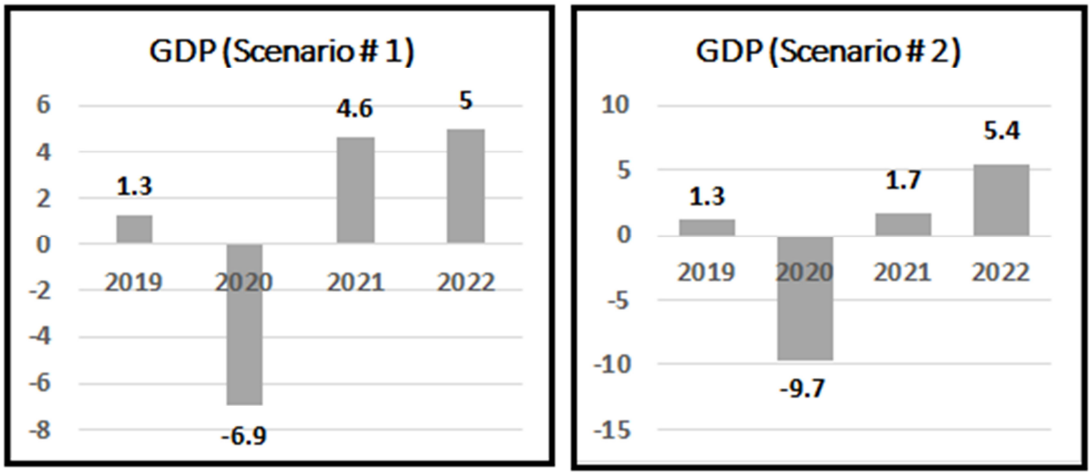
Considering the herd immunity model, one major aspect to be considered is the percentage of the population that needs to be exposed to coronavirus before natural immunity is achieved. As shown in Table 1, there are specific percentages of population that will have to be affected naturally and then recover from the virus before herd immunity is attained.[22] In Table 1, in case of Sweden, the minimum proportion of total population that is required to be infected and recovered by COVID-19 to confer herd immunity is 70.9%, compared to 80.7% in Spain, 69.6% in the US and Germany, 67.6% in France, 65.5% in UK, and 59% in Italy.[22] Considering the practical context in each country, it is impossible to have the virus naturally spread and for such a large proportion of the total population to recover from the virus fast enough to attain herd immunity.[26]

| Table 1. Estimation of COVID-19 Effective Reproduction Number for Selected Countries* | | |
|---|---|---|
| **Country** | **Population Infected by COVID-19** | **Minimum percentage needed to have recovered from COVID-19 to confer immunity and hence halt the epidemic** |
| **Sweden** | 814 | 70.9% |
| **United States** | 2,294 | 69.6% |
| **United Kingdom** | 798 | 65.5% |
| **France** | 3,661 | 67.6% |
| **Spain** | 5,232 | 80.7% |
| **Germany** | 3,675 | 69.6% |
| **Italy** | 17,660 | 59.0% |

***Information is derived from Kwok et al. (2020) study.[22]***

### *3.5 Impact of the Swedish Model on General Economy of Sweden*

The Swedish model that aimed at saving the economy by preventing a lockdown shows both advantages and disadvantages. While some short-term benefits such as lack of economic disruption compared to other countries with lockdown, some experts predict that these benefits will not appear as significant.[31] For instance, in March, Sweden recorded a reduced gross domestic product by just 0.3% compared to 3.8% decline in eurozone.[29] On the other hand, Sweden's central bank, Riksbank, has provided two potential scenarios for overall economic outlook based on how long the infection would continue to spread and restrictions put in in place to cope with COVID-19 spread.[32] As shown in Figure 2, under the Swedish model, the gross domestic product (GDP) would reduce by 6.9% in the year 2020 and would rebound to 4.6% in 2021, while in the second scenario, the reduction would be 9.7% and recovery would be very slow with just 1.7% in 2021.[32] It is predicted that unemployment could be between 8.8%-10.1% compared to the current rate of 7.2%, while the inflation rate would remain at 0.6% in 2020 with oil and electricity prices declining further.[32]




***Information is derived from CNBC News.[32]***

**Fig 2. The Economic Outlook Scenarios for Sweden (2019-2022)***

## 4. DISCUSSION

The previous sections provide insight into the impact of Sweden's herd immunity model on public health, health economics and the overall economy. This section analyses the Swedish model and lockdown model applied in the US, UK, Spain, Italy, France, and Germany.

### *4.1 Impact on Public Health*

Compared to Sweden's lockdown-free model that led to a mortality rate of 311 deaths per million, the lockdown model presented a mortality rate of 577 deaths in Spain, 561 deaths in UK, 525 deaths in Italy, 417 deaths in France, 293.9 deaths in the US and 102.9 deaths in Germany as shown in Table 2.[31] In contrast to the lockdown-free model in Sweden, comparing the lockdown model within the EU5 and the US-based on the date of implementation can shed some light on its effectiveness. Consider that Italy implemented lockdown on March 10th, and France on March 17th and the number of confirmed cases per million are 3,678.9 and 3,234.4, respectively.[31] However, Germany implemented lockdown only on March 23rd and has relatively lower confirmed cases of 2,241.1 per million.[31] Sweden's confirmed cases per million is 2,409 without lockdown (Table 2).[31]

| Table 2. Lockdown Statistics in US and EU5 Countries* | | | | | | |
|---|---|---|---|---|---|---|
| **Country** | **Spain** | **U.K.** | **Italy** | **France** | **US** | **Germany** |
| **Deaths/million** | 577.2 | 561.7 | 525.1 | 417.4 | 293.9 | 102.9 |
| **Cases/million** | 4,735.8 | 3,950.4 | 3,678.9 | 3,234.4 | 4,912.5 | 2,241.1 |
| **Tests/1,000** | 38.6 | 49.4 | 53.2 | 12.3 | 39.5 | 39.2 |
| **Beds/1,000** | 3.0 | 2.5 | 3.2 | 6.0 | 2.8 | 8.0 |
| **National Lockdown (NL)** | Since March 14 | Since March 23 | Since March 10 | Since March 17 | No NL | Since March 23 |

***Information is derived from Bloomberg.[31]***

### *4.2 Impact on Health Economics*

An important aspect of health economics is the number of beds available per 1000 individuals. The rate is 2.2 beds for Sweden, while Germany shows the highest number with 8 beds per 1000 individuals, followed by France with 6 beds, and later Italy, Spain, US and UK with 3.2, 3, 2.8, and 2.5 beds, respectively.[31] The high number of bed availability and other medical services can be a reason as to why Germany has the least number of deaths from COVID-19.[32] However, as previously stated, Sweden has sufficient beds through its doubling of ICU beds to 1000, whereas nations such as US face overwhelming burden in some states with limited beds available.[28] Furthermore, it is seen that Sweden's investment in care packages and financial assistance is relatively lesser compared to countries in lockdown. Sweden could afford putting forth just €25 billion towards care packages compared to €300 billion in Germany, €350 billion in UK, €345 billion in France, €200 billion in Spain, €25 billion in Italy, $2 trillion in the US.[33,34] While Sweden would invest more funds as required, current relatively stable health economics environment means the country does not have to invest as much as other nations that implemented lockdown.

### *4.3 Impact on General Economy*

Considering the general economy, Riksbank predicted that the Swedish economy could reduce its GDP by 6.9-9.7%, while the European Commission forecasted the GDP to fall by 6.1%.[29] Comparatively, the International Monetary Fund predictions that Germany and UK will experience economic reduction by 6.5% and 7%, respectively, whereas GDP fall of 7.2%, 8%, and 9.1% would occur in France, Spain, and Italy, respectively.[32] In case the US does not have a national lockdown in place, it is estimated that GDP would fall by 9% in first quarter and further 34% in second quarter.[34] In terms of the unemployment rate, it is 8.8%-10.1% in Sweden. On the other hand, it is estimated that unemployment rates would reach a record high of 15%-20% in the US,[34] 14.4% in Spain,[35] 9-10% in UK,[36] 8.2% in France,[37] and 5.8% in Germany.[38] It is estimated that most nations that implemented lockdown show higher projected unemployment rates compared to Sweden.[39,40]

## 5. CONCLUSION

Compared to the lockdown model, the Swedish herd immunity model could be more effective considering overall public health, health economic factors, and the overall economy. As a result, Sweden was able to soften the effect of COVID-19 impact on its local economy to a certain extent without lockdown. However, the global economy has some impact on the local Sweden manufacturing industry due to lack of availability of some required parts supplied to Sweden by other countries (e.g., US, UK, France, Spain, Italy, and Germany) that resorted to the lockdown model. The Swedish model failed in controlling infection spread in specific populations (i.e., elderly nursing homes). However, Sweden's overall mortality rate is better than the US, UK, France, Spain, Germany and Italy. Therefore, the herd immunity model is recommended but other factors (e.g., population density) need to be considered before applying the model. It is not plausible for countries with high population density (e.g., Spain, the US, and Germany) to apply the herd immunity model because these countries need a high number of people to be exposed to COVID-19 to attain the herd immunity.

## 6. AUTHORS CONTRIBUTION STATEMENT

Fatema Turkistani, Pharm. D, MSc, PhD, DBA helped in designing the study, collected and analyzed the parts of the data, and wrote many sections of the manuscripts. Aseel Bin Sawad, Pharm D, MSc, MCR, MS, PhD, DBA designed the study, collected data and analyzed parts of the data, and wrote and revised many sections of the manuscript.

## 7. CONFLICT OF INTEREST

Conflict of interest declared none.

## 8. REFERENCES


1. World Health Organization. WHO coronavirus disease (COVID-19) dashboard [internet]. Place unknown: WHO; 2020; [cited May 23 2020]]. Availablefrom:https://covid19.who.int/?gclid=CjwKCAjwk6P2BRAIEiwAfVJ0rKb6lyGk0oY0QzW8HOaCoCwlSpi9C_HzsC55paYnEAmx2RxTzXYQhoCdREQAvD_BwE.
2. Paital B, Das K, Parida S. Inter nation social lockdown versus medical care against COVID-19, a mild environmental insight with special reference to India. *Science of The Total Environment*. 2020;728(1):1-10. doi: 10.1016/j.scitotenv.2020.138914
3. Ghosal S, Bhattacharyya R, Majumder M. Impact of complete lockdown on total infection and death rates: A hierarchical cluster analysis. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. 2020;10(3):1-10. doi: 10.1016/j.dsx.2020.05.026
4. Marais B, Sorrell T. Pathways to COVID-19 'community protection'. *International Journal of Infectious Diseases*. 2020;1-10. doi: 10.1016/j.ijid.2020.05.058
5. Centers for Disease Control and Prevention. Social distancing [internet]. Place unknown: centers for disease control and prevention (US); 2020; [cited May

23 2021]]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/social-distancing.html.
6. Ansumali S, Kaushal S, Kumar A, Prakash MK, Vidyasagar M. Modelling a pandemic with asymptomatic patients, impact of lockdown and herd immunity, with applications to SARS-CoV-2. Annu Rev Control. 2020 Oct 9; 50(1):432-447. DOI: 10.1016/j.arcontrol.2020.10.003
7. McCall B. Shut down and reboot—preparing to minimise infection in a post-COVID-19 era. Lancet Digit Health. 2020 Jun 1;2(6):1-10. DOI: 10.1016/S2589-7500(20)30103-5
8. Davies NG, Kucharski AJ, Eggo RM, Gimma A, Edmunds WJ, Jombart T, O'Reilly K, Endo A, Hellewell J, Nightingale ES, Quilty BJ. Effects of non-pharmaceutical interventions on COVID-19 cases, deaths, and demand for hospital services in the UK: a modelling study. Lancet Public Health. 2020 July 1;5(7):375-85. doi: 10.1016/S2468-2667(20)30133-X.
9. Gerli AG, Centanni S, Miozzo MR, Virchow JC, Sotgiu G, Canonica GW, Soriano JB. COVID-19 mortality rates in the European Union, Switzerland, and the UK: effect of timeliness, lockdown rigidity, and population density. Minerva Med. 2020 August;111(4):308-14. doi: 10.23736/S0026-4806.20.06702-6, PMID 32491297.
10. Hyafil A, Moriña D. Analysis of the impact of lockdown on the reproduction number of the SARS-Cov-2 in Spain. Gac Sanit. 2020 May 23. doi: 10.1016/j.gaceta.2020.05.003, PMID 32571528.
11. Roques L, Klein EK, Papaïx J, Sar A, Soubeyrand S. Impact of lockdown on the epidemic dynamics of COVID-19 in France. Front Med (Lausanne). 2020 June 5;7:274. doi: 10.3389/fmed.2020.00274, PMID 32582739.
12. Alfano V, Ercolano S. The efficacy of lockdown against COVID-19: a cross-country panel analysis. Appl Health Econ Health Policy. 2020 August;18(4):509-17. doi: 10.1007/s40258-020-00596-3, PMID 32495067.
13. Lau H, Khosrawipour V, Kocbach P, Mikolajczyk A, Schubert J, Bania J, Khosrawipour T. The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China. J Travel Med. 2020 April;27(3):taaa037. doi: 10.1093/jtm/taaa037, PMID 32181488.
14. Stickings T. Lockdowns failed to alter the course of pandemic and are now destroying millions of livelihoods worldwide, JP Morgan study claims [internet]. Place unknown: Daily Mail; 2020; [cited Jun 24 2021]]. Available from: https://www.dailymail.co.uk/news/article-8347635/Lockdowns-failed-alter-course-pandemic-JP-Morgan-study-claims.html.
15. Newey S. UNICEF warns lockdown could kill more than Covid-19 as model predicts 1.2 million child deaths [internet]. Place unknown: The Telegraph; 2020; [cited Jun 25 2021]]. Available from: https://www.telegraph.co.uk/global-health/science-and-disease/unicef-warns-lockdown-could-kill-covid-19-model-predicts-12/.
16. Jones H. Was lockdown a waste of time? Study finds stay-at-home order was 'ineffective' [internet]; 2020. Place unknown. Metro; [cited Jun 25 2021]]. Available from: https://metro.co.uk/2020/05/07/was-lockdown-waste-time-study-finds-stay-home-order-was-ineffective-12668944/.
17. Meunier TA. Full lockdown policies in Western Europe countries have no evident impacts on the COVID-19 epidemic. MedRxiv. 2020 January 1. doi: 10.1101/2020.04.24.20078717.
18. Moon MJ. Fighting COVID-19 with agility, transparency, and participation: wicked policy problems and new governance challenges. Public Admin Rev. 2020 July;80(4):651-6. doi: 10.1111/puar.13214, PMID 32836434.
19. Schonberger RB, Listokin YJ, Ayres I, Yaesoubi R, Shelley ZR. Cost benefit analysis of limited reopening relative to a herd immunity strategy or shelter in place for SARS-CoV-2 in the United States. medRxiv. 2020 January 1. doi: 10.1101/2020.06.26.20141044, PMID 32607526.
20. Bae JM. Narrative reviews. Epidemiol Health. 2014;36(1):e2014018. doi: 10.4178/epih/e2014018, PMID 25223334.
21. Green BN, Johnson CD, Adams A. Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. J Chiropr Med. 2006 September 1;5(3):101-17. doi: 10.1016/S0899-3467(07)60142-6, PMID 19674681.
22. Kwok KO, Lai F, Wei WI, Wong SYS, Tang JWT. Herd immunity-estimating the level required to halt the COVID-19 epidemics in affected countries. J Infect. 2020 June 1;80(6):e32-3. doi: 10.1016/j.jinf.2020.03.027, PMID 32209383.
23. Giesecke J. The invisible pandemic. Lancet. 2020 May 30;395(10238):e98. doi: 10.1016/S0140-6736(20)31035-7, PMID 32539940.
24. Friedman TL. Is Sweden doing it right? [internet]. Place unknown: The New York Times; 2020 [updated April 29; cited 2020 May 29]. Available from: https://gilesrichard.com/wpcontent/uploads/2020/04/39.-Opinion-_-How-Sweden-Is-Dealing-With-the-Coronavirus-The-New-York-Times.pdf.
25. Leatherby L, McCann A. Sweden stayed open. A deadly month shows the risks [Internet]. Place unknown: The New York Times; 2020 [updated May 15; cited 2020 May 20]. Available from: https://www.nytimes.com/interactive/2020/05/15/world/europe/sweden-coronavirus-deaths.html
26. Erdbrink T, Anderson C. 'Life has to go on': How Sweden has faced the virus without a lockdown [Internet]. Place unknown: The New York Times; 2020 [updated April 29; cited 2020 May 15]. Available from:https://www.nytimes.com/2020/04/28/world/europe/sweden-coronavirus-herd-immunity.html
27. Savage M. Coronavirus: Has Sweden got its science right? [Internet]. Place unknown: BBC; 2020 [updated April 25; cited 2020 May 16]. Available from: https://www.bbc.com/news/world-europe-52395866
28. Loh T. Who's succeeding against the coronavirus and why? [internet]. Place unknown: Bloomberg Press; 2020 [updated May 23; cited 2020 May 23]. Available from: https://www.bloomberg.com/news/articles/2020-05-22/who-s-succeeding-against-the-coronavirus-and-why-quicktake.
29. Milne R. Sweden is unlikely to feel the economic benefit of a no-lockdown approach [Internet]. Place unknown: The Financial Times; 2020 [updated May 9; cited 2020 May 23]. Available from: https://www.ft.com/content/93105160-dcb4-4721-9e58-a7b262cd4b6e

30. Gardner JM, Willem L, Van Der Wijngaart W, Kamerlin SC, Brusselaers N, Kasson P. Intervention strategies against COVID-19 and their estimated impact on Swedish healthcare capacity. medRxiv. 2020 Jan 1.DOI:10.1101/2020.04.11.20062133.
31. Bloomberg. Mapping the Coronavirus outbreak across the world [Internet]. Place unknown: Bloomberg; 2020 [updated May 23; cited 2020 May 23]. Available from: https://www.bloomberg.com/graphics/2020-coronavirus-cases-world-map/?itm_source=inline
32. Ellyatt H. Sweden had no lockdown but its economy is expected to suffer just as badly as its European neighbors [Internet]. Place unknown: CNBC; 2020 [updated May 23; cited 2020 May 23]. Available from: https://www.cnbc.com/2020/04/30/coronavirus-sweden-economy-to-contract-as-severely-as-the-rest-of-europe.html
33. Cox J. Goldman sees a 15% jobless rate and 34% GDP decline, followed by the fastest recovery in history [Internet]. Place unknown: CNBC; 2020 [updated March 31; cited 2020 May 27]. Available from: https://www.cnbc.com/2020/03/31/coronavirus-update-goldman-sees-15percent-jobless-rate-followed-by-record-rebound.html
34. Nicola M, Alsafi Z, Sohrabi C, et al. The socio-economic implications of the coronavirus pandemic (COVID-19): A review. International Journal of Surgery. 2020;78(1):185-193. DOI:10.1016/j.ijsu.2020.04.018.
35. CAN. Spain adds 280,000 jobless during April lockdown: Government [Internet]. Place unknown: CNA; 2020 [updated May 5; cited 2020 May 28]. Available from: https://www.channelnewsasia.com/news/world/spain-jobless-rate-slows-record-claim-unemployment-covid-19-12703906
36. BBC. UK employment rate at record high before lockdown [Internet]. Place unknown: BBC; 2020 [updated April 21; cited 2020 May 23]. Available from:. *BBC*. https://www.bbc.com/news/business-52364811
37. Thomas L, Fernandez C. Lockdown pushes French unemployment to 11-year low in first quarter [Internet]. Place unknown: The Economic Times; 2020 [updated May 14; cited 2020 May 28]. Available from: https://economictimes.indiatimes.com/news/international/business/lockdown-pushes-french-unemployment-to-11-year-low-in-first-quarter/articleshow/75732017.cms
38. Reuters. Update 1-Coronavirus lockdown hits German jobs, retail sales [Internet]. Place unknown: Reuters;2020 [updated April 30; cited 2020 May 29]. Available from : https://www.reuters.com/article/germany-economy-retailsales/update-1-corona virus lockdown-hits-german-jobs-retailsalesidUSL8N2CI45B
39. Kassem AM. COVID-19: Mitigation or suppression?. Arab J Gastroenterol. 2020 Mar;21(1):1-2. DOI: 10.1016/j.ajg.2020.04.010.
40. Gianicolo E, Riccetti N, Blettner M, Karch A. Epidemiological measures in the context of the COVID-19 pandemic. Dtsch Arztebl Int. 2020 May ;117(19):336-342. DOI:10.3238/arztebl.2020.0336.