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COVID-19 IDEALISM

ANALYSING SOCIETAL AND POLICY UNEVENNESS IN THE GEOGRAPHICAL DISTRIBUTION OF COVID-19 IN EUROPE

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Abstract

This thesis focusses on three distinct unevenness's seen within the Covid-19 pandemic. Geographical unevenness shows in an uneven spread in and between countries. Societal unevenness is seen as Covid-19 deaths mainly occur in the elderly population, or people with underlying conditions. Finally, governmental policy unevenness is seen between countries as some have imposed strict health measures, and others have not. To measure this strictness within government policies, several Covid-19 strictness indexes have been developed that aim to analyse this. However, what these indexes fail to take into account are pharmaceutical policies (e.g., vaccination and hospital policies). The main aim of this thesis is to analyse the total array of government policies (including the pharmaceutical policies) and see how it affects Covid-19 unevenness between countries. The main research question is: *To what extend have government implemented policies in certain European countries affected the geographical and societal unevenness seen within Covid-19?* To answer this research question, the main methodology used is the creation of a new Covid-19 index, based on a theory stemming from political philosophy. This theory of *idealism* explains the extent to which a country is willing to go in implementing Covid-19 measures to lower the experienced societal unevenness (or to lower social injustices).

By adding several pharmaceutical categories, a new index has been developed that measures a country's level of idealism in Covid-19 policy. High scoring countries strive to eradicate all social injustices through Covid-19 policies aimed at the totality of the population. Low idealist countries accept the seen societal unevenness as a result of Covid-19. Nordic countries (Norway, Sweden, Finland, and Denmark) have shown to be low idealist countries, and the Southern European countries (Greece & Italy) can be regarded as high idealist countries. This thesis, analysing ten European countries over a period of nine months saw no visible relationship between a country's idealist level and Covid-19 level (measured in cases, deaths, and excess mortality). And thus, idealism (expressed as the extent to which a country is willing to go in implementing Covid-19 measures to lower societal unevenness) has not been able to explain geographical or societal unevenness. Also, other expected factors in Covid-19 (demographics and underlying conditions) showed no visible relationship towards Covid-19 death rate. Given the existing literature on negative economic and psychological effects of Covid-19 measures, applying a similar framework with the suggested alterations in section 6.1 of this thesis should be used to see if a similar result will be found regarding a larger study area and period.

Key words: Covid-19, Idealism, Social injustice, geographical unevenness, societal unevenness, Covid-19 policy.

Word count: 19990

Preface

This master thesis about Covid-19 unevenness was written for the course SGEM08 (Master thesis) at the department of Human Geography, Lund University. This thesis is the last research project of my master's in human Geography. During my master (and bachelor), I have written about a large array of topics and sub-disciplines. For my master thesis, I have drawn on literature and theory of both the sub-fields of health and medical geography, which I had little knowledge about prior to this thesis. Therefore, this thesis proved to be an interesting learning experience. The topic origin finds itself given my interest in Covid-19, and the different government policies seen across countries, which is strengthened by living in Sweden, that is known for its 'loose' Covid-19 strategy.

During the past semester I have been working to complete this thesis. I would like to thank my supervisor Nicklas Guldåker for the helpful advice and support for the somewhat 'different' methodological path followed within this thesis.

I hope you will enjoy reading this Master thesis.

Floris Moerkens
Lund, 10-05-22

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Chapter 1: Introduction

The Covid-19 pandemic has disrupted the lives of many people and industries. Covid-19 is an infectious disease, caused by the SARS-CoV-2 virus (World Health Organization [WHO], n.d.). Although most infected people experience a mild to moderate respiratory illness, some require medical treatment and become seriously ill (Ibid). Currently, over 350 million Coronavirus cases have been recorded around the world, and over 5.6 million people have died of the virus (Worldometer, January 23rd, 2022). Since the beginning of the pandemic, countries have experienced multiple waves of the virus, leading to the implementation of several health measures. Health measures have varied, among others, from social distancing rules, mask mandates, curfews, and (partial) lockdowns. An important distinction within implemented measures can be made between pharmaceutical interventions and non-pharmaceutical interventions. "Nonpharmaceutical Interventions [NPIs] are actions, apart from getting vaccinated and taking medicine, that people and communities can take to help slow the spread of illnesses like pandemic influenza (flu)" (CDC website, 2020).

Health and geography are intrinsically linked, and geography enables to study disease outbreaks through the lens of space and place (Keeler & Emch, 2018). Looking at the Covid-19 pandemic, geographical unevenness is seen across different scales. Some places experience a higher severity of Covid-19, talking about both cases and deaths. The uneven geographical spread is not caused by a singular driver, but a result of multiple impacts. Examples of this are for instance connectivity and density (Coelho et al., 2020). Besides geographical unevenness between places, there is also an unevenness among the population (societal) when assessing the severity of the disease. Covid-19 deaths are mainly occurring within the older population, and in people with an underlying health condition (Dowd et al., 2020). After geographical and societal unevenness, a third unevenness can be seen looking at governmental health policies. Some countries have shown to be much stricter than others in mandating lockdowns, vaccination passports and other health measures. Sweden for instance is known to have applied a very 'loose' covid-19 policy, contrary to other countries that went from lockdown to lockdown.

The central aim of this thesis is to analyse Covid-19 unevenness from the geographical, societal and policy level, and the regard the possible effects they have on each other. The main emphasis is placed on the latter, aiming to analyse the possible impact of government policy on geographical and societal unevenness. Research on the effect of government policy has mostly focussed on understanding the effectiveness of certain health measures (see for instance

Talic et al., 2021; Bo et al., 2020). Besides, several institutes and researchers have aimed to create an index that analyses the 'strictness' of a country (stringency indexes), in applying Covid-19 measures (Gros et al., 2021; University of Oxford, 2022). However, what these indexes fail to take into account, are the pharmaceutical policies, e.g., vaccine mandates and hospital policies. Yet pharmaceutical policies play a central role in governments actions against Covid-19, as vaccination is seen most important in preventing Covid-19 (EDCD, 2022). A secondary aim of this thesis is to create a similar index to analyse Covid-19 policy, but in such way that pharmaceutical policies are included within the index. After creating such index, Covid-19 cases & deaths will be compared and analysed regarding a country's index score. The main research question has been framed as follow:

To what extent have government implemented policies in certain European countries affected the geographical and societal unevenness seen within Covid-19?

In this research question, these different levels of unevenness are all represented, as the government policies take into account different strictness across different countries. The geographical unevenness will mostly be regarded as Covid-19 spread (number of cases), and societal unevenness could be regarded as an uneven proportion of Covid-19 deaths between (and within) countries. To understand the possible dynamics between the different levels of unevenness, a theory that is adapted from the field of political philosophy will be used. This theory of ***idealism*** is mainly used within this field to explain social (in)justice. Applying this to Covid-19, idealism can be regarded as the extend countries are willingly to go in implementing measures to fight societal unevenness (social injustices). This wider application of the existing stringency indexes can be seen as a development towards an idealist index, rather than just a NPI focussed 'stringency' index. The creation of an idealist index is of vital importance within this thesis. As mentioned, the central aim of this thesis is to analyse Covid-19 unevenness from the geographical, societal and policy level, and the regard the possible effects of policy on the other two. Being able to construct such index is the first step in reaching this. And the possible succession in creating such index should therefore be regarded a goal in itself.

Past research on the effectiveness of government measures to fight Covid-19 mostly show the effectiveness of them (Talic et al., 2021; Bo et al., 2020). However, others (Herby, 2021; Gibson, 2022) claim little to no effectiveness. A minimal effect of government measures

on Covid-19 enlarges the debate surrounding the presented societal unevenness in fighting Covid-19. Supporting the main research question, several sub-questions have been drafted:

- How can idealism, (regarded as the extent to which a country is willing to go in implementing Covid-19 measures to lower social unevenness), be conceptualized from a theoretical and methodological perspective?
- How can an index be developed that measures a country's level of idealism?
- How do certain countries in Europe compare on the idealist index? And how does Covid-19 prevalence differ between the countries?
- Compared to other known factors that affect the level of Covid-19 deaths (e.g., age & overweight), how well does a country's idealist level explain geographical & societal unevenness?
- How does a constructed idealist index compare to a stringency index that is solely based on government measures from a NPI point of view?

This thesis will continue by presenting background information and an overview of the literature regarding Covid-19 (chapter 2). Both of importance here is literature on the geography of Covid-19, as well as literature focussed on the effectiveness of both pharmaceutical policies, as well as NPIs. Understanding the influence of geographical and other factors on Covid-19 spread will present the needed knowledge to prevent making false assumptions purely based on analysing government policies. Also, literature on the effectiveness of both NPIs, as well as vaccination presents important information when trying to understand the results in a later stage, when the dynamics between governmental policy (idealism), and Covid-19 will be analysed.

After, the theoretical and conceptual framework will make up for the next chapter (3) of this thesis. Introducing both the subfields of health and medical geography, and how aspects from both disciplines can later be used within the methodology of this thesis. Furthermore, the central theory of idealism as an explanation behind social justice will be largely discussed in the theoretical framework, to be applied in an own way within the conceptual framework regarding Covid-19.

After these two more literature-based chapters, the emphasis will switch towards creating the idealist index, based on former indexes. The creation of this index is the central part of Chapter 4 (methodology). This will ultimately give the results of high and low-scoring countries based on their level of idealism. As said this step of creating such index is of large

importance within this thesis. Furthermore, these results will then be analysed and compared towards Covid-19 levels (chapter 5). The interaction between idealism, Covid-19 and other societal variables will be analysed to regard the dynamics between the several levels of unevenness.

Finally, chapter 6 gives the conclusion and discussion of this thesis. Both focussing on reflecting on the used methodology and created index, as well as answering the main- and sub questions of this thesis.

Chapter 2: Background & literature review

2.1: Covid-19 background & unevenness

The Covid-19 pandemic has seen an uneven spread across the globe, as well as within countries (Rodríguez-Pose & Burlina, 2021). Looking at the focus countries of this study, table 1 presents the differences that exist among them regarding Covid-19 statistics. The study area is a result from a combination of choices, which is extensively discussed in Chapter 4 (methodology) of this thesis. Depicting both Covid-19 cases and deaths per million (to allow for an even comparison excluding large population differences), a few things immediately stand out. All countries experienced a significant number of Covid-19 cases. Both differences in cases and deaths are seen, but the country-wide differences are bigger when comparing Covid-19 deaths. Although dealing with the highest Covid-19 cases of all countries, the death rate of Denmark remains low compared to the other countries. Most countries hover around 200,000-300,000 Covid cases with only Finland significantly below this at 126,625.7 cases (per million). Particularly Norway and Finland stand out having very low death rates. Greece and Italy are the countries with the largest number of Covid-19 deaths (per million). This duality between cases and deaths is remarkable because it hints at a situation in which countries are not necessarily able to prevent Covid-19 from spreading (similar Covid-19 cases), but they are (possibly) able to prevent deaths.

Table 1: Covid-19 cases and deaths (per million) in focus area as of March 6th (Statista, 2022)

Country	Covid cases (Per million)	Covid deaths (Per million)
Austria	326,719.1	1615.87
Denmark	474,556.7	744.15
Finland	126,625.7	465.86
France	342,439.9	2272.05
Germany	191,434.2	1496.73
Greece	234,636.9	2447.62
Italy	216,030.2	2613.73
Netherland	385,322.4	1242.16
Norway	228,747	310.01
Sweden	238,142.9	1688.1

The impact of Covid-19 in a given country is often assessed from a cases and deaths perspective. However, these two statistics are affected by a country's testing ability and different definitions of Covid-19 causalities (Riffe et al., 2021). "Some countries count only PCR-confirmed COVID-19 deaths, while others include suspected COVID-19 deaths as well" (Karlinsky & Kobak, 2021, p1). Another way of looking at the impact of Covid-19 is analysing the excess mortality in a given country. "Excess mortality, defined as the increase of the all-cause mortality over the mortality expected based on historic trends, has long been used to estimate the death toll of pandemics and other extreme events" (Ibid, p1). According to Beany et al. (2020) and Leon et al. (2020), excess mortality is the most objective indicator of Covid-19 deaths. Table 2 gives an overview of the excess mortality experienced by the focus countries since the country's first 50 Covid deaths.

As seen in the table, excess mortality differs between the countries and a similar pattern compared to the Covid deaths from table 1 can be seen. "The pandemic, however, did not strike the whole of Europe in an even way. Some countries were hit far harder than others" (Rodríguez-Pose & Burlina, 2021, p729). An important question arises of what impacts this difference between countries. Besides country differences, big differences exist on a regional

Table 2: Excess mortality in focus area as of March 16th, since first 50 deaths (The Economist, 2022)

Country	Excess Mortality	Excess mortality per 100k people
Austria	16,790	186
Denmark	3790	65
Finland	4,890	88
France	107,270	159
Germany	121.670	145
Greece	26,860	258
Italy	192,330	319
Netherland	33,420	195
Norway	2,230	41
Sweden	13,660	134

level as well. For example, big cities (Paris and Stockholm from the focus countries) have shown to be hotspots of Covid-19, where other large cities remained unaffected (Rodríguez-Pose & Burlina, 2021). The paper by Rodríguez-Pose and Burlina state several distinct factors that influence the uneven geographical spread of Covid-19. Also, other papers (Florida & Mellander, 2020; Kapitsinis, 2020; Chung et al., 2020; Holmager et al., 2021) have aimed to analyse the geographical spread of Covid-19 and its catalysts.

2.1.1 Geographical factors

An uneven geographical spread raises questions regarding the impact of geographical factors on Covid-19 spread. During the Covid-19 pandemic, this geographical impact has shown in various ways. A first way in which geographical factors affect Covid-19 are the presence of large agglomerations and high interconnectivity between these large agglomerations (Coelho et al., 2020). Population size and global connections (mainly derived from analysing the global flight network) are seen as main explanations in early Covid-19 growth rate (Ibid). "Large and open cities, such as London, Paris, Madrid, or Milan are considered favourable environments for the diffusion of the disease." (Rodríguez-Pose & Burlina, 2021, p734). Large airports provide an entry point for the virus to arrive, to which large and dense agglomerations allowed the virus to spread easily.

This same narrative is shared by Hall et al. (2020), who emphasize the importance of mass transport and tourism in Covid-19 spread. An example of this is seen in the North of Italy, that was hit particularly hard at the beginning of the pandemic (Indolfi & Spaccarotella, 2020). One of the possible explanations in Bergamo (city in this hard-hit region) is the largely attended football match between Atalanta and Valencia hosting over 50,000 spectators (Ibid). A second explanation includes the region's skiing facilities, as recreational skiing is considered high-risk in facilitating Covid spread 'Super-spreaders', "a product of biological, behavioural and environmental factors.", which can be used for policies, events and individuals that contribute to increased rates of infections made the region experience a large Covid outbreak (Cave, 2020, p237; Gianfredi et al., 2021). After such events, large connectivity presents an easy way for a virus to spread. The role of increased interconnectivity shows given the border closures of countries, limiting international air travel. Also, intra-EU borders were closed, limiting the free movement of people within the European Union aiming to mitigate the virus (Renda & Castro, 2020). "On these grounds, regions that are globally interconnected, with high levels of

"openness," through a hundred thousand movements of goods and people on a daily basis, are likely to have recorded a more severe impact" (Kapitsinis, 2020, p1031).

A second geographical impact is derived from density. The specific role of density within Covid-19 perceptibility is however questioned. Prior to Covid-19, the role of density on contagious diseases had rarely been studied (Hamidi et al., 2020). Theoretical, highly dense areas would lead to people having more face-to-face contacts. However, a higher density could also indicate that there is a better accessibility towards health services (Hamidi et al., 2020). This same paper concludes that connectivity of cities matters more in spreading Covid-19 than density of cities does. Florida & Mellander (2021) claim that density does not play a central role within the geography of Covid-19. Diffusion factors (for example proximity towards places with high-level of infections) play a more important role than place-based factors (e.g., density, population size and socioeconomic characteristics). On a global scale, population density does not have a link with Covid-19 cases or deaths (Florida & Mellander, 2020).

2.1.2 Environmental factors

The role of the environment on Covid-19 has been extensively researched. Important factors to consider within this are air quality, temperature, and humidity (Rodríguez-Pose & Burlina, 2021). Auler et al., (2020), Shokouhi et al., (2020) and Wang et al., (2020) all found a relationship between Covid-19 cases and temperature. Zhu et al. (2020) find there is a significant relationship between Covid-19 infection and air pollution (the more polluted the air, the higher the mortality). This is also concluded by Domingo et al. (2020), who claim that the presence of pollutants in the air enable Covid-19 (and other viruses) to spread more easily. According to Filippini et al., (2020) Air pollution might increase susceptibility towards Covid-19 infection. Bashir et al., (2020) state that there is a significant correlation between average temperature, minimum temperature, and air quality with the Covid-19 pandemic. However, no scientific evidence is stated that warm weather supresses Covid-19 (Ibid). "Many European regions with poor air quality, both in terms of PM 2.5 and of carbon emissions, such as Lombardy, Piedmont, Veneto in Italy or Alsace in France, have had a high incidence of the virus." (Rodríguez-Pose & Burlina, 2021, p 735).

The environment affects Covid-19 in several ways. However, within this thesis, emphasis is placed on policies and societal side. The main take-away from environmental factors is that they do matter, which is stressed in the justification for the research area that is further described in chapter 4.

2.1.3 Demographical factors

Demographics play an important role in Covid-19 susceptibility, given that Covid-19 mortality is mostly happening in people aged over 65 (Dowd et al., 2020). “While population age structure is crucial for understanding those at the highest risk of mortality both across and within countries, it is also vital for understanding social distancing measures to reduce critical cases that overload the health system—aka “flattening the curve.”” (Ibid, p9697). According to Rodríguez-Pose and Burlina (2021), the pandemic fundamentally targeted the elderly (p734). Excess mortality was specifically high in regions with an ageing population. Analysing a specific country from the focus area confirms these statistics. In Sweden, the number of Covid-19 deaths by age group is portrayed in table 3. Covid-19 mortality in young people is very low, as is seen from this table. This raises question on implementing both pharmaceutical and non-pharmaceutical covid measures aimed at this group. An interesting example regarding age statistics is the interlinkage of certain government policies. School closures as a result of being regarded a hub of virus transmissions, could lead to increased contacts between children and grandparents (Rodríguez-Pose & Burlina, 2021).

Table 3: Covid-19 deaths per age group in Sweden (Statista, 2022)

Age group	Covid-19 deaths
<9	15
10-19	8
20-29	35
30-39	63
40-49	159
50-59	472
60-69	1257
70-79	3969
80-89	7139
>90	4631

Besides age, another important demographic factor affecting Covid-19 cases and deaths are underlying health conditions (CDC, 2022). Cancer, kidney disease, liver disease, lung disease, fibrosis, neurological conditions, diabetes, heart conditions, HIV infection, weak immune system and obesity could higher chances of serious Covid-19 infection (CDC, 2022).
According to Kompaniyets et al. (2021), from the period of March to December in 2020, 78% of people admitted to the hospital were either overweight (27.8%) or obese (50,2%). "a nonlinear relationship was found between body mass index (BMI) and COVID-19 severity, with lowest risks at BMIs near the threshold between healthy weight and overweight in most instances, then increasing with higher BMI. Overweight and obesity were risk factors for invasive mechanical ventilation. Obesity was a risk factor for hospitalization and death, particularly among adults aged <65 years" (Kompaniyets et al., 2021. P361).

2.1.4 Institutional factors

The severity of the pandemic also possibly has been influenced by institutional variation (Rodríguez-Pose & Burlina, 2021). Institutions, defined as 'rules of the game' that influence human interactions and provide political, social, and economic exchange exists both in formal and informal form (Rodríguez-Pose & Burlina, 2021; North, 1990). Formal institutions can be seen as rules and laws, individuals are subject to, thus shaping organization of society. Informal institutions are more the social norms of society (Rodríguez-Pose & Burlina, 2021). Institutions differ among countries, in which one example is the degree of centralization withing a country. Countries that are highly centralized will have a different response to Covid-19 than countries that are highly decentralized. Despite some countries possessing a high level of decentralization, often is seen that national governments still take lead in adopting tough decisions (Rodríguez-Pose & Burlina, 2021). "They have been mostly responsible for the introduction and policing of often lengthy lockdowns and quarantines, the closure of public spaces, workplaces and educational institutions, restrictions to mobility, or the implementation of mandatory health rules, among others." (Ibid, 2021). Government's capacity and willingness to implement measures highly differs between countries, stemming from a variation in institutions (Rodríguez-Pose & Burlina, 2021). As some European countries have shown to be more stringent than others.

Not only the stringency is of importance, but also the capacity of governments to effectively implement these measures (Rodríguez-Pose & Burlina, 2021). "Long periods of ebbing government quality may have reduced the capacity of governments to respond to deep

shocks, such as the COVID-19 pandemic, leading to difficulties in rising up to the challenge and in garnering the much-needed political consensus in times of emergency" (Ibid, p736). These examples mostly focussed on the role of formal institutions (rules, laws) and its effect on Covid-19. But also, informal institutions, the way people engage with each other has an impact on the spread of the virus (Rodríguez-Pose & Burlina, 2021). An example of this is the earlier mentioned paper by Florida (2021), in which the kind of density matters more than the actual quantitative density. Trust in governments, also seen as formal institution, has an impact on Covid-19 spread, given the acceptance of people to follow rules and instructions. Rodríguez-Pose and Burlina (2021) conclude that although (in)formal institutions shape Covid-19 spread, the expected role they play is "far less prominent" than factors as density, age, and climate (p736).

2.2: Covid -19 & health measures

As a result of rapid Covid-19 spread, governments around the world implemented a large number of policies (Cheng et al., 2020). "Although government responses to the COVID-19 pandemic have inaugurated considerable changes in how billions of people live their lives, they draw on the lessons learned from the long history of pandemics and epidemics that came before" (Ibid, p756). Within the health measures taken by countries, a distinction can be made between pharmaceutical interventions and non-pharmaceutical interventions [NPIs] (ECDC, 2020). NPIs are actions apart from vaccination and medication to slow spread of illnesses (CDC, n.d.). "After vaccination, NPIs are the most effective public health interventions against COVID-19" (EDCD, 2020). Despite effectiveness, the ECDC also emphasizes the possible negative impact of NPIs, stating: "Most NPI can have a negative impact on the general well-being of people, the functioning of society, and the economy. Therefore, their use should be guided by data on the local epidemiological situation, with the overall goal of protecting the most vulnerable individuals in the society" (Ibid). The EDCD documented 1274 measures (from 31 European countries) into 58 distinct categories. Cheng et al. (2020) compiled a large dataset on global government responses, summarizing the health measures and is portrayed in table 4.

Table 4: Implemented NPIs during Covid-19 pandemic (Cheng et al., 2020, p757)

Type of measure	Total number of policies	Number of countries	Average number of targeted countries	With mandatory enforcement (%)
Health resources	2,638	160	64	55
Restriction of non-essential businesses	1,833	143	1	92
Closure of schools	1,441	171	1	91
Quarantine or lockdown	1,168	165	101	88
External border restrictions	1,122	188	166	85
Other	926	137	25	58
Public awareness measures	661	140	1	24
Restrictions of mass gatherings	639	165	1	88
Social distancing	576	139	1	74
Restriction of non-essential government services	432	107	1	83
New task force, bureau or administrative configuration	390	110	1	100
Internal border restrictions	370	119	1	90
Declaration of emergency	347	115	1	100
Health monitoring	343	114	78	69
Health testing	327	101	54	67
Curfew	185	96	1	96

Besides the countless non-pharmaceutical health measures, governments have implemented policies to stimulate vaccination rates (ECDC, 2022). “Countries continue to adapt vaccination strategies and policies based primarily on the changing epidemiological situation at country and sub-national level, vaccine supply, new information regarding the efficacy of the various COVID-19 vaccines, safety, effectiveness and new evidence on the virus and its impact on human health” (Ibid, p8). Due to limited availability of vaccination, most countries prioritized vaccination of people with highest risks (elderly and people with underlying conditions), as well as healthcare workers. With larger vaccine availability, countries are widely vaccinating their whole population. However, difference exists between countries in vaccinating children under the age of 12 (ECDC, 2022). Another distinction is seen with some countries opting for (partial) vaccine mandates. “In the majority of countries vaccination is not mandatory. Six countries have mandatory vaccination in place for different population groups, in particular for healthcare workers and/or workers in long-term care facilities, and two countries are planning to make vaccination mandatory in the future” (Ibid, p2).

Besides mandating vaccination, countries have implemented policies aimed at achieving a higher percentage of vaccination among the citizens. “Countries are using a range of strategies to encourage vaccine acceptance and address vaccine hesitancy or increase uptake. These include measures such as mobile and pop-up vaccination teams/clinics; targeted communication strategies; outreach initiatives and intersectoral partnerships for community-based interventions. Some countries have also introduced incentives to be vaccinated and many

countries require vaccination certificates in order to gain access to places/events" (ECDC, 2022, p2). Another way in which vaccination is (indirectly) stimulated is the implementation of the Covid certificates (Mills et al., 2021). "COVID-19 certification led to increased vaccinations 20 days before implementation in anticipation, with a lasting effect up to 40 days after." (Ibid, p15).

2.2.1: Efficacy & Externalities

The various health measures are implemented hoping it slows Covid-19 spread and lowers death rates, but how well do they work? Giving a concise answer to this question is hard, given the large difference in health measures and contrary evidence on it. According to Talic et al. (2021), utilizing a meta-analysis, "several personal protective and social measures, including handwashing, mask wearing, and physical distancing are associated with reductions in the incidence Covid-19" (p1). Looking at some measures individually, mask wearing indicate a reduction in Covid-19 incidence, as well as Covid-19 mortality (Ibid). "Specifically, a natural experiment across 200 countries showed 45.7% fewer covid-19 related mortality in countries where mask wearing was mandatory" (p4). Looking at physical distancing, it reduced Covid-19 incidence by 25% (average of five studies with 108,933 participants). Also stay at home measures and lockdowns were related to a lower rate of Covid-19 (Talic et al., 2021). This argument is supported by other studies, including for example Bo et al. (2020), that assess NPIs as effective in reducing transmission. Flaxman et al. (2020) find a large effect of NPIs (lockdown in particular) on reducing transmission. Lai et al. (2020) concluded that NPIs have been effective, concluding case-rate would be 67-fold higher if not implemented (p410).

Some studies claim a minimum effect of (some) NPIs (mainly lockdowns and masks), but some of these studies include pre-prints, and the totality of these studies is smaller than studies showing effectiveness (see for example Herby, 2021; Gibson, 2022; Born et al., 2020). The study by Gibson (2022) analyses the difference between states in USA and found no evidence that states that implemented lockdowns had fewer deaths. Born et al. (2020 find by analysing the specific case of Sweden, that implementing a lockdown would not have lowered Covid-19 infections. However, voluntary social restraints are ought to have played a role in this. Finally, a study carried out by Fokas et al. (2021), found that if lockdown measures are eased only for the young sub-population (sub 40 years), the effects on deaths and infections are small (p5839).

Table 5: Effectiveness EU approved vaccines at preventing Covid-19 (%)
(Institute for Health Metrics & Evaluation, 2022)

	ANCESTRAL		ALPHA		BETA		GAMMA		DELTA		OMICRON	
Vaccine	**S.D.**	**Inf**	**S.D.**	**Inf**	**S.D.**	**Inf**	**S.D.**	**Inf**	**S.D.**	**Inf**	**S.D.**	**Inf**
AstraZeneca	**94**	**63**	**94**	**63**	**94**	**69**	**94**	**69**	**94**	**69**	**71**	**36**
J&J	**86**	**72**	**86**	**72**	**76**	**64**	**76**	**64**	**76**	**64**	**57**	**33**
Moderna	**97**	**92**	**97**	**92**	**97**	**91**	**97**	**91**	**97**	**91**	**73**	**48**
Pfizer	**95**	**86**	**95**	**86**	**95**	**84**	**95**	**84**	**95**	**84**	**72**	**44**

(S.D.= Severe disease; Inf= Infection)

Switching from NPI effectivity towards vaccine effectivity, there are some important takeaways from the data. The Institute for Health Metrics and Evaluation (IHME) provides an overview for vaccine efficacy at preventing severe disease and infection. Table 5 shows that Covid-19 vaccines were effective against early strains of the virus. Against later strains, this effectivity seems to decline, especially against infection rates. The vaccine still remains quite effective against severe disease in the later strains of Delta and Omicron, with only Johnson & Johnson dropping below 60% effectiveness at preventing severe disease (IHME, 2022).

The ability of vaccinated people to still contract the virus is also shown by Wilder-Smith (2022) and Singanayaman et al. (2021), who showed that the impact of vaccination on community transmission was not significantly different from the impact of unvaccinated people. “Vaccination reduces the risk of delta variant infection and accelerates viral clearance. Nonetheless, fully vaccinated individuals with breakthrough infections have peak viral load similar to unvaccinated cases and can efficiently transmit infection in household settings, including to fully vaccinated contacts.” (Singanayaman et al., 2021, p183). Vaccinated people being able to still spread the virus questions mandates, as these are mostly implemented for this same reason (Ibid). Other studies found similar results, including for instance the breakthrough infection in healthcare workers in Israel (Bergwerk et al., 2021).

Despite showing evidence of NPIs on lowering Covid-19 incidence, there are also (negative) externalities related to the implementation. A first negative effect is the seen economic decline (Atalan, 2020). Goolsbee & Syverson (2020) call the collapse of economic activity in 2020 “immense” (p1). A second negative externality deals with the psychological effects as a result from the implementation of lockdowns (Atalan, 2020). Both stress and depression were common reactions during the pandemic (Ibid). Both arguments are supported by Ahamed et al. (2020), who see Covid measures directly related to mental and economic

downturn. A special emphasis is placed on the effects of lockdowns on the mental health of children and youth. Depression and anxiety account for most of the mental disorders in this group (Merikangas et al., 2010). Xie et al (2020) found an increase in prevalence of these disorder associated with Covid-19. “The typical development and expression of mood and anxiety problems will change as the impact of COVID-19 evolves. At an individual level, children and youth have suddenly lost many of the activities that provide structure, meaning, and a daily rhythm, such as school, extracurricular activities, social interactions, and physical activity. Over a sustained period, these losses may worsen depressive symptoms and may further entrench the social withdrawal, anhedonia, and hopelessness that are already part of these disorders.” (Courtney et al., 2020).

2.3: Covid-19 indexes

2.3.1: Overview

Since the outbreak of the virus, several stringency indexes, focussed on analysing the ‘strictness’ of government responses have been developed. The Oxford Coronavirus Government Response Tracker calculates a stringency score based upon nine variables (Ritchie et al., 2021). The nine variables used are “school closures; workplace closures; cancellation of public events; restrictions on public gatherings; closures of public transport; stay-at-home requirements; public information campaigns; restrictions on internal movements; and international travel controls.” (Hale et al., 2020, p530). Besides the stringency index, Hale et al. (2020) have other indexes that focus on a wider set of indicators. The Government Response index (compared to the stringency index) adds six variables focussed on economic support and health systems, including for example vaccination policy.

Gros et al. (2021) developed a ‘new Covid policy stringency index’ for Europe, as a development of the Oxford index, that according to them had a few flaws. Gros et al. (2020) have built an index based on the ECDC data, which provides a couple of advantages compared to the Oxford one. Firstly, it contains information on measures that are not included in the Oxford stringency index (for example restrictions of indoor activities). Besides, it distinguishes between different types of school closures, given the large difference in type of school closures. Lockdown policies are measured in a graduated way, enabling to distinguishing nation-wide lockdowns from specific area lockdowns. Lastly, a distinction is made between mandatory and voluntary measures (Gros et al., 2021). The index uses 8 categories, derived from 40 Covid measures, and calculates a monthly stringency score of countries.

1.3.2: Outcomes of prior indexes

The Oxford stringency index presents a stringency score for any given day since the start of the pandemic. Figure 1 shows the stringency score of the focus area since the start of the pandemic. Some broad takeaways from analysing the figure are that in the beginning of the pandemic, all countries responded in some sort of way, although Sweden and Finland were clearly not as strict as other countries. Another interesting takeaway is seen in recent stringency scores, as there is a clear divide between still quite strict countries (Germany, Greece, France, and Italy) and loose countries (Finland, Sweden, Denmark, and Norway).

The Gros et al. index (2021) analyses government stringency over the period from January to November 2020, and thus fails to keep an updated statistic as is seen by the Oxford index. Table 6 shows the outcome of the study. During the first year of the pandemic, Austria, Greece, and Italy showed to be the most stringent countries. Finland, Denmark, Germany, and Sweden all presented to be a lot less stringent, hovering around an index score of 22-23. Sweden is particularly interesting, since the maximum measured score throughout this period is only at 37, which is similar to other countries' mean score.

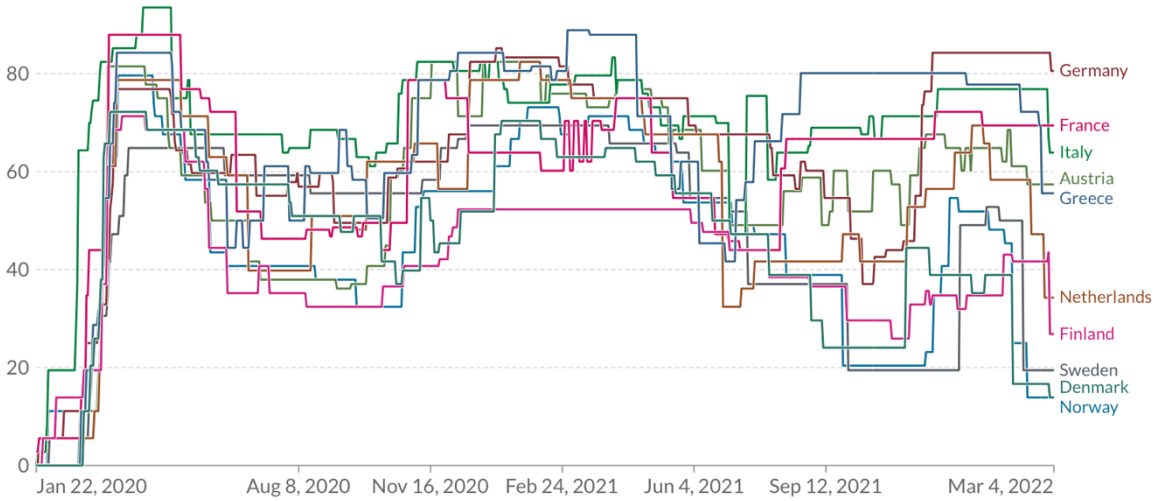

Figure 1: Oxford stringency index results study area

(Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, University of Oxford, 2022)

Table 6: Results of Gros et al. stringency index (Gros et al., 2021)

Country	Mean	Max	Min	Min (Mar.-Nov.)
Austria	37	85	0	26
Denmark	24	56	0	21
Finland	22	48	0	13
France	35	81	0	18
Germany	23	57	0	15
Greece	37	80	0	26
Italy	38	86	0	26
Netherlands	32	67	0	25
Norway	28	54	0	25
Sweden	23	37	0	15

Chapter 3: Theoretical & conceptual framework

This theoretical framework, based on the aspects from both medical geography and health geography, acts as the theoretical base for the continuation of this thesis. The history and emergence of both sub-fields will be discussed, to further understand how health geography developed out of medical geography. The two terms are often used synonymously, which causes confusion given the distinct differences between them. The notion of new health geography will be discussed, including the critical stance and the appreciation of place. Social justice theory will be explored from a health geography perspective. What is it? What can it be used for? How can we understand it? Paradoxically, social justice theory has been addressed by some for lacking a supporting theory. The 'idealist' versus 'non-idealist' debate, stemming from political philosophy, is used as supporting theory, to further understand the concept of social justice, following the recommendation of Rosenberg (2014). This theory of idealism enables to understand the different stances by governments regarding Covid-19 policy. Ultimately, a combination of both aspects from medical and health geography will be utilized to help understand Covid-19 policy and its possible impact on the spread of Covid-19.

3.1: Medical geography

Medical geography, concerned with the spatiality of disease has been around for a long time. In a search for ancestors of the discipline, often is referred towards Greek physician Hippocrates and his work 'On air, waters, and places' (Valencius, 2000). The work focuses on the local characteristics of his Island Cos, claiming that disease "is a product of specific locales" (Valencius, 2000, p7). It considers the environment (wind, seasonal changes, and source of waters) and its influence on human illness and well-being (Ibid). During the colonial era, the discipline of medical geography grew quickly, given the various transmitted diseases that travelled in between continents. This growing importance stagnated with the introduction of the germ theory by Louis Pasteur in 1861 (microorganisms or 'germs' can lead to disease). However, the significance of socio-cultural factors on disease re-emerged after the inability of germ theory to deal with complex nature of disease (Ibid). Around this time, perhaps the most famous work of the sub-discipline of medical geography originated in an area of London (Koch & Denike, 2009). John Snow's investigation of the Cholera outbreak in the London suburb Westminster utilized mapping disease spread and linked it to a specific water pump in Broad Street (Koch & Denike, 2009).

These historical examples portray the subdiscipline of medical geography. Although the specific definition of medical geography is different among researchers; a well phrased definition is given by Askari and Gupta. “Medical geography is a promising field of research to analyse the geographical pattern of health and disease including its environmental and social relationship. According to May (1950), medical geography studies the relationship between pathological factors (pathogens) and geographical factors (geogens). Among these geogens there is a distinction between physical, human, and biological factors. Physical factors concern itself with climate, relief, soil, and hydrography. The human aspect is derived from population distribution, standard of living and religion. Biological factors include vegetable life, animal life, parasites, diseases, and the occurrence of dominant blood groups (Ibid).

Medical geography has an empirical focus, and fascinates with the unique (Jones & Moon, 1993). The importance of locality within research shows with the wide application of case studies (Ibid). Within medical geography, disease is viewed as a product of environmental, social, cultural, and biological factors (Mayer, 1982). Although research focuses on the particular and local scale, generalizations are possible and could be applied to a multitude of scales (Ibid). Human geography has been subject to many debates regarding the role of theory (Litva & Eyles, 1995). This theory debate has mainly passed by medical geography, which has often been regarded as ‘atheoratical’ and a tool for biomedicine (Litva & Eyles, 1995). However, according to this same paper, this is merely an appearance and positivism (scientifical verification through logical or mathematical proof) has had the biggest influence on the discipline of medical geography. Medical geography has shown to be a practical subdiscipline, closely related to epidemiology (Ibid). Its focus is mainly disease mapping, where the concept of disease is viewed as a product from its geographical location (Litva & Eyles, 1995).

3.2: From medical geography to health geography

Kearns and Moon (2002) analysed the change from medical geography towards health geography. The analysis starts with the with a notion that the discipline of medical geography has been regarded as a ‘lonely discipline’ by Jones & Moon (1991). At this time, within medical geography, disease ecology and health services research were seen as two distinct (and widening) streams. This ‘twin stream’ model contrasted studies of disease distributions or diffusion with welfarist and largely empiricist studies of health care provision.” (Kearns &

Moon, 2002, p607). By the 1990s, this duality became more blurred, as cross-boundary research focussed on applying both areas of work (Moon et al., 1998).

The blurred duality is characterized by the rearticulation of medical geography as health geography (Kearns & Moon, 2002). “Throughout the 1990s, key publications within the field show this rearticulation. What is important to note is that these essays often look outside health geography, and indeed outside geography itself, at areas in which health geography might frame knowledge or where such a framing had already begun.” (Kearns & Moon, 2002, p 607-608). At the same time, another group of publications were more inward-looking, and an attempted shift towards a cultural/humanistic standpoint came about when advocating towards ‘post-medical geographies of health’. “This ‘post-medical’ challenge, seeking to shift the subdiscipline from a concern with disease and disease services towards a focus on health and wellness, was inevitably a case of not far enough to some, but too far for others.” (Kearns & Moon, 2002, p 608). This resulted in an ongoing debate between conservatives aiming for a continuum of the medical geography tradition versus the more humanistic approach towards a cultural geography of health (Ibid).

The shift is also seen in major geography conferences, stating that medical/health geography has changed. “The key observations are that there is an increased awareness that places matter, an enhanced sensitivity to difference (notably in confronting issues of gender and impairment), and a move away from the two traditions model in favour of more thematic concerns.” (Kearns & Moon, 2002, p608). Also, the dictionary of human geography notes the growing importance of place within the discipline (Kearns & Moon, 2002; Mohan, 2000). “In the entry for medical geography, there is a stress on a biomedical model of health and a focus on quantitative methods; place is framed as part of a critique. In contrast, the entry for health geography has place as the lead theme, Foucault gets a mention, there is an emphasis on what is termed a ‘socioecological’ model of health, and methodological pluralism rules.” (Ibid, p608).

3.3: New health geography: place, theory and critical

The shift from medical geography towards health geography emphasised a few important changes. Most notably, the appreciation of place, a more critical stance, and the adaption and creation of underlying theories. According to Kearns & Moon (2002), these can be seen as the core characteristics of new health geography. These three characteristics will be discussed thoroughly to get a better understanding of what exactly entails this new geography of health.

Theory on health inequalities and the connected idealism debate will specifically act as underlying theory, being able to explain the differences seen between governments in Covid-19 policies.

3.3.1: The notion of 'place' within new health geography

The notion of place became increasingly important within the new geography of health from the 1990s (Prior et al., 2019). "The call to investigate the mechanisms of place has produced an extensive literature, both quantitative and qualitative, revealing various features of health and place relation." (Prior et al., 2019, p534). This newly profound concern with place is seen as the unifying theme within the reformed health geography (Prior et al., 2019; Kearns & Moon, 2002; Rosenberg, 1998). "An awareness of place as a socially constructed and complex phenomenon has been a talismanic point of reference for the new health geography. The objective has been to show that 'places matter' with regard to health, disease, and health care, and it has been followed through in three strikingly different ways." (Kearns & Moon, 2002, p610). The first group of studies regards place as the specifics of particular localities (p610). Focus is placed on a 'local place' that can range anywhere from people's home towards the rural localities. These studies have different "epistemological underpinnings", ranging from positivist, political economy towards more humanist traditions (p610). The created knowledge is regarded as place-bound, as research focusses on this specific locality.

The second group utilizes the concept of landscape and emphasizes the cultural importance of specific places. It also enhanced the connection of the cultural and politico-economic in health care promotion (Ibid). Several themes that emerged out of this are 'landscape of despair', 'landscapes of restructuring' and 'therapeutic landscapes' (Kearns & Moon, 2002). The concept of landscape presents different meanings, ranging from defining localities, to representing a metaphor "for the complex layering of history, social structure and built environment that converge in particular places" (p611). Although internal inconsistencies of the usage of landscape (leading to pluralism), it is regarded as hallmark of new health geography.

The last group of work utilizes multilevel modelling as a way of researching place-awareness. This group mainly utilizes quantitative research and thus asks for the conceptualization of place, which has both strengths and weaknesses (p611). Positives to this are the clear idea of hierarchy of people within places. "They also allow for considerable

complexity in forms of contextual variation and are thus both more faithful to external reality and effective as an empirical means of 'capturing place'" (p611).

3.3.2: Theory adaption and creation

Health geography has been characterized not only by applying theories, but actively developing social theories (Kearns & Moon, 2002). Where medical geography has been regarded as mostly atheoratical, and mostly utilizing theories from other subfields, health geography broke with this tradition and concerned itself with the development or reshaping of new theory. Despite this theoretical turn, Kearns & Moon (2002) consider two omissions within health geography theory. The first omission concerns itself with the absence of literature concerned with the body (Longhurst, 1997; Kearns & Moon, 2002). The disembodiment is seen in the absence of narratives in health geography. "A tendency to see the individual not as a person but as an observation has been largely retained in health geography (although geographies of mental health have long-included exceptions" (Kearns & Moon, 2002, p613). The second omission is concerned with public health and the notion of risk. "Health-related behaviour is just one area where risk provides an underlying construct that begs further theorization with regard to its spatialized manifestation. Looking out from health geography, it is also clear that much groundwork has been already undertaken in this regard in other disciplines." (Ibid, p613-614).

Contrary to these two neglected areas within health geography, Kearns and Moon (2002) see a continuation of positivist perspectives in current health geography research. Another aspect that characterizes health geography theory is the equality/inequality and exclusion/ inclusion theory. Lots of work around the beginning of the 90s focussed on researching equality or exclusion (Ibid).

One of the earliest emerging themes focussing on equality within health geography focusses on access to care (Rosenberg, 2014). There is however a large difference in what and who is studied. During its emergence, focus was around researching the geographical distribution of physicians. Current research shifted towards researching the variety of health services. "Like previous studies on access, once one takes into account the particular service, the focus of many if not all of these studies are on the socio-economic characteristics of the users, and then on the barriers that they face in accessing services, particularly issues of distance and the geographical configuration of where the services are located." (Rosenberg, 2014, p468). A final focus within this realm is found within the so called 'food–physical

activity–obesity nexus'. The main idea within these studies is that access to healthy food and physical activity indirectly leads to better health (Rosenberg, 2014).

Another theme within health geography that focusses on the equality/ inequality theory and closely related to access to care is the focus on neighbourhoods and the characteristic of its living population (Rosenberg, 2014). Different methodological paths have emerged in regard to neighbourhood research, to the extent that Rosenberg is calling it a methodological battleground. Despite a large array of methodological advances, Rosenberg notes a lack of debate about underlying theory. A final theme is found within the environmental justice literature, as it echoes accessibility and neighbourhood literature (Ibid). The rhetoric is however opposite, in which accessibility literature focus on proximity towards health facilities, in environmental justice literature proximity to pollution means a potential lower level of health (Rosenberg, 2014; Amram et al., 2011). "The environmental justice literature explicitly invokes the concept of justice, even if what is meant by justice is rarely discussed here beyond the implicit arguments that living in proximity to environmental hazards is unjust or that the actions ensuring that environmental hazards are more likely to be located in places nearest to marginalized populations are unjust. (Ibid, p469).

3.3.3: Critical health geography

A final notion to discuss within the new health geography is the critical stance and resemblance towards other critical forms of human geography. "Radical and critical geographies seek not only to interpret the world, but also to change it through the melding of theory and political action." (Blomley, 2008, p285). According to Painter (2000), in the dictionary of human geography, critical geography opposes unequal and oppressive power relations, devotion towards social justice and transformative political, and the application of critical theory. The above-described application of mainly equality and exclusion theories is the most prominent feature of critical theories. Discovering inequalities as a product of place is a central component within health geography. Health geography's commitment to social justice shows in research towards health care implications as a result of neoliberal policies (Kearns & Moon, 2002). Critical health geography turned towards activism, in an attempt to diminish health inequities and better care for minorities (Ibid). Health geographers try to influence policy makers, which provides a challenge in choosing between insurgency or collaboration. The reinvention of medical geography into health geography led to a more critical understanding of health and

society and aims to explain (and thus change) variation in health status based on geographical factors (Parr, 2004).

3.3.4: Social justice theory paradox

The equality debate relates closely to the notion of social justice. The adoption of social justice into the realm of human geography is by many noted with David Harvey's book *Social Justice and the City* (1973). However, the adoption of social justice into the fields of medical and health geography was relatively slowly. "Even after Kearns (1993) called for medical geographers to create a more theoretically informed subdiscipline, explicit theories of social justice rarely found their way into the published research either in the medical or health geography literature." (Rosenberg, 2014, p 466). However, given the theoretical turn in health geography, social justice theory has played an important role. All the mentioned inequality theories (access to care, neighbourhoods, environmental justice) stem from a social justice theory point of view (Rosenberg, 2014). "The research implies that it is unjust that some people are denied access to care because of where they live; who they are; the absence of services in their neighbourhoods; or the presence nearby of sources of pollution." (Rosenberg, 2014, p470). The theoretical problem arises when research implies that any improvements in the living environment, leads directly or indirectly to better health (and thus are more socially just). "The dilemma is that rarely is the research grounded in an explicit theory of social justice, although various conceptual frameworks are sometimes cited as guiding the research" (Ibid, p47). A couple of examples given by Rosenberg (2014) explain this theoretical paradox further. Imagining a situation in which there is an absence of economic and social barriers to access to care, some people will inevitably still find themselves further situated from these services. Similarly, some people will always live closer to sources of pollution than others. Noting that this is 'unjust' does not grant social justice if eliminating air pollution leads to an impoverished economy. "In other words, how should one position access to care, neighbourhood, or environmental justice research within a theory of social justice?" (Ibid, p67). Rosenberg (2014) presents the idea of applying the political philosophy theory of idealism.

3.4: 'Idealist' versus 'non-idealist' theory

According to Rosenberg (2014), the theory of idealism presents to be particularly useful in within the field of health geography. The debate is characterized by a heterogeneity, as it presents three distinct features, displayed in table 7. Firstly, ideal theory is regarded as 'full-

compliance theory' and non-ideal theory is seen as 'partial compliance theory'. Secondly, ideal theory presents the idea of 'utopian or idealistic theory, and non-ideal theory is understood as 'realistic theory'. Finally, ideal theory focusses on the 'end-state', where non-ideal theory applies a 'transitional theory'. All these heterogeneities will be discussed in depth to further understand social justice theory.

3.4.1: Heterogeneities explained

Full compliance theory versus partial compliance theory is concerned with what duties apply to individuals, in situation of partial compliance, as opposed to a situation of full compliance (Rosenberg, 2014; Valentina, 2012). An important question within this arises when not every individual does their part, what should you do? Three possible answers are given by Miller (2011): Do exactly your fair share; do more than your fair share; do less than your fair share. How individuals should act is arbitrary, and a master-principle applicable for all situations does not exist (Valentina, 2012). Individuals should do what is reasonably within their power to fight social justice. "What counts as reasonable, in turn, depends on the particular situation at hand" (Ibid, p656). Applying this principle to the notion of social justice within health geography, "one might consider the differences between ensuring that everyone has access to as much health care as they need (full compliance), set in contrast to ensuring that everyone has access to some primary health care over a specified time and geographical space, but acknowledging that no health care system can provide all of the care that a person needs and that some people will always choose (or be constrained) to live in places where they have less access to care or live in places farther away from care no matter what the geographical distribution of care might be (partial compliance)" (Rosenberg, 2014, p471).

The utopian versus realist debate deals with if feasibility constraints should be taken into account, and if so which ones (Rosenberg, 2014; Valentina,2012). "'fully utopian' theories, which altogether reject the need to place feasibility constraints on principles of justice, and 'realistic' theories, which accept some such constraints". (Valentina, 2012, p 657).

Table 7: Idealist theory vs non-idealist theory (Valentina, 2012)

Idealist theory	Non-idealist theory
Full compliance theory	Partial compliance theory
Utopian theory	Realistic theory
End-state theory	Transitional theory

Principles of justice are independent of constraints, and it is seen as a timeless value. Applied towards health geography, "Utopian or idealistic theory might define a socially just health care system such that there are no barriers to health care at any level of service (primary, secondary, tertiary, etc.), for any type of service (physician, nursing, home care, etc.) or any ancillary needs (prescriptions, wheelchairs, etc.), covering all of the population through general government revenues. Applying realistic theory, the starting point for research on access to health care might be what can a society feasibly provide in a socially just fashion within the constraints of what funds actually exist for its health care system." (Rosenberg, 2014, p471).

End-state theory versus transitional theory focuses on an ideal of societal perfection. What should be identified and strived for, or whether focus should lie on transitional improvements without constructing such optimum (Rosenberg, 2014). End-state theory centres around a long-term goal for institutional reform, where transitional theory focuses on the gradual steps towards a certain long-term goal (Valentina, 2012). "End-state theory applied to access to health care might be about defining a health care system which achieves access in a socially just fashion. It is distinct from a utopian or idealistic health care system in that the end state might be a health care system that guarantees no one is more than a specified distance from a primary health care provider. In contrast, taking a transitional theory position would suggest that, even if one cannot define the end state, any improvements to access to primary health care which removes any barrier (economic, sociocultural, or geographical) are worth making because they move a society closer to a socially just system, even if one cannot specify what a socially just system might ultimately be." (Rosenberg, 2014, p6).

3.5 Idealist theory and Covid-19 policy

The application of idealist theory within health geography focusses on access to health care, and how to eliminate potential social injustices. Chapter 2 has shown how Covid-19 unevenly affects the elderly and people with an underlying health condition. Implementing both pharmaceutical and non-pharmaceutical measures to fight Covid, aimed at the totality of people, rather than just these groups, hints at an ultimate aim of lowering these social injustices (towards elderly and people with an underlying condition). For this reason, idealist theory (used & able to explain these social injustices in health geography) is taken from a wider perspective and will be used to analyse the totality of Covid-19 policy. Access to health care is part of Covid-19 policy and will thus be part of the broader variables that aims to explore idealism. Having a wider focus on the totality of Covid-19 policy, rather than just looking at idealism in

access to healthcare aims to provide a larger interpretation and application of the results, which is not yet covered by the former indexes explored in section 2.3.

Section 3.4 showed how the different characteristics of idealism are applied in health geography. For the continuation of this thesis, it is important how this can be wider interpreted in terms of Covid-19 policy. The theory of full compliance presents an interesting take on the Covid-19 pandemic and government health measures. Government policy both focuses on providing health care for sick people, as well as preventing Covid-19 spread. So, a distinction can be made between achieving social justice in providing healthcare, and social justice in preventing sickness. Achieving social justice in healthcare (thus full compliance) would aim at providing everyone access to the health care they need. This, opposed to partial compliance, in which everyone has some access to primary health care. Focussing on prevention, countries that implement very strict measures, including for example lockdowns and forced vaccination could be regarded as striving for (forced) 'full-compliance', in which all inhabitants comply with the demands of social justice. Everyone stays home, everyone takes the vaccine, everyone wears a mask, and so on. On the contrary, countries implementing a 'looser' strategy base themselves more on the partial compliance theory, providing vaccines for everyone, but acknowledging that no matter the degree of health measures, some people will still contract Covid-19, given that some people will choose to not get vaccinated, or choose to not wear a mask. In this situation of partial compliance, the above-described questions arise on how individuals should act.

Governments acting from a utopian point of view see no feasibility constraints in providing socially just Covid-19 care. Regarding Covid-19 measures, everyone will follow government recommendations, as it is designed to eradicate social justice. Realist governments acknowledge that there are feasibility constraints present that influence this. Examples of these feasibility constraints include that not every person can be vaccinated due to possible complications. Another feasibility constraint is the degree of vaccination in other countries. One big problem of this is the global vaccine inequity, in which Africa deals with a much lower availability of vaccines (Partners of Health, 2022). A low degree of vaccination gives way for mutations of the virus (Hinshaw, 2021). Which in turn will impact other countries if people travel. Acknowledging this situation is seen in a realist approach, where governments consider that circumstances in other countries will influence the situation, and thus never present a situation in which social justice can be totally achieved. Even if say that the whole population is vaccinated (which already fails to consider national feasibility constraints), the emergence

of new variants will provide a socially unjust situation for specific groups more at risk, if that strain travels to that given country.

Linked towards the Covid-19 pandemic, end-state theory would focus on creating a certain 'ideal' in which applying health measures derived on socially just fashion. Government stemming from an end-state theory focus on a 'socially just ideal'. This can be seen as the 'end-state' in which the governments have provided the most socially just situation. Contrary, in a transitionary theory, such a goal would be merely an strive, and emphasis is placed on getting people to vaccinate. Educating people and aiming to increase vaccine uptake. In this situation, every person extra vaccinated would be seen as a positive and a gradual step, rather than striving for a certain predetermined number.

3.6 Conceptualizing idealism in Covid-19 policy

Figure 2 shows the conceptualization of chapter 2, 3 and also some parts from the following chapter 5. This figure aims to provide a clear understanding of the used theory, and how it is used in combination with the intended methodology. This figure acts as a bridge between the chapters two and three, and the methodology chapter (5), to provide a clear overview of the thought process in measuring idealism in Covid-19 policy. From a theoretical point of view, Idealism in Covid-19 policy is made up from the explained three components: full compliance theory vs partial compliance theory, utopian theory vs realistic theory, and end-state theory vs transitional theory. From a methodological point of view, these theories have to be turned into a measurable variable to be able to calculate a countries idealist score. As idealism analyses the social justice, Covid policies that aim to minimize social injustices should be included in this figure. Both pharmaceutical and non-pharmaceutical policies are implemented with the aim of lowering social injustices, and thus can be used to calculate idealism within Covid-19. Measures by Gros et al. (2021) are the utilized NPIs. Vaccination takes account for pharmaceutical interventions, as well as healthcare policies, which is portrayed from an idealist perspective. The idealist perspective aims to show how the concept of idealism in Covid-19 policy originated from this access to health perspective, and how the two interlink.

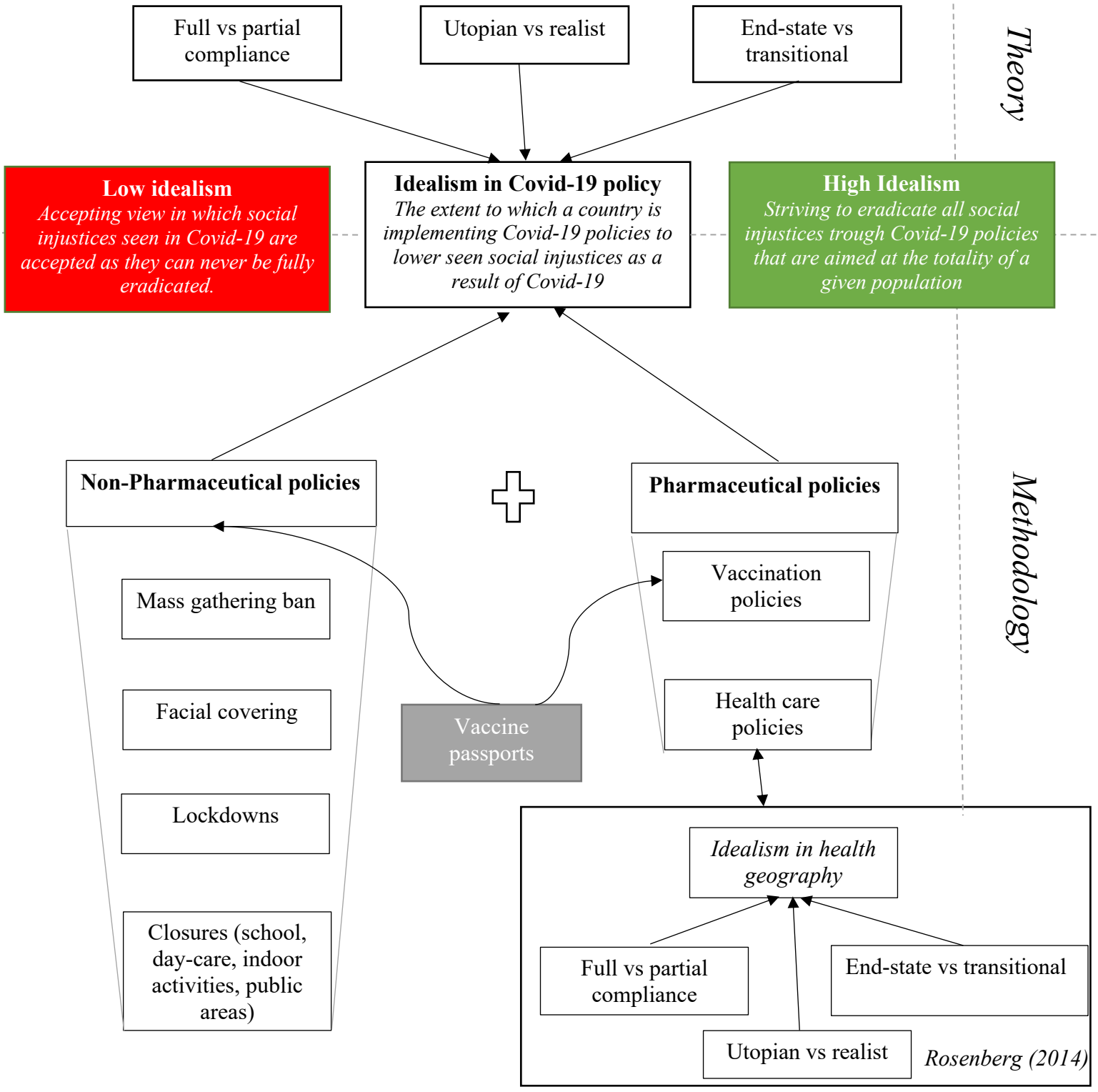

Figure 2: Conceptualization of idealism within Covid-19 policy

Chapter 4: Methodology

4.1 Philosophical stance

To what extent is it possible to reach the reality within research? Questioning what exists and if we ultimately can achieve this truth is also known as ontology. On the other hand, epistemology deals with the question of how knowledge is created. Ontological and epistemological are a central theme within philosophy of science. A researcher's philosophical stance influences the way 'reality' is regarded (ontology) and how this 'reality' is achieved through various methods (epistemology).

A large array of different philosophies exists. Rather than explaining all of these, a spectrum will be portrayed that looks at the extremes, before specifying my own thoughts on ontology and epistemology. A good overview of the two extremes is given by Seamon and Gill (figure 3), who show realism that assumes a single truth versus social constructionism that assumes differing (multiple) realities. The connected ontological and epistemological assumptions are also depicted in the figure. Absolute truth exists and can be explained and understood through science in realist philosophies. Epistemologically there is a strong emphasis on evidence that can be measured and mathematized. Social constructionism does not see an absolute reality, as all human experience it differently. This results in the belief that knowledge is constructed, rather than representing one absolute truth. Knowledge is seen as relative and changeable (Seamon & Gill, 2016).

The most suitable approach for this thesis is somewhat in between these two extremes and can be noted by the term of critical realism. This stance sees a shifting reality, in which common features can be seen. As far as epistemological assumptions, both real world evidence as well as shared understanding are used to find a specific outcome. Within this thought, the absolute truth does exist "independently of individual perception", but also recognizes the role of "individual interpretation" (Taylor, 2018, p217).

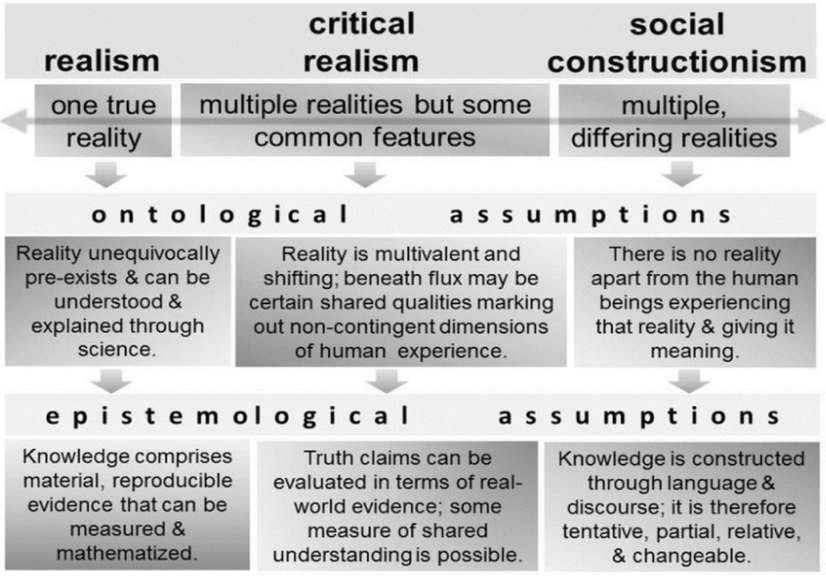

Figure 3: Key assumptions within realism, critical realism, and social constructionism (Seamon & Gill, 2016, p4)

4.2: Creating the idealist index

The central methodology within this thesis is the Covid-19 idealist index. The Idealist index will build forward on the work of Gros et al. (2021), who created the 'new European stringency index'. An important addition towards this index is derived from the 'idealist' versus 'non-idealist' debate and mostly focussed on policies aimed at lowering social injustices (hospital policies, and vaccination policies) that are both absent in the Gros et al. index. The inclusion of these two factors is important given that focussing on purely health measures does not give an adequate view of the idealist notion of total government policy. Vaccination is seen as the most important factor in preventing Covid-19 deaths (ECDC, 2022), but vaccination policies are not represented in the Gros et al. index. Thus, adding these two variables will transform a stringency index focussed on just NPIs into a wider index that aims to calculate the notion of idealism based in Covid-19 policy. A country could for instance be relatively mild in imposing social distancing measures, but if it imposes strict vaccination and healthcare policies, it could be more idealist (striving towards social justice) than any stringency index could show.

The Oxford government policy index is slightly similar to this, as it as well includes a wider array of variables, but it fails to look at policies from a mandatory aspect. Vaccination is included in this calculation, but is derived from an availability aspect, and not mandated aspect. The adoption of both (partial) vaccine mandates and vaccination passports is an area not yet much researched within government stringency indexes. Similarly healthcare policies are

largely absent from both former indexes, despite entailing an important part of government policy. Adding health care policies means that the overlooked aspect of health geography (mainly access to health) will be taken into account.

4.2.1 Categorization of Covid-19 measures

The idealist index, made up from two components as seen in the conceptual framework in chapter 3 (pharmaceutical and non-pharmaceutical policies), is derived from a total of ten categories. As said, the idealist index can be seen as an extension of the Gros et al. index. Within the idealist index, apart from one, the categories used to calculate NPIs are the same as proposed by Gros et al. (2021), accompanied by one extra NPI. The eight categories from the Gros et al. index (2021) are based on 40 measures. This choice on 40 measures (from 58 originally) stems that some are duplicate in nature (Gros et al., 2021, p117). The category that will be left out within the idealist index is the category of "Teleworking", that focusses on partial or total teleworking recommendations. Teleworking, the action or practice to work from home making use of the internet (Oxford dictionary) is seemed less important in an idealist index since it just covers a recommendation. The added NPI into the idealist index is the implementation of Covid-19 passports (vaccination certificates). The implementation of Covid-19 passports is an important government policy, serving two important roles. Firstly, it aims to prevent unvaccinated people to attend certain gatherings, shops, or public areas. Secondly (and indirectly), because of this it stimulates people to vaccinate if they want to have a social life (represented also in the situatedness in the conceptual framework in chapter 3). The implementation of Covid passports is recognized by either a 2G or 3G implementation, differencing in allowing testing or not (2G= no testing). This difference is big since it results in unvaccinated unable to attend public areas, bars, restaurants, or even public transport.

The NPIs are only a part of the total index. Pharmaceutical interventions, vaccination and hospital policies are added in the idealist index. 4 measures are taken into account to define a country's idealist notion of vaccination policy. The partial and total vaccination mandates are seen most important in discovering strictness of a country. Partial vaccination is regarded as any subgroup of the population that is subject to mandatory vaccination (no difference in for example mandating elderly or health workers). Given the theme of social justice, an extra focus is added that looks at a country's recommendation of children aged 5-11. Given the evidence (section 2.1.3 on low deaths among children), recommendation for these hints at a strive to lower social injustice and thus should be seen as very idealistic. Adding this measure presents

a bit of a paradox, or biased selection, since teleworking was removed for being just a recommendation. However, it is regarded that opposed to teleworking, this policy represents the dilemma of social justice despite being just a recommendation. Countries can have either a partial or full recommendation, in which partial recommendations are solely focussed on certain groups of 5–11-year-olds, and not all of them. Finally, hospital policies deal with the ability of country's to provide care for all that need it, following the work of Rosenberg (2014) and the connection between health geography and access to care as seen in the theoretical framework. All of the added variables are developed using a similar cardinal scale as is used in Gros et al. (2021). The complete overview is portrayed in table 8.

Table 8: Categorization of Covid-19 measures

Category	Measure	Cardinal Scale
Closure: Day-care	Partial Closure Day-care	1
	Total Closure Day-care	2
Closure: School	Partial Closure Primary Schools	1
	Total Closure Primary Schools	2
	Partial Closure Secondary Schools	1
	Total Closure Secondary Schools	2
	Partial Closure Higher Education	1
	Total Closure Higher Education	2
Closure: Public Area	Partial Closure Public Area	1
	Total Closure Public Area	2
Closure: Indoor Activities	Partial Closure Public Transport	1
	Total Closure Public Transport	2
	Partial Closure Entertainment Venues	1
	Total Closure Entertainment Venues	2
	Partial Closure Sports Centres and Gyms	1
	Total Closure Sports Centres and Gyms	2
	Partial Closure Hotels	1
	Total Closure Hotels	2
	Partial Closure Non-Essential Shops	1
	Total Closure Non-Essential Shops	2
	Partial Closure Worship Places	1
	Total Closure Worship Places	2
	Partial Closure Private Gatherings	1
	Total Closure Private Gatherings	2
	Partial Closure Restaurants and Cafes	1
	Total Closure Restaurants and Cafes	2
Mass Gathering Ban	Partial Ban of Mass Gathering	1
	Total Ban of Mass Gathering	2
Facial Covering	Partial Masking Closed Spaces	1
	Total Masking Closed Spaces	2
	Partial Masking All Spaces	1
	Total Masking All Spaces	5
Stay Home (Population)	Stay Home (advice, specific areas)	1
	Stay Home (advice, all areas)	2
	Stay Home (enforced, specific areas)	3
	Stay Home (enforced, all areas)	4
Covid Passports	Partial 3G	1
	Full 3G	2
	Partial 2G	3
	Full 2G	4
Vaccination Policies	Recommended Vaccines Aged 5-11 With Risk Factors	1
	Recommended Vaccines Aged 5-11	2
	Partial Vaccine Mandate	1
	Total Vaccine Mandate	2
Hospital accessibility	Number of Hospital beds (Max capacity)	1
	Number of ICU beds (Max capacity)	1

4.2.2: Calculation of categories

Most measures are mutually exclusive, leading to a straightforward calculation. Example: 'closure day-care', a partial closure is less stringent (idealist) than a total closure and those are mutually exclusive, as both cannot happen at the same time (Gros et al., 2021, p117). The maximum unweighted score of this category is thus 2. The same is applicable to "Closure Public Area", and "Mass Gathering Bann". The category that looks at "Stay Home Population" is different in that it presents four mutually exclusive measures, bringing the maximum unweighted score to 4. A similar structure is used for the category of "Covid passports". "School Closures" have three levels of education, totalling up to an unweighted score of 6. Closure of indoor activities focus on eight different activities, bringing the unweighted score towards 16. "Vaccination Policies" focusses on two different activities, adding up to a maximum of 4.

The category of "Facial Covering" presents a special case, as the categories are not mutual exclusive. Masking measures can both be applied on open and close spaces. Therefore, countries can have overlapping measures (partial masking in closed spaces and partial masking all spaces). The combined stringency is however lower than a complete mandatory masking in all spaces (Gros et al., 2021). Therefore, total masking all spaces measure with value 5 is added. If this measure is not undertaken, stringency levels of any parallel measures are added up. The specific category of masking is calculated with the following equation:

$$s_{face,t} = min\{5, \sum_{n} x_{nt}\},$$

for n ∈{PartialClosed, TotalClosed, PartialOpen, TotalOpen}.(Gros et al., 2021, p119)

The category of Hospital Policies presents some arising problems, leading to the choice of two single measures that are not mutually exclusive. The first encountered problem is that countries implementing hospital policies (e.g., extending ICU beds as seen in many of the study area) implemented these policies during the first wave of the Covid-19 outbreak (see 4.3.1 regarding study period). But even the usage of an ICU expansion could be questioned within an idealist framework because a high initial ICU capacity makes such policy not necessary. The second encountered problem was the absence of data on these hospital policies. Bringing these two together, fixating on mutual exclusive hospital policies during this specific period was likely to not present any differential data between countries that distinguishes the level of idealism between them (none of them implementing such policies in this timeframe). And it would mean

that former data of a different period had to be used to say anything useful, lowering the validity of the results, as now different time periods would be used to compare. To cope with these problems, a countries' hospital and ICU bed capacity is used to measure idealism in hospital policy. Absolute numbers are better to distinguish idealism in regard to this policy since unlike NPIs, hospital policies could still highly differ between countries (unlike NPIs).

While this is not a direct Covid-19 policy, a countries' hospital and ICU capacity is a result of health policy implemented in the past and is able to show differences in the idealist' notion of a countries' health policy. Since categories are weighted differently, it is impossible to use absolute numbers for the category of hospital policies (If hospital policies are 20% of total index, how are absolute numbers converted to 20%?). For this reason, the country with the highest hospital beds and ICU beds respectively is ranked with a 1 in each category (thus seen most idealist). Other countries are ranked compared to this country as a percentage, enabling the weighting of this category in the continuation of the calculation of idealism. Utilizing these two measures, it means that this category will be static, and thus presents no data on fluctuating monthly scores. However, it is seemed most representable to show idealism in healthcare policy. Secondly such policies in general are more static in nature, and not fluctuating as much as the others. To conclude, regarding ICUs, max capacity statistics are chosen, rather than initial capacity, because the ability of a country to quickly add ICU beds gives a more accurate view of the countries' capabilities and upper limit.

4.2.3 Weights of categories

An arising problem when developing such an index is the comparability between the different categories. For example, an index value of 2 in the "Mass gathering ban" category does not represent a same level of strictness as an index value of 2 in the category of "Closure day-care". "It is thus important to keep indices of categories separate" (Gros et al., 2021, p119). However, it is helpful to have a composite stringency index. Summation does not exactly reflect the relative stringency levels of categories but is straightforward and transparent" (Gros et al., 2021, p119). To overcome this issue of incomparableness, categories are weighted differently. Weighing the variables is done slightly different than the Gros et al. index, given there are ten categories instead of eight. Emphasis in weighting the categories will be placed on those stressing idealism (countering social injustice).

Tables 9 and 10 present the difference in weight assigned to the variables. The Idealist index is a combination of both pharmaceutical and non-pharmaceutical policies. To have an

equal representation of both, these categories are weighted equally at 40%. A large emphasis in the Gros index is placed upon closures (day-care, school, public area, and indoor), accounting for a total weight of 50%. For an idealist index, this is too high, as both a mass gathering ban, and a stay-at-home order also imply these things. And because NPIs totally account for 40%. Thus, these categories are lowered significantly, in which the four categories together now account for 10%, rather than 50%. Together with the mass gathering ban, face masks, and stay at home order (all accounting 10%), the total of NPIs is 40%. As said, also the pharmaceutical policies are weighted 40%. In this, it is chosen to put a greater weight on vaccination policies than hospital policies. Vaccination policies are seen most important in lowering Covid-19 incidence, this category has more idealist' basis in reducing social injustices, and a larger availability of monthly data compared to hospital policies supports this decision. Summing both up, brings a total of 80%, leaving a 20% allocation towards Covid passport policies, given the significant influence on both categories, and its idealist notion.

Table 9: Weights of Gros et al. index

CATEGORY	WEIGHT
CLOSURE: DAY-CARE	10%
CLOSURE: SCHOOL	10%
CLOSURE: PUBLIC AREA	20%
CLOSURE: INDOOR ACTIVITIES	10%
MASS GATHERING BAN	10%
FACIAL COVERING	10%
STAY HOME (POPULATION)	20%
TELEWORKING	10%
TOTAL	100%

Table 10: Weights of idealist index

CATEGORY	WEIGHT
CLOSURE: DAY-CARE	2.5%
CLOSURE: SCHOOL	2.5%
CLOSURE: PUBLIC AREA	2.5%
CLOSURE: INDOOR ACTIVITIES	2.5%
MASS GATHERING BAN	10%
FACIAL COVERING	10%
STAY HOME (POPULATION)	10%
COVID PASSPORTS	20%
VACCINATION POLICIES	30%
HOSPITAL POLICIES	10%
TOTAL	100%

The ECDC provides data on Covid-19 measures and the date they have been implemented. This makes it possible to compute a monthly index score of each category. Following Gros et al. (2020), "For the monthly index, we multiply each index value by the fraction of the month

for which the measure in question has been in force (p120). The unweighted score of a category (except the above explained masking category) is calculated by the following formula:

$$s_{it} = \sum_{n=1}^{N_i} \rho_{nt} v_n,$$

"Where Ni is the number of measures within the category i, Pnt the fraction of days in month t that measure i is in effect, and Vn the associated cardinal value of the respective measure." (p121)

Ignoring the comparability concerns, the index scores are summed up taking to account the above ascribed weights with the following formula.

$$S_t = \sum_{i=1}^{10} s_{it} w_i$$

(p121)

4.3: Study area

Given the limited timeframe of this thesis, a specific research area should be chosen to be able to conclude the study. When choosing the study area, several important factors should be taken into account. Firstly, it is of vital importance that the chosen countries provide the needed data to undertake the calculations. A perfect study area on other factors would be preferred, but if these countries lack the data, any further analysis would be impossible to carry out. The European Centre for Disease Prevention and Control (ECDC) provides Covid-19 data on NPIs and vaccination policy, including the date of implementation. For this reason, a first choice is made to focus solely on European countries. However, this does not narrow it down enough, as too many countries are part of this dataset.

Another point that benefits the choice for Europe is the difference in Covid-19 strategy. Albeit the goal of the study to analyse a country's level of idealism, the literature review showed differences exists. According to the ECDC, six countries implemented mandatory vaccinations (Austria, France, Germany, Greece, Hungary, Italy, Latvia, Poland). Besides, it is also known from the literature review that the Nordic countries (especially Sweden) carried out a quite loose Covid-19 strategy in the first experienced Covid-19 wave. One aspect to consider is the environmental impact, which might affect Covid-19 surge (section 1.1.2).

The first countries chosen to include in the study are the Nordic countries (Norway, Sweden, Finland, and Denmark). This because of Sweden's different Covid-19 response, allowing for a comparison with geographically close countries. A second choice is to include a fourfold of Western-European countries (The Netherlands, France, Germany, and Austria). This because their intrinsically similarities, but also difference in Covid-19 response, seen in vaccination mandates. Finally, Greece and Italy are added for this same reason, as they add the vaccination mandate aspect into the study. This will ultimately allow for a comparison between countries that include mandatory vaccination (Western and Southern Europe), and countries that abstain from mandatory vaccination (Northern Europe). However, given environmental and economic differences, caution has to be taken when comparing these regions. Therefore, large part of the analysis will also look at differences within these country groups, as this presents a lesser possibility of fallacies. The complete study area is pictured in figure 4.

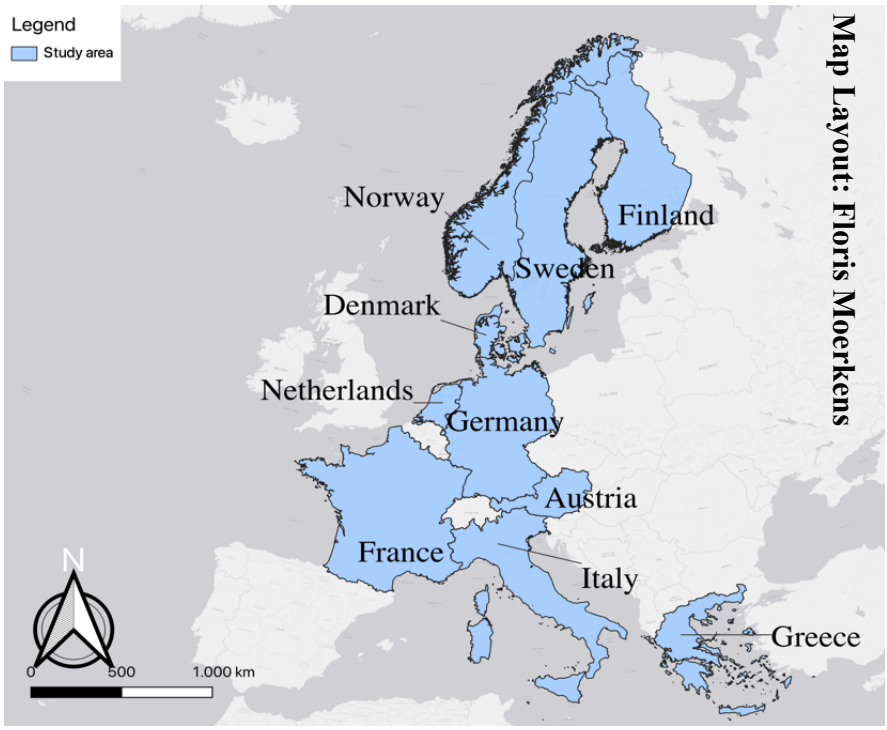

Figure 4: Study Area

4.3.1: Study period

Given that the idealist index focuses on both pharmaceutical and non-pharmaceutical policies, the chosen study period to analyse idealism is from July 1st, 2021, towards March 30th , 2022. The choice for July 1st is based on the implementation of the EU digital Covid-19 certificate. Although this certificate implementation focussed on facilitating travel within the EU, it also provided countries with the digital infrastructure, allowing them to implement national Covid-19 passports (Rijksoverheid, n.d.). Since a big part of the idealist index focuses on Covid-19 passports, and also vaccinations, a study period prior to this would not work, since these policies were not yet implemented (vaccinations started earlier but takes time to vaccinate a significant percentage of the population).

An affiliated problem of the chosen study period is that data and occurrences prior to this study-period are not included in the analysis. This matters especially regarding the Covid-19 death rate and the experienced excess mortality. If a country experienced a very high death rate and excess mortality prior to the study-period, it is likely to suffer less deaths and excess mortality (given large share of elderly that has passed away already). Also, the opposite is true, if a country has experienced low mortality the first two years, it is more likely to have a higher excess deaths statistic after. Since the analysis includes cases, deaths, and excess mortality, rather than one singular statistic, the possible impact of this is regarded less, but still important to keep in mind when making assumption based on these statistics in chapter 5.

4.4: Data gathering

As briefly mentioned above, the main data source used is derived from the ECDC, that keeps an updated overview of government issued Covid-19 health measures. The dataset contains European countries and their Covid-19 response, date of implementation and end date. This will make it able to calculate a monthly index score based on which measure is in place what fraction of the month. For example, the dataset shows: "Austria","ClosDaycare",2020-03-16,2020-05-04 and "Austria","ClosDaycare",2020-11-17,2020-12-07. The data shows which country implements what measure (Closure day-care) and both the date of implementation and end. An example is portrayed in Appendix A. However, this dataset solely provides the necessary data on NPIs, and not on vaccination and hospital policies.

Besides this government response tracker dataset, The ECDC provides a different policy report on vaccination by countries. This document shows what vaccination policy is carried out by which country. However, a date of implementation and end date in this report is

lacking. It just states which countries have mandatory vaccination, or which countries recommend vaccination towards kids aged 5-11 years old. This presents a possible problem in which not a monthly score cannot be calculated, but merely a representing index score based on whether such policy is implemented can be used. To solve this problem, it will be necessary to assess the beginning and end dates of specific policies individually through an internet search. For example: The ECDC shows that a certain country has implemented a partial vaccination mandate, the next step will be to do a concentrated search on when this policy was implemented, and if it is still in place. For example: vaccine passports have been used in Austria according to the ECDC vaccination policy document. Searching on google on "Austria Covid-19 passport implementation", data is obtained that a 3G implementation of Covid-19 passports (testing still allowed) was implemented. From the 8th of November, this changed towards not allowing testing for entrance, switching the policy from 3G towards 2G (making it a full Covid-19 passport implementation according to table 3. This same method has to be utilized for hospital policies, as this data is not widely available. An overview of the (raw) dataset that is not compiled by the ECDC is added in appendix B.

4.4.1: Covid-19 & Demographics data

To allow for a comparison between a country's idealist score, and Covid-19, Covid-19 statistics have to be used for the same specific months as the idealist score is calculated. This is important because the level of idealism is calculated in these specific months (4.3.1). Comparing this to the totality of Covid-19 statistics would present false results, as in an earlier stage, Covid-19 policy might have been more or less idealist, resulting in an unfair comparison. To overcome this problem, Covid-19 statistics (cases, deaths, excess mortality) have to be calculated for the months July 2021 until March 2022.

Regarding Covid-19 cases and deaths, data is provided by the ECDC, that provides data on daily Covid-19 cases and deaths. This data is publicly available on their website. To retrieve monthly Covid-19 statistics, the data is added up accordingly. Calculating the Covid-19 cases and deaths per 100.000 is done by accounting for the countries' population size. Excess mortality statistics are downloaded from Our World in Data (2022), that provide weekly excess mortality statistics (Appendix B). Since it is weekly data, the first week that is utilized is the week starting from July 4th. Another minor problem is that not all countries have provided data until the end of march. Most countries have provided data for 37 or 38 weeks. However, Italy and Greece both respectively only provided data for 31 and 32 weeks. As excess mortality is

calculated as an average this means the total data has to be divided by 31 or 32, compared to the 37 or 38 from other countries. This is not optimal, as February and March are not taken into account for these countries, but it is the best option given the available data. Also, since Covid-19 deaths specifically are analysed as well, there is no fixation on excess mortality specifically. Finally, demographic data on overweight and age statistics are acquired from Eurostat (2019) (see appendix C).

4.4.2: Missing data

During data collection, a few minor problems occurred which have been dealt with as follow. Within the implementation of Covid-19 health passes, an implementation date for Norway could not be found. An article by Chini (2021) states that Norway will implement 'vaccine certificates' from early June. On the 24th of June, Norway implemented the verification of the EU Covid-19 Vaccination passport. Another article states that Norway intends to use the health pass to open up society more and earlier. Since the system was approved on June 24th, this date has been used as the implementation date. Other sources confirm that this first period ended on September 25th (Klesty & Solsvik, 2021).

Regarding the recommendation to vaccinate children aged 5-11, Austria lacks a clear date this recommendation was given. According to the ECDC report, Austria recommends vaccination in this age group for all. An article from Euronews (2021) states that a large-scale child vaccination campaign has started, aimed at vaccinating children from 5-11 on the 15th of November, this date is used as implementation date. The EDCD (2021) states that Norway issued a wide recommendation towards vaccinating children. However, a government issued statement reads the following: "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." (Ministry of Health & Care Norway, 2021). This government issued data is followed.

4.5: GIS mapping

Geographical information systems [GIS] allows to understand the spatial dimension of Covid-19 (Franch-Pardo et al., 2020). Within the Covid-19 and GIS literature, five distinct categories can be found. These categories have great overlap with the earlier discussed factors that affect Covid-19 spread. A first application of GIS in Covid-19 research is the ability of 'spatiotemporal analysis'. GIS and spatial statistics can be deployed to analyse the spatial

spread over time and help mitigate through providing scientific information of spatial correlations in finding transmission dynamics (Franch-Pardo et al., 2020; Xiong et al., 2020). Spatiotemporal analysis showed to be helpful during the outbreak of the pandemic, as it allowed to understand the characteristics of patients, as is seen in Guan et al. (2020). Besides spatiotemporal analysis, other use cases include mapping related health problems (Franch-Pardo et al., 2020), environmental impacts on disease (Oto-Perilías, 2020 Coccia 2020), Data mining, and web-based mapping (Franch-Pardo et al. 2020).

Within this thesis, GIS plays a minor supporting role in depicting the results of the idealist index, and the Covid-19 cases, and deaths in the study area.

4.6: Analysis

The outcome of the idealist index will present monthly idealist levels per country. This allows for the comparison between highly idealist, and low-idealist countries in regard to their Covid-19 levels. Besides this, it will be possible to see the differences among the different groups of Countries (see section 4.3). Since only 10 countries are part of the dataset, most of the analysis will be of descriptive nature. In order to carry out a correlation analysis between two variables, certain assumptions have to be met, one of which is a linear relationship (given that the supposed analysis carried out would be a Pearson correlation analysis). If the scatterplot does show a linear relationship, and the other assumptions are met, possibly, a correlation analysis could be carried out. However, since the sample size is very small, and far lower than for example David (1938) recommends (n>25) (as cited in Bonet & Wright, 2000, p24), it is chosen not to perform this analysis. Thus, the scatterplot will be used to assess any possible relationship from a descriptive nature, without emphasizing the correlation coefficient given the large room for error. Besides analysing how different variables relate to each other, it is also interesting to analyse how the idealist index compares to the Gros et al. index, since it originated from it, and because the Gros et al. index takes up 40% of the idealist index. Again, plotting the relationship in a scatterplot will show the possible relationship between the two indexes. If certain assumptions are met, a correlation analysis could be carried out to see how strongly the two indexes correlate, since the n>25 is met in this case.

4.7: Relationship methodology, literature, and theory

Before continuing with the analysis part of this thesis, it is important to stress how the different parts of the thesis, especially the theoretical part and this methodological part, interact. The

literature showed the several geographical and social impacts on Covid-19. This has played an important role in deciding the study area. But also, the section on NPI and vaccine efficacy, not necessarily questioning whether those work, but more stressing the possible lower impact of those is an important aspect in combination with the adapted theory of idealism in lowering social injustices. Because if indeed over a long period of time, no large difference exist between very strong and very loose countries, why are all those measures implemented giving the economic and psychological consequences (section 1.2.3)

Chapter two has shown the duality between medical geography and health geography, and how the two fields differ from each other. Relating this back to the methodology, it is important to have an understanding from both sub-fields, as aspects from both fields are used in the methodology of this thesis. Medical geography, focussed mainly on disease mapping, and seeing disease as a result from its geographical location (environment, social interactions) is represented in calculating Covid-19 statistics per country, and mapping these as explained in section 4.5. As emphasized in chapter 1, Covid-19 is influenced by many other aspects than a country's Covid-19 policy, and this depiction of Covid-19 over these months is thus a result of the geographical location of these countries. Showing great resemblances to the field of medical geography.

Besides this aspect of medical geography, health geography plays a role in providing adequate theory explaining these results. Health geography has been characterized not only by applying theories, but actively developing social theories (Kearns & Moon, 2002). Within this thesis, both are utilized with the continuation of the developed social justice theory seen in human geography, but also theory adaption, as the idealist theory (stemming from political philosophy) is adapted as an explaining factor in differing Covid-19 policies. Ultimately, a combination of both medical and health geography allows for an analysis of Covid-19 policy and prevalence over this period, with an underlying theory that aims to explain the reasoning behind such policy.

Chapter 5: Analysis

This chapter will present the results from the idealist index and analyse the results between countries. The chapter is split up in three parts. The first part will focus on presenting the results from the idealist index, over the period July 2021-March 2022. This will present an overview of high-scoring idealist countries, and low-scoring idealist countries. Regarding this, the individual data will be analysed to see what makes countries score differently. As been emphasized in the introduction of this thesis, the ability to create such index fulfils the second sub-question of this thesis (how can an index be developed that measures a country's level of idealism?), regardless of the ability of the idealist index to explain Covid-19 unevenness. The second part of the analysis utilizes this data and will look at the relationship between a country's idealist level and Covid-19 statistics, as is explained in section 4.6. Both the comparison between high and low idealist countries, as well as comparing countries of the same 'group' is of interest. In the final and third part, the results of the index will be compared to the Gros et al. index, to see how the two indexes compare, given the similarity in methodology and data source, but alteration of used categories.

5.1: Idealist results

The results of the idealist index are presented in table 11. (Besides table 11, appendix E shows an example of the raw scores in Excel). Starting with the Nordic countries, they all score relatively low, especially Sweden with an average of 11,9. The country's low score is the result of the absence of NPIs applied in this period. A mass gathering ban in the beginning, and the introduction of vaccine passports (2G variant) in the months December and January make the average go up to 11,9. Denmark, Finland and Norway show similar idealist levels, where the main difference is that Finland scored very low the first months but upped their restrictions and thus idealist level. The seen increase is mainly caused by both small NPI implementations (mass gathering bans), and the recommendation for children to vaccinate.

Austria, France, Greece, Italy. and to some extend Germany are high-ranking countries. A similarity between these countries is that they have all implemented some sort of vaccination obligation. But also, NPIs are seen, as stay at home enforcements were implemented in Austria and France. Also, Masking obligations were seen in all these countries. The country that is left and does not really it in either category is The Netherlands, that scored 29,5 overall and could be seen as a medium idealist country. They score lower than the just mentioned given the

absence of mandatory vaccinations and allowance for testing (3G) within their Covid passport policy.

The results of Table 11 are also visibly presented in figure 5, that shows the monthly fluctuation of countries and their idealist score. This figure depicts the mentioned increase around December well, and also shows a decline for most countries in March 2022. The only country experiencing an increase in March 2022 is Germany. Analysing the individual dataset, this increase is the result of the partial vaccine mandate that came into force for health-care workers.

Table 11: Average and monthly idealist score per country

	Avg.	**Jul/21**	**Aug/21**	**Sep/21**	**Oct/21**	**Nov/21**	**Dec/21**	**Jan/22**	**Feb/22**	**Mar/22**
Austria	**40,1**	14,9	20,0	24,9	24,9	47,2	65,1	64,3	68,0	32,0
Denmark	**19,2**	26,4	16,4	8,4	4,6	11,1	33,0	33,8	19,7	19,7
Finland	**18,4**	5,5	4,8	9,6	14,7	14,6	28,1	29,7	29,5	29,5
France	**42,6**	14,6	28,7	34,6	38,3	45,5	53,3	58,8	62,9	47,2
Germany	**38,5**	19,6	23,1	28,7	28,7	31,8	47,9	53,0	53,0	60,6
Greece	**45,4**	14,5	19,3	36,7	33,1	36,2	60,9	71,2	71,0	65,8
Italy	**46,2**	18,1	27,5	29,8	29,8	29,8	66,8	75,8	70,6	67,8
Netherlands	**29,5**	12,6	13,0	14,6	22,6	25,8	49,8	54,9	41,5	31,2
Norway	**19,8**	19,0	19,3	17,2	6,7	13,1	21,6	27,7	22,5	31,2
Sweden	**11,9**	14,7	14,7	14,2	3,0	3,0	13,0	18,5	15,9	10,5

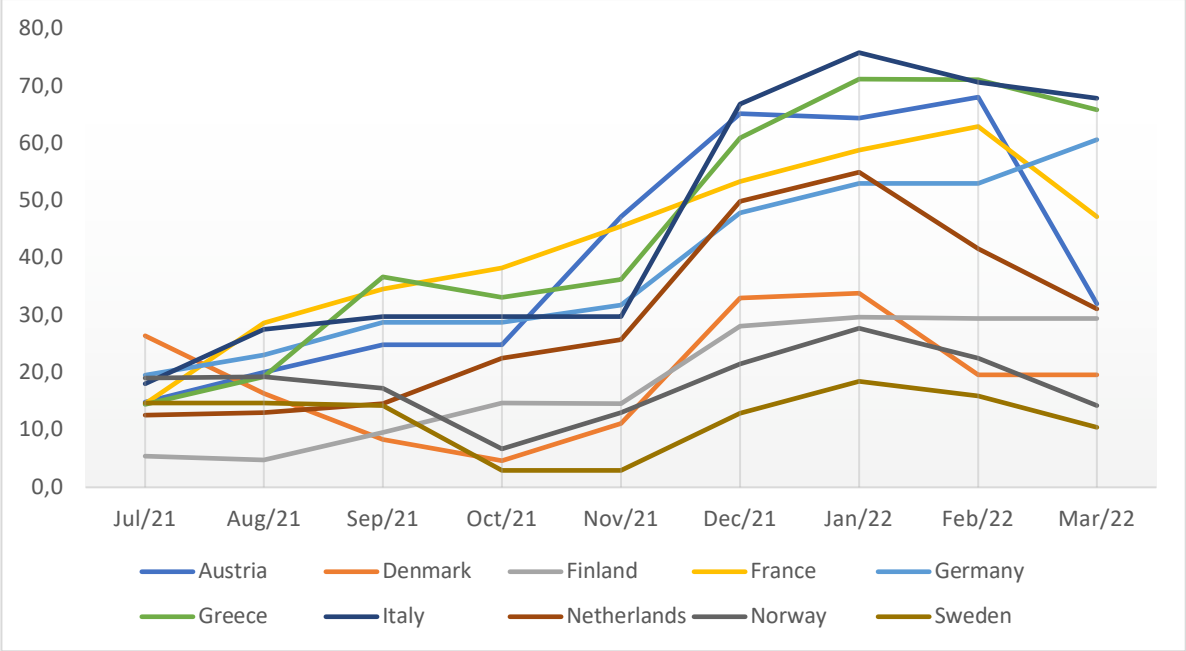

Figure 5: Covid-19 Policy Idealism

5.2: Idealism, Covid-19 & other determents

How does a countries' idealist level compare to their Covid-19 levels? Table 12 presents an overview of a countries' idealist level (as presented in section 5.1), their Covid-19 prevalence measured in cases, deaths and excess mortality, and statistics focussed on demographics and health (aged population, overweight). Before analysing some possible relations, some initial thoughts will be given when just analysing the table. Looking at Covid-19 cases/100k first, Denmark has seen the highest incidence of Covid-19, followed by the Netherlands (both relatively low idealist scores). Lowest cases are seen by Sweden and Finland, that both have a very low level of idealism. Looking at deaths, Greece is a clear outlier with far more average deaths than the other countries at 134/100k. The Netherlands experienced the lowest death rate among all countries. Excess mortality is very low in both France and Sweden. Once again, Greece is very high compared to the other countries. Both demographics and overweight prevalence look quite similar among countries, with Finland and Greece having a slightly higher overweight population. Looking at the overweight share of the 75+ population, Finland, and Greece show to be a bit higher than the other countries. Denmark, Norway, and Sweden score relatively low.

Table 12: Covid idealism and prevalence

Country	Idealist Score	Covid cases	Covid Deaths	Cases /100k	Deaths /100k	Excess mortality (%)	Demographics (%65+)	Overweight Prevalence (%)	Overweight 75+ (%)
Austria	40,1	3.253.311	5105	36.550	57	10,1	19,2	52,2	58,7
Denmark	19,2	2.671.239	3020	45.876	52	7,5	20,1	50,4	50,5
Finland	18,4	799.752	2345	14.474	42	9,3	22,7	59	65,7
France	42,6	19.839.542	31191	29.470	46	4,0	20,7	47,2	53,6
Germany	38,5	17.737.808	39501	21.328	47	6,1	22	53,3	57,4
Greece	45,4	2.607.973	14394	24.331	134	22,3	22,5	57,6	68,8
Italy	46,2	10.382.445	31817	17.408	53	8,8	23,5	45,7	55,0
Netherlands	29,5	6.174.383	4237	35.469	24	9,4	19,8	50,0	54,3
Norway	19,8	1.275.402	1724	23.761	32	9,4	17,9	50,6	49,2
Sweden	11,9	1.398.136	3816	13.538	37	3,7	20,1	51,3	52,4

5.2.1: Idealism & Covid-19 cases

Figure 6 portrays the idealist results of section 5.2 in combination with the Covid-19 cases/100k people per country. The divide explained in section 5.2 is clearly visible as the Northern countries are portrayed very lightly, and the southern countries very dark (low vs high idealism). Besides the idealist score per country, the figure also shows the Covid-19 case/100k. Analysing the scatterplot in figure 7, there is no expected relationship between a country's idealist level and a country's Covid-19 cases. There are countries with a very low idealists score (bottom left, marked in green), but also countries with a high idealist score, having similar Covid-19 case levels. For example, Denmark is seen scoring the highest cases with a relative low idealist score.

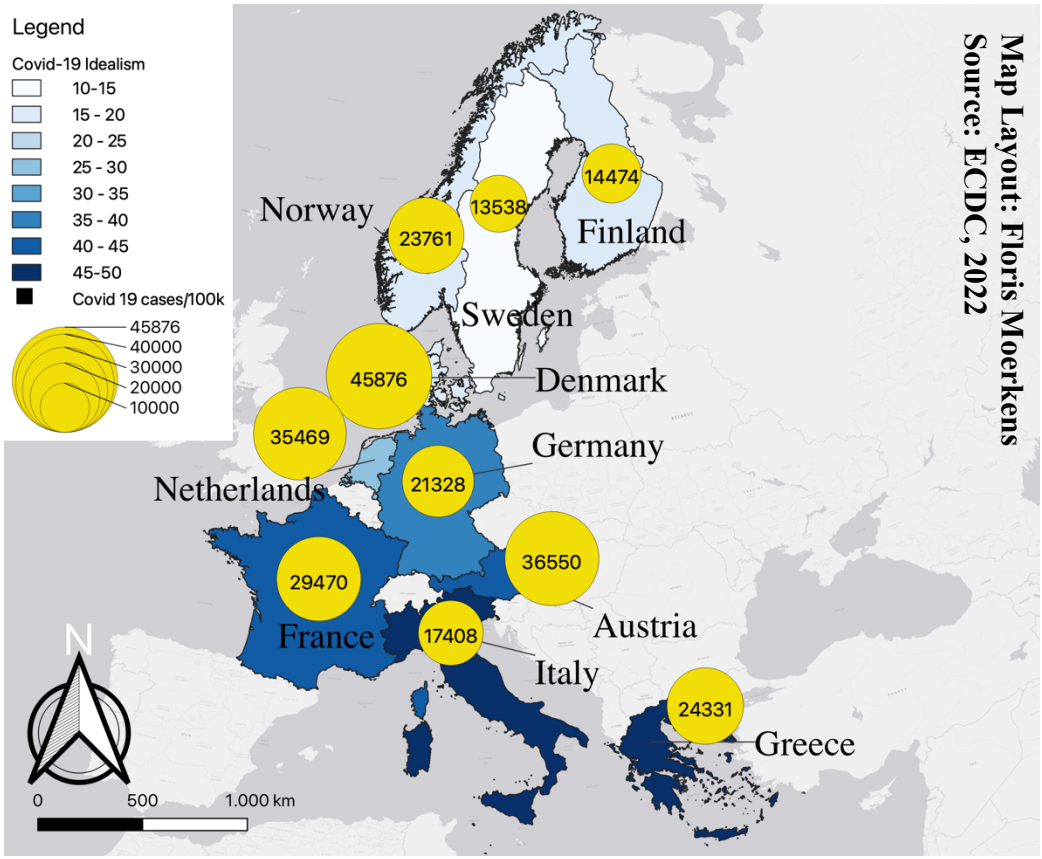

Figure 6: Covid-19 Idealism and Covid-19 cases/100k

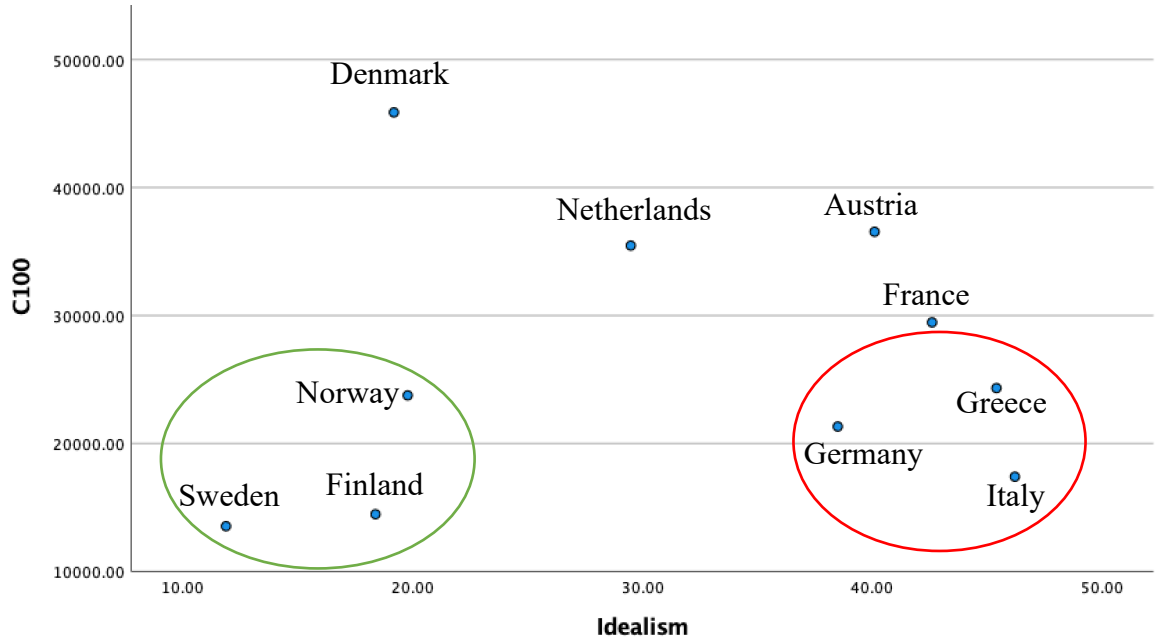

Figure 7: Scatterplot Idealism by Covid-19 cases/100k

5.2.2: Idealism and Covid-19 deaths

Figure 8 portrays a similar map seen in section 5.2.1, but the map now displays deaths/100k instead of cases. Figures 8 and 9 present the scatterplot comparing idealist levels (horizontal axis) with respectively deaths/100k and excess mortality (vertical axis). As seen in both figures, there is no visible relationship between the two variables and a country's level of idealism. See again the distinction made between the green and red circles that shows that both low and high idealist countries have similar death levels. This hints that during these nine months, and for these ten countries respectively, a country's idealist level is not expected to correlate with Covid-19 deaths or excess mortality. As is seen in figure 8 and 9, both countries scoring a low idealist level, as a high idealist level see a similar deaths /100k rate. This same statement can be made when comparing idealism and excess death. A clear outlier in both figures can be seen, which is Greece. Both analysing deaths per 100k and excess mortality, Greece has a far higher level than another country.

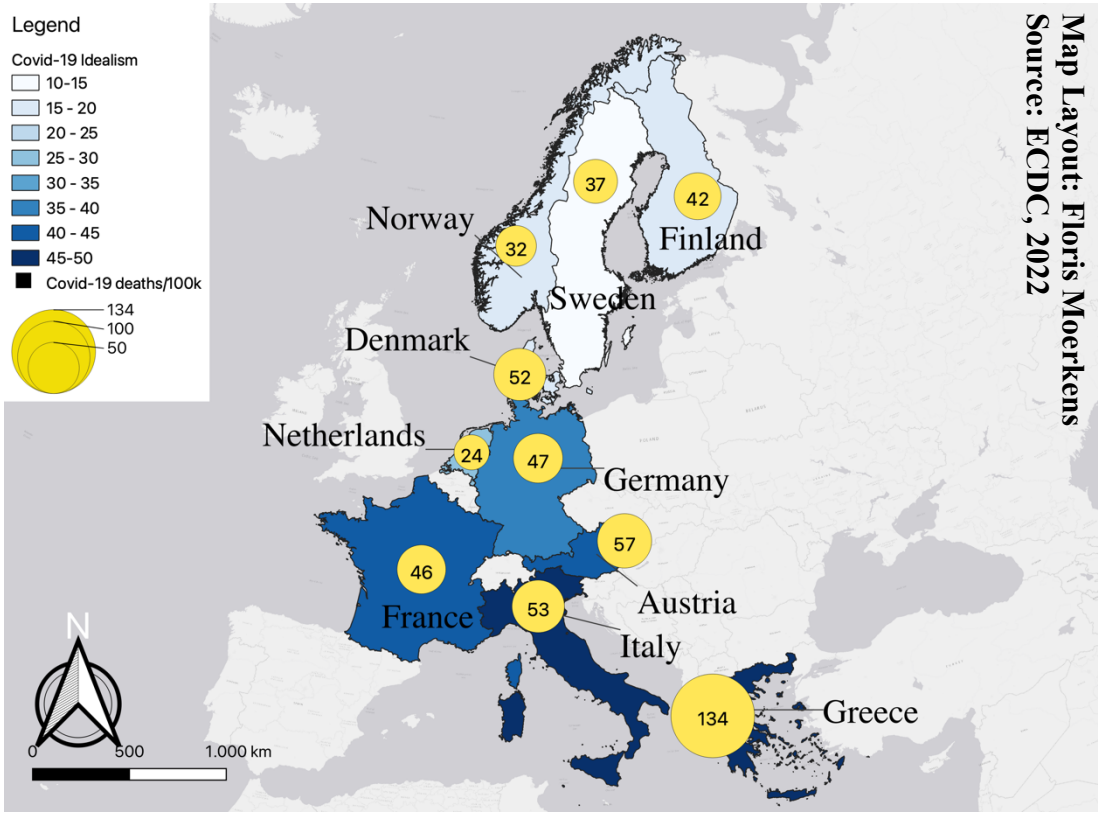

Figure 8: Covid-19 Idealism and Covid-19 deaths/100k

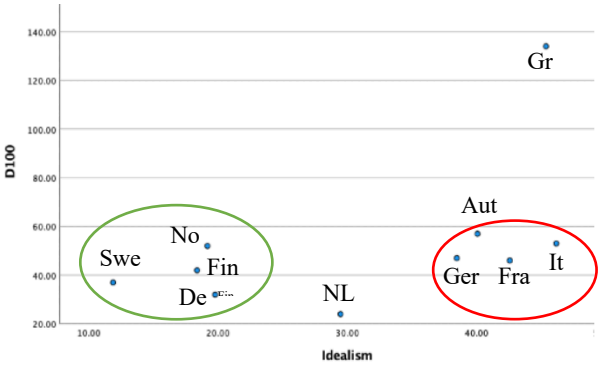

Figure 9: Scatterplot Idealism by deaths/100k

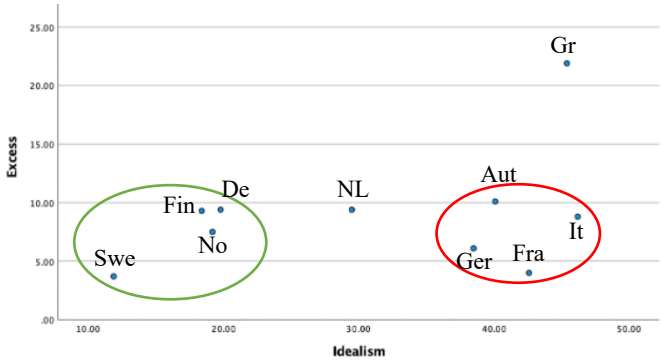

Figure 10: Scatterplot Idealism by excess deaths

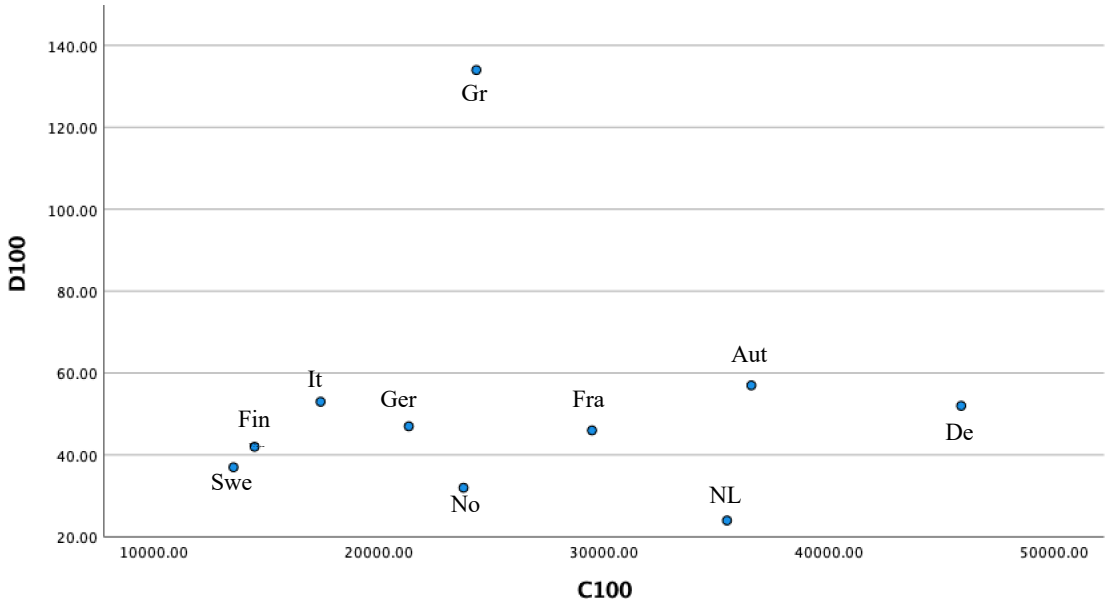

Figure 11: Scatterplot cases/100k by deaths/100k

Although visualizing the data in a scatterplot is just a first step withing a statistical analysis, it presents a first indication of the possible absence of relationship between idealism and Covid-19 over this period. An interesting support for the absence of relationship between idealism and Covid-19 is found when comparing a country's Covid-19 cases and death rate. Figure 11 shows the scatterplot, in which is portrayed that a country's number of Covid-19 cases does not show a relationship with a country's Covid-19 death rate. Again, Greece is a large outlier, but analysing the remaining countries, no matter the Covid-19 cases/100k, Covid-19 deaths/100k are at a similar level.

5.2.2: Obesity & Covid-19

Besides idealism, two other indicators were added in the analysis to see how those affect Covid-19 levels (based on the literature, see section 1.1.3). As was seen in table 12, no big differences were seen when comparing a country's share in 65+ population and share of overweight people. Figures 12 & 13 show the scatterplot comparing the share of population above 75 that are also overweight with Covid-19 deaths and excess mortality. Both figures do not show any possible relation between the percentage overweight in the 75+ group and either deaths/100k or excess mortality. As Greece is a clear outlier, performing any statistical analysis could portray a false correlation, as its position in the top right corner will hint at a possible correlation. However, looking at the other countries, this view is not represented.

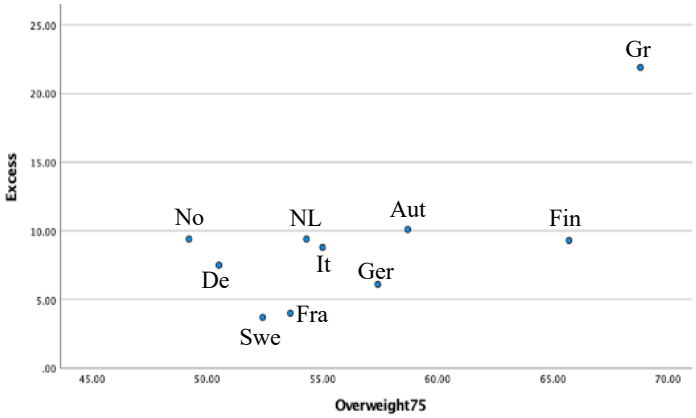

Figure 12: Overweight (75+) by deaths/100k

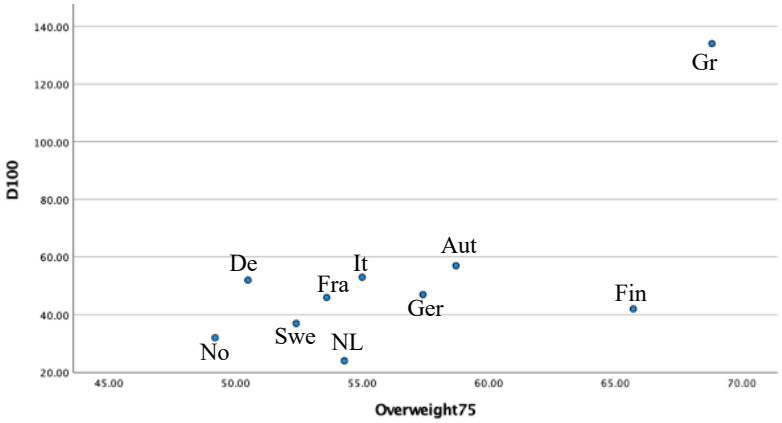

Figure 13: Overweight (75+) by excess mortality

5.2.3 Comparing inwards

As stated in the literature review of this thesis also other factors could influence Covid-19 prevalence within countries. This is why it is interesting not only to compare high idealist countries with low idealist countries, but also look within the specific country groups as divided in section 4.3. Within the country groups, assessed differences seem minimal. The Nordic countries all score low on the idealist index. Especially Sweden, although the main difference here is that Sweden abstained from recommending vaccines towards all kids aged 5-11 (Norway as well). When comparing Covid-19 deaths, Norway scores quite a bit lower compared to Denmark, while having a similar idealist level. The excess mortality statistic for Sweden is very low. However, the above disclaimer has to be reminded as a possible influence.

Western European countries all scored relatively high on the idealist index, with the exception being The Netherlands (mainly because of absence mandatory vaccination, and more lenient Covid passports). Comparing the death rate, The Netherlands actually scores the lowest

of this group (and all countries). When comparing excess mortality, France and Germany score a lower than Austria and The Netherlands.
Finally, the two southern countries experienced a high level of Covid-19 mortality. Also, their idealist level is regarded as high over this period. As Greece is seen a clear outlier, any comparison will automatically show Greece as the worst performer, despite having a slightly lower idealist score.

5.3: Relation towards literature & theory

The analysis in section 5.1 and 5.2 discovered the difference in idealism between countries but failed to see an indication that a country's idealist level relates to Covid-19 death rate or excess mortality. As the literature showed, several factors have an influence on the spread and death rate of Covid-19. Besides this, the literature review showed the effectiveness of NPIs on reducing Covid-19 (Talic et al., 2021; Bo et al., 2020). Also, the effectiveness of vaccination on both severe disease and infection were regarded as effective. However, this view is not represented in the analysis of idealism and Covid-19 incidence. Several possible explanations can be given when trying to explain this. A first possible explanation is that NPIs work especially well in reducing a Covid-19 peak in a short time period, but over a longer period (as in this study), the number of cases/deaths will equal later when restrictions are eased. Then, when the NPIs are introduced, it is likely to see a lower initial Covid-19 number. However, over a larger time frame, the effectiveness of these individual NPIs is less visible.

The central idea within this thesis of assessing a country's idealist level stems from the theoretical framework based on social injustice literature. "The research implies that it is unjust that some people are denied access to care because of where they live; who they are; the absence of services in their neighbourhoods; or the presence nearby of sources of pollution." (Rosenberg, 2014, p470). Relating this towards the Covid-19 pandemic, this should be interpreted that it is regarded 'unjust', that people are suffering more from Covid-19 because of their age and because of underlying health conditions. The problem that arises here is that it is regarded that the implementations of both NPIs as pharmaceutical policies will reduce this socially unjust situation. This study covering ten countries over nine months does not show reason to support this claim. This is especially true based on the indication that a country's Covid-19 cases does not show to relate to the Covid-19 death rate (figure 8).

The extent to which a country is willing to implement Covid-19 measures to fight Covid-19 is expressed as idealism. Figure 14 shows the meaning of low and high idealism as

originally portrayed in figure 2. The low scoring (Nordics) countries regard the socially unjust situation within Covid-19 as something inherent to the disease. High scoring idealist countries implemented more NPIs and pharmaceutical policies, hoping to lower the socially unjust situation. The results of this thesis give reason to believe that a realist view, connected to a non-idealist stance is possibly a more useful stance than a utopian viewpoint. Although literature suggest both NPIs and vaccination work in a in a given time-period, over a longer period, (with for example virus mutations), a utopian stance seems to remain utopic. When looking back at the literature, the study of Born et al. (2020) found that implementing a lockdown would not have resulted in lower cases. Fokas et al. (2021) found that easing lockdowns for specific age groups would not have a large impact on Covid-19 cases and deaths. The preliminary results of this thesis, with the fallacy of only analysing nine months after the biggest peak shows reason to support these claims. Especially the study by Fokas (2021) presents an interesting take, as it specifically deals with the question regarding social justice. In no shape or form does this analysis show that government implemented policies have no effect on lowering Covid-19 incidence, but the results present a reason to further research the relationship between idealism and Covid-19, to see if these results remain in a larger and longer study.

5.4: Relatedness to Gros et al. index

Given the partial overlap with the Gros et al. index, it is interesting to see how results from both indexes compare. However, the Gros index and results have been published for a given time period that is different than the one used in this thesis. So, to be able to compare outcomes, the Gros et al. index has to be calculated for the same months as the idealist index, which is simply done by changing the weight of the index scores, taking out pharmaceutical policies and covid passes, and add teleworking back in. Doing this, the results of the Gros et al. index for the given time period is displayed in table 13. The differences between the two indexes are portrayed in figures 15 and 16. The causation of the seen differences will be further discussed. in section 5.4.1.

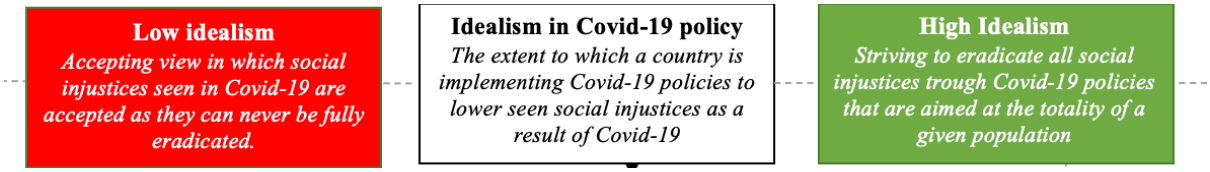

Figure 14: Low and high idealism

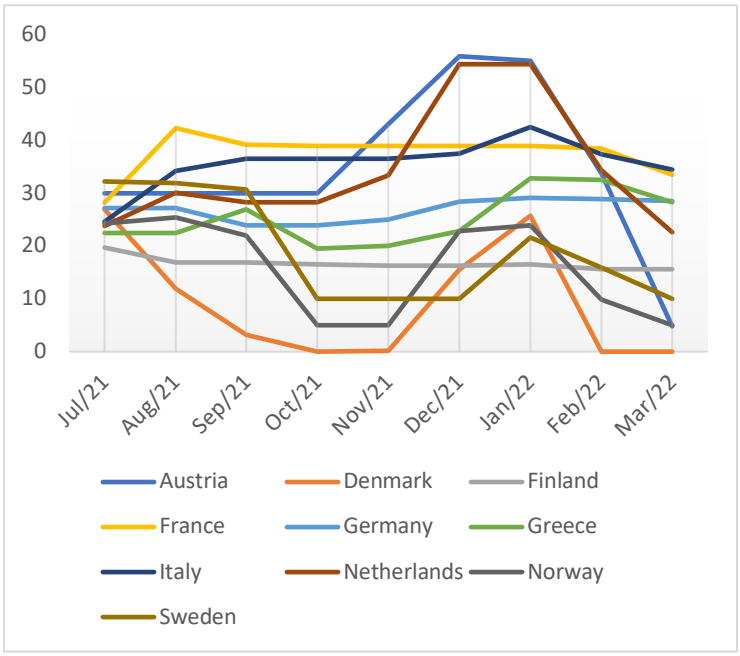

Figure 15: Results Gros et al. index

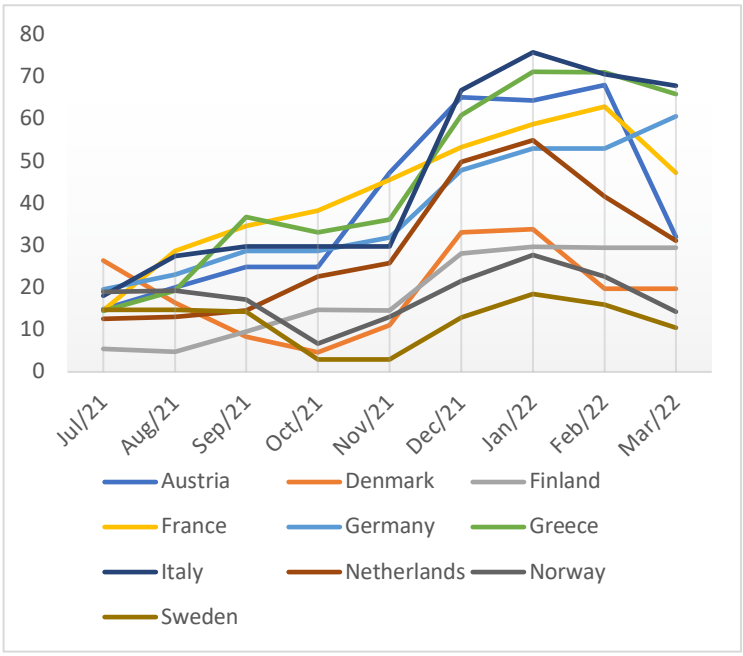

Figure 16: Results idealist index

Table 13: Results Gros et al. (2021) index

	Agg.	Jul/21	Aug/21	Sep/21	Oct/21	Nov/21	Dec/21	Jan/22	Feb/22	Mar/22
Austria	34,7	30	30	30	30	43,1	55,9	55	33,7	4,8
Denmark	9,3	26,9	11,9	3,2	0	0,1	15,6	25,75	0	0
Finland	16,7	19,7	16,9	16,9	16,5	16,3	16,3	16,5	15,6	15,6
France	37,5	28,2	42,3	39,2	38,9	38,9	38,9	38,9	38,5	33,5
Germany	26,9	27,2	27,2	23,9	23,9	25	28,4	29,1	28,9	28,5
Greece	25,3	22,5	22,5	26,9	19,5	20	22,8	32,8	32,5	28,3
Italy	35,6	24,6	34,2	36,5	36,5	36,5	37,5	42,5	37,4	34,5
Netherlands	34,4	23,8	30,1	28,3	28,3	33,3	54,4	54,4	34,3	22,6
Norway	15,9	24,3	25,4	22	5	5	22,8	23,9	9,8	5
Sweden	19,1	32,2	31,9	30,7	10	10	10	21,6	15,9	10

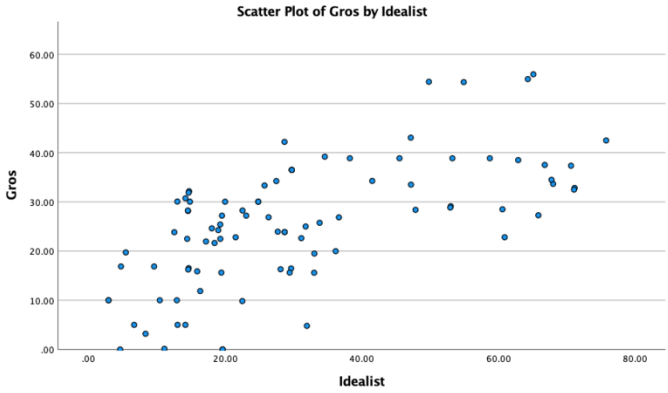

Figure 17: Pearson R correlation Gros by Idealist (N=90)

		Idealist	Gros
Idealist	Pearson Correlation	1	.644**
	Sig. (2-tailed)		<.001
	N	90	90
Gros	Pearson Correlation	.644**	1
	Sig. (2-tailed)	<.001	
	N	90	90

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 18: Correlation outcome

The scatterplot, displaying the interaction between the idealist index, and the Gros et al. index, is displayed in figure 17. As is seen in the figure, although not perfectly, the scatterplot suggests a linear correlation between the Gros et al. index and the idealist index. Since this time the number of cases is a lot larger, it is possible to perform the Pearson R analysis, that looks at the level of linear correlation. Performing this, a correlation of 0.664 is found (figure 18). This hints at a moderate positive correlation (statistically significant).

5.4.1: Causation of the differences

Why the correlation statistic is not higher than the observed 0.644 is mainly down to two reasons. The first one being the different country responses between NPIs and pharmaceutical policies. In both indexes the Nordic countries score low in respectively implemented policies and idealism. The difference being Sweden scores lower on the idealist index given the lower policies on vaccination. Denmark scores the lowest (9,3) on the Gros index, compared to19,2 on the idealist index, hinting that they implemented several policies dealing with the pharmaceutical side or Covid-19 passports. Analysing the data, it can be seen that Denmark both implemented Covid-19 passports, as well recommended vaccination towards 5–11-year-olds.

A big difference can be seen when analysing the Netherlands. In the idealist index the country scored 29,5, in-between the high and low idealist countries. Within the Gros et al. index, The Netherlands scores 34,4 and is among the groups with the highest score. This difference is the result of the relative absence of pharmaceutical policies (no mandatory

vaccination, lenient Covid-19 passport). However, the Netherlands implemented a relatively large number of NPIs (given the high score on Gros et al. index), which gets balanced out within the idealist index given the low number of pharmaceutical policies. Country differences like these are one of the possible reasons the two indexes do not show a larger correlation coefficient.

The other possible reason explaining the difference between the indexes are the added variables within the idealist index that are more static by nature. The partial vaccination mandate, implemented by four of the countries, is implemented on a specific date, to be continued throughout the whole study period. The same could be said about the recommendation of vaccination children aged 5-11. This is not necessarily a negative associated with the choice for these specific variables, but more their characteristics in just being less fluctuating. Finally, the hospital policies are static as a direct result for choosing to cope with the seen problems in this way. This results in a guaranteed static number throughout the whole study period, which will automatically lead to a lower correlation statistic.

Chapter 6: Discussion & Conclusion

6.1 Reflection on the methodology & results

The creation of the idealist index stems from both the literature review and theoretical framework of this thesis. The absence of vaccination and hospital policies in similar indexes (from a mandatory perspective) presents a new way of analysing the total array of Covid-19 policies. Having completed the analysis in chapter 5, some follow up reflections will be given on my thoughts regarding the created index, what could be improved, the 'absence' of relationship between idealist policy and Covid-19, and finally some further suggestions for research.

The idealist index could be seen as an extension of the Gros et al. index, of which pharmaceutical categories have been added. Given the opposing views seen in the literature review, and the societal question whether long periods of Covid-19 measures are proportionate towards the virus, I believe the developed framework from an idealist viewpoint are helpful to analyse Covid-19. Although the adaption of a specific theory is not a necessity, as research could also solely focus on government measures (both pharmaceutical and NPIs), adding in the theory could help explain the underlying drivers. And as the conceptual framework showed, the idealist theory describes almost exactly the divergence of Covid-19 policy.

In a hypothetical scenario of continuing this study, or using this as a future reference, I do have some suggestion for alterations of the idealist index. I believe the assigned weight distribution (40%-40%) is fair, so that both pharmaceutical policies and NPIs are equally represented within the index. So, I would suggest keeping the weights the same. However, given the low number of variables within the added pharmaceutical policies, a large weight has come on these single or double variables. The prime example of these are the vaccination policies. Having a weight of 30%, given the significance in idealism, a large share of the index is dictated by this. However, only two different variables make up for this variable (vaccine mandates and recommendation vaccinating children aged 5-11). This resulted in a disproportionate weight towards this latter variable. I believe this category is important, given the inherent idealist notion of protecting elderly by vaccinating children. But currently this variable is overrepresented. To cope with this, I would suggest adding more variables within the category of vaccination, rather than lowering the weight, because as said, I think the 40-40 divide is fair.

Regarding for the used solution of the hospital policies, I believe this solution presented to be adequate regarding this thesis. However, it would be preferred to actually implement

these hospital policies. One important addition, which was not possible to implement within this timeframe, but what would add a lot of value towards this topic is the addition of hospital policies regarding who receives treatment. Within the Covid-19 pandemic, several countries being overrun had to stop regular treatment/care because of the of the capacity of the hospital and ICUs. This would add a whole new dimension into the social justice theory, as it presents questions like: Why do Covid-19 patients receive a favourable treatment position opposed to other patients?

This hints at the suggestion towards further research, which this is indeed one of. Another suggestion would be to extend this study, with the alteration of the variables, and analyse more countries/ over a longer period. If a longer period is chosen, large alterations have to be made, because at the start there were no vaccinations and Covid passports, but more emphasis could be placed in this time period regarding the hospital policies. If the same time period is chosen with more countries, it would be interesting to see if the preliminary results will also show in a larger study area. A final concern regarding this is the need for adequate data. The ECDC provides data on government implemented NPIs, but this just accounts for Europe. Regarding the rest of the world, it would be impossible to calculate such index numbers since the data is not there. Even regarding Europe, vaccination policies, hospital policies and the implementation of Covid passports is not sufficiently documented. This resulted in having to gather the data one by one, which has cost a lot of time. Given the significance of Covid-19, and the need of research like this towards a better understanding of the influence of policies, datasets like the one available regarding NPIs should be constructed for pharmaceutical policies as well.

6.2 Conclusion

The central aim of this thesis has been to analyse Covid-19 unevenness from the geographical, societal and policy level, and regard the possible effects they have on each other, with an emphasis on the influence of government policies on geographical and societal unevenness. A combination of the distinct chapters making up this thesis allows for an answer towards all the sub-questions, and main question of this thesis. The literature review showed the importance of geographical and societal difference in Covid-19 prevalence. But also, other factors as environment and institutionalism were discussed, paving the way for the chosen study area. Finally, this section showed a first introduction to similar Covid-19 measure indexes and gave

a rough idea of which countries have been strict/ lenient, over a different time period than this study.

The theoretical framework started with an overview of both the sub-disciplines of health and medical geography. This distinction has shown to be important, because aspects from both disciplines have been utilized within this thesis. One of the core characteristics within (new) health geography is theory adaption and creation. This exact concept is utilized by adapting a theory from political philosophy, and applying it firstly to health geography, and even more concretely into Covid-19. Answering the first sub-question *How can idealism, (regarded as the extent to which a country is willing to go in implementing Covid-19 measures to lower social injustices), be conceptualized from a theoretical perspective?* Idealism has been conceptualized from both a theoretical and methodological perspective. This is well depicted in figure 2. Theoretically, Covid-19 idealism is conceptualized utilizing the same distinction made by Rosenberg (2014), focussing on the three distinct dualities (full vs partial compliance, realist vs utopian and end-state vs transitional). From a methodological point of view. Idealism is conceptualized by the totality of Covid-19 measures, which account for both NPIs (as seen by Gros et al. 2021), and pharmaceutical policies.

The second sub-question dealt with the creation of an idealist index. *How can an index be developed that measures a country's level of idealism?* Following Gros et al. (2021), a similar methodology has been applied. Utilizing a cardinal scale, several categories of health measures can be put into a number to ultimately create an index. Compared to the Gros index, pharmaceutical policies have been added to transform the original index into an index measuring idealism from a more social justice point of view.

The next three sub-questions have dealt with the results of the index. *How do countries compare on the idealist index? And how does Covid-19 prevalence differ between the countries?* As is discussed in 5.1, the Nordic countries have a low idealist score, compared to Western and Southern European countries. By analysing the scatterplot, idealist levels do not seem to have a relationship towards a country's Covid-19 case or death rate. Also, the other factors expected to show a relationship did not seem to have a relationship towards Covid-19 deaths and excess mortality (answering the fourth sub-question: *Compared to other known factors that affect the level of Covid-19 deaths (e.g., age and/or overweight), how well does a country's idealist level explain geographical unevenness?)*. The last sub question was stated as follow: *How does a constructed idealist index compare to a stringency index that is solely focussed on government measures from an NPI view?* The idealist index showed a moderate correlation towards the Gros et al index. This is ought to be caused by both a different policy

implementation, which is seen in for example the Netherlands (high NPIs, low pharmaceutical), and the characteristics of some of the added pharmaceutical categories, that have shown to be more static in nature.

Coming back the main question of this thesis, the question was stated as follow: ***To what extend have government implemented policies affected the geographical and societal unevenness seen within Covid-19?*** As is discussed above, regarding this nine-month study period, and for these ten countries specifically, government implemented policies (expressed as idealism) has not seem to effect geographical or societal unevenness within Covid-19. The literature showed the decline in efficacy of vaccinations, and ability of people to still contract Covid-19 after vaccination. The NPIs are mostly perceived as very effective. But for instance, Born et al. (2020) found no benefit of a hypothetical lockdown. The results of this study perhaps align mostly with statements made by Fokas et al. (2021), that paved the way for easing lockdowns age specific. Given the low death rate in young age groups, no seemed relationship between a country's Covid-19 cases and deaths, and psychological and economic impact on society (Courtney et al., 2020) it seems most logical to protect the vulnerable in a way that does not affect people not at risk. This would ethically bring new obstacles and questions, but it is an interesting take for the future.

However, several times within this thesis the plausible fallacies have been discussed when comparing Covid-19 statistics. This is even more so when analysing Covid-19 data on a country-scale, as large differences could also exist regionally. Therefore, the most important takeaway from this study is the succession in creating a theory-based index, that is able to capture the total array of Covid-19 policies. Results did not seem to suggest a relationship between Covid-19 and idealism, but as only 10 countries have been analysed, this is not a hard statement. Therefore, applying a similar framework with the suggested alterations in section 6.1 could be used in the future to see if a similar result will be found regarding a larger study area and period.

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Appendices

A. Response dataset ECDC (2021) example Austria

response_graphs_data_2022-03-04

Country	Response_measure	date_start	date_end
Austria	AdaptationOfWorkplace	2020-03-16	2020-04-13
Austria	AdaptationOfWorkplace	2021-04-01	NA
Austria	BanOnAllEvents	2020-11-03	2021-05-18
Austria	ClosDaycare	2020-03-16	2020-05-04
Austria	ClosDaycare	2020-11-17	2020-12-07
Austria	ClosHigh	2020-03-16	2020-09-30
Austria	ClosHighPartial	2020-11-03	2022-02-28
Austria	ClosPrim	2020-11-17	2020-12-07
Austria	ClosPrim	2020-12-26	2021-02-06
Austria	ClosPrimPartial	2020-03-16	2020-05-18
Austria	ClosPubAny	2020-03-16	2020-04-13
Austria	ClosPubAny	2020-05-02	2020-05-14
Austria	ClosPubAny	2020-11-16	2020-12-06
Austria	ClosPubAny	2020-12-28	2021-02-06
Austria	ClosPubAnyPartial	2020-04-14	2020-05-01
Austria	ClosPubAnyPartial	2020-05-15	2020-11-15
Austria	ClosPubAnyPartial	2020-12-07	2020-12-27
Austria	ClosPubAnyPartial	2021-02-07	2022-03-05
Austria	ClosSec	2020-11-03	2021-02-07
Austria	ClosSecPartial	2020-03-16	2020-06-03
Austria	ClosSecPartial	2021-02-08	2021-05-16
Austria	EntertainmentVenues	2020-03-16	2020-04-30
Austria	EntertainmentVenues	2020-11-03	2021-02-07
Austria	EntertainmentVenuesPartial	2021-02-08	2022-03-04
Austria	GymsSportsCentres	2020-11-03	2021-05-18
Austria	GymsSportsCentresPartial	2021-05-19	2022-03-04
Austria	HotelsOtherAccommodation	2020-03-31	2020-05-29
Austria	HotelsOtherAccommodation	2020-11-03	2021-05-18
Austria	HotelsOtherAccommodationPartial	2021-05-19	2022-03-04
Austria	IndoorOver100	2020-03-11	2020-06-30

B. Pharmaceutical data complete

	A	B	C	D	E	F	G	H	I	
1		Measure								
2	Country	Covid pasports 3g	Covid pasports 2g	Partial 5-11 recommendations	Full 5-11 recommendation	Partial vaccine mandate	Full vaccine mandate	Vaccine pass		
3	Austria	15-08-21,8-11-21	08-11-21- 05/03/21	none	15/11/2021	none	01-02-22, 09-03-22	https://www.healthcareitnews.com/news/emea/covid-19-vaccine-p	https://www.thelocal.at/20211105/austria-new-covid-rules-restric	https://www.schengenvi
4	Denmark	06-04-21, 10-09-21; 12-11-21, 01-02-22	none	none	01/12/2021	none	none	https://www.theguardian.com/world/2021/aug/27/denmark-to-lift	https://apnews.com/article/coronavirus-pandemic-europe-denmar	https://www.france24.cc
5	Finland	16-10-21, 28-02-22	none	03/12/2021	none	none	none	https://stm.fi/en/the-covid-19-passport	https://www.helsinkitimes.fi/finland/finland-news/domestic/2045	https://valtioneuvosto.fi
6	France	09-08-21, 14-03-22	24-01-21, 14-03,21	15/11/2021	20/12/2021	15/09/2021	none	https://www.france24.com/en/live-news/20220303-france-to-sus	https://www.politico.eu/article/french-parliament-approves-covid-	https://www.campusfrar
7	Germany	23-08-21, ongoing	18-11-21-)17-02-22)* Partial(ongoing)	09/12/2021	none	15/03/2022	none	https://www.iamexpat.de/expat-info/german-expat-news/3g-rule-c	https://www.dw.com/en/covid-germany-introduces-new-measures-to-curb-the-pandemic/a	
8	Greece	15-07-21, ongoing	22-11-21, ongoing	none	13/12/2021	01/09/2022	none	https://gr.usembassy.gov/health-alert-vaccination-requirements-fo	https://www.covidpasscertificate.com/greece-eu-digital-covid-certi	https://www.arabnews.c
9	Italy	06-08-21,05-12-21	06-12-21-ongoing (may 1st*)	none	01/12/2021	05/01/2022	none	https://www.tuscanynowandmore.com/discover-italy/essential-ad	https://www.covidpasscertificate.com/italy-to-create-covid-green-p	https://www.schengenvi
10	Netherlands	25-09-21, 24-02-21	none	10/01/2021	18/01/2022 (implementation)	none	none	https://www.nu.nl/coronavirus/6184293/coronapas-in-de-ijskast-maar-wanneer-komt-hij-terug-of-verdwijnt-ie-definitief.html		
11	Norway	24-06-21**,25-09-21; 12-11-21, 17-02-22	none	14/01/2021	none	none	none	https://medicalxpress.com/news/2021-11-norway-reinstate-natio	https://www.regjeringen.no/en/aktuelt/vaccination-of-children-and-adolescents-against-cov	
12	Sweden	none	01-12-21, 09-02-22	27/01/2021	none	none	none	https://www.regjeringen.no/en/topics/koronavirus-covid-19/natio	https://www.schengenvisainfo.com/news/norway-starts-implemen	https://www.reuters.com

C. Excess death

SUM =SUM(E1109:E1145)/37

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	Entity	Code	Day	p_proj_all_a	p_proj_all_ages,ages											
2	Austria	AUT	05/01/2020	-11.72	-11,72		Country	Excess deaths								
3	Austria	AUT	12/01/2020	-9.28	-9,28		Austria	10,1	10,056316							
4	Austria	AUT	19/01/2020	-0.48	-0,48		Denmark	7,5	7,4958974							
5	Austria	AUT	26/01/2020	0.72	0,72		Finland	9,3	9,3302857							
6	Austria	AUT	02/02/2020	5.94	5,94		France	4,0	3,9935135							
7	Austria	AUT	09/02/2020	-9.38	-9,38		Germany	6,1	6,0592105							
8	Austria	AUT	16/02/2020	-6.06	-6,06		Greece	21,9	22,34625							
9	Austria	AUT	23/02/2020	-6.64	-6,64		Italy	8,8	8,7648387							
10	Austria	AUT	01/03/2020	-3.64	-3,64		Netherlands	9,4	9,3848718							
11	Austria	AUT	08/03/2020	-1.62	-1,62		Norway	9,4								
12	Austria	AUT	15/03/2020	-0.73	-0,73		Sweden	3,6	=SUM(E1109:E1145)/37							
13	Austria	AUT	22/03/2020	13.53	13,53											
14	Austria	AUT	29/03/2020	6.01	6,01											
15	Austria	AUT	05/04/2020	13.92	13,92											
16	Austria	AUT	12/04/2020	14.54	14,54											
17	Austria	AUT	19/04/2020	10.46	10,46											
18	Austria	AUT	26/04/2020	6.62	6,62											
19	Austria	AUT	03/05/2020	-0.26	-0,26											
20	Austria	AUT	10/05/2020	4.21	4,21											
21	Austria	AUT	17/05/2020	0.46	0,46											
22	Austria	AUT	24/05/2020	2.79	2,79											
23	Austria	AUT	31/05/2020	-1.09	-1,09											
24	Austria	AUT	07/06/2020	4.08	4,08											
25	Austria	AUT	14/06/2020	-0.11	-0,11											
26	Austria	AUT	21/06/2020	-0.97	-0,97											
27	Austria	AUT	28/06/2020	1.34	1,34											
28	Austria	AUT	05/07/2020	7.33	7,33											
29	Austria	AUT	12/07/2020	-0.97	-0,97											
30	Austria	AUT	19/07/2020	-3.09	-3,09											
31	Austria	AUT	26/07/2020	-3.71	-3,71											
32	Austria	AUT	02/08/2020	0.2	0,2											
33	Austria	AUT	09/08/2020	-0.86	-0,86											
34	Austria	AUT	16/08/2020	8.6	8,6											
35	Austria	AUT	23/08/2020	1.65	1,65											
36	Austria	AUT	30/08/2020	3.73	3,73											
37	Austria	AUT	06/09/2020	9.07	9,07											
38	Austria	AUT	13/09/2020	8.59	8,59											
39	Austria	AUT	20/09/2020	8.79	8,79											
40	Austria	AUT	27/09/2020	2.76	2,76											
41	Austria	AUT	04/10/2020	3.75	3,75											
42	Austria	AUT	11/10/2020	5.58	5,58											
43	Austria	AUT	18/10/2020	6.21	6,21											
44	Austria	AUT	25/10/2020	16.48	16,48											
45	Austria	AUT	01/11/2020	23.74	23,74											
46	Austria	AUT	08/11/2020	31.23	31,23											
47	Austria	AUT	15/11/2020	45.52	45,52											
48	Austria	AUT	22/11/2020	55.02	55,02											
49	Austria	AUT	29/11/2020	56,00	56											
50	Austria	AUT	06/12/2020	57.19	57,19											
51	Austria	AUT	13/12/2020	52.46	52,46											
52	Austria	AUT	20/12/2020	35.34	35,34											
53	Austria	AUT	27/12/2020	21.47	21,47											
54	Austria	AUT	03/01/2021	14.23	14,23											
55	Austria	AUT	10/01/2021	6.94	6,94											
56	Austria	AUT	17/01/2021	4.06	4,06											
57	Austria	AUT	24/01/2021	10.87	10,87											
58	Austria	AUT	31/01/2021	10.01	10,01											
59	Austria	AUT	07/02/2021	1.29	1,29											
60	Austria	AUT	14/02/2021	-5.55	-5,55											
61	Austria	AUT	21/02/2021	-6.33	-6,33											

Pharmaceutial data and dates | index table | covid cases & Deaths | excess deaths

D. Share of overweight population by sex and age, 2019 (%)

	Males	Females	Total						
	18 years or over		18 years or over	18 to 24	25 to 34	35 to 44	45 to 64	65 to 74	75 years or over
EU	60.2	45.7	52.7	25.0	39.3	49.7	59.8	65.7	59.3
Belgium	56.2	44.6	50.2	26.2	36.2	49.0	57.3	62.6	52.7
Bulgaria	64.3	46.3	54.9	23.2	37.2	48.8	63.4	70.2	62.6
Czechia	69.8	50.6	60.0	20.9	43.3	57.8	68.7	76.4	67.8
Denmark	57.8	43.3	50.4	26.0	40.0	50.1	59.6	57.6	50.5
Germany	60.7	46.5	53.5	28.2	40.8	52.3	60.0	66.1	57.4
Estonia	61.7	52.3	56.7	26.5	35.9	51.5	67.0	75.7	67.8
Ireland	62.3	46.4	54.4	39.7	52.1	52.9	61.5	59.7	57.5
Greece	66.8	49.1	57.6	23.4	39.7	50.4	66.0	74.7	68.8
Spain	61.7	45.9	53.7	25.1	37.4	49.6	60.4	68.3	66.0
France	52.9	42.0	47.2	22.3	37.8	43.7	53.9	57.2	53.6
Croatia	73.2	58.5	64.8	27.3	45.1	59.8	69.3	78.7	70.0
Italy	55.3	37.1	45.7	18.0	31.2	39.7	49.9	58.8	55.0
Cyprus	59.4	40.8	49.8	23.5	32.7	49.2	61.6	65.7	64.7
Latvia	60.1	56.9	58.3	22.3	38.9	52.4	67.8	73.5	71.7
Lithuania	60.2	53.9	56.8	20.1	40.0	48.2	69.1	74.0	65.5
Luxembourg	58.5	38.4	48.4	24.1	36.5	46.7	56.9	62.5	57.1
Hungary	67.3	53.3	59.9	31.3	43.9	55.4	68.4	76.4	67.3
Malta	71.0	58.0	64.8	38.6	56.6	66.1	73.3	73.7	72.5
Netherlands	55.1	45.1	50.0	25.0	39.4	49.8	57.4	60.2	54.3
Austria	60.6	44.1	52.2	27.2	39.0	48.3	59.9	66.4	58.7
Poland	66.9	50.2	58.1	26.6	43.4	55.3	67.8	73.7	65.4
Portugal	60.9	51.5	55.9	27.6	38.9	52.3	62.9	70.4	63.6
Romania	66.9	50.9	58.7	25.4	42.8	55.4	70.2	72.3	62.3
Slovenia	66.3	49.8	58.1	26.1	42.7	53.3	66.1	72.9	68.8
Slovakia	67.3	50.5	58.7	23.8	42.0	58.0	68.3	77.3	73.0
Finland	62.5	55.8	59.0	30.4	45.9	58.9	65.9	69.1	65.7
Sweden	57.1	45.7	51.3	27.5	39.7	50.3	60.9	60.1	52.4
Norway	57.7	43.3	50.6	28.2	40.8	50.9	61.0	57.6	49.2
Serbia	62.7	45.0	53.6	24.1	42.1	51.8	62.4	65.1	53.8
Turkey	59.8	57.8	58.8	26.9	44.8	65.1	74.3	73.3	59.8

Source: Eurostat (online data code: hlth_ehis_bm1e)

eurostat

Table 1: Share of overweight population by sex and age, 2019 (%)

Source: Eurostat (hlth_ehis_bm1e)

E. Individual country scores per category

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1	Country	Month	Aggregate	Closure daycare	Primary school	Sec school	High school	Clos public area	transport	entertainment	sports	hotels	non-essential	worship	private gath	restuarants	mass gather	masking	stayhome	covid passports	vaccine 5-11	mandate	hospital beds	ICU beds
2	Austria	Jul/21		0	0	0	1	1	0	1	1	1	1	1	1	1	0	2	0	0	0	0	0,89	0,73
3	Austria	Aug/21		0	0	0	1	1	0	1	1	1	1	1	1	1	0	2	0	1,03	0	0	0,89	0,73
4	Austria	Sep/21		0	0	0	1	1	0	1	1	1	1	1	1	1	0	2	0	2	0	0	0,89	0,73
5	Austria	Oct/21		0	0	0	1	1	0	1	1	1	1	1	1	1	0	2	0	2	0	0	0,89	0,73
6	Austria	Nov/21		0	0	0	1	1	0	1	1	1	1,3	1	1	1,3	0	3	2,13	3,48	1	0	0,89	0,73
7	Austria	Dec/21		0	0	0	1	1	0	1	1	1	1,37	1	1	2	0,61	3	4	4	2	0	0,89	0,73
8	Austria	Jan/22		0	0	0	1	1	0	1	1	1	1	1	1	2	1	1,65	4	4	2	0	0,89	0,73
9	Austria	Feb/22		0	0	0	1	1	0	1	1	1	1	1	1	2	1	1	0	4	2	2	0,89	0,73
10	Austria	Mar/22		0	0	0	0	0,16	0	0,13	0,13	0,13	0,13	0,16	0,16	0,26	0,13	0,13	0	0,65	2	0,58	0,89	0,73
11	Denmark	Jul/21		0	0	0	0	1	0	1	1	0	0	0	0	1	2	0	0	2	0	0	0,39	0,54
12	Denmark	Aug/21		0	0	0	0	1	0	1	1	0	0	0	0	1	0	0	0	2	0	0	0,39	0,54
13	Denmark	Sep/21		0	0	0	0	0,3	0	0,3	0	0	0	0	0	0	0	0	0	0,66	0	0	0,39	0,54
14	Denmark	Oct/21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,39	0,54
15	Denmark	Nov/21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,067	0	1,27	0	0	0,39	0,54
16	Denmark	Dec/21		0	0	0	0	0,77	0	1,16	0	0	0,39	0,39	0,39	0,39	0	1	0	2	2	0	0,39	0,54
17	Denmark	Jan/22		0	0	0	0	1	0	2	0	0	1	1	1	1	0	1	0	2	2	0	0,39	0,54
18	Denmark	Feb/22		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0,39	0,54
19	Denmark	Mar/22		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0,39	0,54
20	Finland	Jul/21		0	0	1	1	1	0	1	0	0	0	0	1	0,23	0	0	0	0	0	0	0,47	0,14
21	Finland	Aug/21		0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0,47	0,14
22	Finland	Sep/21		0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0,97	0	0	0,47	0,14
23	Finland	Oct/21		0	0	0	0	1	0	1	0	0	0	0	1	0,45	0	0	0	2	0	0	0,47	0,14
24	Finland	Nov/21		0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	2	0	0	0,47	0,14
25	Finland	Dec/21		0	0	0	0	1	0	1	0	0	0	0	1	0,096	0	0	0	2	1,8	0	0,47	0,14
26	Finland	Jan/22		0	0	0	0	1	0	1	0	0	0	0	1	0,35	0	0	0	2	2	0	0,47	0,14
27	Finland	Feb/22		0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	2	0	0,47	0,14
28	Finland	Mar/22		0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0,47	0,14
29	France	Jul/21		0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	0,19	0	0	0	0,5	0,41
30	France	Aug/21		0	0	1	1	1	0	1	1	0	0	0	0	1	1	1	3	1,42	0	0	0,5	0,41
31	France	Sep/21		0	0	0,097	0,097	1	0	1	1	0	0	0	0	1	1	1	3	2	0	0,5	0,5	0,41
32	France	Oct/21		0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	3	2	0	1	0,5	0,41
33	France	Nov/21		0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	3	2	0,968	1	0,5	0,41
34	France	Dec/21		0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	3	2	2	1	0,5	0,41
35	France	Jan/22		0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	3	3,097	2	1	0,5	0,41
36	France	Feb/22		0	0	0	0	1	0	1	1	0	0	0	0	1	0,57	1,89	3	4	2	1	0,5	0,41
37	France	Mar/22		0	0	0	0	1	0	0,42	1	0	0	0	0	1	0	1	3	1,806	2	1	0,5	0,41
38	Germany	Jul/21		0	1	1	0	1	0	1	0	0	1	0	0	1	1	1	0	0	0	0	1	1
39	Germany	Aug/21		0	1	1	0	1	0	1	0	0	1	0	0	1	1	1	0	0,71	0	0	1	1
40	Germany	Sep/21		0	0	0	0	1	0	1	0	0	1	0	0	1	1	1	0	2	0	0	1	1
41	Germany	Oct/21		0	0	0	0	1	0	1	0	0	1	0	0	1	1	1	0	2	0	0	1	1
42	Germany	Nov/21		0	0	0	0	1	0,43	1	0	0	1	0	0	1	1	1,43	0	2,43	0	0	1	1
43	Germany	Dec/21		0	0	0	0	1	1	1	0	0	1	0	0,97	1	1	2,64	0	3	1,41	0	1	1
44	Germany	Jan/22		0	0	0	0	1	1	1	0	0	1	0	1	1	1	3	0	3	2	0	1	1
45	Germany	Feb/22		0	0	0	0	1	1	1	0	0	0,57	0	1	1	1	3	0	3	2	0	1	1
46	Germany	Mar/22		0	0	0	0	1	1	1	0	0	0	0	1	1	1	3	0	3	2	1,03	1	1
47	Greece	Jul/21		0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	0,39	1,03	0	0	0,6	0,24
48	Greece	Aug/21		0	0	0	1	1	0	1	0	0	0	1	0	1	0	1	0,39	2	0	0	0,6	0,24
49	Greece	Sep/21		0	0	0	0,43	1	0	1	0,43	0	0	1	0	1	0	1	1,4	2	0	2	0,6	0,24
50	Greece	Oct/21		0	0	0	0	1	0	1	1	0	0	1	0	1	0	1	0	2	0	2	0,6	0,24
51	Greece	Nov/21		0	0	0	0	1	0	1	1	0	0,77	1	0	1	0	1	0	2,6	0	2	0,6	0,24
52	Greece	Dec/21		0	0	0	0	1	0	1	1	0	1	1	0	1	0,23	1,77	0	4	2	2	0,6	0,24
53	Greece	Jan/22		0	0	0	0	1	0	1	1	0	0,55	1	0	1	1	5	0	4	2	2	0,6	0,24
54	Greece	Feb/22		0	0	0	0	1	0	1	1	0	0	1	0	1	1	5	0	4	2	2	0,6	0,24
55	Greece	Mar/22		0	0	0	0	1	0	1	1	0	0	1	0	1	1	2,39	0	4	2	2	0,6	0,24
56	Italy	Jul/21		0	0	0	0	0	0	0	0	0	0	0	1	0	2	2	0	0	0	0	0,43	0,35
57	Italy	Aug/21		0	0	0	0	0,81	0	0,81	0,81	0	0	0	1	0,81	2	2	0	1,61	0	0	0,43	0,35
58	Italy	Sep/21		0	0	0	0	1	0	1	1	0	0	0	1	1	2	2	0	2	0	0	0,43	0,35
59	Italy	Oct/21		0	0	0	0	1	0	1	1	0	0	0	1	1	2	2	0	2	0	0	0,43	0,35
60	Italy	Nov/21		0	0	0	0	1	0	1	1	0	0	0	1	1	2	2	0	2	0	0	0,43	0,35
61	Italy	Dec/21		0	0	0	0	1	0	1	1	0	0	0	1	1	2	2,51	0	3,68	2	1,68	0,43	0,35
62	Italy	Jan/22		0	0	0	0	1	0	1	1	0	0	0	1	1	2	5	0	4	2	2	0,43	0,35
63	Italy	Feb/22		0	0	0	0	1	0	1	1	0	0	0	1	1	2	2,43	0	4	2	2	0,43	0,35
64	Italy	Mar/22		0	0	0	0	1	0	1	1	0	0	0	1	1	2	1	0	4	2	2	0,43	0,35
65	Netherlands	Jul/21		0	0	0	1	0,68	0	0,68	0	0	0	0	0,68	0,68	1	1	0	0	0	0	0,45	0,35
66	Netherlands	Aug/21		0	0	0	0,94	1	0	1	0	0	0	0	0,41	1	1	1	0	0	0	0	0,45	0,35
67	Netherlands	Sep/21		0	0	0	0	1	0	1	0	0	0	0	0	1	1	1	0	0,4	0	0	0,45	0,35
68	Netherlands	Oct/21		0	0	0	0	1	0	1	0	0	0	0	0	1	1	1	0	2	0	0	0,45	0,35
69	Netherlands	Nov/21		0	0	0	0,6	1	0	1	0,13	0	0,6	0	0,6	1	1	2,13	0,2	2	0	0	0,45	0,35
70	Netherlands	Dec/21		0	0,71	0,71	0,63	1	0	1,42	1	0	1,42	0	1	1,42	1,42	5	2	2	1,42	0	0,45	0,35
71	Netherlands	Jan/22		0	0,58	0,58	0,54	1	0	1,8	0,46	0	1,45	0	1	1,8	2	4,23	1,8	2	2	0	0,45	0,35
72	Netherlands	Feb/22		0	0	0	0,86	0,86	0	0,86	0	0	0,86	0	1	0,86	2	1	0	1,71	2	0	0,45	0,35
73	Netherlands	Mar/22		0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	2	0	0,45	0,35
74	Norway	Jul/21		0,77	0	0	1	1	0	2	1	0	0	0	2	1	0	0	0	2	0	0	0,52	0,57
75	Norway	Aug/21		1	0	0	1	1	0	2	1	0	0	0	2	1	0	0	0	2	0	0	0,52	0,57
76	Norway	Sep/21		1	0	0	0,83	0,83	0	1,67	0,83	0	0	0	1,67	0,83	0	0	0	1,67	0	0	0,52	0,57
77	Norway	Oct/21		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,52	0,57
78	Norway	Nov/21		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,27	0	0	0,52	0,57
79	Norway	Dec/21		1	0	0	0,81	0,74	0	1,23	0	0	0	0	1,48	0,74	0,61	0	0	2	0	0	0,52	0,57
80	Norway	Jan/22		1	0	0	1	0,45	0	2	0	0	0	0	2	0,45	1	0	0	2	0,58	0	0,52	0,57
81	Norway	Feb/22		1	0	0	0	0	0	0	0	0	0	0	0,86	0	0,43	0	0	1,21	1	0	0,52	0,57
82	Norway	Mar/22		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0,52	0,57
83	Sweden	Jul/21		0	0	0	0	1	0,48	0	0	0	0	0	2	1	2	0	0	0	0	0	0,33	0,26
84	Sweden	Aug/21		0	0	0	0	1	0	0	0	0	0	0	2	1	2	0	0	0	0	0	0,33	0,26
85	Sweden	Sep/21		0	0	0	0	0,93	0	0	0	0	0	0	1,93	0,93	1,93	0	0	0	0	0	0,33	0,26
86	Sweden	Oct/21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,33	0,26
87	Sweden	Nov/21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,33	0,26
88	Sweden	Dec/21		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0,33	0,26
89	Sweden	Jan/22		0	0	0	0,64	0,64	0	0	0	0	0	0	0,84	0,65	0,65	0	0	2	0,13	0	0,33	0,26
90	Sweden	Feb/22		0	0	0	0,29	0,32	0	0	0	0	0	0	0,64	0,32	0,32	0	0	0,64	1	0	0,33	0,26
91	Sweden	Mar/22		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0,33	0,26
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Country	Month	Aggregate	Closure daycare	Closure School	Clos public area	Closure indoor	mass gather	masking	stayhome	covid passports	Vaccine Pol	Hospital po	Teleworking
Austria	Jul/21		0	1	1	7	0	2	0	0	0	1,62	2
Austria	Aug/21		0	1	1	7	0	2	0	1,03	0	1,62	2
Austria	Sep/21		0	1	1	7	0	2	0	2	0	1,62	2
Austria	Oct/21		0	1	1	7	0	2	0	2	0	1,62	2
Austria	Nov/21		0	1	1	7,6	0	3	2,13	3,48	1	1,62	2
Austria	Dec/21		0	1	1	8,37	0,61	3	4	4	2	1,62	2
Austria	Jan/22		0	1	1	8	1	1,65	4	4	2	1,62	2
Austria	Feb/22		0	1	1	8	1	1	0	4	4	1,62	2
Austria	Mar/22		0	0	0,16	1,1	0,13	0,13	0	0,65	2,58	1,62	0,32
Denmark	**Jul/21**		**0**	**0**	**1**	3	**2**	**0**	**0**	**2**	0	0,93	**1**
Denmark	**Aug/21**		**0**	**0**	**1**	3	**0**	**0**	**0**	**2**	0	0,93	**0**
Denmark	**Sep/21**		**0**	**0**	**0,3**	0,3	**0**	**0**	**0**	**0,66**	0	0,93	**0**
Denmark	**Oct/21**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	0	0,93	**0**
Denmark	**Nov/21**		**0**	**0**	**0**	0	**0**	**0,067**	**0**	**1,27**	0	0,93	**0**
Denmark	**Dec/21**		**0**	**0**	**0,77**	2,72	**0**	**1**	**0**	**2**	2	0,93	**0,84**
Denmark	**Jan/22**		**0**	**0**	**1**	6	**0**	**1**	**0**	**2**	2	0,93	**2**
Denmark	**Feb/22**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	2	0,93	**0**
Denmark	**Mar/22**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	2	0,93	**0**
Finland	Jul/21		0	**2**	1	2,23	0	0	0	0	0	0,61	**1**
Finland	Aug/21		0	**0**	1	3	0	0	0	0	0	0,61	**1**
Finland	Sep/21		0	**0**	1	3	0	0	0	0,97	0	0,61	**1**
Finland	Oct/21		0	**0**	1	2,45	0	0	0	2	0	0,61	**1**
Finland	Nov/21		0	**0**	1	2	0	0	0	2	0	0,61	**1**
Finland	Dec/21		0	**0**	1	2,096	0	0	0	2	1,8	0,61	**1**
Finland	Jan/22		0	**0**	1	2,35	0	0	0	2	2	0,61	**1**
Finland	Feb/22		0	**0**	1	1	0	0	0	2	2	0,61	**1**
Finland	Mar/22		0	**0**	1	1	0	0	0	0	2	0,61	**1**
France	**Jul/21**		**0**	**2**	**1**	3	**1**	**1**	**0,19**	**0**	0	0,91	**1**
France	**Aug/21**		**0**	**2**	**1**	3	**1**	**1**	**3**	**1,42**	0	0,91	**1**
France	**Sep/21**		**0**	**0,194**	**1**	3	**1**	**1**	**3**	**2**	0,5	0,91	**1**
France	**Oct/21**		**0**	**0**	**1**	3	**1**	**1**	**3**	**2**	1	0,91	**1**
France	**Nov/21**		**0**	**0**	**1**	3	**1**	**1**	**3**	**2**	1,968	0,91	**1**
France	**Dec/21**		**0**	**0**	**1**	3	**1**	**1**	**3**	**2**	3	0,91	**1**
France	**Jan/22**		**0**	**0**	**1**	3	**1**	**1**	**3**	**3,097**	3	0,91	**1**
France	**Feb/22**		**0**	**0**	**1**	3	**0,57**	**1,89**	**3**	**4**	3	0,91	**1**
France	**Mar/22**		**0**	**0**	**1**	2,42	**0**	**1**	**3**	**1,806**	3	0,91	**1**
Germany	Jul/21		0	**2**	1	3	1	1	0	0	0	2	**1**
Germany	Aug/21		0	**2**	1	3	1	1	0	0,71	0	2	**1**
Germany	Sep/21		0	**0**	1	3	1	1	0	2	0	2	**1**
Germany	Oct/21		0	**0**	1	3	1	1	0	2	0	2	**1**
Germany	Nov/21		0	**0**	1	3,43	1	1,43	0	2,43	0	2	**1**
Germany	Dec/21		0	**0**	1	4,97	1	2,64	0	3	1,41	2	**1**
Germany	Jan/22		0	**0**	1	5	1	3	0	3	2	2	**1**
Germany	Feb/22		0	**0**	1	4,57	1	3	0	3	2	2	**1**
Germany	Mar/22		0	**0**	1	4	1	3	0	3	3,03	2	**1**
Greece	**Jul/21**		**0**	**1**	**1**	3	**0**	**1**	**0,39**	**1,03**	0	0,84	**1**
Greece	**Aug/21**		**0**	**1**	**1**	3	**0**	**1**	**0,39**	**2**	0	0,84	**1**
Greece	**Sep/21**		**0**	**0,43**	**1**	3,43	**0**	**1**	**1,4**	**2**	2	0,84	**1**
Greece	**Oct/21**		**0**	**0**	**1**	4	**0**	**1**	**0**	**2**	2	0,84	**1**
Greece	**Nov/21**		**0**	**0**	**1**	4,77	**0**	**1**	**0**	**2,6**	2	0,84	**1**
Greece	**Dec/21**		**0**	**0**	**1**	5	**0,23**	**1,77**	**0**	**4**	4	0,84	**1**
Greece	**Jan/22**		**0**	**0**	**1**	4,55	**1**	**5**	**0**	**4**	4	0,84	**1**
Greece	**Feb/22**		**0**	**0**	**1**	4	**1**	**5**	**0**	**4**	4	0,84	**1**
Greece	**Mar/22**		**0**	**0**	**1**	4	**1**	**2,39**	**0**	**4**	4	0,84	**1**
Italy	Jul/21		0	**0**	0	1	2	2	0	0	0	0,78	**2**
Italy	Aug/21		0	**0**	0,81	3,43	2	2	0	1,61	0	0,78	**2**
Italy	Sep/21		0	**0**	1	4	2	2	0	2	0	0,78	**2**
Italy	Oct/21		0	**0**	1	4	2	2	0	2	0	0,78	**2**
Italy	Nov/21		0	**0**	1	4	2	2	0	2	0	0,78	**2**
Italy	Dec/21		0	**0**	1	4	2	2,51	0	3,68	3,68	0,78	**2**
Italy	Jan/22		0	**0**	1	4	2	5	0	4	4	0,78	**2**
Italy	Feb/22		0	**0**	1	4	2	2,43	0	4	4	0,78	**2**
Italy	Mar/22		0	**0**	1	4	2	1	0	4	4	0,78	**2**
Netherlands	**Jul/21**		**0**	**1**	**0,68**	2,04	**1**	**1**	**0**	**0**	0	0,8	**1,42**
Netherlands	**Aug/21**		**0**	**0,94**	**1**	2,41	**1**	**1**	**0**	**0**	0	0,8	**2**
Netherlands	**Sep/21**		**0**	**0**	**1**	2	**1**	**1**	**0**	**0,4**	0	0,8	**2**
Netherlands	**Oct/21**		**0**	**0**	**1**	2	**1**	**1**	**0**	**2**	0	0,8	**2**
Netherlands	**Nov/21**		**0**	**0,6**	**1**	3,33	**1**	**2,13**	**0,2**	**2**	0	0,8	**2**
Netherlands	**Dec/21**		**0**	**2,05**	**1**	6,26	**1,42**	**5**	**2**	**2**	1,42	0,8	**2**
Netherlands	**Jan/22**		**0**	**1,7**	**1**	6,51	**2**	**4,23**	**1,8**	**2**	2	0,8	**2**
Netherlands	**Feb/22**		**0**	**0,86**	**0,86**	3,58	**2**	**1**	**0**	1,71	2	0,8	**2**
Netherlands	**Mar/22**		**0**	**0**	**0**	1	**2**	**1**	**0**	0	2	0,8	**2**
Norway	Jul/21		0,77	**1**	1	6	0	0	0	2	0	1,09	**1**
Norway	Aug/21		1	**1**	1	6	0	0	0	2	0	1,09	**1**
Norway	Sep/21		1	**0,83**	0,83	5	0	0	0	1,67	0	1,09	**0,83**
Norway	Oct/21		1	**0**	0	0	0	0	0	0	0	1,09	**0**
Norway	Nov/21		1	**0**	0	0	0	0	0	1,27	0	1,09	**0**
Norway	Dec/21		1	**0,81**	0,74	3,45	0,61	0	0	2	0	1,09	**0,77**
Norway	Jan/22		1	**1**	0,45	4,45	1	0	0	2	0,58	1,09	**1**
Norway	Feb/22		1	**0**	0	0,86	0,43	0	0	1,21	1	1,09	**0,43**
Norway	Mar/22		1	**0**	0	0	0	0	0	0	1	1,09	**0**
Sweden	**Jul/21**		**0**	**0**	**1**	3,48	**2**	**0**	**0**	**0**	0	0,59	**2**
Sweden	**Aug/21**		**0**	**0**	**1**	3	**2**	**0**	**0**	**0**	0	0,59	**2**
Sweden	**Sep/21**		**0**	**0**	**0,93**	2,86	**1,93**	**0**	**0**	**0**	0	0,59	**2**
Sweden	**Oct/21**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	0	0,59	**2**
Sweden	**Nov/21**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	0	0,59	**2**
Sweden	**Dec/21**		**0**	**0**	**0**	0	**0**	**0**	**0**	**2**	0	0,59	**2**
Sweden	**Jan/22**		**0**	**0,64**	**0,64**	1,49	**0,65**	**0**	**0**	**2**	0,13	0,59	**2**
Sweden	**Feb/22**		**0**	**0,29**	**0,32**	0,96	**0,32**	**0**	**0**	**0,64**	1	0,59	**2**
Sweden	**Mar/22**		**0**	**0**	**0**	0	**0**	**0**	**0**	**0**	1	0,59	**2**

Country	Month	Aggregat	Daycare	Closure Sch	Clos public	Closure ind	mass gather	masking	stayhome	covid passp	Vaccine Policy	Hospital policy
Austria	Jul/21	14,858	0	0,416	1,25	1,092	0	4	0	0	0	8,1
Austria	Aug/21	20,008	0	0,416	1,25	1,092	0	4	0	5,15	0	8,1
Austria	Sep/21	24,858	0	0,416	1,25	1,092	0	4	0	10	0	8,1
Austria	Oct/21	24,858	0	0,416	1,25	1,092	0	4	0	10	0	8,1
Austria	Nov/21	47,1766	0	0,416	1,25	1,1856	0	6	5,325	17,4	7,5	8,1
Austria	Dec/21	65,1217	0	0,416	1,25	1,30572	3,05	6	10	20	15	8,1
Austria	Jan/22	64,314	0	0,416	1,25	1,248	5	3,3	10	20	15	8,1
Austria	Feb/22	68,014	0	0,416	1,25	1,248	5	2	0	20	30	8,1
Austria	Mar/22	31,9816	0	0	0,2	0,1716	0,65	0,26	0	3,25	19,35	8,1
Denmark	**Jul/21**	26,368	0	0	1,25	0,468	10	0	0	10	0	4,65
Denmark	**Aug/21**	16,368	0	0	1,25	0,468	0	0	0	10	0	4,65
Denmark	**Sep/21**	8,3718	0	0	0,375	0,0468	0	0	0	3,3	0	4,65
Denmark	**Oct/21**	4,65	0	0	0	0	0	0	0	0	0	4,65
Denmark	**Nov/21**	11,134	0	0	0	0	0	0,134	0	6,35	0	4,65
Denmark	**Dec/21**	33,0368	0	0	0,9625	0,42432	0	2	0	10	15	4,65
Denmark	**Jan/22**	33,836	0	0	1,25	0,936	0	2	0	10	15	4,65
Denmark	**Feb/22**	19,65	0	0	0	0	0	0	0	0	15	4,65
Denmark	**Mar/22**	19,65	0	0	0	0	0	0	0	0	15	4,65
Finland	Jul/21	5,47988	0	0,832	1,25	0,34788	0	0	0	0	0	3,05
Finland	Aug/21	4,768	0	0	1,25	0,468	0	0	0	0	0	3,05
Finland	Sep/21	9,618	0	0	1,25	0,468	0	0	0	4,85	0	3,05
Finland	Oct/21	14,6822	0	0	1,25	0,3822	0	0	0	10	0	3,05
Finland	Nov/21	14,612	0	0	1,25	0,312	0	0	0	10	0	3,05
Finland	Dec/21	28,127	0	0	1,25	0,32698	0	0	0	10	13,5	3,05
Finland	Jan/22	29,6666	0	0	1,25	0,3666	0	0	0	10	15	3,05
Finland	Feb/22	29,456	0	0	1,25	0,156	0	0	0	10	15	3,05
Finland	Mar/22	19,456	0	0	1,25	0,156	0	0	0	0	15	3,05
France	**Jul/21**	14,575	0	0,832	1,25	0,468	5	2	0,475	0	0	4,55
France	**Aug/21**	28,7	0	0,832	1,25	0,468	5	2	7,5	7,1	0	4,55
France	**Sep/21**	34,5987	0	0,0807	1,25	0,468	5	2	7,5	10	3,75	4,55
France	**Oct/21**	38,268	0	0	1,25	0,468	5	2	7,5	10	7,5	4,55
France	**Nov/21**	45,528	0	0	1,25	0,468	5	2	7,5	10	14,76	4,55
France	**Dec/21**	53,268	0	0	1,25	0,468	5	2	7,5	10	22,5	4,55
France	**Jan/22**	58,753	0	0	1,25	0,468	5	2	7,5	15,485	22,5	4,55
France	**Feb/22**	62,898	0	0	1,25	0,468	2,85	3,78	7,5	20	22,5	4,55
France	**Mar/22**	47,2075	0	0	1,25	0,37752	0	2	7,5	9,03	22,5	4,55
Germany	Jul/21	19,55	0	0,832	1,25	0,468	5	2	0	0	0	10
Germany	Aug/21	23,1	0	0,832	1,25	0,468	5	2	0	3,55	0	10
Germany	Sep/21	28,718	0	0	1,25	0,468	5	2	0	10	0	10
Germany	Oct/21	28,718	0	0	1,25	0,468	5	2	0	10	0	10
Germany	Nov/21	31,7951	0	0	1,25	0,53508	5	2,86	0	12,15	0	10
Germany	Dec/21	47,8803	0	0	1,25	0,77532	5	5,28	0	15	10,575	10
Germany	Jan/22	53,03	0	0	1,25	0,78	5	6	0	15	15	10
Germany	Feb/22	52,9629	0	0	1,25	0,71292	5	6	0	15	15	10
Germany	Mar/22	60,599	0	0	1,25	0,624	5	6	0	15	22,725	10
Greece	**Jul/21**	14,459	0	0,416	1,25	0,468	0	2	0,975	5,15	0	4,2
Greece	**Aug/21**	19,309	0	0,416	1,25	0,468	0	2	0,975	10	0	4,2
Greece	**Sep/21**	36,664	0	0,17888	1,25	0,53508	0	2	3,5	10	15	4,2
Greece	**Oct/21**	33,074	0	0	1,25	0,624	0	2	0	10	15	4,2
Greece	**Nov/21**	36,1941	0	0	1,25	0,74412	0	2	0	13	15	4,2
Greece	**Dec/21**	60,92	0	0	1,25	0,78	1,15	3,54	0	20	30	4,2
Greece	**Jan/22**	71,1598	0	0	1,25	0,7098	5	10	0	20	30	4,2
Greece	**Feb/22**	71,074	0	0	1,25	0,624	5	10	0	20	30	4,2
Greece	**Mar/22**	65,854	0	0	1,25	0,624	5	4,78	0	20	30	4,2
Italy	Jul/21	18,056	0	0	0	0,156	10	4	0	0	0	3,9
Italy	Aug/21	27,4976	0	0	1,0125	0,53508	10	4	0	8,05	0	3,9
Italy	Sep/21	29,774	0	0	1,25	0,624	10	4	0	10	0	3,9
Italy	Oct/21	29,774	0	0	1,25	0,624	10	4	0	10	0	3,9
Italy	Nov/21	29,774	0	0	1,25	0,624	10	4	0	10	0	3,9
Italy	Dec/21	66,794	0	0	1,25	0,624	10	5,02	0	18,4	27,6	3,9
Italy	Jan/22	75,774	0	0	1,25	0,624	10	10	0	20	30	3,9
Italy	Feb/22	70,634	0	0	1,25	0,624	10	4,86	0	20	30	3,9
Italy	Mar/22	67,774	0	0	1,25	0,624	10	2	0	20	30	3,9
Netherlands	**Jul/21**	12,5842	0	0,416	0,85	0,31824	5	2	0	0	0	4
Netherlands	**Aug/21**	13,017	0	0,39104	1,25	0,37596	5	2	0	0	0	4
Netherlands	**Sep/21**	14,562	0	0	1,25	0,312	5	2	0	2	0	4
Netherlands	**Oct/21**	22,562	0	0	1,25	0,312	5	2	0	10	0	4
Netherlands	**Nov/21**	25,7791	0	0,2496	1,25	0,51948	5	4,26	0,5	10	0	4
Netherlands	**Dec/21**	49,8294	0	0,8528	1,25	0,97656	7,1	10	5	10	10,65	4
Netherlands	**Jan/22**	54,9328	0	0,7072	1,25	1,01556	10	8,46	4,5	10	15	4
Netherlands	**Feb/22**	41,5412	0	0,35776	1,075	0,55848	10	2	0	8,55	15	4
Netherlands	**Mar/22**	31,156	0	0	0	0,156	10	2	0	0	15	4
Norway	Jul/21	19,0145	0,9625	0,416	1,25	0,936	0	0	0	10	0	5,45
Norway	Aug/21	19,302	1,25	0,416	1,25	0,936	0	0	0	10	0	5,45
Norway	Sep/21	17,2128	1,25	0,34528	1,0375	0,78	0	0	0	8,35	0	5,45
Norway	Oct/21	6,7	1,25	0	0	0	0	0	0	0	0	5,45
Norway	Nov/21	13,05	1,25	0	0	0	0	0	0	6,35	0	5,45
Norway	Dec/21	21,5502	1,25	0,33696	0,925	0,5382	3,05	0	0	10	0	5,45
Norway	Jan/22	27,7227	1,25	0,416	0,5625	0,6942	5	0	0	10	4,35	5,45
Norway	Feb/22	22,5342	1,25	0	0	0,13416	2,15	0	0	6,05	7,5	5,45
Norway	Mar/22	14,2	1,25	0	0	0	0	0	0	0	7,5	5,45
Sweden	**Jul/21**	14,7429	0	0	1,25	0,54288	10	0	0	0	0	2,95
Sweden	**Aug/21**	14,668	0	0	1,25	0,468	10	0	0	0	0	2,95
Sweden	**Sep/21**	14,2087	0	0	1,1625	0,44616	9,65	0	0	0	0	2,95
Sweden	**Oct/21**	2,95	0	0	0	0	0	0	0	0	0	2,95
Sweden	**Nov/21**	2,95	0	0	0	0	0	0	0	0	0	2,95
Sweden	**Dec/21**	12,95	0	0	0	0	0	0	0	10	0	2,95
Sweden	**Jan/22**	18,4737	0	0,26624	0,8	0,23244	3,25	0	0	10	0,975	2,95
Sweden	**Feb/22**	15,9204	0	0,12064	0,4	0,14976	1,6	0	0	3,2	7,5	2,95
Sweden	**Mar/22**	10,45	0	0	0	0	0	0	0	0	7,5	2,95

CK	CL	CM	CN	CO	CP	CQ
Country	Month		Idealist		Gros	
Austria	Jul/21		14,86		30,042	
Austria	Aug/21		20,01		30,042	
Austria	Sep/21		24,86		30,042	
Austria	Oct/21		24,86		30,042	
Austria	Nov/21		47,18		43,067	
Austria	Dec/21		65,12		55,94825	
Austria	Jan/22		64,31		54,967	
Austria	Feb/22		68,01		33,667	
Austria	Mar/22		31,98		4,7975	
Denmark	Jul/21		26,37		26,875	
Denmark	Aug/21		16,37		11,875	
Denmark	Sep/21		8,37		3,1875	
Denmark	Oct/21		4,65		0	
Denmark	Nov/21		11,13		0,134	
Denmark	Dec/21		33,04		15,6	
Denmark	Jan/22		33,84		25,75	
Denmark	Feb/22		19,65		0	
Denmark	Mar/22		19,65		0	
Finland	Jul/21		5,48		19,72775	
Finland	Aug/21		4,77		16,875	
Finland	Sep/21		9,62		16,875	
Finland	Oct/21		14,68		16,53125	
Finland	Nov/21		14,61		16,25	
Finland	Dec/21		28,13		16,31	
Finland	Jan/22		29,67		16,46875	
Finland	Feb/22		29,46		15,625	
Finland	Mar/22		19,46		15,625	
France	Jul/21		14,58		28,159	
France	Aug/21		28,70		42,209	
France	Sep/21		34,60		39,1984	
France	Oct/21		38,27		38,875	
France	Nov/21		45,53		38,875	
France	Dec/21		53,27		38,875	
France	Jan/22		58,75		38,875	
France	Feb/22		62,90		38,505	
France	Mar/22		47,21		33,5125	
Germany	Jul/21		19,55		27,209	
Germany	Aug/21		23,10		27,209	
Germany	Sep/21		28,72		23,875	
Germany	Oct/21		28,72		23,875	
Germany	Nov/21		31,80		25,00375	
Germany	Dec/21		47,88		28,38625	
Germany	Jan/22		53,03		29,125	
Germany	Feb/22		52,96		28,85625	
Germany	Mar/22		60,60		28,5	
Greece	Jul/21		14,46		22,492	
Greece	Aug/21		19,31		22,492	
Greece	Sep/21		36,66		26,86056	
Greece	Oct/21		33,07		19,5	
Greece	Nov/21		36,19		19,98125	
Greece	Dec/21		60,92		22,815	
Greece	Jan/22		71,16		32,84375	
Greece	Feb/22		71,07		32,5	
Greece	Mar/22		65,85		27,28	
Italy	Jul/21		18,06		24,625	
Italy	Aug/21		27,50		34,24375	
Italy	Sep/21		29,77		36,5	
Italy	Oct/21		29,77		36,5	
Italy	Nov/21		29,77		36,5	
Italy	Dec/21		66,79		37,52	
Italy	Jan/22		75,77		42,5	
Italy	Feb/22		70,63		37,36	
Italy	Mar/22		67,77		34,5	
Netherlands	Jul/21		12,58		23,842	
Netherlands	Aug/21		13,02		30,07323	
Netherlands	Sep/21		14,56		28,25	
Netherlands	Oct/21		22,56		28,25	
Netherlands	Nov/21		25,78		33,34145	
Netherlands	Dec/21		49,83		54,42985	
Netherlands	Jan/22		54,93		54,36265	
Netherlands	Feb/22		41,54		34,27112	
Netherlands	Mar/22		31,16		22,625	
Norway	Jul/21		19,01		24,267	
Norway	Aug/21		19,30		25,417	
Norway	Sep/21		17,21		21,95861	
Norway	Oct/21		6,70		5	
Norway	Nov/21		13,05		5	
Norway	Dec/21		21,55		22,80652	
Norway	Jan/22		27,72		23,94825	
Norway	Feb/22		22,53		9,8375	
Norway	Mar/22		14,20		5	
Sweden	Jul/21		14,74		32,175	
Sweden	Aug/21		14,67		31,875	
Sweden	Sep/21		14,21		30,7375	
Sweden	Oct/21		2,95		10	
Sweden	Nov/21		2,95		10	
Sweden	Dec/21		12,95		10	
Sweden	Jan/22		18,47		21,64813	
Sweden	Feb/22		15,92		15,88343	
Sweden	Mar/22		10,45		10	