

# World Happiness Report

## Data Analysis

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## 1.0 Overview

The World Happiness report published yearly since 2012, ranks countries based on their level of happiness. The report uses a survey conducted by the Gallup World Poll that asks a question, known as the Cantril ladder, where participants rank their own lives on a scale of 0 to 10, where the two extremes represent the worst and the best possible lives they can imagine for themselves, respectively (*World Happiness Report*). The report also provides a breakdown of the influence of the following six factors - Economy, Family, Health (Life Expectancy), Freedom, Government Trust (Corruption) and Generosity and their contribution to the overall Happiness Score.

## 2.0 Objectives

The six factors that contribute to the happiness score are factors that experts believe measure well-being and consequently the progress of a nation. As the report gained recognition with the United Nations, more countries have used this to help drive their policies and decision making to further improve their country's state of happiness (*World Happiness Report*).

Our primary objective is to determine whether the hypothesis that nations are targeting policies, in regards to the six factors, to improve their nation's well being is true. Our strategy to tackle this is two-fold:

1. By conducting an overall year over year analysis of the happiness score and the different factors that contribute to it
2. By tracking the progress of the top and bottom 10 nations in terms of the overall happiness score as well as each of the six factors

With this approach we can determine if the hypothesis holds true as if policies are being targeted to improve a country's well being in any of the six areas for a given year, this would be evident in the results of the scores from the subsequent year.

In addition, we also conduct a brief analysis of regional differences in happiness score and each of the six factors. Our goal here is to further supplement the findings from the results of the hypothesis and identify any correlation to region and speculate why such differences may exist.

## 3.0 Data Preparation

Our data was extracted from Kaggle which is an open data site that hosts a variety of datasets. We chose this source due to ease of accessibility and use of reliable data collection methods.

The data was available in 5 separate csv files, 1 file for each year from 2015 – 2019. The data quality was good in general but there were a few issues we had to address. The column order and names were different across the years. In 2015 and 2016 the datasets were prepared the same way, but the naming convention for the columns were changed for the subsequent years. This was handled by renaming the columns consistently across all years.

In the 2018 and 2019 dataset, the region along with many other previously measured attributes were dropped. Our solution was to focus only on columns required for analysis. As the region column was dropped for datasets after 2017, the values in this column were imputed for the subsequent datasets using the values assigned to the same country from earlier years. We disregarded dropped columns as they weren't pertinent to our analysis.

An obstacle we faced with the country column were changes in country name over the years along with some countries that had data only in more recent years. For countries that were renamed, we used the most recent instance of the country name. And for analysis by a group, such as by region or year, as we used averages and less than 10% of the countries had missing data for some earlier years, we excluded those as we assumed that they wouldn't have significantly shifted group averages.

For data analysis, to ensure we were able to analyze trends, we created a column representing the year for each data set and concatenated all the files into a single dataset. This allowed us to perform the necessary analysis to form meaningful conclusions from the data. The analysis was done fully in multiple Jupyter notebooks, each focusing on a specific factor. Python was the language of choice to do the analysis as it offered many simple built-in libraries such as pandas, matplotlib and seaborn.

## 4.0 Data Analysis

This section showcases the analysis and trends observed in our data. The focus of our analysis was the influence of and trends observed in each of the six factors: Economy, Family, Health (Life Expectancy), Freedom, Trust (Government Corruption,) and Generosity in relation to the happiness score. Note that all figures in each of the sub-sections correspond to a jupyter notebook labelled the same in supporting documents.

## 4.1 Happiness Score (Jupyter Notebook: Overall Happiness Analysis)

To obtain an initial understanding of the data, an analysis of the overall happiness score was conducted to see the trends for the various regions and countries over time. Figure 4.1-1 below shows the average happiness for all countries over the years.

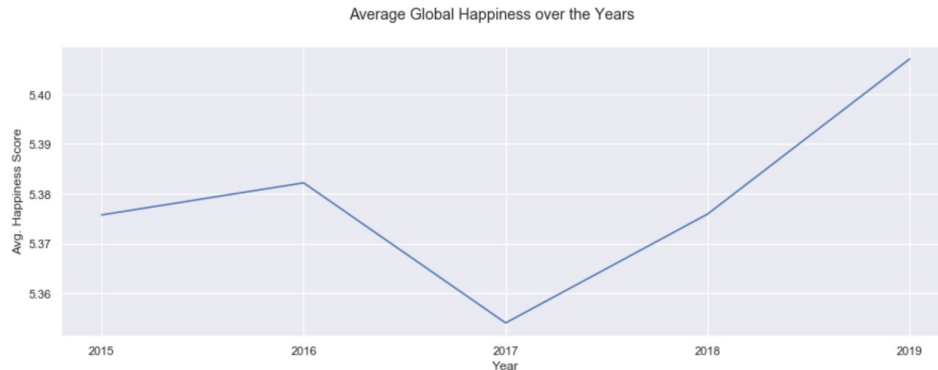


Figure 4.1-1: Average Global Happiness over the Years

The average happiness score increased slightly in 2016, decreased in 2017, and increased between 2017 - 2019. Overall, from 2015 to 2019, the happiness score increased from 5.38 to 5.41. The average happiness score was taken from approximately 165 different countries; due to this large number, it was concluded that the result really does not give us too much information and thus there must be further specifications to obtain meaningful information from the data.

Next, in an effort to further specify, the happiness scores were plotted for each region which resulted in Figure 4.1-2 below.

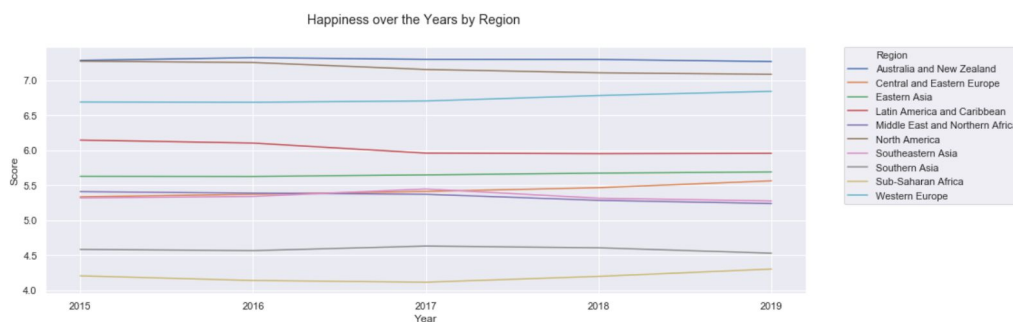


Figure 4.1-2: Happiness Score by Region over the Years

The trends in the above figure show minimal change in the regions scores over the years but consistently display a distinct pattern in the happiness rankings for each region with Australia and New Zealand at the top and Sub-Saharan Africa at the bottom.

Ultimately, individual countries were compared alongside each other, as seen below in Figures 4.1-3 and 4.1-4.

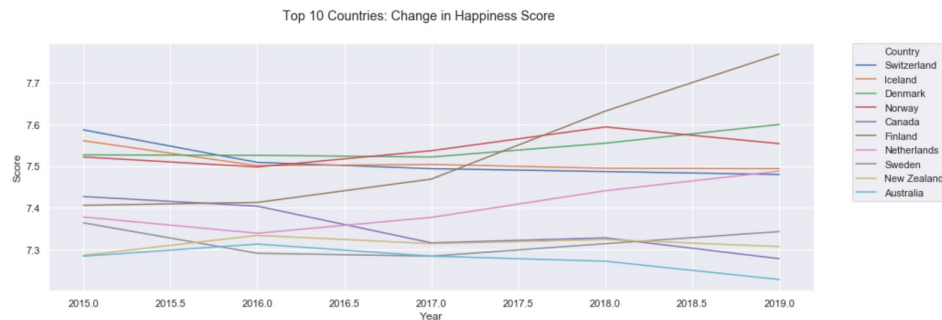


Figure 4.1-3: Change in Happiness Score (Top 10 Countries)

The top 10 countries consistently have a happiness score well above 7.0; although, they do fluctuate and switch rankings over time. The only country that appears to be consistently improving over time is Finland.

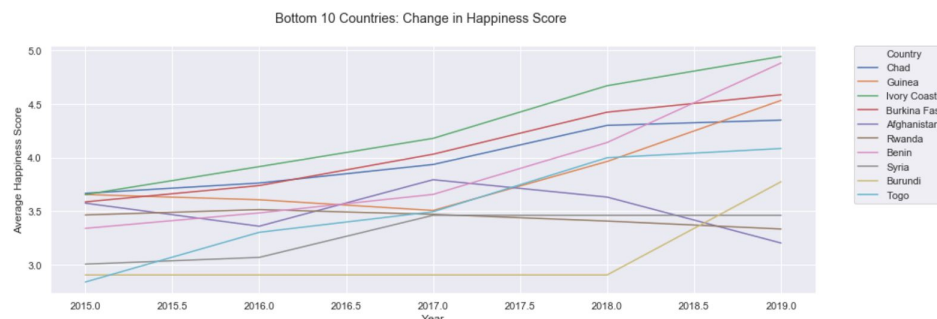


Figure 4.1-4: Change in Happiness Score (Bottom 10 Countries)

The bottom 10 countries on the other hand appear to have a trend of improving over time for the most part with average happiness scores approximately ranging from a little less than 3.0 to almost 5.0.

In the following sections, the six factors that contribute to Happiness Score will be investigated in an effort to explain the overall trends.

## 4.2 Economy (Jupyter Notebook: Economy & Family Analysis)

### 4.2.1 Trend analysis

The first area is Economy (GDP per Capita). GDP is the total of all the goods and services produced in an economy in a given year. This is often used to indicate how wealthy the country is.

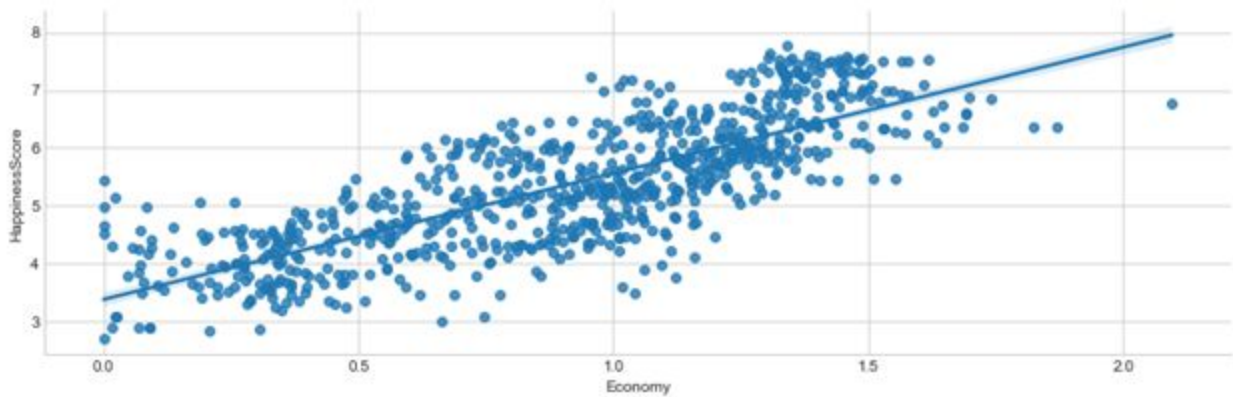


Figure 4.2-1: Overall Happiness score by Economy between 2015 -2019

Figure 4.2-1 shows economy has an almost linear relationship with Happiness score. This can be interpreted as people in a stronger economy tend to be happier, as this enables a country to support and serve people better.

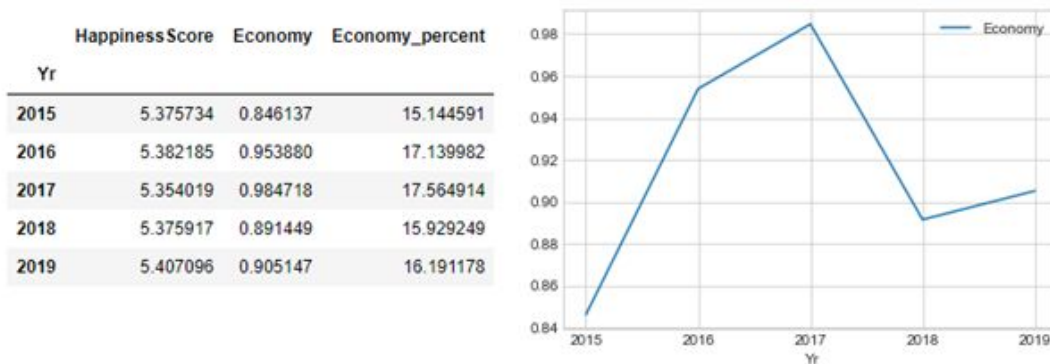


Figure 4.2-2: Happiness Score by Economy between 2015-2019

Figure 4.2-2 shows the contribution of economy to Happiness score in percentage (%) over the years.



## 4.2.2 Regional analysis

Figure 4.2-3 shows regions with a strong Economy like 'Western Europe', 'North America' and 'Australia and New Zealand' mark higher in Happiness score and as expected, regions with weaker Economy like 'Sub-Saharan Africa' and 'Southern Asia' rank lower on Happiness score.

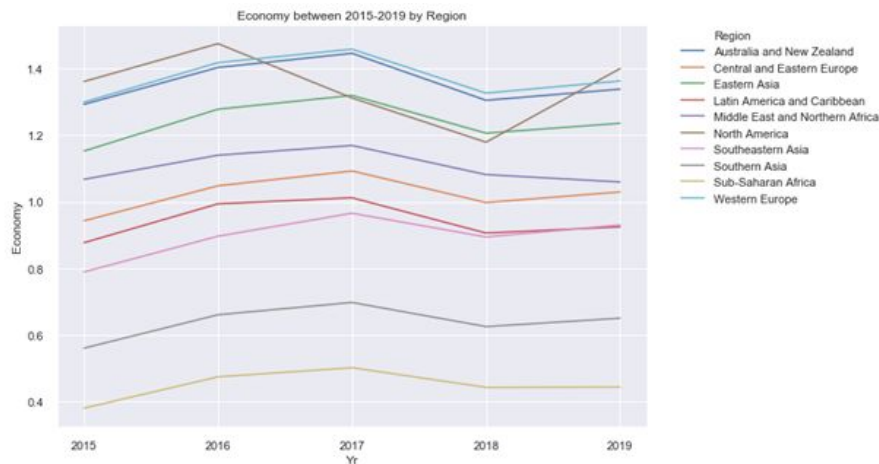


Figure 4.2-3: Economy by Region between 2015-2019

## 4.2.3 Country analysis

There were no significant trends that were observed in analysis of the top and bottom 10 countries over the years that weren't already drawn in sections 4.2.1 and 4.2.2. In general, the top 10 countries mostly belonged to Western Europe whereas the bottom 10 were in poorer countries from Sub-Saharan Africa (see Appendix A for supporting data).

## 4.3 Family (Jupyter Notebook: Economy & Family Analysis)

### 4.3.1 Trend analysis

In the survey, the sample population was asked whether they could count on their friends and relatives for help during times of crisis. Respondents answered either yes or no where a yes would equal 1 and a no would amount to 0. The average of all the answers is then converted to a single value representing the contribution of family to the happiness score.

As Figure 4.3-1 shows Happiness and Family have a positive relationship meaning people with good social support tend to feel happier than the people without.

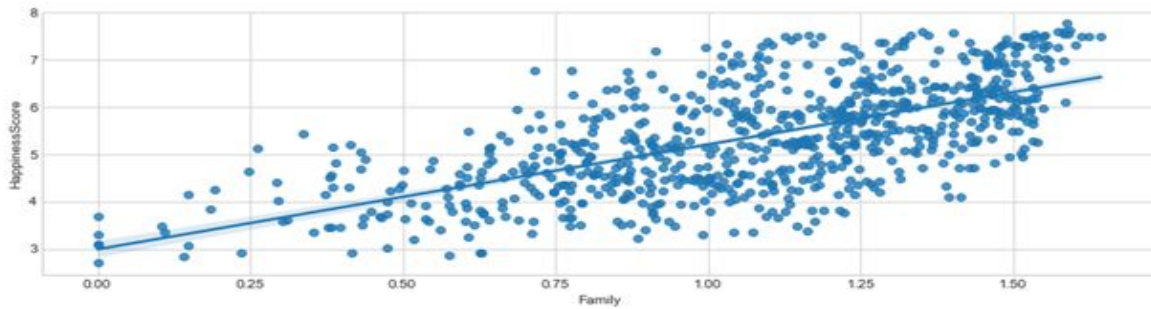


Figure 4.3-1: Happiness Score by Family between 2015-2019

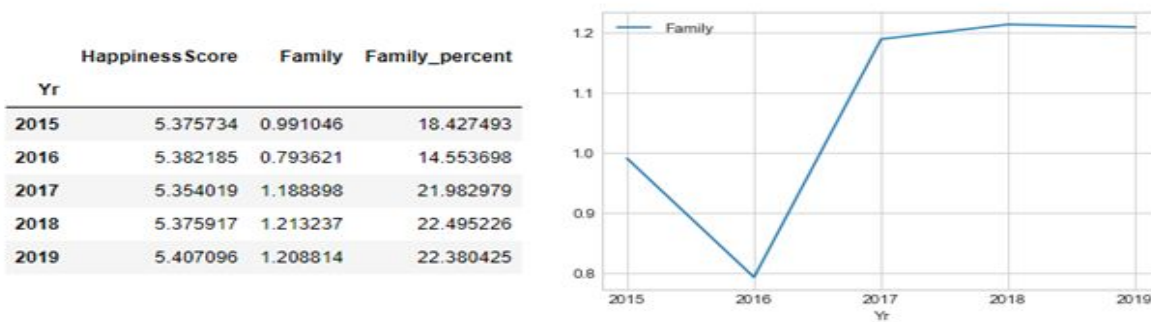


Figure 4.3-2: Happiness Score by Family between 2015-2019

Figure 4.3-2 shows the contribution of family to Happiness score in percentage (%) per year which ranges from 15% to 22%.

### 4.3.2 Regional analysis

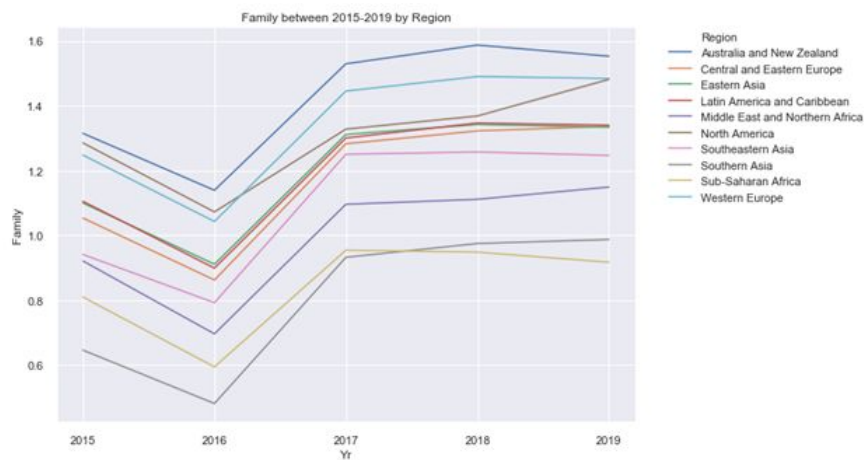


Figure 4.3-3: Family by Region between 2015-2019

Figure 4.3-3 shows regions with strong social support like ‘Western Europe’ ‘North America’ and ‘Australia and New Zealand’ mark high Happiness scores and the regions with weak Family (Social support) like ‘Sub-Saharan Africa’ and ‘Southern Asia’ mark low Happiness scores.

### 4.3.3 Country analysis

There were no significant trends that were observed in analysis of the top and bottom 10 countries over the years that weren’t already drawn in sections 4.3.1 and 4.3.2. See Appendix B for a list of top and bottom 10 countries by Family (Social Support).

## 4.4 Health (Jupyter Notebook: Health Analysis)

### 4.4.1 Trend analysis

The Health (Life Expectancy) (“Health”) factor is analyzed from two perspectives: the absolute score and its percentage contribution to the Happiness score (i.e. health score / happiness score \* 100). The reason why Health factor proportion to the Happiness score is used is to avoid the bias risk that countries with higher Happiness score are likely to have higher Health score even when the contribution of health to happiness for these countries might be lower.

The percentage of health score as part of the Happiness score in 2015 was 11.5%, which decreased between 2015 – 2017 and increased from 2017 to 2019 to 13.2 (Figure 4.4-1). This pattern is also reflected in the Health factor absolute score. Though the graphs indicate the change as a sharp rise, the increase in percentage from 2015 to 2020 is about 1.8 percent.



Figure 4.4-1. Health Score % Contribution to Happiness Score

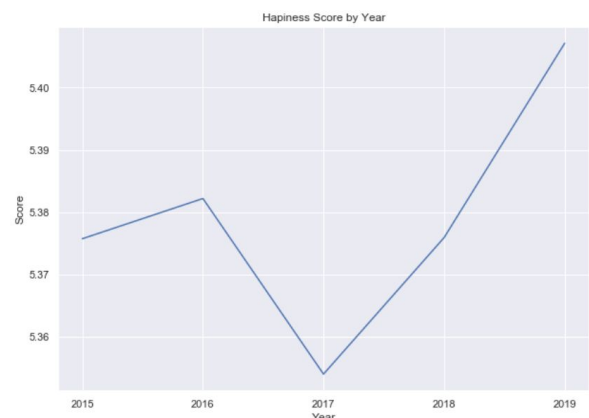


Figure 4.4-2 Happiness Score

The year-over-year trend for the Health factor differs from that of the Happiness score, which increased in 2016 from 2015, decreased in 2017, and increased between 2017 to 2019 (Figure 4.4-2). From 2015 to 2019, the Happiness trend is still upward, from 5.38 to 5.41, similarly to the Health trend.

#### 4.4.2 Regional analysis

The Health contributing percentage to the Happiness score is compared among 10 regions (Figure 4.4-3). The region with the highest Health contributing percentage between 2015 to 2019 is Eastern Asia whereas the region with the lowest Health contributing percentage is Sub-Saharan. For the remaining regions, the Health contributing percentage to the Happiness scores are similar, ranging between 10 -14 percent.

The regional patterns differ for the Happiness score (Figure 4.4-4). The region with the highest score is Australia and New Zealand. In addition, the regions create three clusters of score: North America, Australia and New Zealand, and Western Europe have the highest score (above 6.5), and Southern Asia and Sub-Saharan Africa have the lowest scores (below 5), and the remaining regions hover between 5 and 6.5.

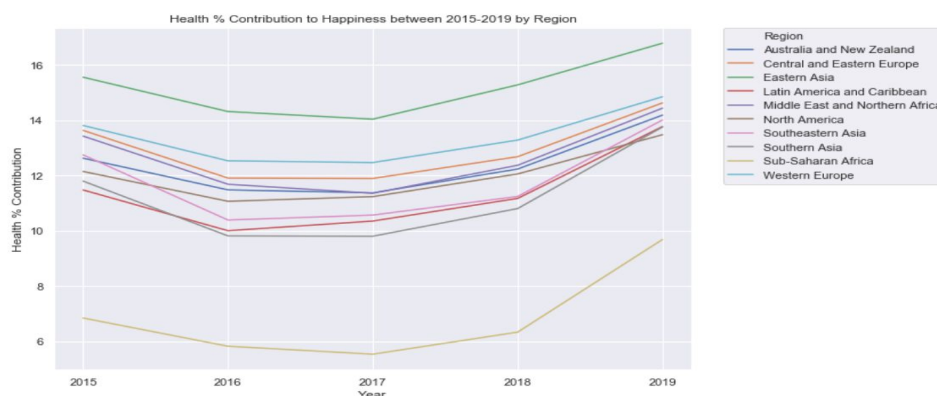


Figure 4.4-3. Health Score % Contribution to Happiness Score by Region

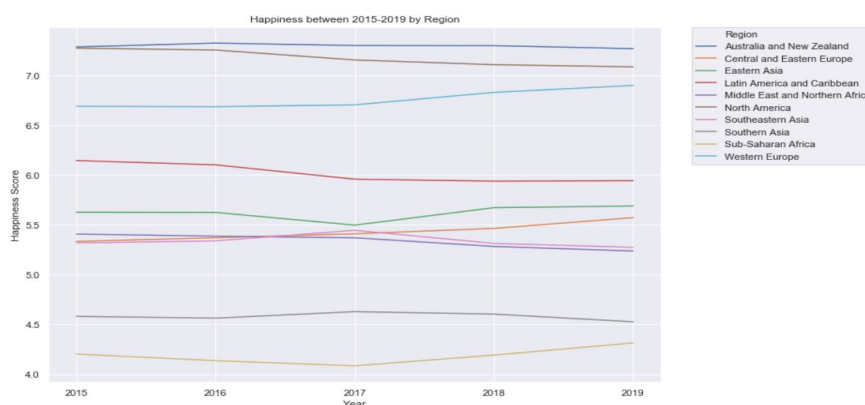


Figure 4.4-4. Happiness Score by Region

### 4.4.3 Country analysis

In 2019, the country where Health makes the largest proportion of the Happiness Score is Hong Kong (21%). The top 10 countries come from different regions of the World (Figure 4.4-5 in Appendix B), and the absolute percentage spread between the first and the tenth is 2.8 percent (20.7 vs 17.9). Meanwhile, the country with the highest absolute Health score is Singapore (1.141), and the top 10 countries are countries from Western Europe and developed countries in Asia (see Figure 4.4-6 in Appendix B).

The countries with the lowest percentage contribution of Health to the Happiness score is Swaziland, at 0 percent. The country with the second lowest score is Central African Republic, at 3.4 percent. The bottom 10 countries are predominantly from Sub-Saharan Africa except for Somalia, which is also from Africa (Figure 4.4-7 in Appendix B). These patterns mirror what's observed in the 10 countries with the lowest absolute Health score (Figure 4.4-8 in the Appendix B).

## 4.5 Freedom (Jupyter Notebook: Freedom & Trust Analysis)

The amount of freedom citizens feel in their country can have a significant impact on their psychological health. Freedom was measured based on an individual's freedom to make life decisions. This can be impacted by an individual's financial situation, job stability, government restrictions, etc.

Our assumption when evaluating freedom in relation to happiness score was that a nation with a higher happiness score would as a result have a high perception of freedom. This assumption is based on the idea that individuals that are happy have a greater sense of freedom.

### 4.5.1 Regional Analysis

Over the 5 year period there is an evident pattern that can be seen globally across the regions as shown in Figure 4.5-1. In 2016, almost every country experienced low levels of freedom which then gradually grew back to the same level in 2017 as we saw in 2015. There was an all-time high in 2018, falling in 2019 back to a similar level that we observed in 2015 and 2017. Regionally, Australia and New Zealand are leading in freedom, followed by North America. Both have strong stability and cater to Freedom in terms of basic human rights. Central and Eastern Europe, Sub-Saharan Africa and Middle East and Northern Africa have very low scores for freedom. This is likely caused by the political unrest in a lot of the countries that are in these regions.

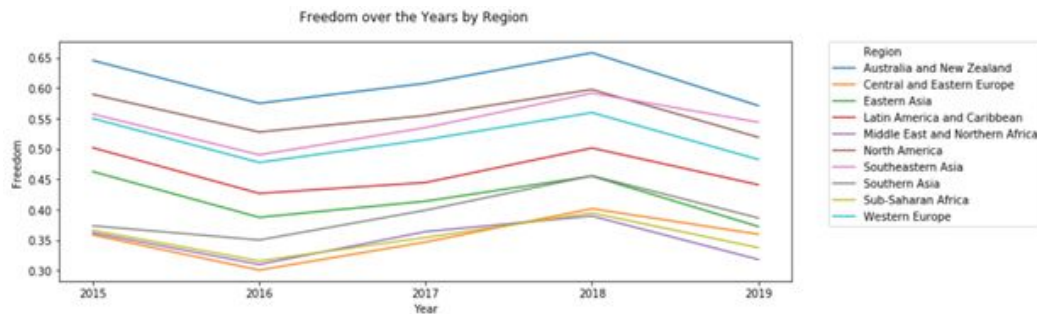


Figure 4.5-1 - Freedom by Region from 2015-2019

## 4.5.2 Country Analysis

When evaluating the top 10 countries in Figure 4.5-2 we notice the global trend is further amplified in Our assumption is that these countries have greater access to news and information and protected freedom of speech laws. Additionally, it is interesting to note that there are a few bottom ranked countries that still have a fairly high freedom rate (see Figure 4.5-3 in Appendix D for graph).

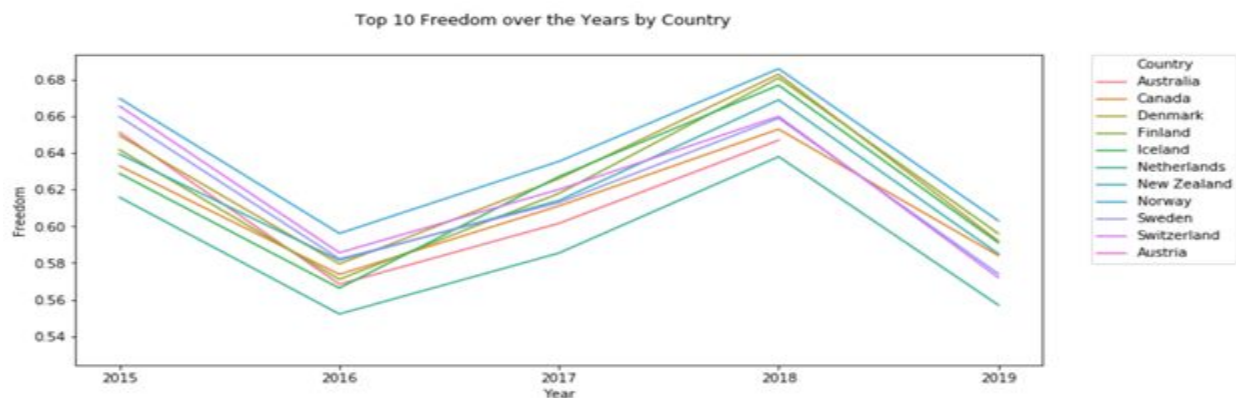


Figure 4.5-2: Top 10 countries by Freedom from 2015-2019

## 4.5.3 Other Observations

The contribution of freedom to the happiness score is not high in general. Figure 4.5-4 shows a scatter matrix outlining the correlations between Happiness score, Freedom and Trust (Perceptions of corruption). From the graph, there is a positive relation between the Happiness score and Freedom. Generally countries that are happier, also have a greater sense of freedom have greater autonomy. Additionally, we wanted to investigate the relation that freedom has with trust. From Figure 4.5-4, a weak positive correlation can be observed.

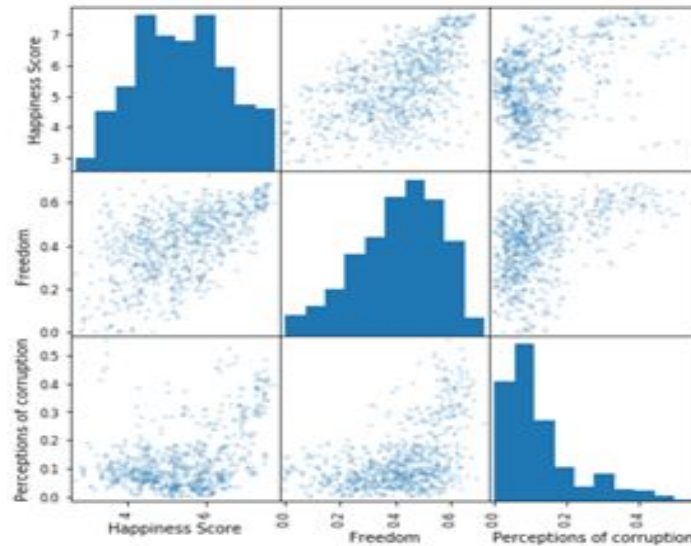


Figure 4.5-4: Scatter Matrix of Freedom, Trust and Happiness Score

## 4.6 Trust (Government Corruption) (Jupyter Notebook: Freedom & Trust Analysis)

In the 21<sup>st</sup> century we have seen more political protests than ever before. It seems like every country globally is going through some sort of unrest between the people and the governing body.

### 4.6.1 Regional Analysis

Figure 4.6-1 outlines the trust citizens have in their governments. As seen from the graph, the highest scoring region, Australia and New Zealand, averages at around 40%. The lowest ranking region for trust is central and Eastern Europe, many of which are part of the European Union. In general trust has been on a steady decline globally but in North America there was about a 7% decline in 2017, which eventually was brought back up to 25% in 2019.

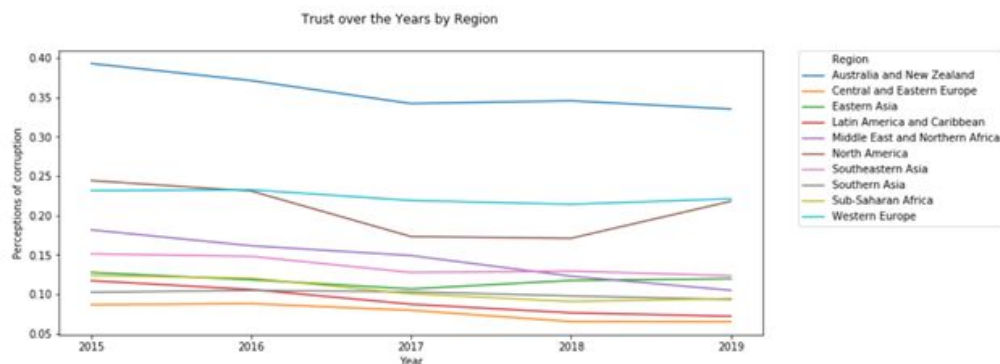




Figure 4.6-1: Trust by Region from 2015-2019

## 4.6.2 Country Analysis

In Figure 4.6-2, we see that the trust of the top ten countries is generally about 30%. Although Iceland has a high Happiness score, the trust score is below 15%. Upon further research it was found that Iceland is known for being the most corrupt Nordic country. There are growing issues about conflict of interest between politicians and business and there is a great sense of lack of transparency with the government and its citizens. In a span of 2 years the country had 4 different Prime Ministers, the latest being elected 2018, whose goal was to increase the citizen's trust in the government, but the trust rate continues to decrease ("Iceland's New Leader").

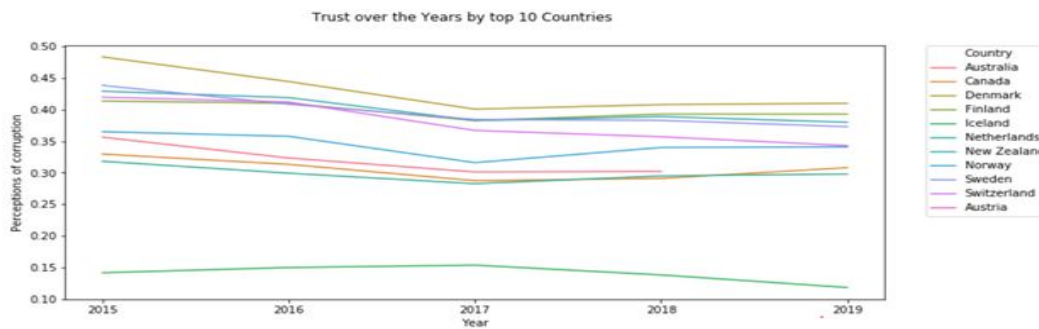


Figure 4.6-2: Contribution of Trust by Top 10 countries from 2015-2019

Figure 4.6-3 and Figure 4.6-4 (Appendix E) represent the top and bottom 10 countries in terms of trust. The top scorers still see a decline of trust over the years. This is potentially due to greater transparency of governments through social media and technology. The trend for the bottom countries by trust rating are more sporadic although this remains below 25% even at its peak, there are a lot of drastic increases and decreases, leading us to conclude that there are many changes occurring in the government.

## 4.6.3 Other Observations

Looking back at the scatter matrix in Figure 4.5-4, we see that Happiness score and Trust have a weak nonlinear positive correlation. This indicates that countries with higher happiness scores are likely to have greater trust in the government. We also note the contribution of this factor to the happiness score is not significant, therefore it does not have a huge impact on the overall happiness of a country.

## 4.7 Generosity (Jupyter Notebook: Generosity Analysis)

Generosity in the index is measured by the number of participants that responded positively to the question - "Have you donated money to a charity in the past month?" . While this can arguably be a rather narrow-sighted question to gain insight on a nation's overall level of generosity, for analysis purposes we will assume that this is a reliable indicator.



### 4.7.1 Trend Analysis

By our hypothesis, as nations improve their well-being we expect to see an overall increase in the Happiness Score and consequently an increase in the level of generosity. In Figure 4.7-1, the line graph shows the yearly average of the happiness score of all participating countries between the years 2015 to 2019. While the range of these values only fluctuate 0.05 points on the scale, we notice a slight increase from 2015 to 2016, hitting an all-time low of 5.35 in 2017 and then a strong steady increase for the remainder years.



Figure 4.7-1 : Average Happiness Score and Generosity % for 2015-19 (See Appendix F, Table 4.7-2 for numerical data)

The bar graph in the same figure plots *Generosity %*, that is on average the contribution of generosity to the happiness score. By observing changes in this measure, in relation to the average happiness score, one can notice in the early years there's a direct relationship where an increase in the influence of generosity positively affects the happiness score. However starting 2017 we notice an inverse relationship, meaning the less happy a nation is the more "generous" or charitable they are.

An explanation for the reversal of trends could be attributed to fluctuations in other factors that have a greater influence on happiness score such as health, economy, freedom etc. as over the 5 years, on average generosity contributes at most ~5% to the happiness score. One possible interpretation of this is that it could be exposing an inherent property where this factor has a limited impact on one's state of happiness, as fluctuations are sufficiently minor that it is well within the margin of error.

### 4.7.2 Regional Analysis

In Figure 4.7-3, analysis by region reveals that the top 3 regions with the highest levels of generosity across all years are Australia & New Zealand, Southeastern Asia and North America. However when compared to the top 3 regions by happiness score (see Figure 4.7-4 in Appendix F), fluctuations by region are minimal and Western Europe enters the list and Southeastern Asia ranks in the bottom 3 regions by happiness score. By inspecting Figure 4.7-5 below we notice that in terms of Generosity %,

Southeastern Asia, Southern Asia and Australia & New Zealand all rank high on the scale across all years which could reveal that countries in these regions value generosity as an integral part of happiness as opposed to countries in other regions.

In more recent years the trend across all regions appears to be that both Generosity and Generosity % are declining which could mean nations are more “selfish” now compared to the past. However as fluctuations in happiness score by regions (see Figure 4.7-3, in Appendix F) are minimal, this can indicate that nations are deriving happiness from the five other contributing factors.

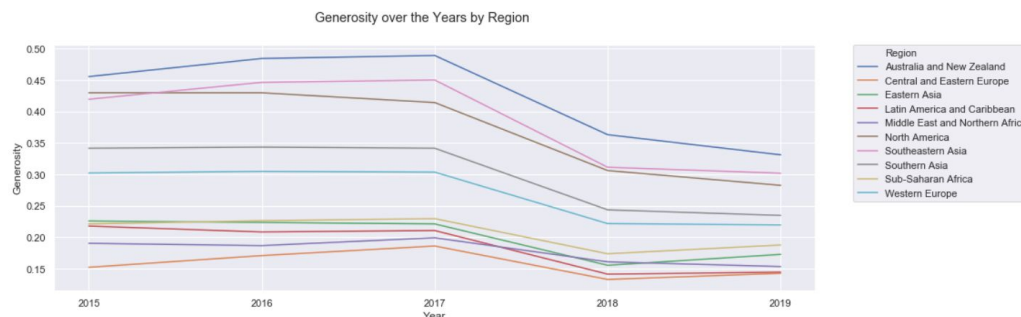


Figure 4.7-3: Average Generosity by Region for 2015-19

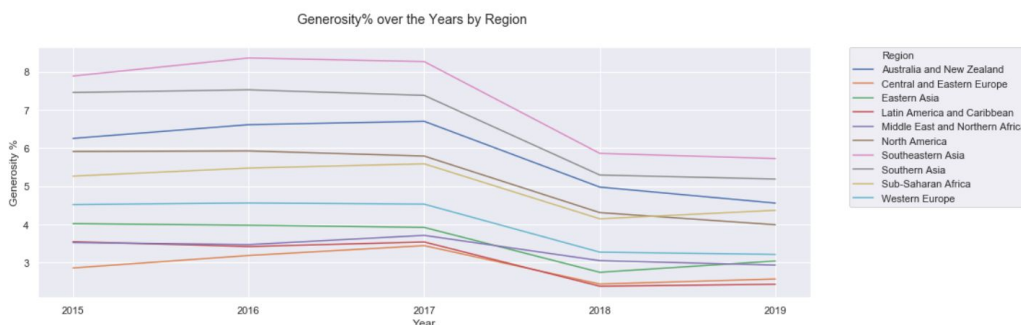


Figure 4.7-5: Average Generosity% by Region for 2015-19

### 4.7.3 Country analysis

Analysis of the top 10 countries by generosity showed a steady score with minimal fluctuations across all years, whereas with the bottom 10 counties, the global trend of declining generosity in more recent years is observed (see Appendix F, Figures 4.7-6 and 4.7-7 for supporting graphs).

## 5.0 Conclusion

The analysis of the Happiness score and the six factors (Economy, Family, Health, Freedom, Trust in government and Generosity) that potentially contribute to the Happiness score reveals a complex picture. Overall, the average Happiness score across all countries increased slightly between 2015 to 2019, without significant changes in the regional scores. Bucking against the generally upward trendline, the average happiness score decreased in 2017.

Between 2015 to 2019, the Health, Economy and Family factors increased, while the Freedom, Trust and Generosity factors either remained flat or decreased. Though these trends might reflect the absolute changes in these factors, they might also reflect the changes in relative contribution of these factors to the Happiness score. The causal relationships among these factors and the happiness score is difficult to conclude.

The Economy factor has a positive linear relationship with the happiness score, indicating that people in stronger economies are more likely to feel happier. Consequently, regions known for having strong economies have higher happiness scores, and regions with less robust economies have lower Happiness scores. A similar story is found in the Family factor, which shows that people and regions with good social support tend to feel happier than those without. The Health factor experiences the similar upwards trend. It is found that the East Asia region has the highest health score as a percentage contribution to the overall Happiness Score, and the top ten countries in this aspect are regionally diverse.

For the Freedom factor, the same pattern is observed across regions: In 2016 almost every country experienced low levels of freedom which then gradually grew back to the same level in 2017 as we saw in 2015. There was an all-time high in 2018, falling in 2019 back to a similar level that we observed in 2015 and 2017. Meanwhile, the related Trust factor has been on a steady decline globally except for North America, where there was about a 7% decline in 2017, which eventually increased back up to 25% in 2019.

The Generosity factor indicates a positive direct relationship with happiness between 2015-2016, and a negative relationship from 2017 – 2019, which resulted in a net decrease between 2015 to 2019. The contribution of the generosity factor to the overall happiness score is the lowest among the factors, at most being 5 % for the examined period.

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## 7.0 Appendix

### Appendix A - Top and Bottom 10 Countries by Happiness and the Economy scores in 2019

Yr	HappinessRank	Region	Country	HappinessScore	Economy	Economy_percent
2019	147	Latin America and Caribbean	Haiti	3.597	0.323	8.774789
2019	148	Sub-Saharan Africa	Botswana	3.488	1.041	28.303426
2019	149	Middle East and Northern Africa	Syria	3.462	0.619	16.880284
2019	150	Sub-Saharan Africa	Malawi	3.410	0.191	5.224289
2019	151	Middle East and Northern Africa	Yemen	3.380	0.287	7.852257
2019	152	Sub-Saharan Africa	Rwanda	3.334	0.359	10.008364
2019	153	Sub-Saharan Africa	Tanzania	3.231	0.476	13.314685
2019	154	Southern Asia	Afghanistan	3.203	0.350	10.101010
2019	155	Sub-Saharan Africa	Central African Republic	3.083	0.026	0.778443
2019	156	Sub-Saharan Africa	South Sudan	2.853	0.306	10.179641

Figure 4.3-4. Top 10 Countries 2019 by Happiness and the Economy scores

Yr	HappinessRank	Region	Country	HappinessScore	Economy	Economy_percent
2019	1	Western Europe	Finland	7.769	1.340	17.661790
2019	2	Western Europe	Denmark	7.600	1.383	18.291231
2019	3	Western Europe	Norway	7.554	1.488	19.768832
2019	4	Western Europe	Iceland	7.494	1.380	18.346185
2019	5	Western Europe	Netherlands	7.488	1.396	18.796284
2019	6	Western Europe	Switzerland	7.480	1.452	19.605725
2019	7	Western Europe	Sweden	7.343	1.387	18.799133
2019	8	Australia and New Zealand	New Zealand	7.307	1.303	17.694188
2019	9	North America	Canada	7.278	1.365	18.734559
2019	10	Western Europe	Austria	7.246	1.376	18.890719

Figure 4.3-5. Bottom 10 Countries 2019 by Happiness and the Economy scores

## Appendix B - Top and Bottom 10 Countries by Happiness and the Family factor in 2019

Yr	HappinessRank	Region	Country	HappinessScore	Family	Family_percent
2019	1	Western Europe	Finland	7.769	1.587	20.917359
2019	2	Western Europe	Denmark	7.600	1.573	20.804126
2019	3	Western Europe	Norway	7.554	1.582	21.017670
2019	4	Western Europe	Iceland	7.494	1.624	21.590003
2019	5	Western Europe	Netherlands	7.488	1.522	20.492797
2019	6	Western Europe	Switzerland	7.480	1.526	20.604915
2019	7	Western Europe	Sweden	7.343	1.487	20.154513
2019	8	Australia and New Zealand	New Zealand	7.307	1.557	21.143400
2019	9	North America	Canada	7.278	1.505	20.656053
2019	10	Western Europe	Austria	7.246	1.475	20.249863

Figure 4.4 -4. Top 10 Countries 2019 by Happiness and the Economy scores

Yr	HappinessRank	Region	Country	HappinessScore	Family	Family_percent
2019	147	Latin America and Caribbean	Haiti	3.597	0.688	18.690573
2019	148	Sub-Saharan Africa	Botswana	3.488	1.145	31.131049
2019	149	Middle East and Northern Africa	Syria	3.462	0.378	10.308154
2019	150	Sub-Saharan Africa	Malawi	3.410	0.560	15.317287
2019	151	Middle East and Northern Africa	Yemen	3.380	1.163	31.819425
2019	152	Sub-Saharan Africa	Rwanda	3.334	0.711	19.821578
2019	153	Sub-Saharan Africa	Tanzania	3.231	0.885	24.755245
2019	154	Southern Asia	Afghanistan	3.203	0.517	14.920635
2019	155	Sub-Saharan Africa	Central African Republic	3.083	0.000	0.000000
2019	156	Sub-Saharan Africa	South Sudan	2.853	0.575	19.128410

Figure 4.4 -4. Bottom 10 Countries 2019 by Happiness and the Economy scores

## Appendix C - Top and Bottom Countries in terms of Health in 2019

Happiness Rank	Happiness Score	Country	Region	Health (Life Expectancy)	Year	Health % Contribution	
75	76	5.430	Hong Kong	Eastern Asia	1.122	2019	20.662983
129	130	4.366	Sri Lanka	Southern Asia	0.831	2019	19.033440
81	82	5.287	Greece	Western Europe	0.999	2019	18.895404
106	107	4.719	Albania	Central and Eastern Europe	0.874	2019	18.520873
57	58	5.886	Japan	Eastern Asia	1.088	2019	18.484540
151	152	3.334	Rwanda	Sub-Saharan Africa	0.614	2019	18.416317
123	124	4.461	Tunisia	Middle East and Northern Africa	0.815	2019	18.269446
63	64	5.718	Northern Cyprus	TBD	1.042	2019	18.223155
33	34	6.262	Singapore	Southeastern Asia	1.141	2019	18.221016
115	116	4.559	Armenia	Central and Eastern Europe	0.815	2019	17.876727

Figure 4.4-5. Top 10 Countries by Health Score % Contribution to Happiness Score

	Happiness Rank	Happiness Score	Country	Region	Health (Life Expectancy)	Year	Health % Contribution	
	33	34	6.262	Singapore	Southeastern Asia	1.141	2019	18.221016
	75	76	5.430	Hong Kong	Eastern Asia	1.122	2019	20.662983
	57	58	5.886	Japan	Eastern Asia	1.088	2019	18.484540
	29	30	6.354	Spain	Western Europe	1.062	2019	16.713881
	5	6	7.480	Switzerland	Western Europe	1.052	2019	14.064171
	23	24	6.592	France	Western Europe	1.045	2019	15.852549
	48	49	6.046	Cyprus	Western Europe	1.042	2019	17.234535
	63	64	5.718	Northern Cyprus	TBD	1.042	2019	18.223155
	35	36	6.223	Italy	Western Europe	1.039	2019	16.696127
	8	9	7.278	Canada	North America	1.039	2019	14.275900

Figure 4.4-6 Top 10 Countries by Health Score

Happiness Rank	Happiness Score	Country	Region	Health (Life Expectancy)	Year	Health % Contribution	
127	128	4.390	Mali	Sub-Saharan Africa	0.308	2019	7.015945
95	96	5.044	Cameroon	Sub-Saharan Africa	0.331	2019	6.562252
111	112	4.668	Somalia	TBD	0.268	2019	5.741217
128	129	4.374	Sierra Leone	Sub-Saharan Africa	0.242	2019	5.532693
98	99	4.944	Ivory Coast	Sub-Saharan Africa	0.232	2019	4.692557
84	85	5.265	Nigeria	Sub-Saharan Africa	0.245	2019	4.653371
143	144	3.802	Lesotho	Sub-Saharan Africa	0.168	2019	4.418727
131	132	4.350	Chad	Sub-Saharan Africa	0.192	2019	4.413793
154	155	3.083	Central African Republic	Sub-Saharan Africa	0.105	2019	3.405774
134	135	4.212	Swaziland	Sub-Saharan Africa	0.000	2019	0.000000

Figure 4.4-7. Bottom 10 Countries by Health Score % Contribution to Happiness Score

	Happiness Rank	Happiness Score	Country	Region	Health (Life Expectancy)	Year	Health % Contribution
127	128	4.390	Mali	Sub-Saharan Africa	0.308	2019	7.015945
155	156	2.853	South Sudan	TBD	0.295	2019	10.339993
111	112	4.668	Somalia	TBD	0.268	2019	5.741217
84	85	5.265	Nigeria	Sub-Saharan Africa	0.245	2019	4.653371
128	129	4.374	Sierra Leone	Sub-Saharan Africa	0.242	2019	5.532693
98	99	4.944	Ivory Coast	Sub-Saharan Africa	0.232	2019	4.692557
131	132	4.350	Chad	Sub-Saharan Africa	0.192	2019	4.413793
143	144	3.802	Lesotho	Sub-Saharan Africa	0.168	2019	4.418727
154	155	3.083	Central African Republic	Sub-Saharan Africa	0.105	2019	3.405774
134	135	4.212	Swaziland	Sub-Saharan Africa	0.000	2019	0.000000

Figure 4.4-8. Bottom 10 Countries by Health Score

## Appendix D - Bottom 10 countries in terms of Freedom between 2015-2019

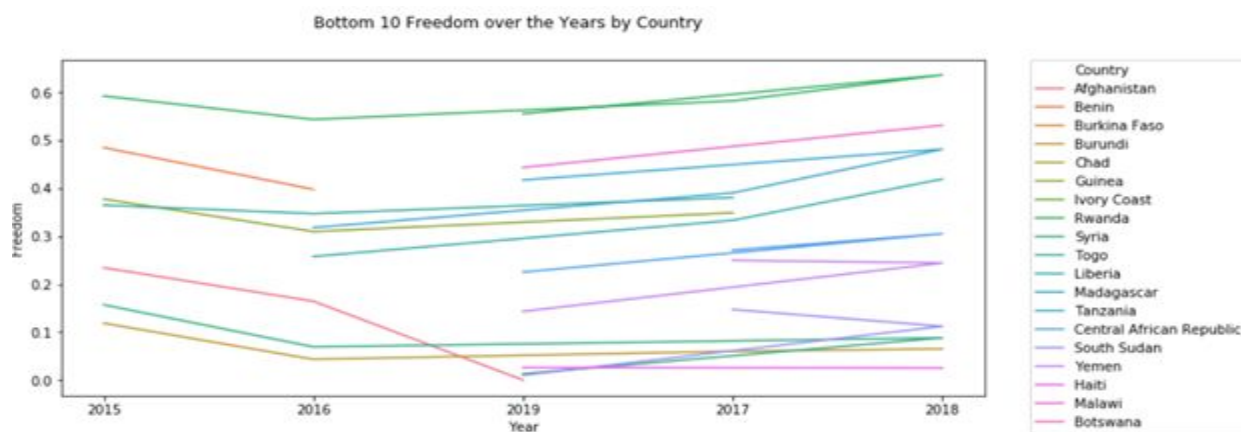


Figure 4.5-3. Bottom 10 Countries by Freedom Score



## Appendix E - Top and bottom 10 countries in terms of Trust between 2015-2019

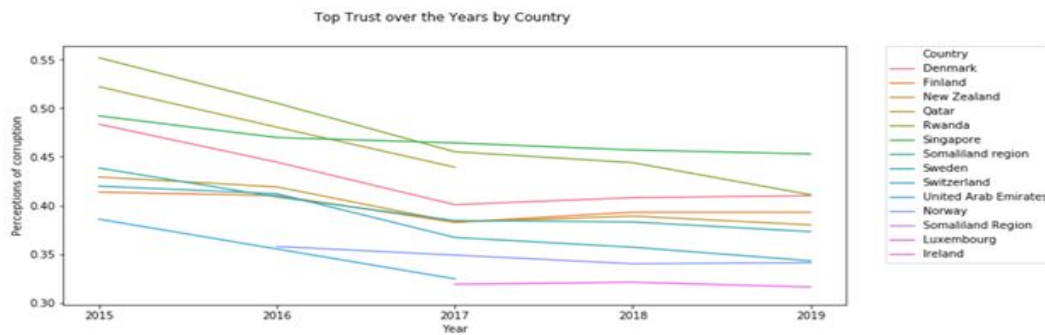


Figure 4.6-3. Perception of corruption in top 10 countries from 2015-2019

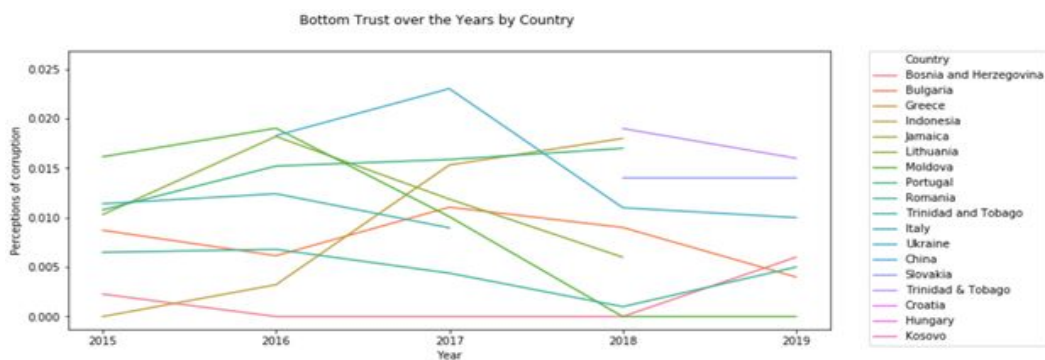


Figure 4.6-4. Perception of corruption in bottom 10 countries from 2015-2019

## Appendix F - Generosity

	Score	Generosity	Generosity%
Year			
2015	5.375734	0.237296	4.414197
2016	5.382185	0.242635	4.508112
2017	5.354019	0.246883	4.611180
2018	5.375917	0.181006	3.366987
2019	5.407096	0.184846	3.418585

Table 4.7-2: Average Happiness Score, Generosity & Generosity% from 2015-19

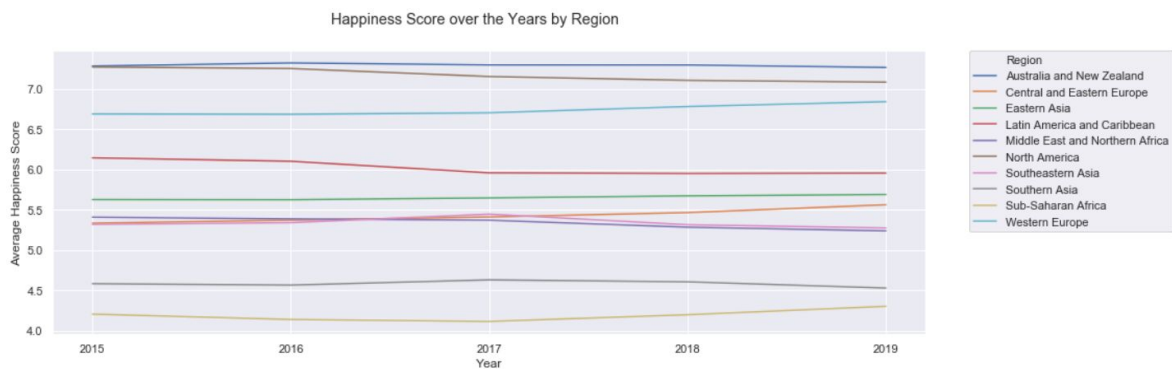


Figure 4.7-4: Average Happiness Score by Region for 2015-19

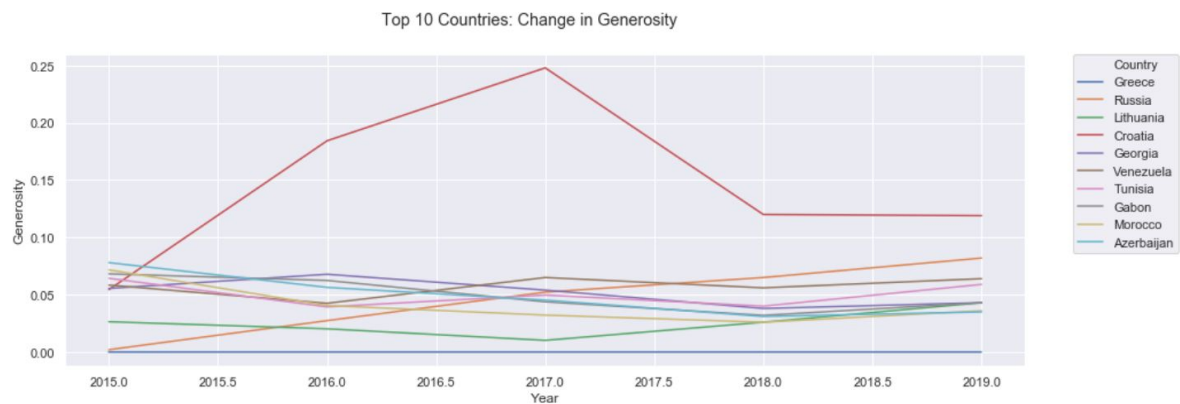


Figure 4.7-6: Generosity of Top 10 countries for 2015-19

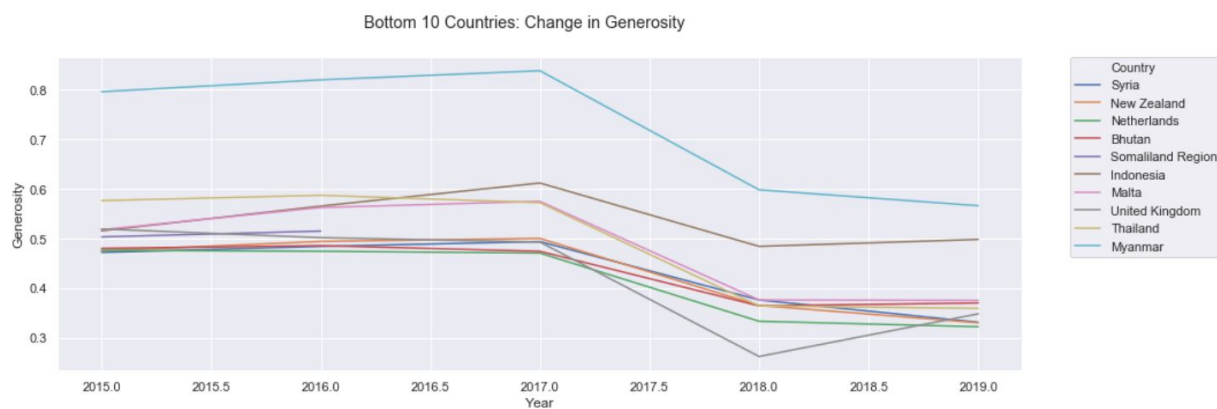


Figure 4.7-6: Generosity of Bottom 10 countries for 2015-19