<u>There should not have been a lockdown in the UK during the large spikes of New Covid-19 Cases in the first quartile and third quartile of 2020.</u>

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<u>Abstract:</u>

The UK public has been critical of the lockdown put in place by the government, with many saying it is was not required to control the spread of the virus. This paper will try to determine whether the implementation of a lockdown is justified by looking at the data of other nations which used other methods to control the virus. To remove any population size bias, any calculation done will use a created factor called As of Population, which is a number relative to the size of the population. The countries in focus are Laos, Andorra, UK, USA, New Zealand, South Korea, Sweden, Germany, Belgium and China. These countries will be looked into a greater detail. The data analysis shows that lockdowns are effective and the results are reproduceable, however, some nation have been able to produce the same results using other methodologies. The paper concludes that the use of lockdowns was required given the limited time and rate the virus was spreading. If there had been time to prepare, the use of track and trace along with the use of mathematical modelling would have been a better strategy potentially helping avoid the lockdowns.

<u>Introduction:</u>

This paper will argue if the lockdown imposed by the British government on the 23rd of March and the 5th of November have made a significantly smaller impact in reducing the number of confirmed Covid-19 cases in comparison to the natural decline due to herd immunity or other measures imposed by other countries. I have analysed the data given by EU Open Data Portal [1] alongside the information provided by various news articles to evaluate if the use of prolonged lockdowns were required to "flatten the curve".

<u>Background:</u>

The first lockdown began on the 23rd of March when the Prime Minister of the United Kingdom made an announcement ordering the public to stay at home, banned gatherings of more than two people, and closed all non-essential retail. On the 1st of June another announcement was made allowing people from different households to meet in groups of six in gardens or outdoor spaces; this was followed by a further announcement allowing non-essential shops to open from the 15th of June.[2] The implementation of lockdown rules ran in conjunction with the enforcement of social distancing and the use of face masks in public and shared areas.

On the 31st of October, the oncoming of the second lockdown starting from the 5th of November was announced. Likewise, to the first lockdown, the public were ordered to stay at home, there was a ban on the gatherings of more than two people, and all non-essential retail stores and services were closed. [3] The lockdown was scheduled to end on the 2nd of December, with the reopening of all non-essential services and stores and a travel window period where the public are expected to make their necessary travel journeys in preparation of potential third lockdown during the Christmas period of this year.

Methodology and data:

Countries with larger populations naturally tend to have more infection cases due to more carriers of the virus being present before prevention methods are implemented. To avoid population size bias, when looking at data points I always compared it to the total population size.

The data provided by EU Open Data Portal [1] showed the number of daily new cases and the population of that country, using this information I was to calculate the number of new cases on a day-by-day bases and find the percentage of the population infected on a particular day which I have named "As of Population". I worked out the average of the As of Population over the course of the days information was available for, to create a list of the countries that on average had the least number of people infected.

Figure 1:

countriesAndTerritories	As of Population	Ranking		countriesAndTerritories	As of Population	Ranking
Laos	2.1995E-08	1		Albania	5.6246E-05	148
United_Republic_of_Tanzania	3.27427E-08	2		Monaco	5.88166E-05	149
Vietnam	4.18623E-08	3		Lebanon	5.95154E-05	150
Cambodia	6.39049E-08	4		United_States_Virgin_Islands	6.17862E-05	151
Taiwan	8.77836E-08	5		Ukraine	6.98489E-05	152
Timor_Leste	9.11522E-08	6		Bahamas	7.28801E-05	153
Vanuatu	1.14988E-07	7		Oman	7.43097E-05	154
Thailand	1.75325E-07	8		CuraÃ§ao	7.44138E-05	155
China	1.85877E-07	9		United_Kingdom	7.61198E-05	156
Fiji	1.86569E-07	10		Cape_Verde	7.65792E-05	157
Burundi	2.45438E-07	11		Turks_and_Caicos_islands	7.66331E-05	158
Papua_New_Guinea	2.95223E-07	12		Malta	7.79757E-05	159
Niger	3.22878E-07	13		Belize	7.86501E-05	160
Yemen	3.42351E-07	14		Romania	7.879E-05	161
Chad	4.09141E-07	15		Slovakia	7.89738E-05	162
Solomon_Islands	4.61453E-07	16		Palestine	8.39016E-05	163
New_Caledonia	4.82264E-07	17		Sweden	8.43574E-05	164
Democratic_Republic_of_the_Congo	5.86351E-07	18		Italy	8.43925E-05	165
Burkina_Faso	6.27599E-07	19		Lithuania	8.58032E-05	166
Eritrea	7.05633E-07	20		Bulgaria	8.7358E-05	167
Benin	9.71636E-07	21		Jordan	8.99423E-05	168
Mongolia	1.02931E-06	22		Kosovo	9.00317E-05	169
Mali	1.039E-06	23		Maldives	9.07315E-05	170
Nigeria	1.04578E-06	24		Brazil	9.16743E-05	171
New_Zealand	1.07771E-06	25		Hungary	9.52058E-05	172
Somalia	1.10639E-06	26		Netherlands	9.55575E-05	173
South_Sudan	1.15951E-06	27		North_Macedonia	9.95134E-05	174
Sierra_Leone	1.22828E-06	28		France	9.98995E-05	175
Greenland	1.26541E-06	29		Austria	0.00010002	176
Liberia	1.26661E-06	30		Colombia	0.000100385	177
Brunei_Darussalam	1.27187E-06	31		Kuwait	0.000100708	178
Malawi	1.29411E-06	32		Poland	0.00010158	179
Togo	1.42993E-06	33		Spain	0.000105431	180
Grenada	1.46535E-06	34		Costa_Rica	0.000105445	181
Mauritius	1.53063E-06	35		Sint_Maarten	0.00010575	182
Marshall_Islands	1.61994E-06	36		Chile	0.000106196	183
Sudan	1.73102E-06	37		Bosnia_and_Herzegovina	0.000106943	184
Saint_Kitts_and_Nevis	1.82695E-06	38		Moldova	0.000107208	185
Rwanda	1.82942E-06	39		Peru	0.000108448	186
Angola	1.8792E-06	40		Croatia	0.000111079	187
Syria	1.91844E-06	41		Portugal	0.000112171	188
Uganda	2.04932E-06	42		Argentina	0.000118075	189
Mozambique	2.05797E-06	43		Holy_See	0.000118155	190
Bhutan	2.09383E-06	44		Gibraltar	0.000118449	191
South_Korea	2.23123E-06	45		Israel	0.000119771	192
Madagascar	2.45973E-06	46		Switzerland	0.000121146	193
Anguilla	2.60622E-06	47		Serbia	0.000122205	194
				Georgia	0.000127576	195
				Puerto_Rico	0.000133373	196
				United_States_of_America	0.000133639	197

This is a very small segment of the table; the full table can be accessed – see below bibliography. The "countriesAndTerritories" is the names of the countries and landmasses, the "As of Population" is the average of the daily infection cases in comparison to total population and the "ranking" is the position the country in comparison to the rest of the world based on the As of Population results. Two countries/territories were omitted, "International Conveyance Japan" and "Wallis and Futuna" based on insufficient data.

From the graph, the United Kingdom ranks 156th, just under the upper quartile by 1.44%. The countries with the lowest As of Population numbers were Laos, United Republic of Tanzania, and Vietnam. The countries with the highest As of Population numbers were Luxemburg, French Polynesia, and Andorra.

Based on this table I selected 10 countries (Sweden, Germany, China, Laos, New Zealand, Belgium, USA, South Korea, United Kingdom, and Andorra) to perform further research on their geographical properties and Covid-19 response methods. The sample contained countries from all the quartiles to ensure a fair representation, however, high income countries with similar geographical location to the UK were favoured to ensure comparisons were fair when evaluating the data.

Andorra: The area within Andorra covers three mountain valleys; the nation is surrounded by mountains, altitudes about 3000m above sea level. Vella, the capitol of Andorra is the highest capital in Europe. The climate is dependent on the elevation of the with the mountainous areas being much cooler than the valley regions. Average temperatures in the capitol ranging between 5°c in the winter and 22°c in the summer.[4] Andorra has a population 76117, population density of 32 per km^2, and a GDP of $3.237 billion USD. [5] Andorra, ranked 212th on the As of Population scale.

Lockdown timeline:

22nd September – the authorities publish restriction rules, this includes social distancing and use of face masks along with retractions placed on the usage of public services and non-essential services and shops.[6]

The country is yet to go into full lockdown, but harsher distancing and quarantine rules have been put in place over the course of the last six months.

Figure 2:
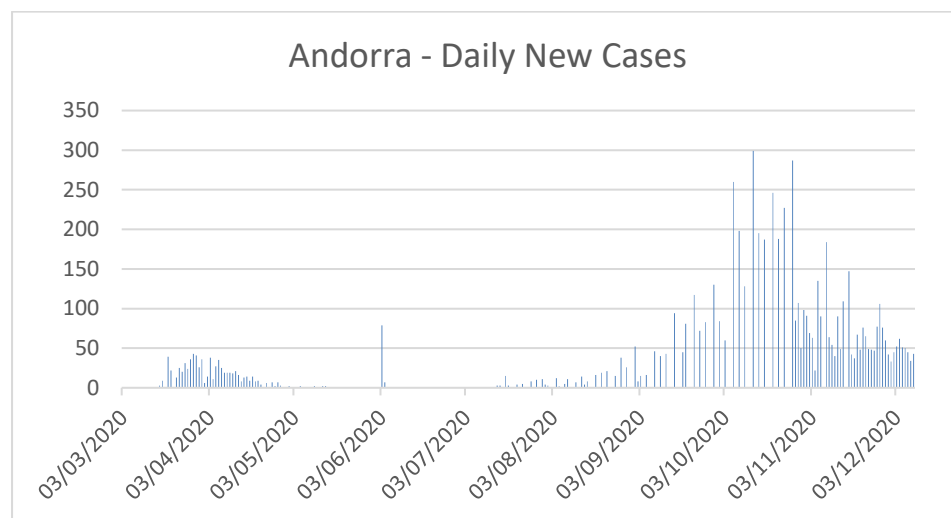
Data provided EU Open Data Portal [1]
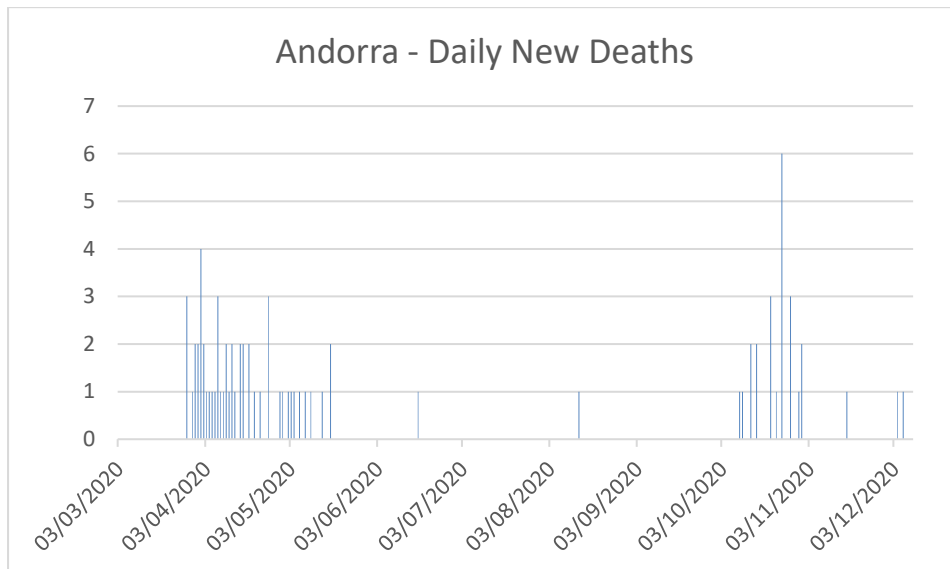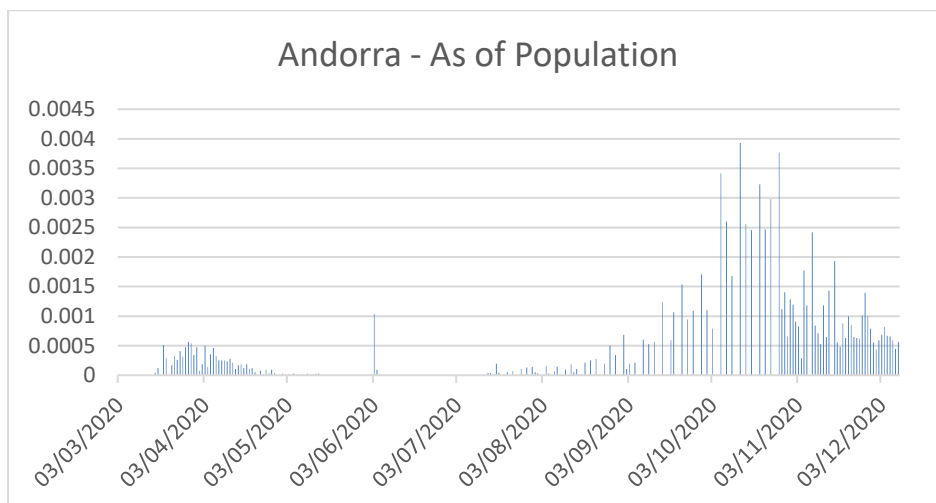
Figure 3:

Andorra - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 4:

Andorra - As of Population

Data provided EU Open Data Portal [1]

Figure 5:

Andorra -
Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 6:

Andorra - Change in Case Numbers
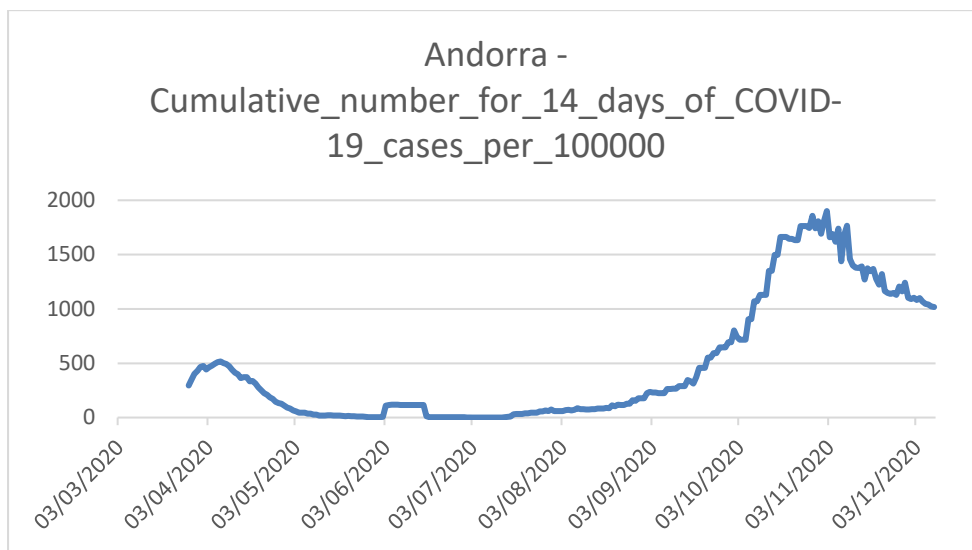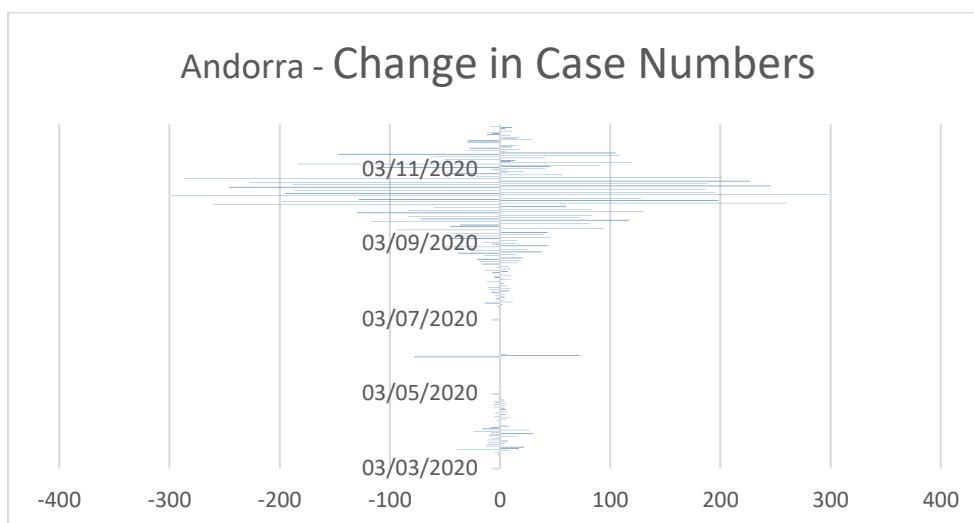
Data provided EU Open Data Portal [1]

Figure 7:
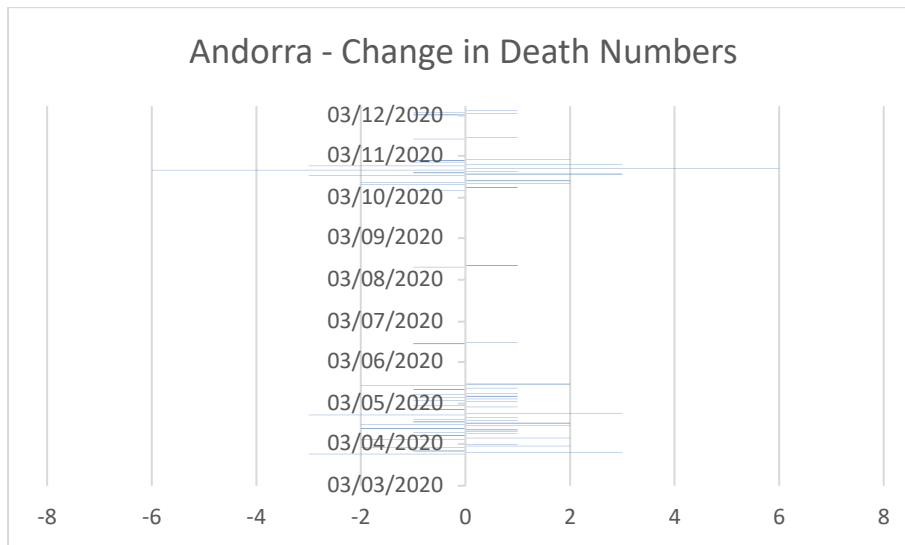
Data provided EU Open Data Portal [1]

Belgium: Belgium has fertile and sandy heaths protected by the dunes of the North Sea Coast, at the north and west with fertile low hills covering most of south Belgium.[4] Belgium has a temperate maritime climate influenced by the North Sea and Atlantic Ocean, with cool summers and moderate winters. Since the country is small there is little variation in climate from region to region. Sometimes easterly winds can cause a more continental type of weather, warm and dry in the summer, but cold and clear in the winter with temperatures sometimes far below zero. [4] Belgium has a population of 11 million, population density of 383 per km^2, and a GDP of $542.8 billion USD. [5] Belgium, ranked 201th on the As of Population Scale.

Lockdown timeline:

17th March – the Prime Minister announces strict lockdown measures, effective from the following day till 5th of April.
27th March – the Prime Minister announces the extension of the national lockdown till 18th April.
4th May –the first phase of the exit plan begins, followed by additional measures on 11th May.
18th May – the second phase of the lockdown exit plan begins.
June 8th = the third phase of the lockdown exit plan begins.
[7]

Figure 8:
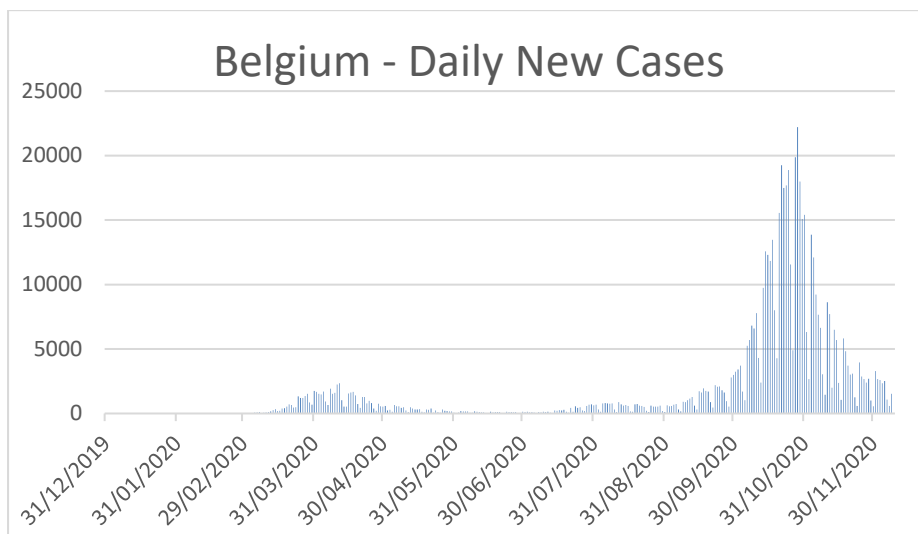
Belgium - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 9:
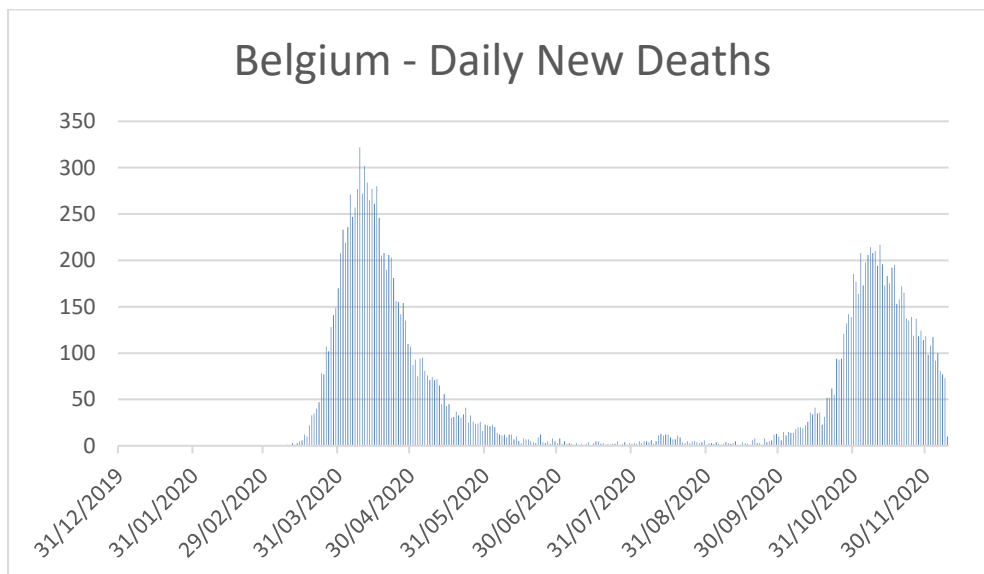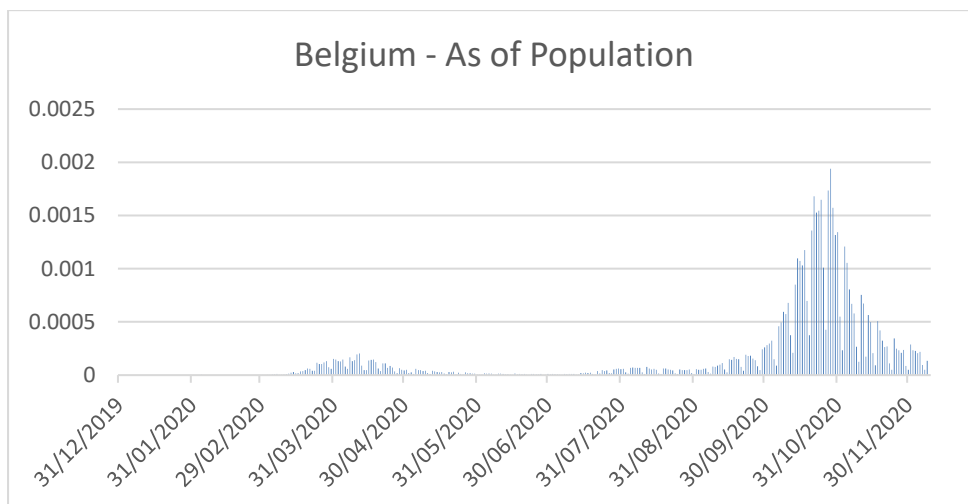
Belgium - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 10:

Belgium - As of Population

Data provided EU Open Data Portal [1]

Figure 11:

Belgium - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Belgium - Change in Case Number

Data provided EU Open Data Portal [1]

Belgium - Change in Death Number
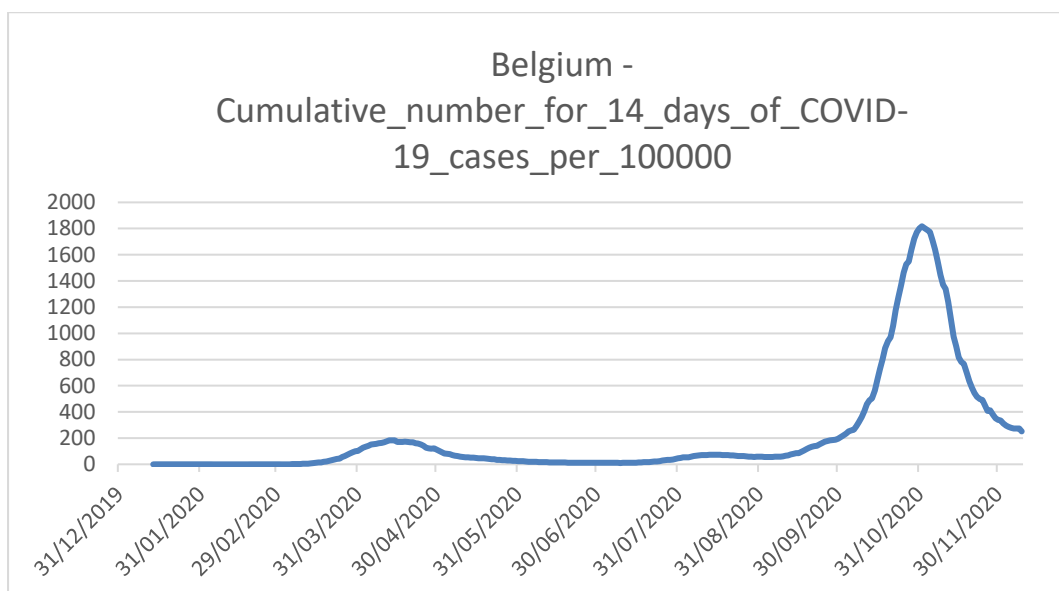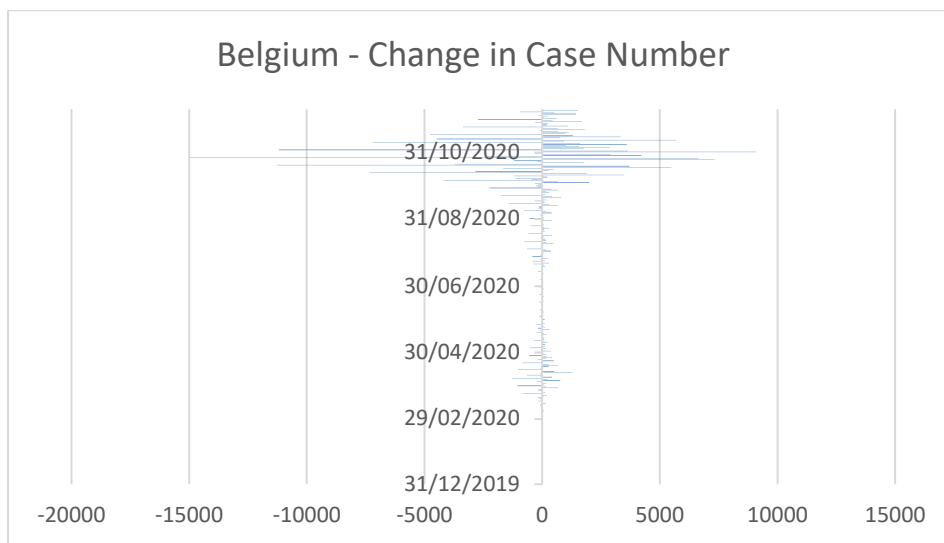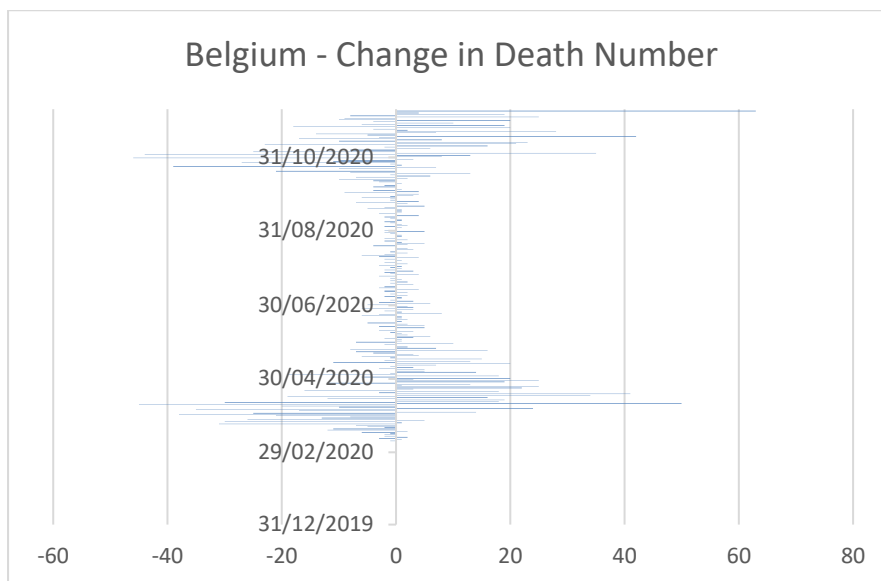
Data provided EU Open Data Portal [1]

China: China is the third largest landmass in the world, with fertile lowlands in the east, the Tibet Highlands in the west and Himalayas in the south-west. Western China is mostly plateaus and steppes that turns in dessert in the north-west and north of the country. Due to its large size the climate of country varies largely between its provinces. It ranges from continental climate in central, barren desert and steppe in the west, subtropical in the north and tropical in the south. [4] China has the largest population in the world with a population of 1.39 billion, with a population density of 148 per km^2, and a GDP of $13.61 trillion USD. [5] Its rank was 9th on the As of Population scale.

Lockdown timeline:

China only imposed a lockdown in the Hubei period.
23rd January – a soft travel lockdown starts in Wuhan, extending to the Hubei area the next day.
13th February – all non-essential companies shut down.
17th March – travel lockdown eased in Hubei.
25th March – lockdown outside the Wuhan area lifted.
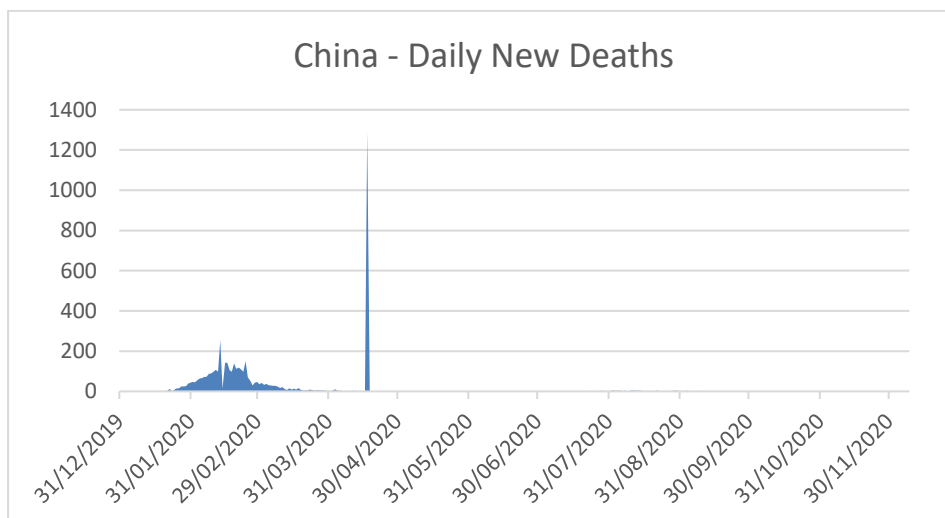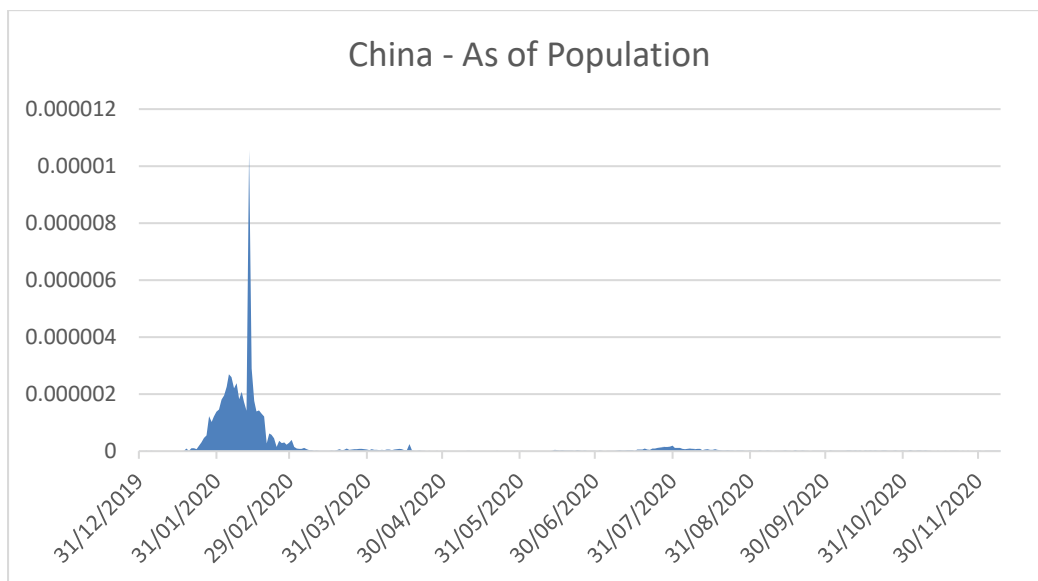8th April – lockdown in the Wuhan area lifted.

[8]

Figure 14:
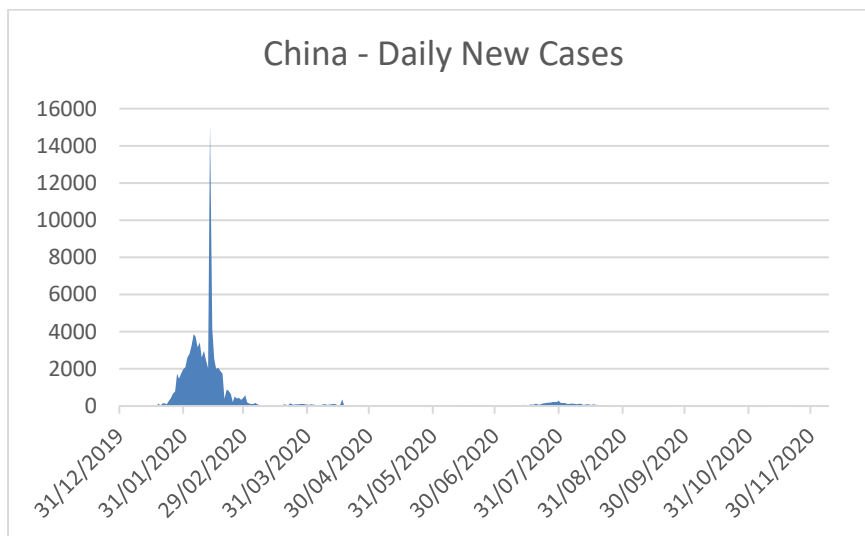
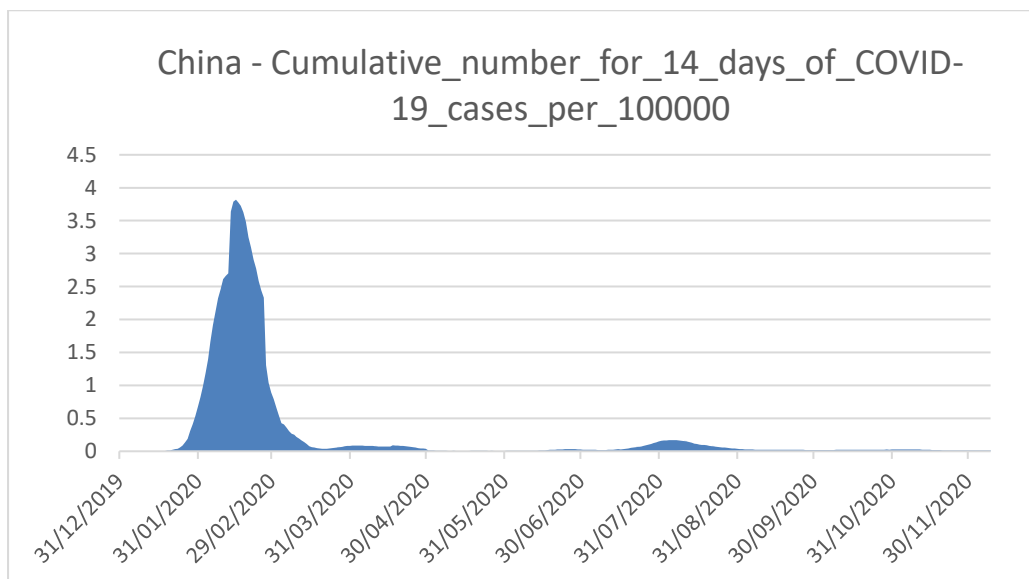Data provided EU Open Data Portal [1]

Figure 15:

Data provided EU Open Data Portal [1]

Figure 16:

China - As of Population

Data provided EU Open Data Portal [1]

Figure 17:

China - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 18:

China - Change in Case Number

Data provided EU Open Data Portal [1]

Figure 19:

China - Change in Death Number
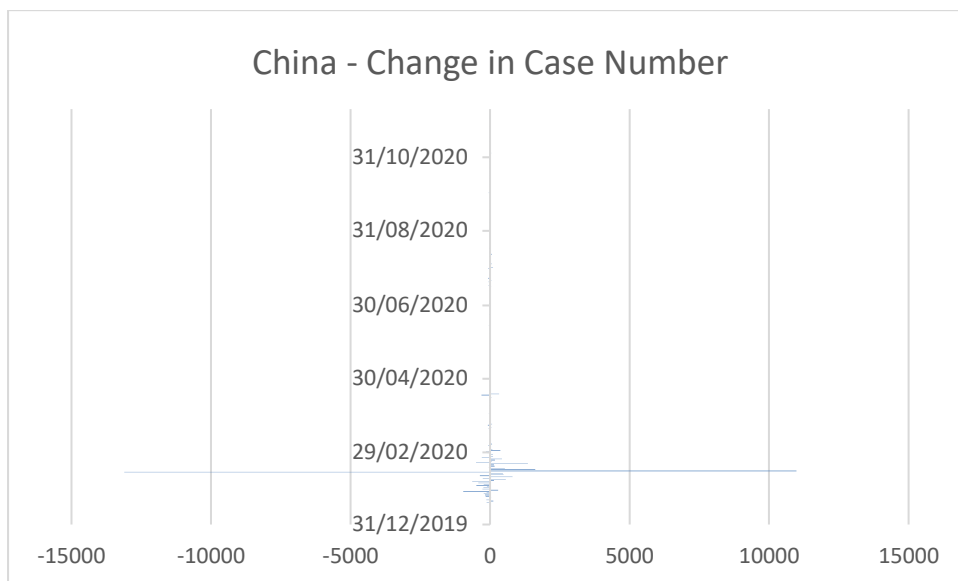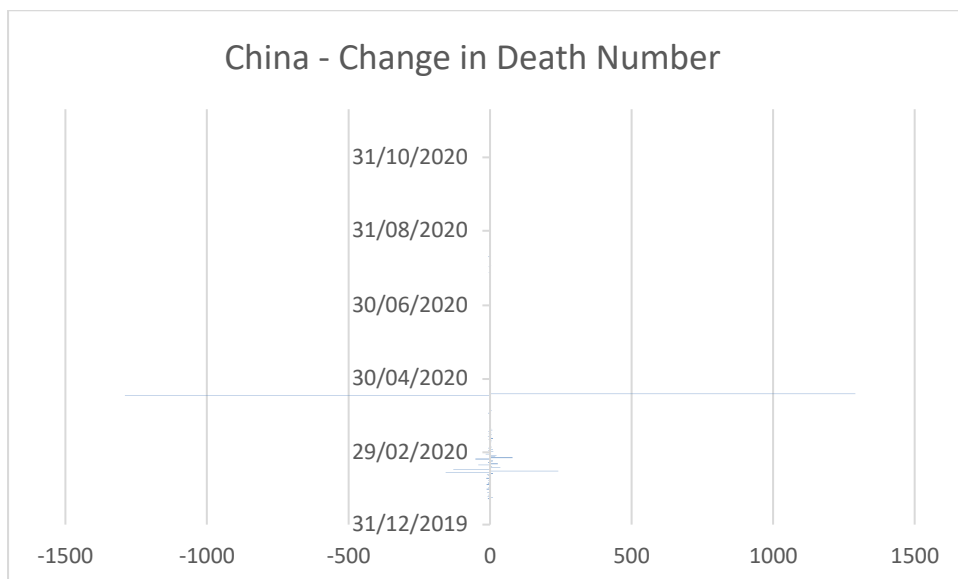
Data provided EU Open Data Portal [1]

Germany: Germany's central and southern regions have forested hills and mountains cut through by the Danube, Main, and Rhine river valleys. In the north, the landscape flattens out to a wide plain that stretches to the North Sea. [9] Germany's climate is moderate and has generally no longer periods of cold or hot weather. North-western and coastal Germany have a maritime influenced climate which is characterized by warm summers and mild cloudy winters. [10] Germany has a population of 83.02 million, a population to the density 240 per km², a GDP of $3948 billion USD [5], and ranked 133rd on the As of Population scale.

Lockdown Timeline:

Germany implemented state-based lockdown. Each state experienced different severities of lockdown at different times but the general period was between January up till March.
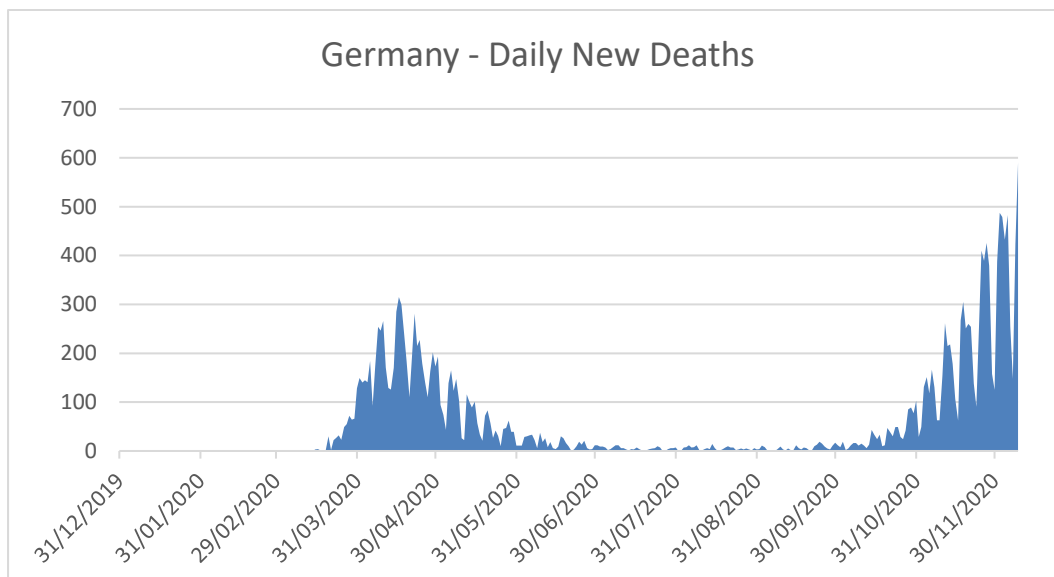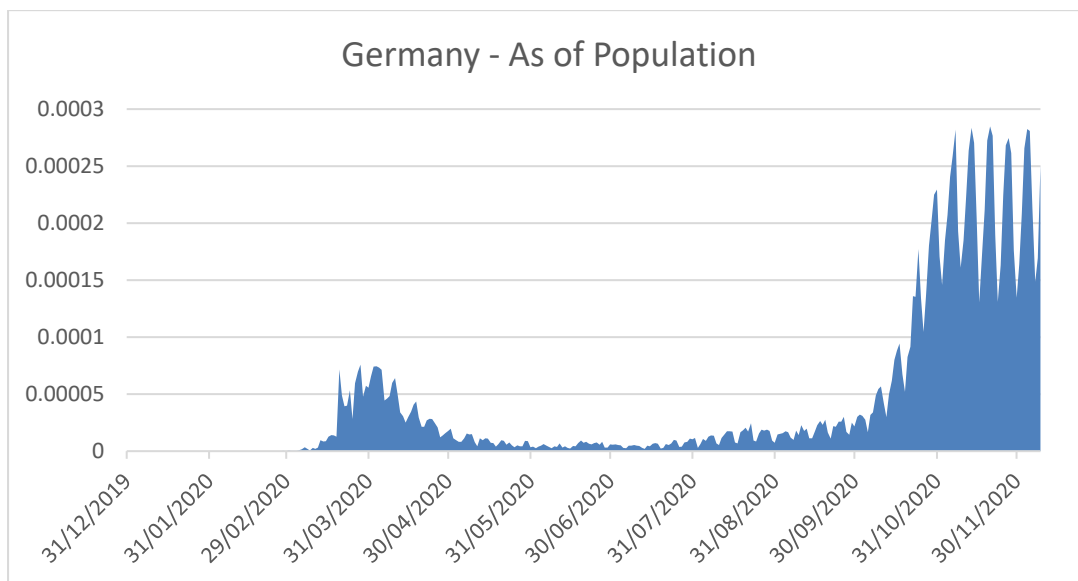
[11]

Figure 20:
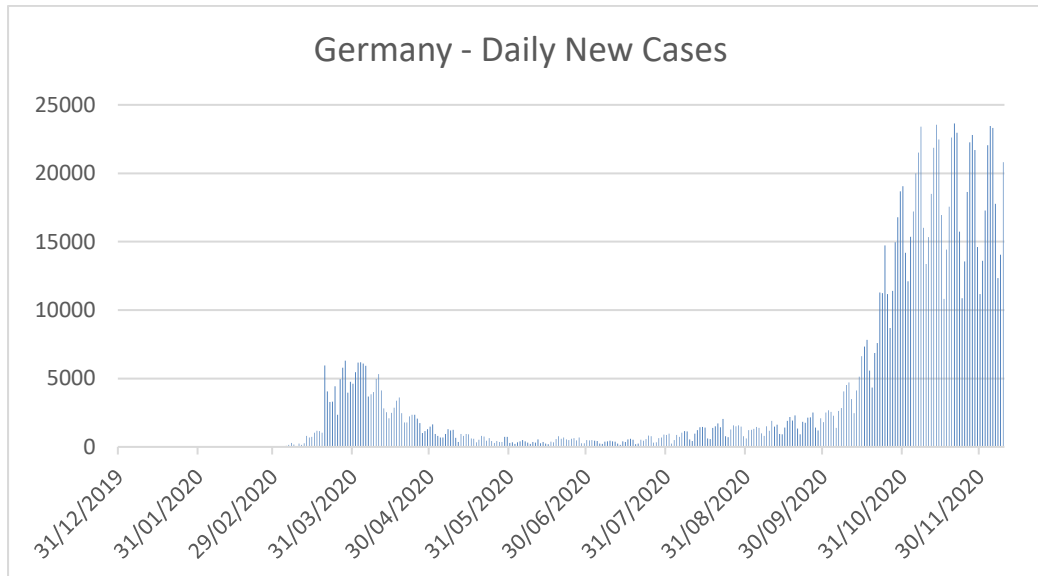
Germany - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 21:

Germany - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 22:

Germany - As of Population

Data provided EU Open Data Portal [1]

Figure 23:

Germany -Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 24:

Germany - Change in Case Number

Data provided EU Open Data Portal [1]

Figure 25:

Germany - Change in Death Number
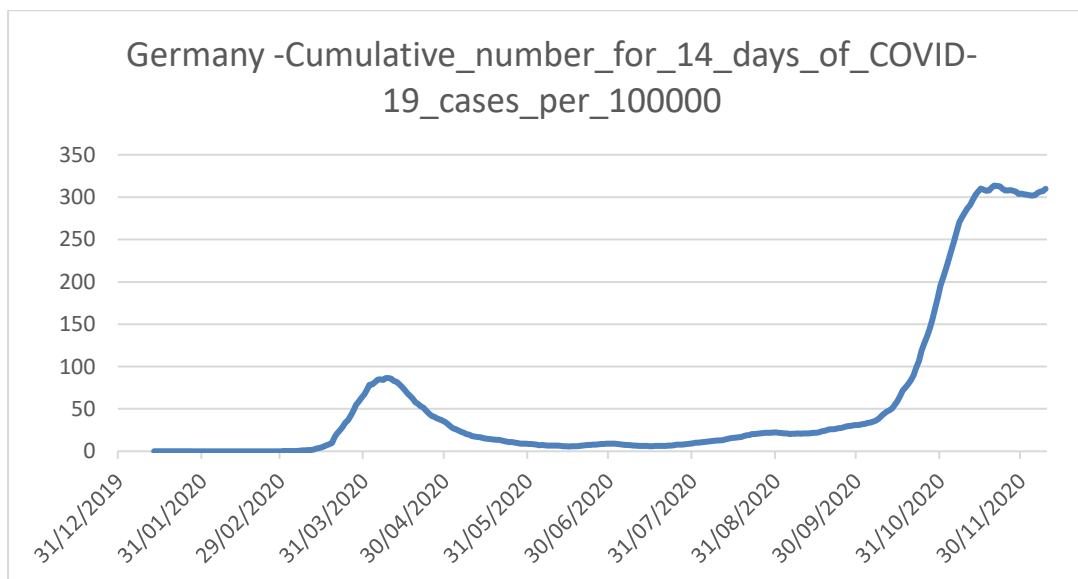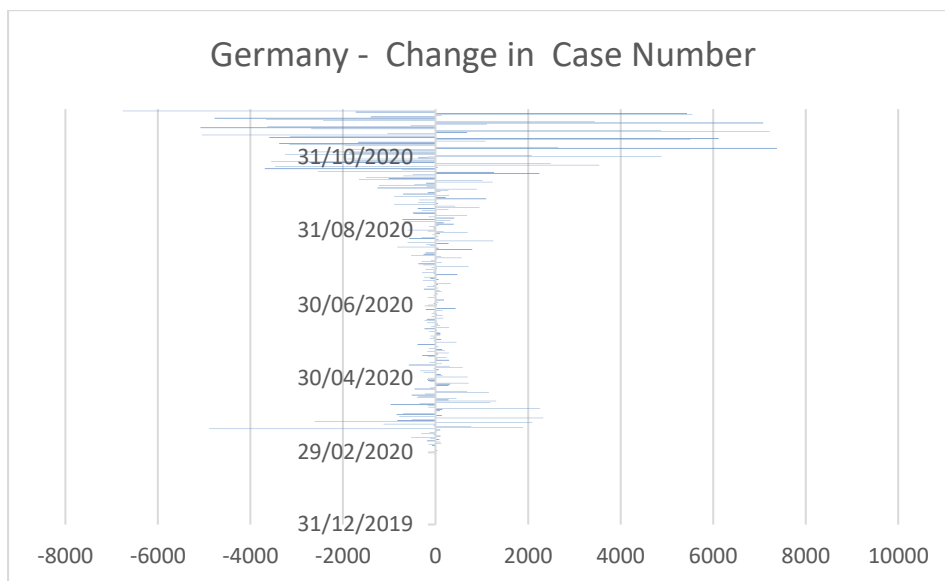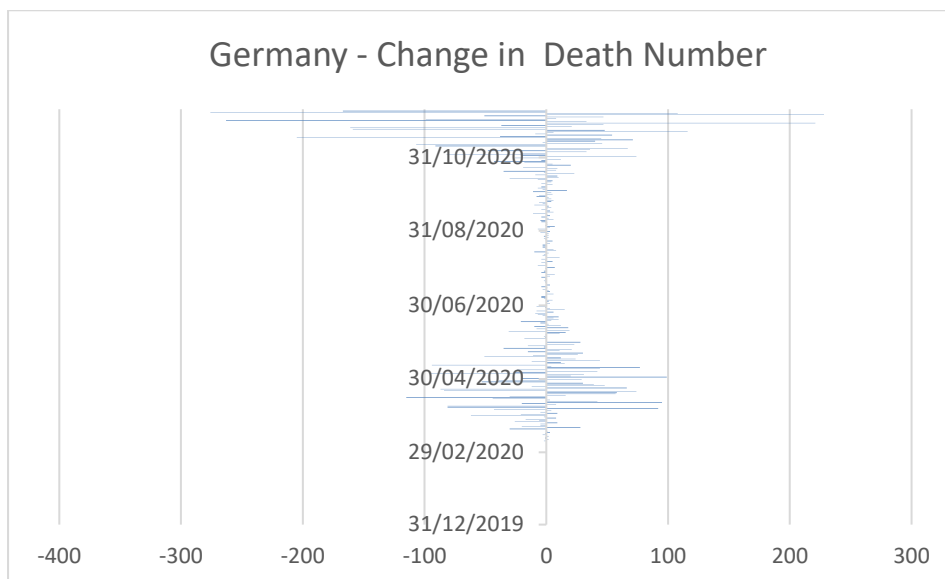
Data provided EU Open Data Portal [1]

Laos: The country is surrounded by the Xianghoang Plateau to the north and Boloven Pleateau to the south, with forests covering 40 per cent of the area. Loas has a tropical monsoon climate with the monsoon season lasting from May to September and an average temperature 27°c. [4] Laos has a population 7.06 million, a population density of 32 per km², and a GDP of $17.95 billion USD. [5] Its rank was 1th on the As of Population scale.

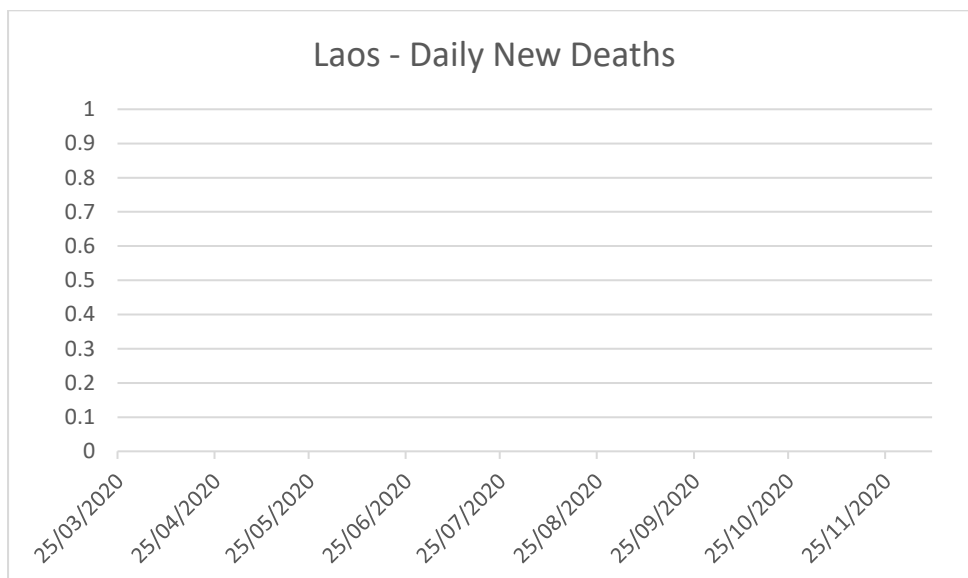Lockdown timeline:

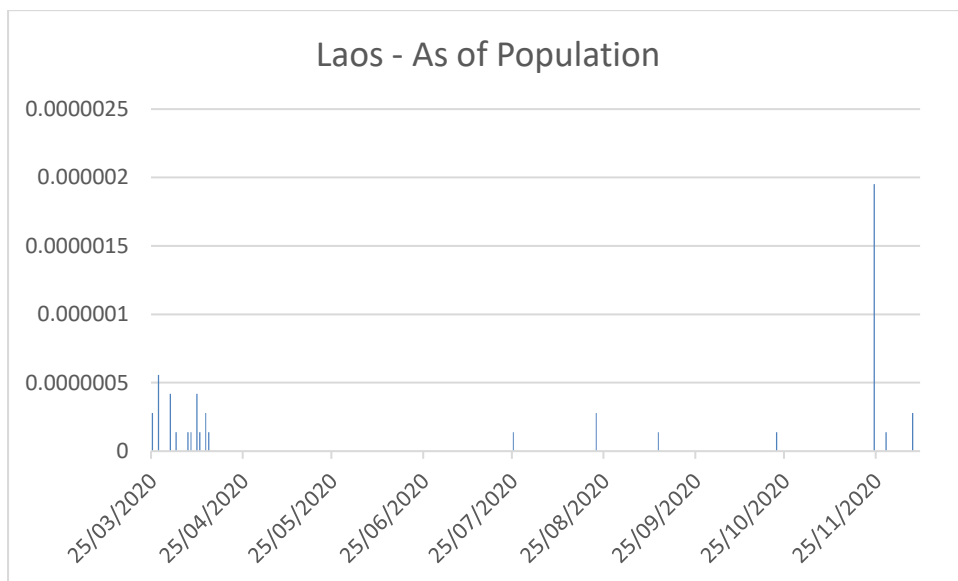30th March – Lockdown starts
18th May – Lockdown Eased
[12]

Figure 26:
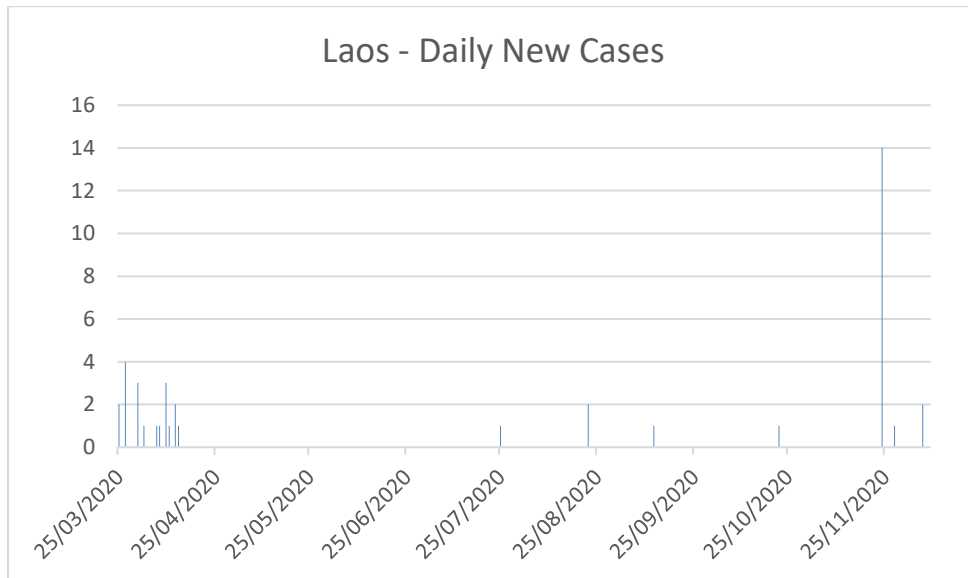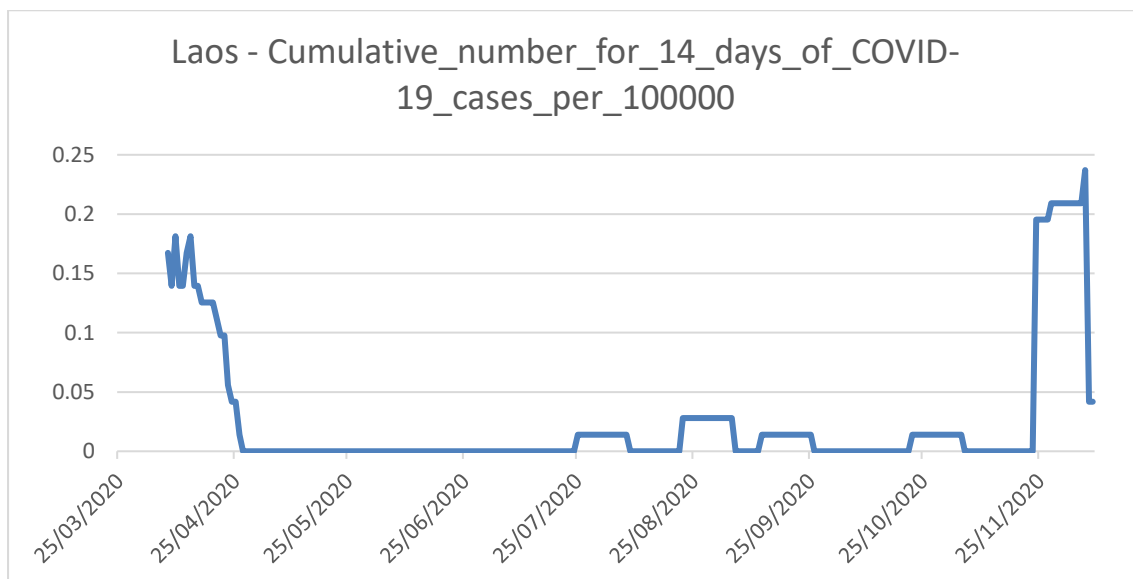

Data provided EU Open Data Portal [1]

Figure 27:
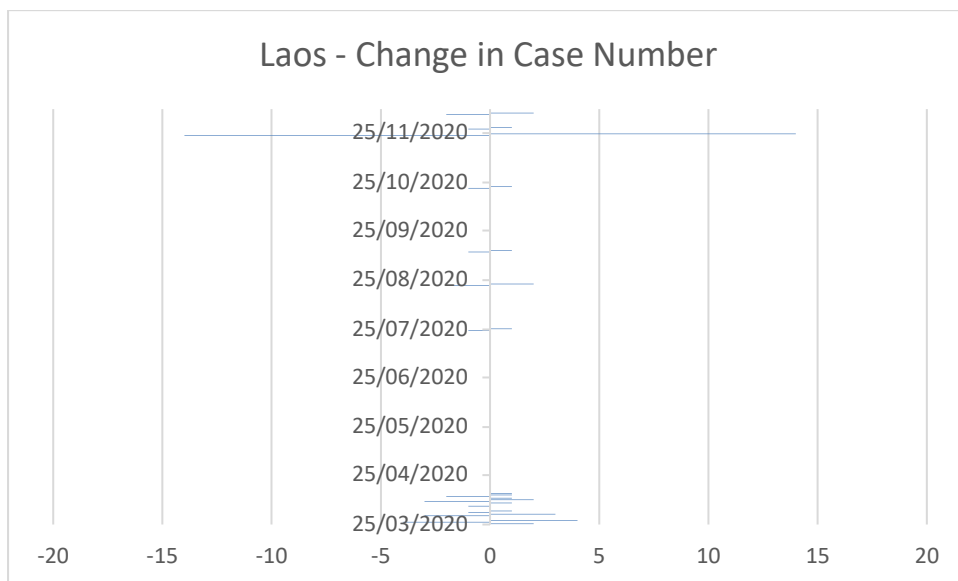

Data provided EU Open Data Portal [1]

Figure 28:

Laos - As of Population

Data provided EU Open Data Portal [1]

Figure 29:

Laos - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 30:

Laos - Change in Case Number

Figure 31:

Laos - Change in Death Number
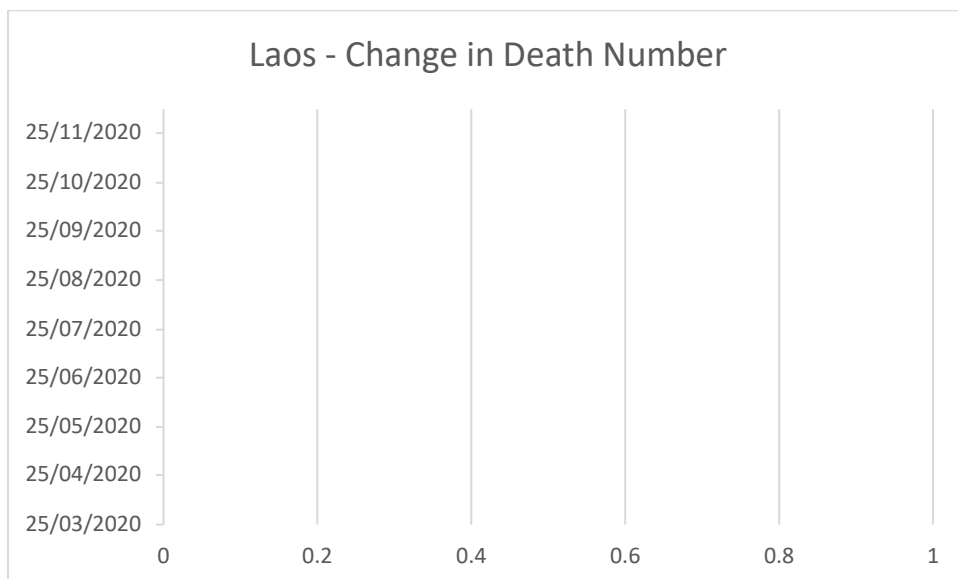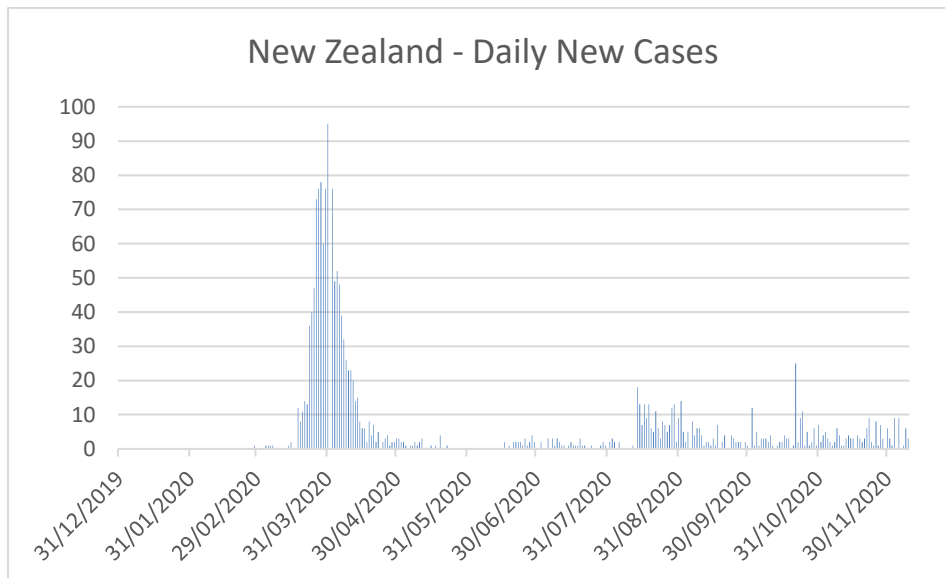
New Zealand: New Zealand has mostly mountainous or steep hills, volcanic peaks in the central North Island, and fiords in the far south west. It is mostly temperate, with some areas being tundra and subantarctic. The population of New Zealand is 4.886 million, with a population density of 15 per km^2, and GDP of $204.9 billion USD. It ranks 25th on the As Per Population scale. [5]

Lockdown timeline:

Did not implement lockdown. Used genomic sequencing and mathematical modelling [13] instead to identify areas at risk and provide support there.

Figure 32:
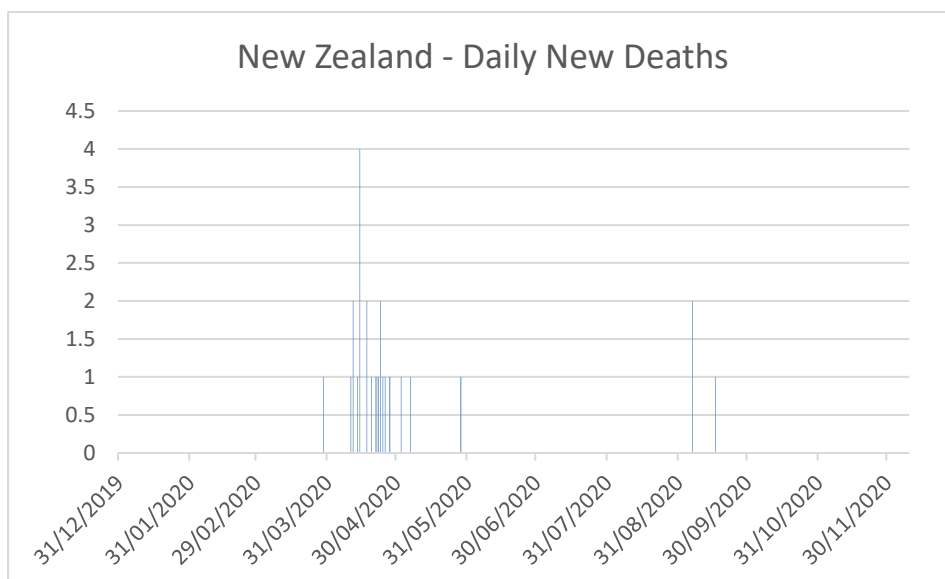
New Zealand - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 33:

New Zealand - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 34:

New Zealand - As of Population

Data provided EU Open Data Portal [1]

Figure 35:

New Zealand - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 36:

New Zealand - Change in Case Number

Data provided EU Open Data Portal [1]

Figure 36:

New Zealand - Change in Death Number
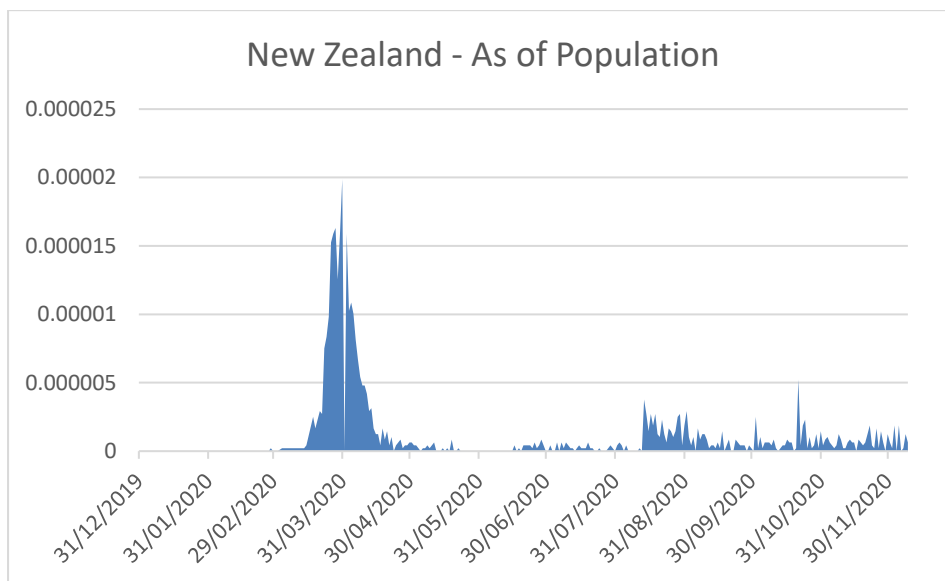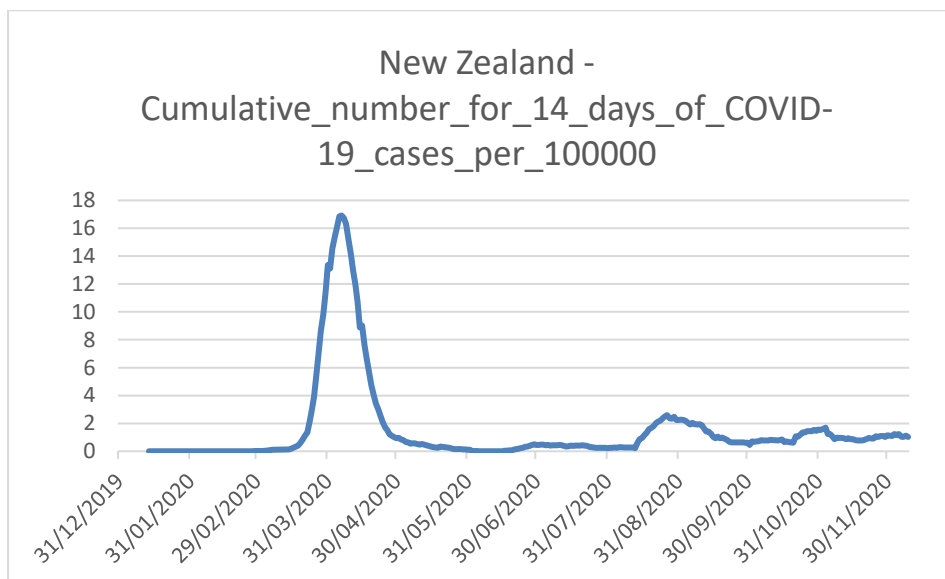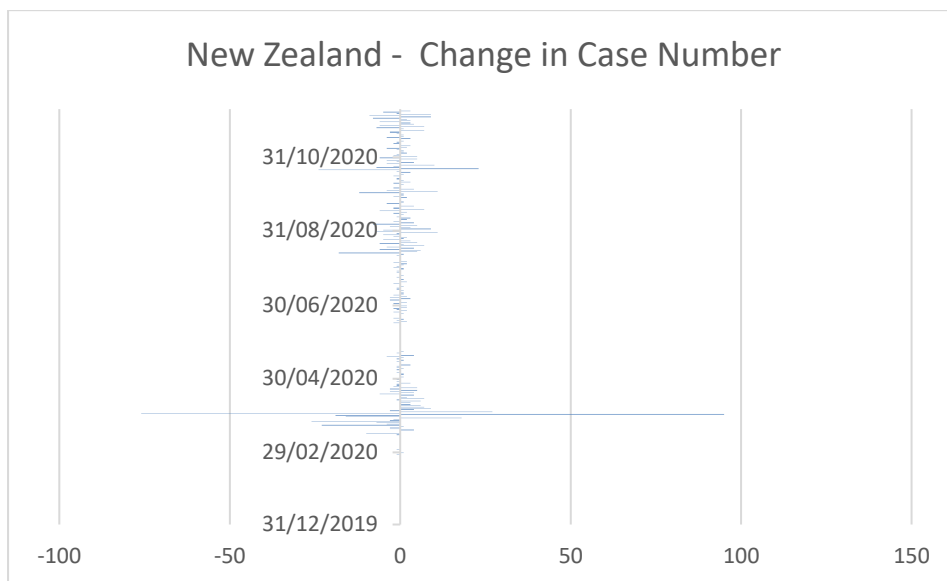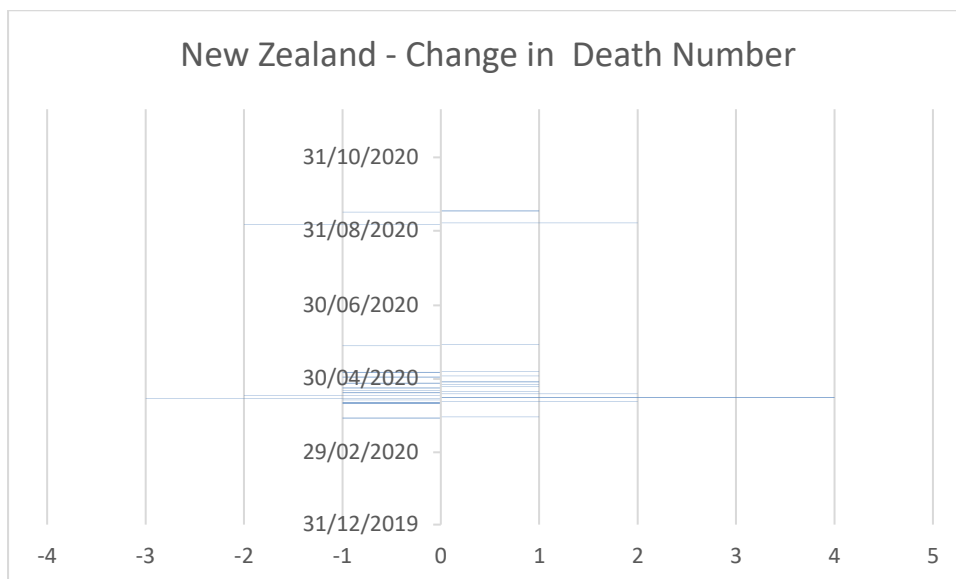
Data provided EU Open Data Portal [1]

South Korea: The country is largely mountainous, with small valleys and narrow coastal plains. The T'aebaek Mountains run in roughly a north-south direction along the eastern coastline and northward into North Korea, forming the country's drainage divide [14] South Korea has a temperate climate with four distinct seasons. Winters are usually long, cold, and dry. Summers are very short, hot, and humid. Spring and autumn are pleasant but also short in duration. [15] South Korea has a population of 51.64 million, a population density of 527 per km^2, and a GDP of $1.619 trillion USD. [5] South Korea ranks 45th on the As per Population scale.

Lockdown timeline:

Did not implement lockdown. Used the "test, track, treat and transparency" [16] method instead.

Figure 37:
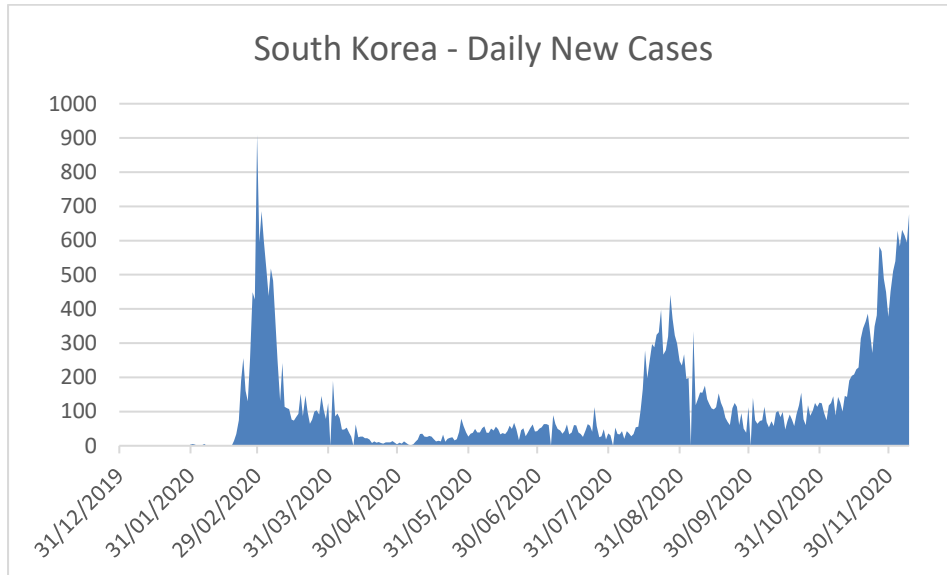
South Korea - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 38:

South Korea - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 39:

South Korea - As of Population

Data provided EU Open Data Portal [1]

Figure 40:

South Korea - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 41:

South Korea - Change in Case Number

Data provided EU Open Data Portal [1]

Figure 42:

South Korea - Change in Death Number
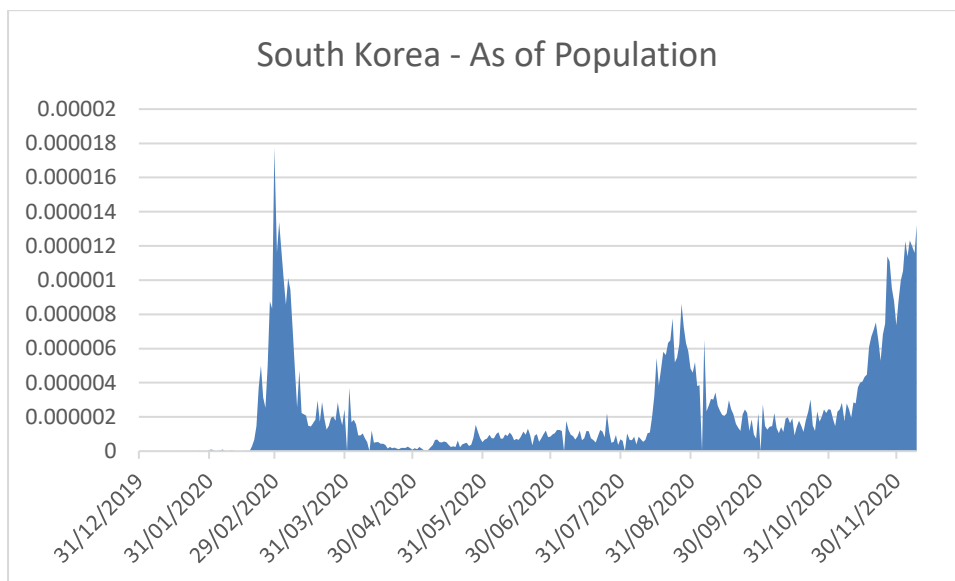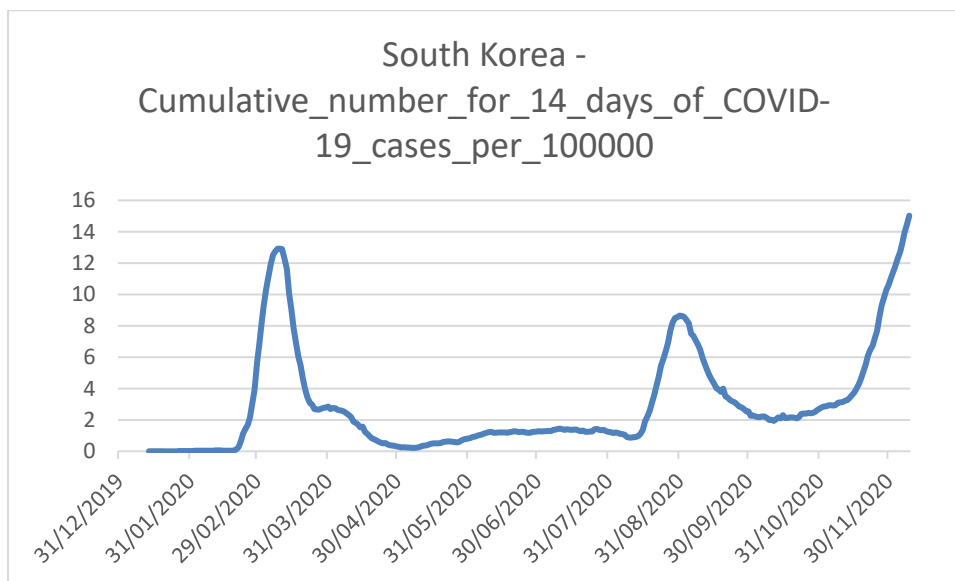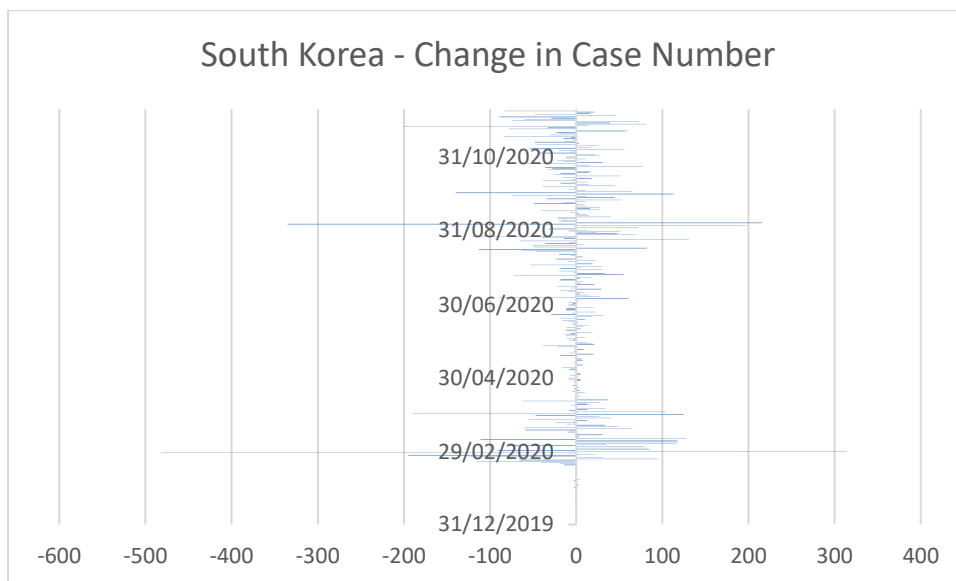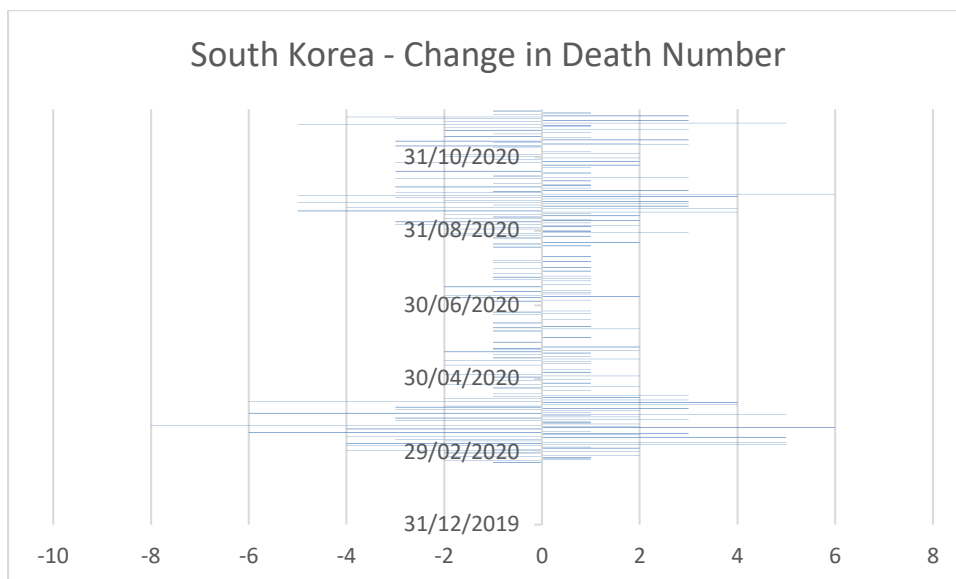
Data provided EU Open Data Portal [1]

United Kingdom: The physical geography of the UK varies greatly. England consists of mostly lowland terrain, with upland or mountainous terrain only found north-west of the Tees-Exe line. The lowland areas are typically traversed by ranges of low hills, frequently composed of chalk, and flat plains. Scotland is the most mountainous country in the UK. Wales is mostly mountainous, though south Wales is less mountainous than north and mid Wales. Northern Ireland consists of mostly hilly landscape. [17] The UK has a population of 66.62 million, a population density of 156 pre km^2, and a GDP of $2.855 trillion USD. [5] The UK ranked 156th on the As per Population scale.
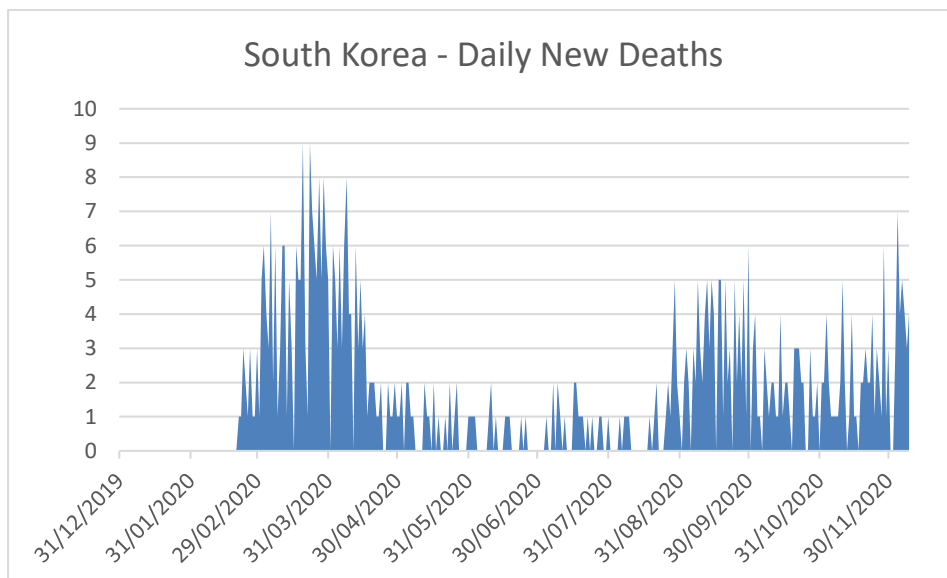
Lockdown timeline:

23rd March – lockdown one begins. With the public ordered to stay in and some businesses to close.
15th June – lockdown one lifted.
5th November – lockdown two begins.
2nd December – lockdown two lifted.
[2][3]

Figure 43:
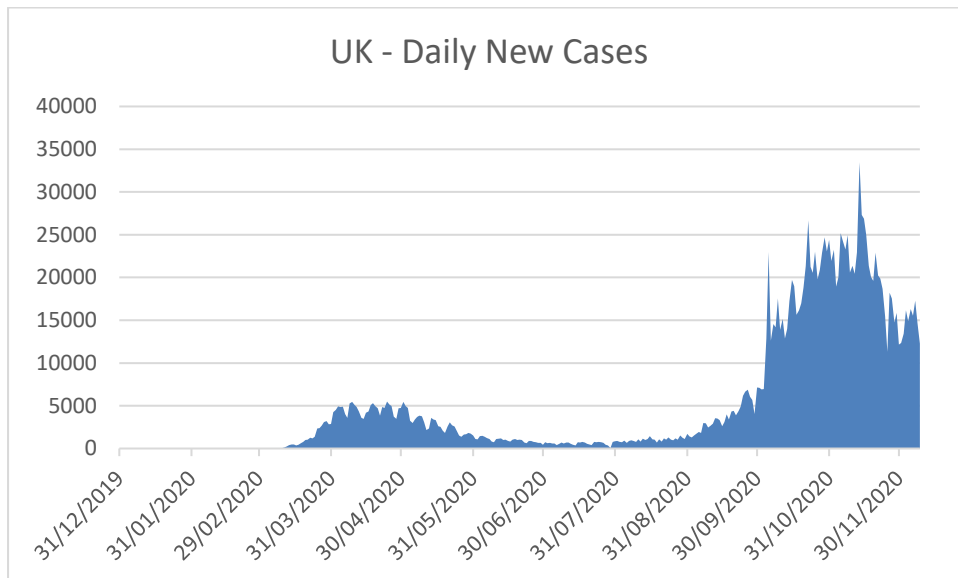
UK - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 44:
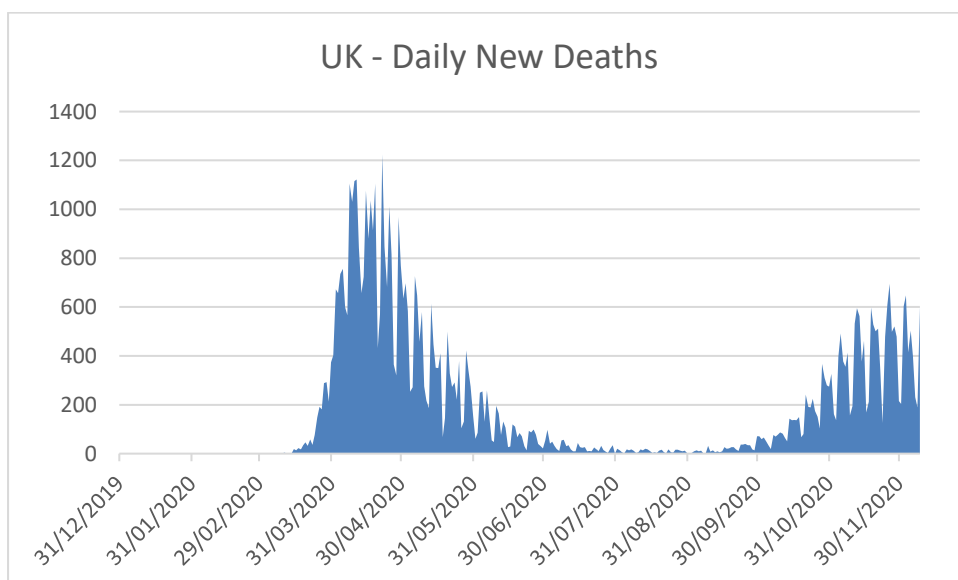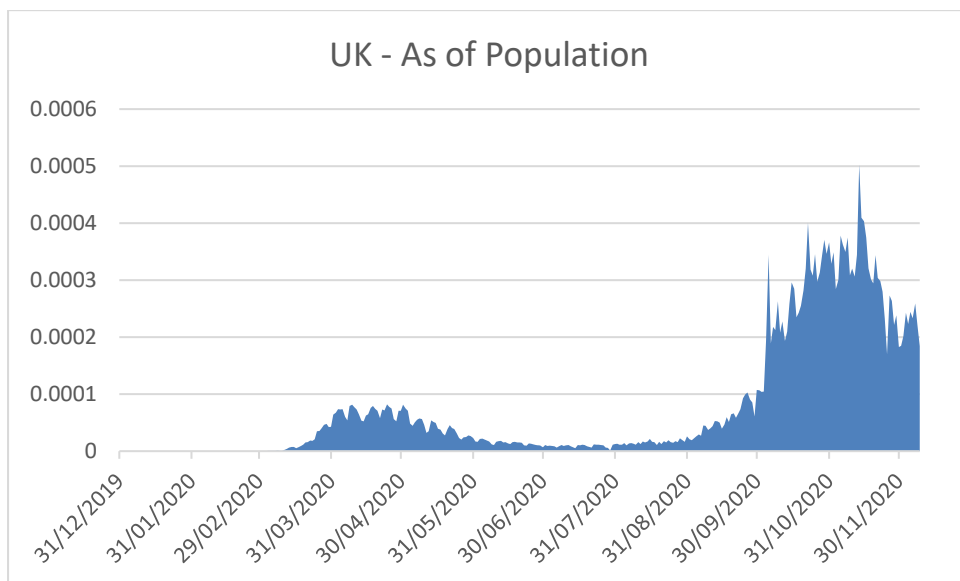
UK - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 45:

UK - As of Population

Data provided EU Open Data Portal [1]

Figure 46:

UK - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 47:

UK - Change in Case Number

Data provided EU Open Data Portal [1]

Figure 48:

UK - Change in Death Number
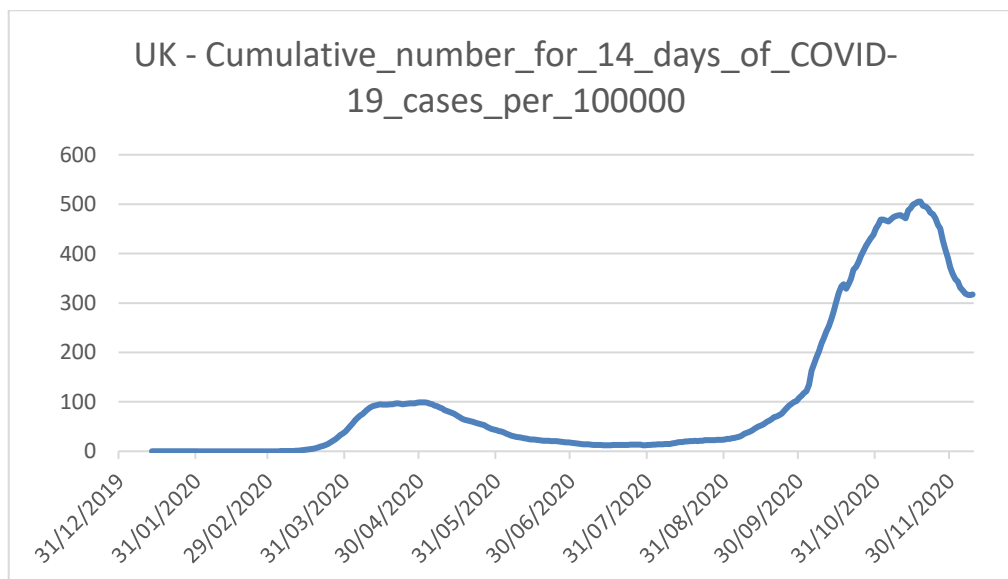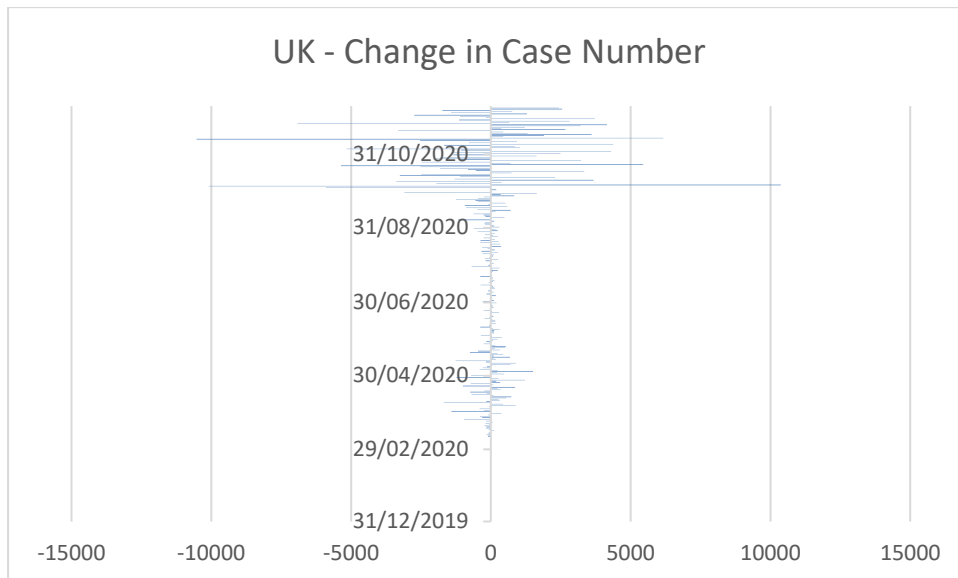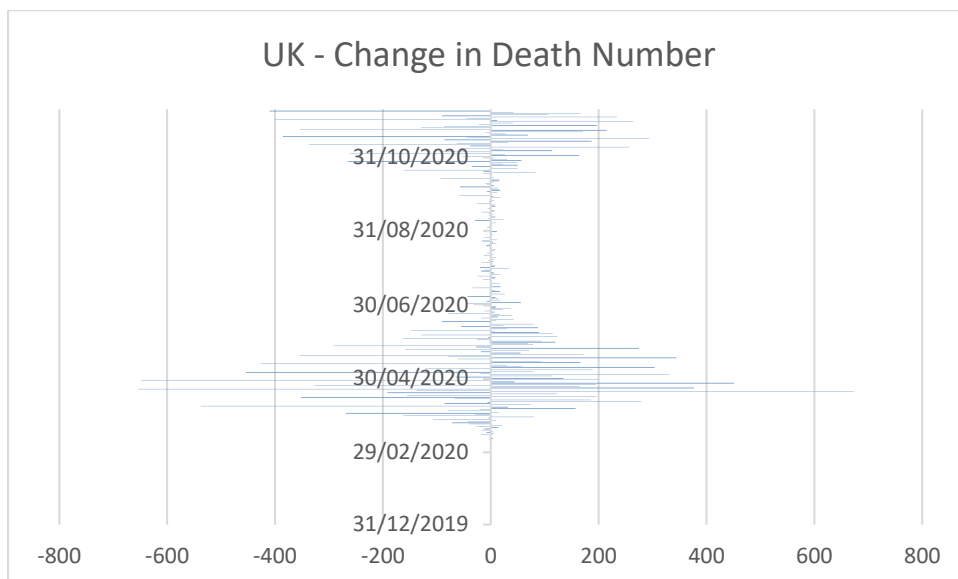
Data provided EU Open Data Portal [1]

United States of America: North America can be divided into five physical regions: the mountainous west, the Great Plains, the Canadian Shield, the varied eastern region, and the Caribbean. Mexico and Central America's western coast are connected to the mountainous west, while its lowlands and coastal plains extend into the eastern region.[18] Being a huge country, the contiguous United States is home to a wide variety of climates. However, in general it has a continental climate, with cold winters (often frigid) and hot summers (sometimes very hot), with a different season duration depending on latitude and distance from the sea. [19] The USA has a population of 328 million, with a population density of 197 per km^2, and a GDP of $20.54 trillion USD. [5] The USA ranked 197th on the As per Population scale.

Lockdown timeline:

Due to the unique nature of the US political system, each state introduced lockdown at various times. However, most states introduced a form of lockdown starting between late March and early April. [20]

Figure 49:
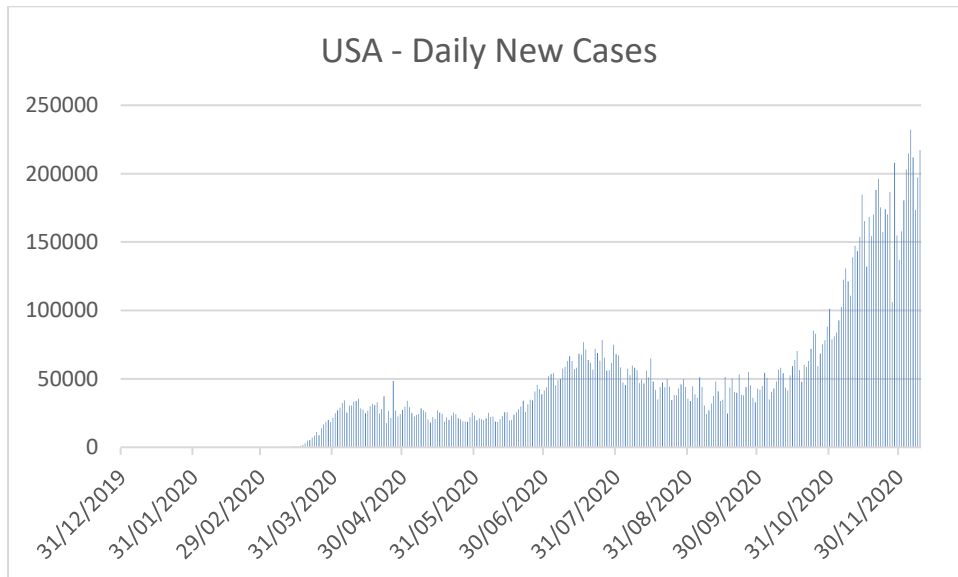
USA - Daily New Cases

Data provided EU Open Data Portal [1]

Figure 50:
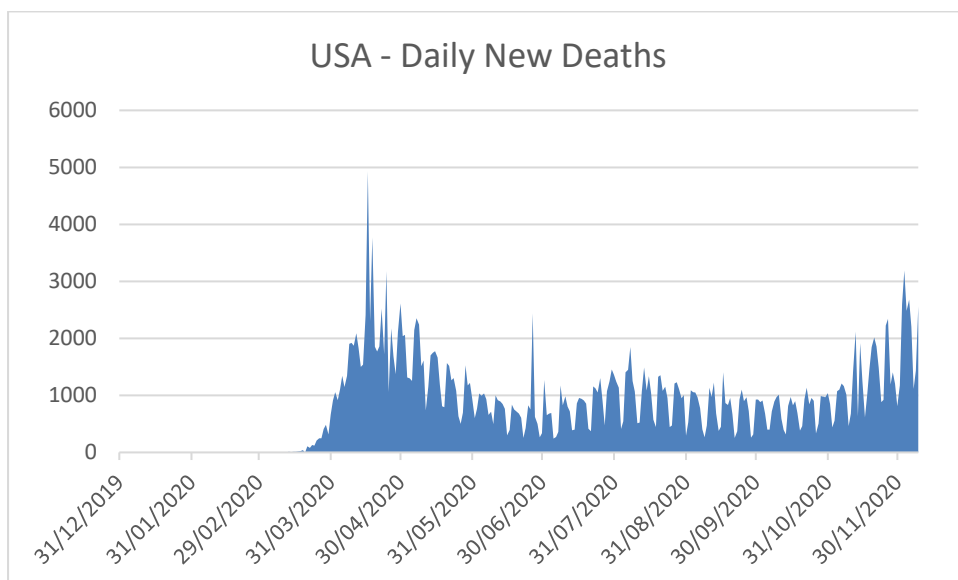
USA - Daily New Deaths

Data provided EU Open Data Portal [1]

Figure 51:

USA - As of Population

Data provided EU Open Data Portal [1]

Figure 52:

USA Cumulative_number_for_14_days_of_COVID-19_cases_per_100000
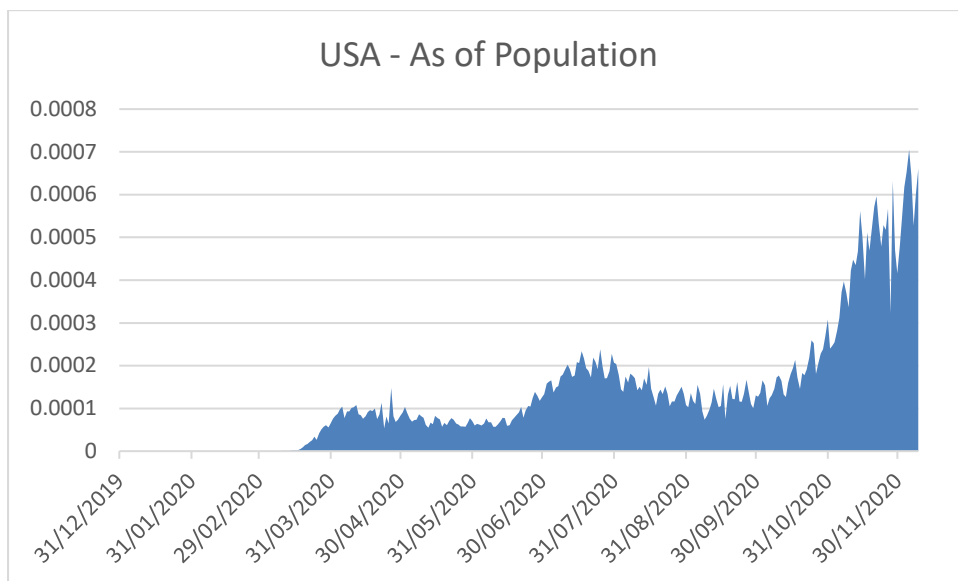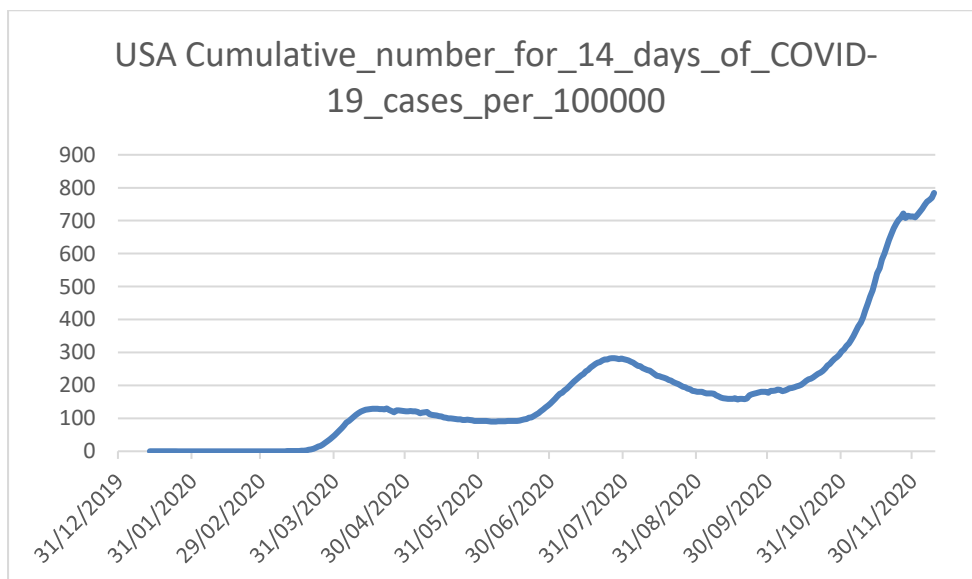
Data provided EU Open Data Portal [1]

Figure 53:

USA - Change in Case Number

Figure 53:

USA - Change in Death Number
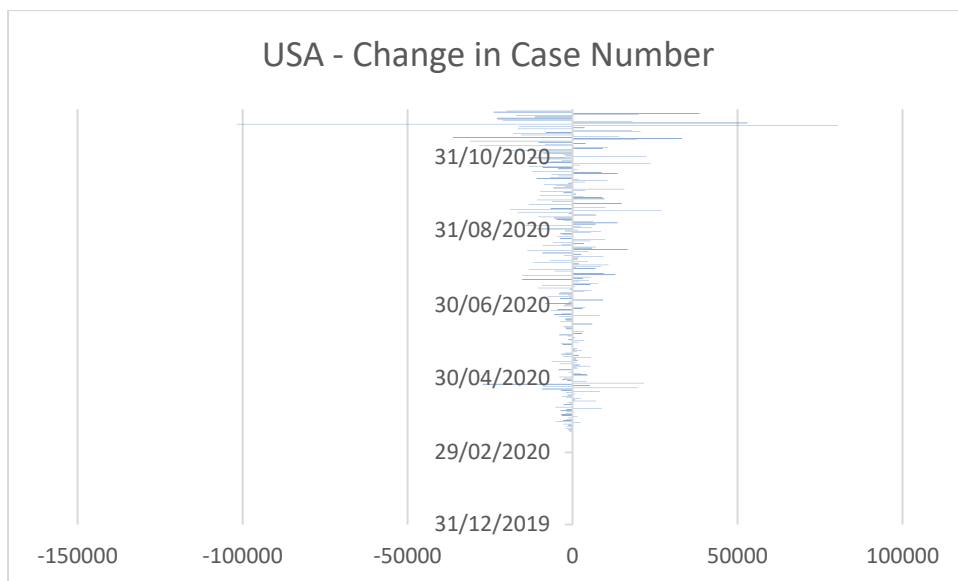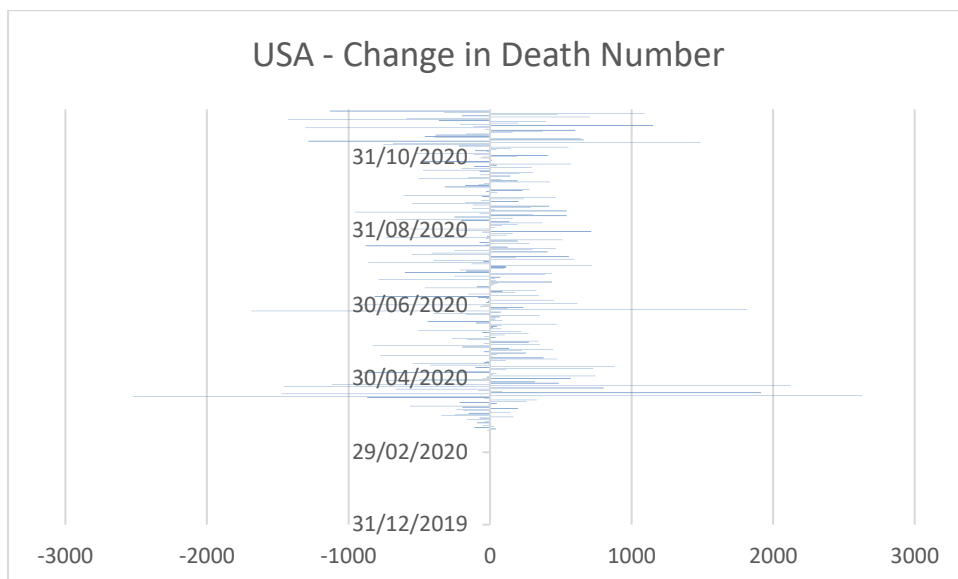
Sweden: The country is divided into three regions: to the north is Norrland, the vast mountain and forest region; in central Sweden is Svealand, an expanse of lowland in the east and highland in the west; and in the south is Götaland, which includes the Småland highlands and, at the southern extremity, the small but rich plains of Skåne. In the far north the region of Lappland overlaps Norrland and northern Finland.[21] Winter and summer temperature differences in Sweden are extreme, but generally the country enjoys a temperate climate, thanks to the Gulf Stream. [22] The country has a population of 10.23 million, with a population density of 25.4 per km^2, and a GDP of $556.1 billion USD. [5] Sweden ranked 164th on the As per Sweden scale.

Lockdown timeline:

Sweden did not have any lockdowns but they encouraged social distancing and use of face masks.[23]

Figure 54:
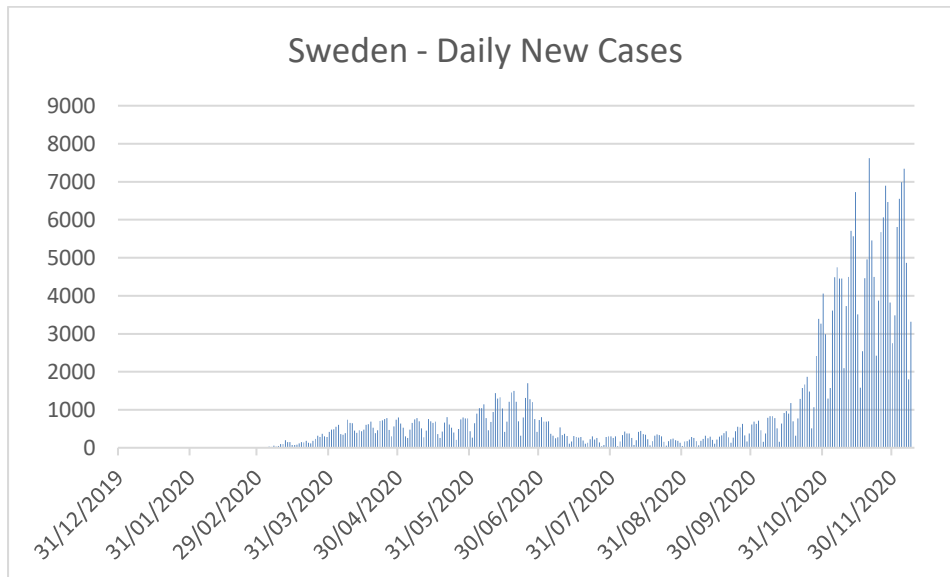
Data provided EU Open Data Portal [1]

Figure 55:
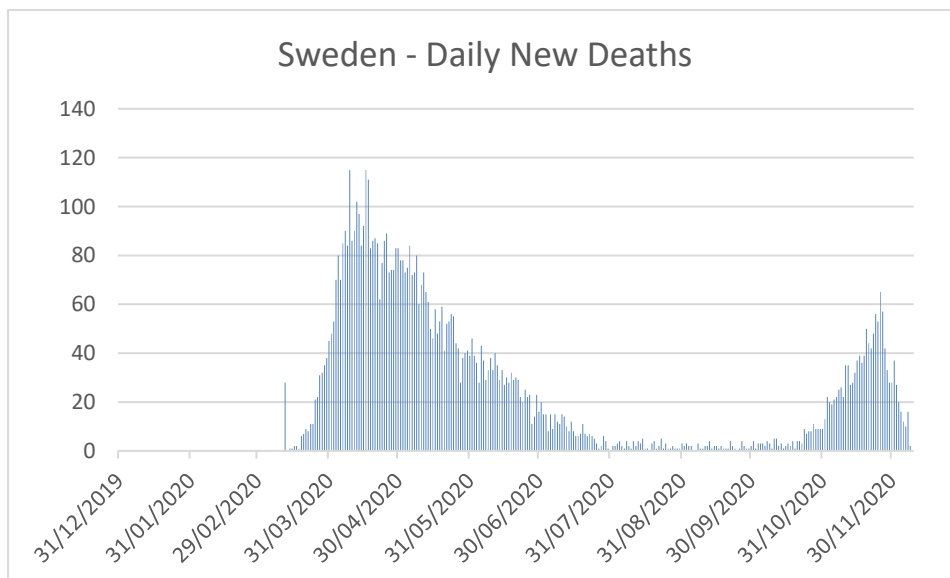
Data provided EU Open Data Portal [1]

Figure 56:
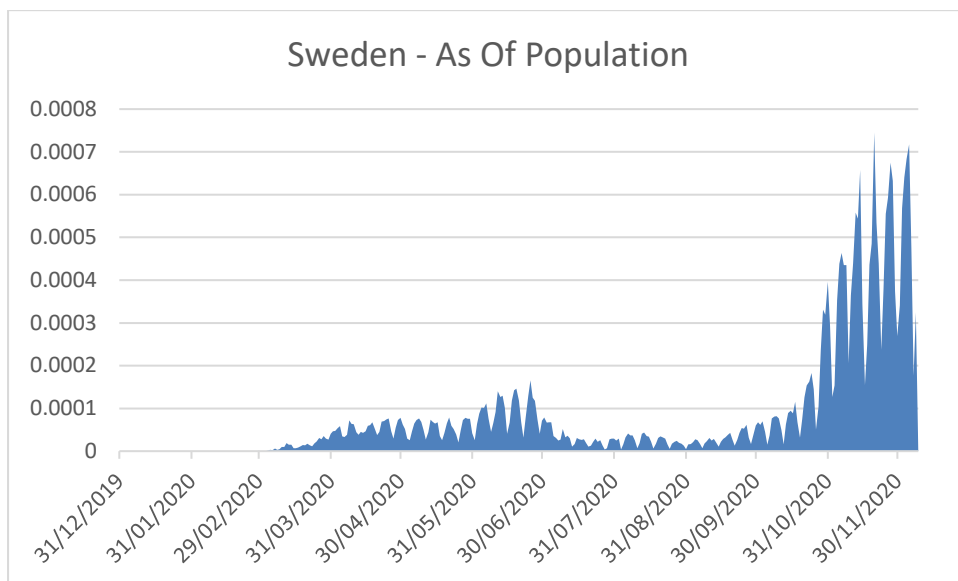
Sweden - As Of Population

Data provided EU Open Data Portal [1]

Figure 57:
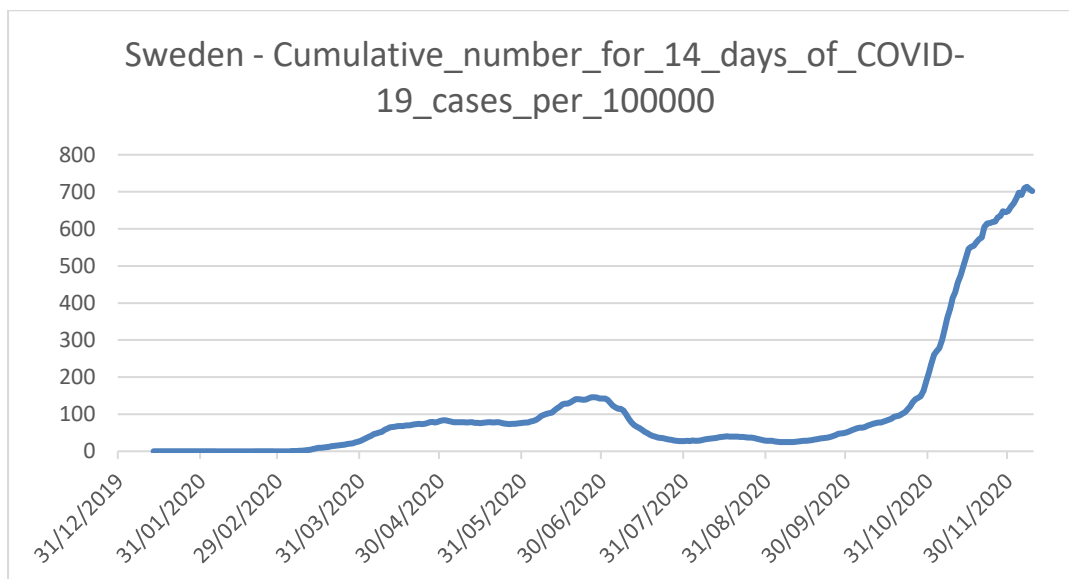
Sweden - Cumulative_number_for_14_days_of_COVID-19_cases_per_100000

Data provided EU Open Data Portal [1]

Figure 58:

Sweden - Change in Death Number

Data provided EU Open Data Portal [1]

Figure 59:

Sweden - Change in Death Number
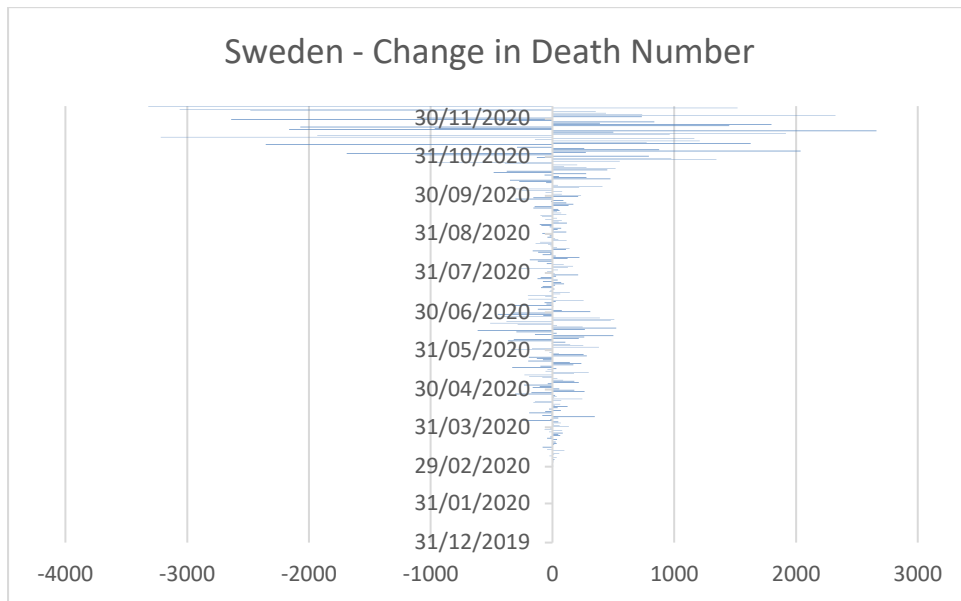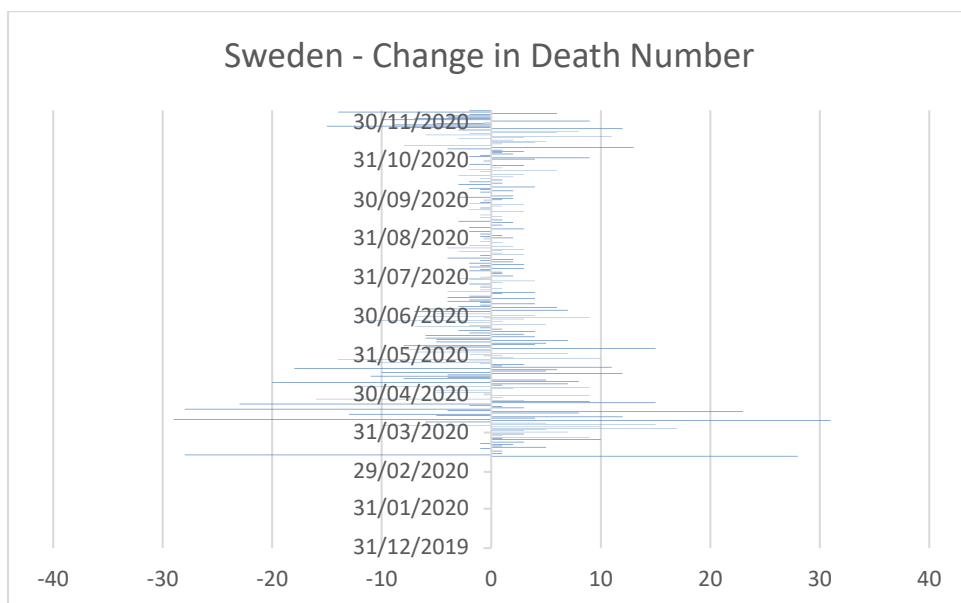
Data provided EU Open Data Portal [1]

Analysis and Evaluation of the data:

Looking at all the graphs displaying the number of daily new cases, all the countries in the sample (except for the USA) show an initial peak between December and February 2019 followed by a second peak between September and December 2020. The USA, shows the same patterns of the rest of the nations in their first peak, with exponential growth followed by a dip. The USA was among the slowest countries to implement and enforce Covid-19 guidelines, along with its large population and areas with low population density; it can inferred that the USA is currently experiencing its first wave of the virus whereas the rest of the sample are experiencing the second wave of the virus.

When comparing the UK and the US As of Population graphs, lookdown measures were introduced to both nations when approximately an additional 0.01% of the total population of the country had confirmed cases per day. Based on the projections of the rest of the sample, there will be an increase in number of new cases for another month, followed by a steady decline and stagnation. However, this projection for the US may not come into fruition due to the development of Covid-19 vaccines being a significant external factor that will affect the number of new cases. This means the effectiveness of the lockdowns throughout the US cannot measured without having large rooms of error, reducing its valued weight when concluding.

Laos had the lowest average As of Population score in the sample, it also was among the first nations to implement lockdown measures. The nation was praised for its early response by International health organisations after declaring itself virus free on June 2020.[25] This would make it an ideal candidate to show benefits of starting a lockdown, however, like most low-income countries the number of data points provided were far fewer than the high-income countries and newly developed countries. This makes the representations of data for these countries less reliable than others in the sample.

On the contrary, Andorra had the highest As of Population score in the sample. The nation has yet to experience a full lockdown, however it was among the first countries to impose social distancing rules and making wearing face masks mandatory. Likewise, to Laos, Andorra would also be an ideal candidate to suggest the benefits of a lockdown but like Laos there was less data points for Andorra than other countries making it less reliable.

China imposed a lockdown for only the Hubei province when the number of new cases in the country began to rise. Based on the Figure 15, the lockdown seemed to be effective as the number of new cases began to drop after two weeks. This complies with the statements of experts, who say the impact of a lockdown can only be gauged after two weeks. [24] The Hubei province shares very similar characteristics to the UK, both the Hubei province and the UK was about 60 million residents, with a population density of about 300 per km^2 and have about the same mainland area size (excluding off the coast islands and Ireland for the UK). With both the UK and Hubei area seeing a drop in new cases and deaths after the implementation of a lockdown, there is strong reason to believe that a national lockdown was required.

The argument for a lockdown is further solidified by looking at the graphs of Germany and Belgium. Both these national introduced lockdown rules in the first quartile of 2020, when the number of new cases, deaths and As of Population value began to rise. In a similar case to China, there was an initial rise due to the lag time in the number of infected seeing the effects of the lockdown followed by a decline and a stagnation and in number of new cases. Although correlation does not always mean causation, the reproducibility of the results among many countries gives a strong indication to the success of imposing a lockdown.

However, after looking at the graphs of South Korea and New Zealand, the need for a lockdown comes into question. Both these nations experienced a similar rise in cases in

the first quartile of 2020 Both these nations enforce social distancing rules and made wearing masks mandatory, New Zealand used mathematical modelling, while South Korea used the 4t's method. The nations were able to reduce the number of new cases without thew use of lockdowns. Their timeframe and As per Population followed the same trends as the nations who used lockdowns. New Zealand in particular was praised by the World Health Organisation for its success with tackling the virus with its "unique" approach.[26] However, despite their successes, these nations prepared their strategies weeks to months in advance. South Korea in particular, was very prepared for a potential outbreak as it had learnt from the MERS outbreak in 2015. The government was quick to act and had made several reforms to boost preparedness. [27]

Sweden was another example of a nation which did not impose a lockdown and had the most relaxed Covid-19 guidelines. Sweden's aim was to establish herd immunity to flatten its curve. The results for it's first wave was very similar to nations who had lockdowns suggesting a form of herd immunity had been established. However, the number of deaths were very high. This suggests in the UK the peak of the first wave would have naturally levelled off and fallen, when enough people caught the virus and developed immunity. However, recently the concept of establishing herd immunity has become controversial after reports stating the created T.Cells only lasting six months.[28] Looking at the graphs, the countries that are currently experiencing a second wave did have their first wave about six months ago. Sweden is suffering from a much larger second wave then most countries. This may be attributed to its over reliance on herd immunity while other nations did indirectly establish a form of herd immunity but they branched out to other methods.

Ideally, I would want to read the data of every single country in the world, however due to limited time and resources this would not be possible. Furthermore, many countries do not have a complete set of data, this makes the analysis based on the data provided less reliable and there could be cases of data tampering. I have tried to account these factors along with everything else to come to a conclusion.

Conclusion:

Many methods were used to tackle Covid-19 by the nations of the world. There are enough reproduced results to prove the use of lockdowns was effective at flatting the curve, however, many nations were able to produce the same results using their own methods. For the UK, the government was correct to initiate a lockdown as the other methods used by nations, ones talked about in this paper, required planning and preparation before As per Population number raised above 0.001% (usually three to four weeks beforehand). The UK is currently using a strategy similar to the one used by South Korea. The NHS Covid-19 app was developed to track and trace people who could have potentially come in contact with virus carrier so they can test themselves. Although, we can see successes and failures of each method at this very moment, the full picture can only be established once this pandemic is declared to be over.

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