

Tracking Happiness Through the Covid Pandemic

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Abstract

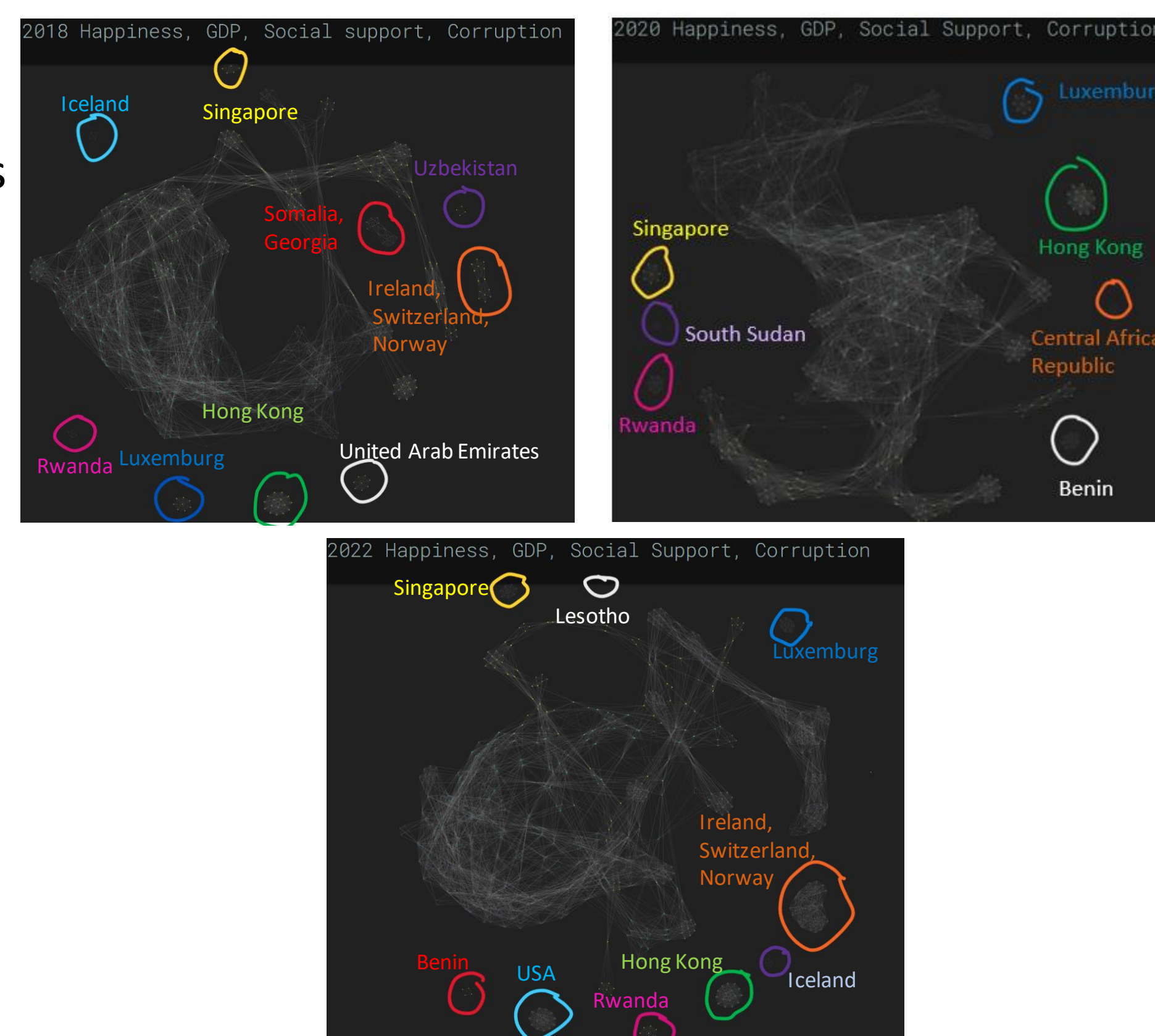
We quantified trends in happiness across three years pre, mid and post Covid. Beyond happiness, the Gallup Poll gathers various data from ~150 countries who opted to participate. We evaluated 4 variables, which are defined below, and applied a Topological Data Analysis method known as the Kepler Mapper Algorithm (kmapper).

One major result we found, was that in 2020, the countries were less fragmented by the 4 variables we examined. They came closer together by those metrics relative to 2018 and 2022.

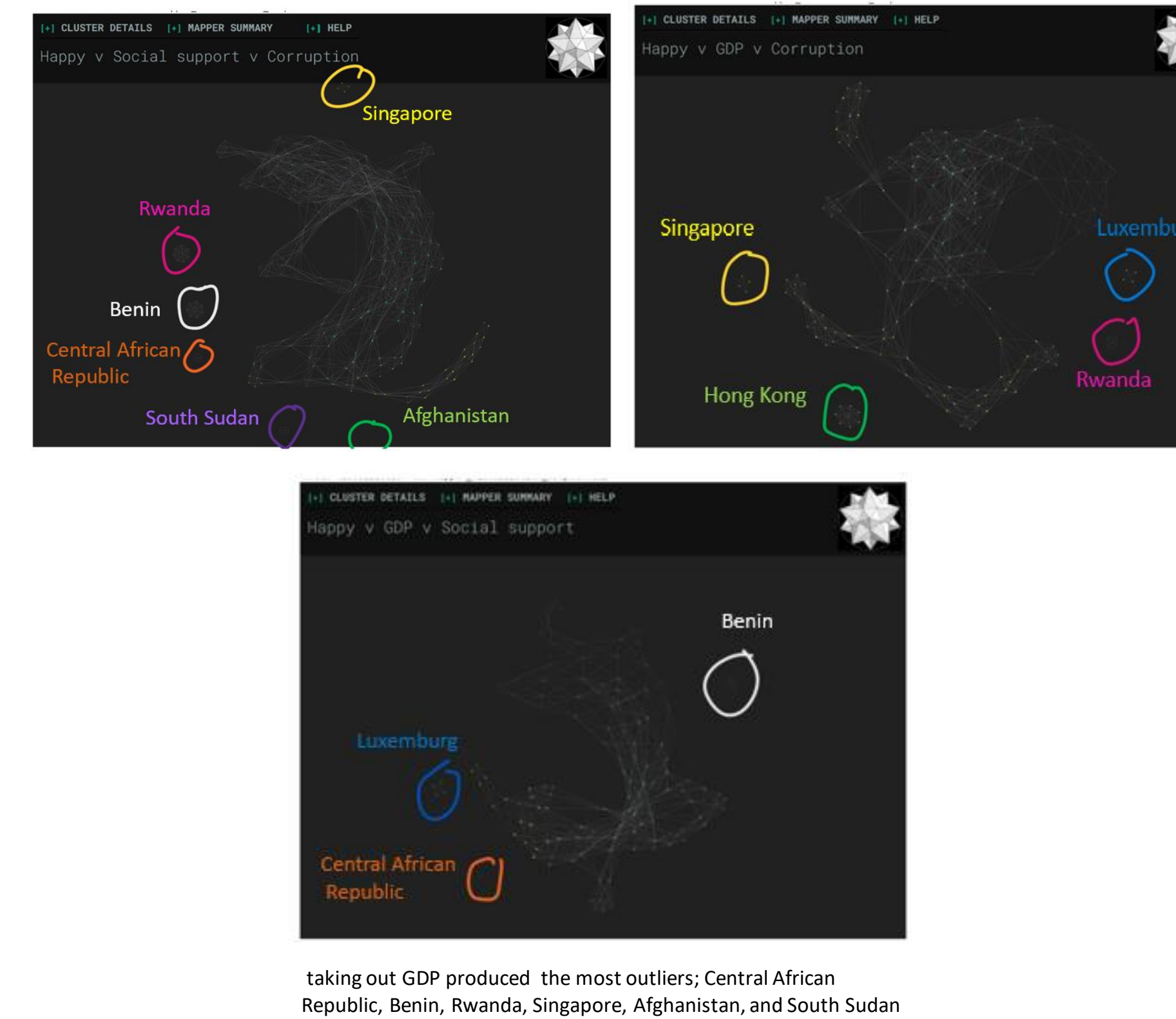
Another finding was that GDP did not have a large weight on how fractured the clusters were, however, corruption did. Specifically, we found that more countries' corruption score moved closer to the average for all countries in 2020. Further investigation revealed that the pandemic did not greatly affect the uniformity of corruption. Since the number of clusters were consistent before and throughout the pandemic, we can assert that the pandemic did not create large enough outliers of these variables relative to their closest neighbors in happiness.

How Has Covid Affected Happiness?

Kepler Mapper Algorithm: Happiness vs GDP vs Social support vs Corruption for 2018,2020,2022

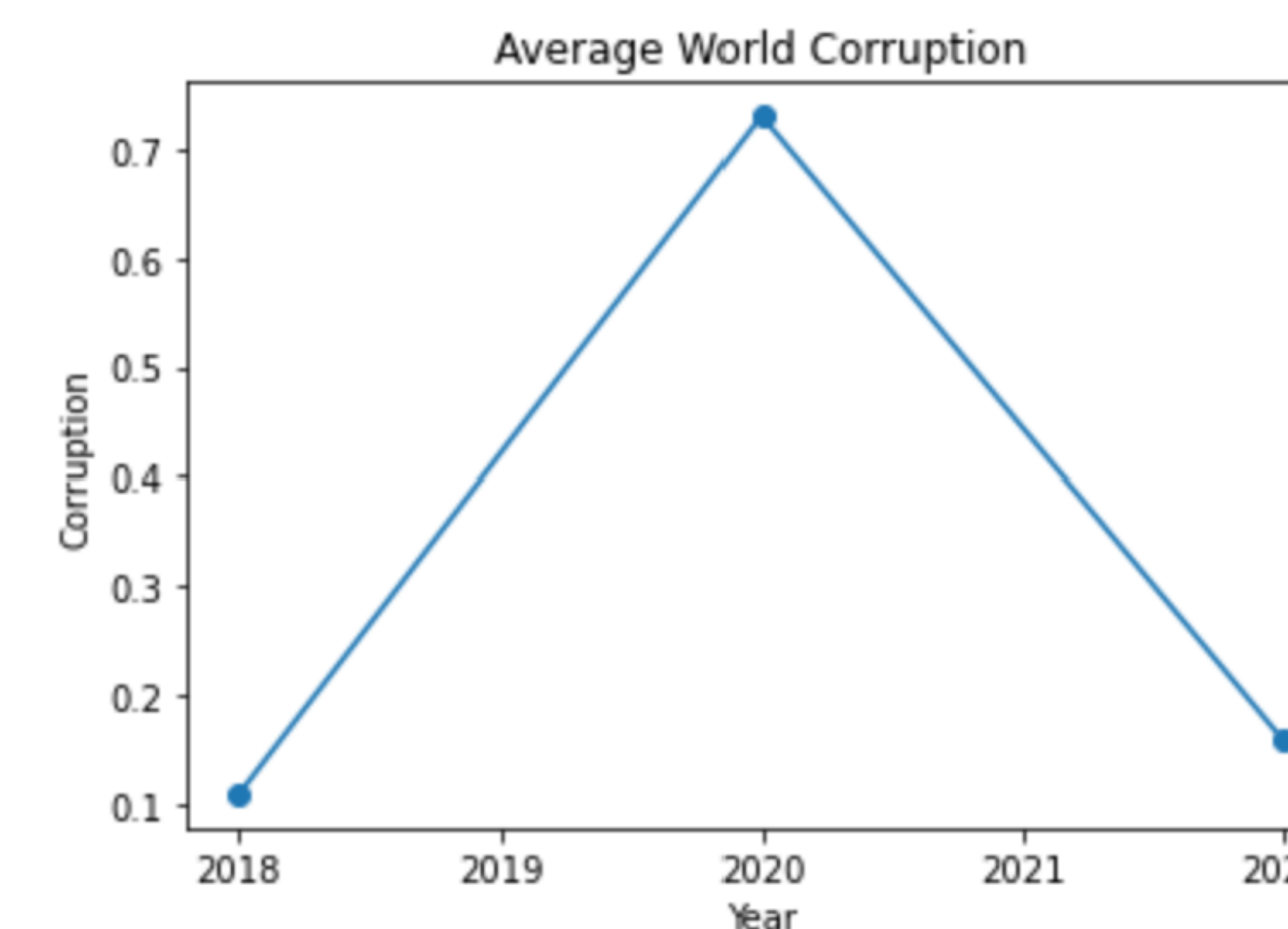


Taking a Closer Look

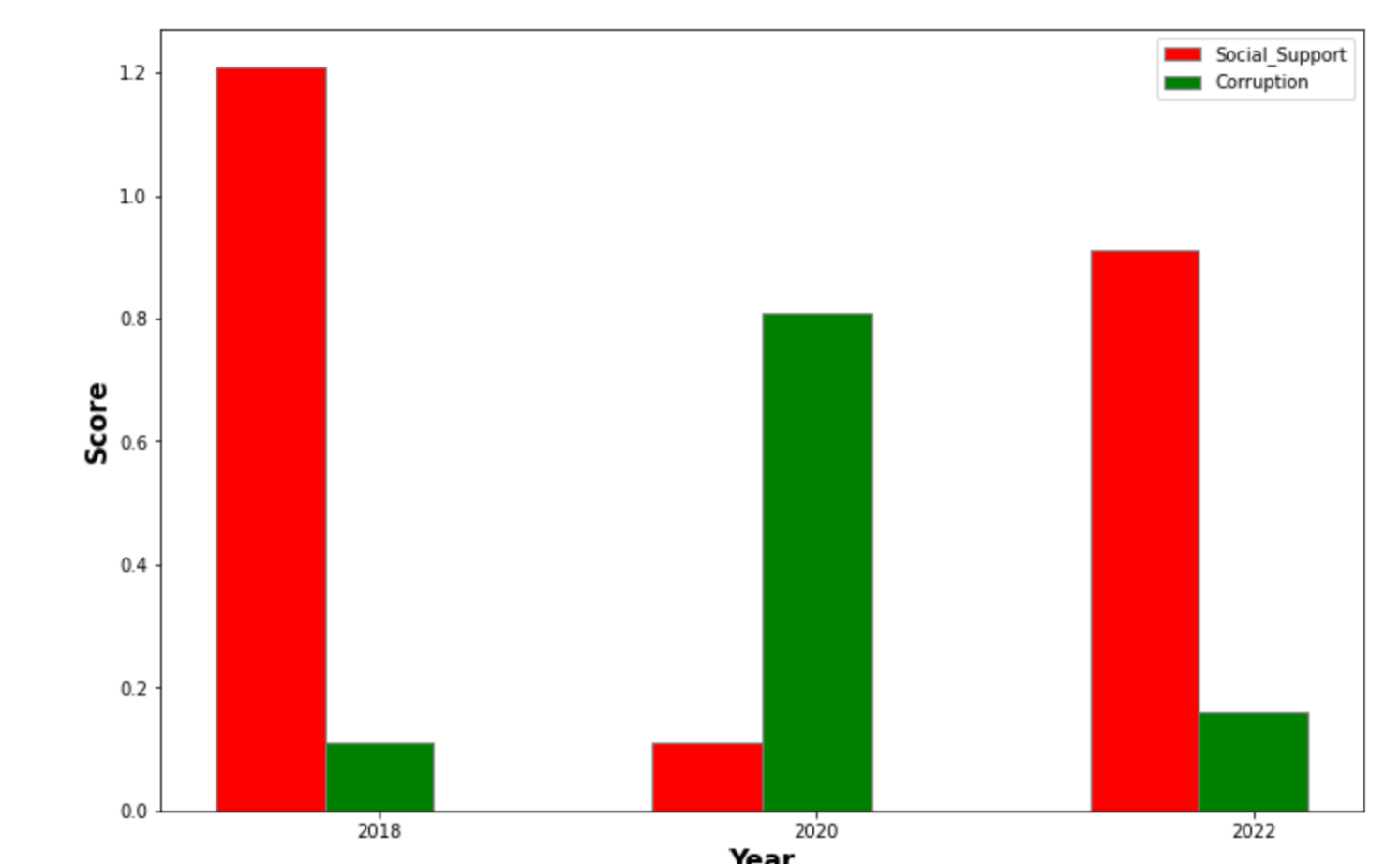


taking out GDP produced the most outliers; Central African Republic, Benin, Rwanda, Singapore, Afghanistan, and South Sudan

Social Support vs Corruption



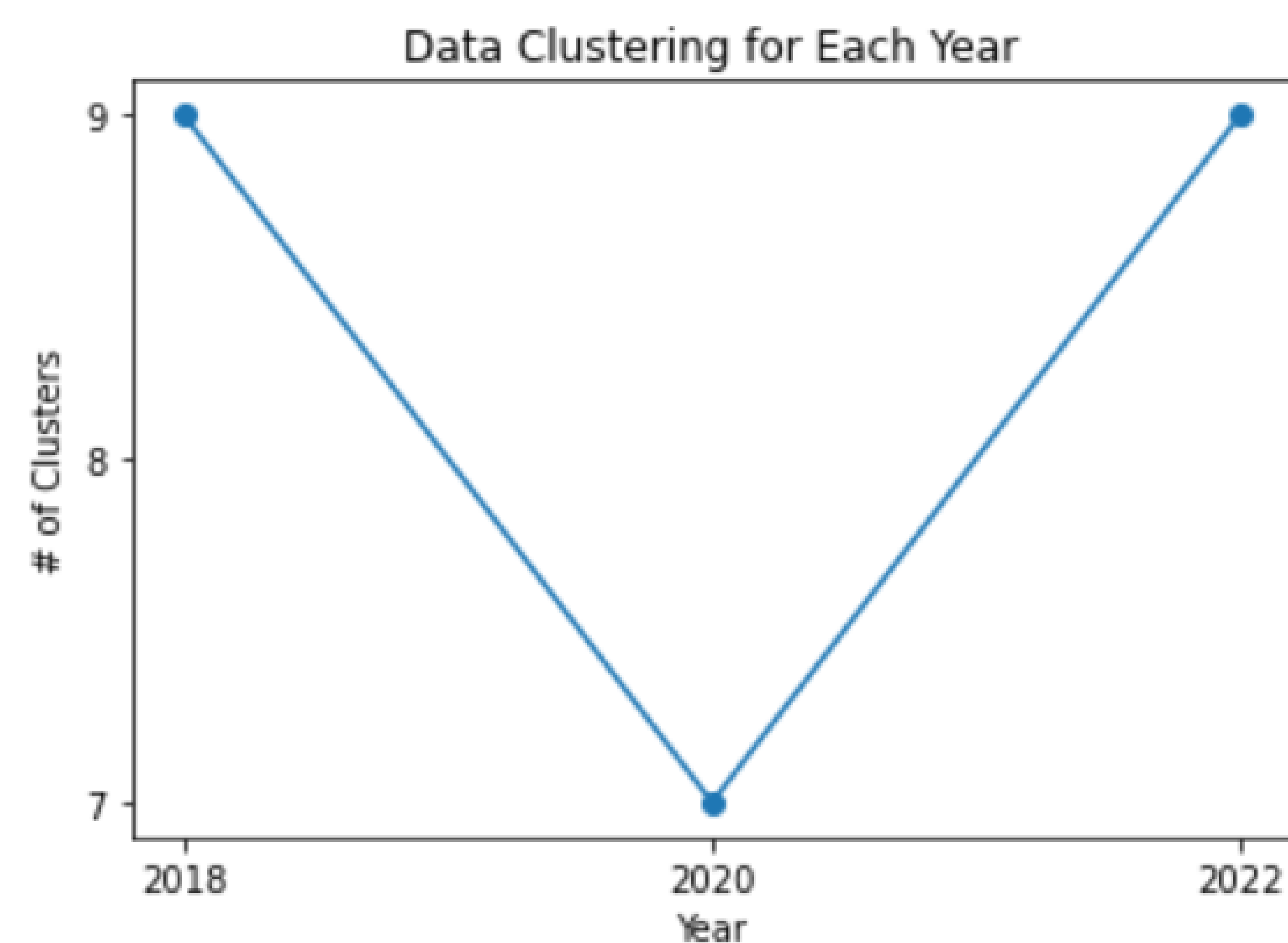
Average world social support vs corruption



How Each Factor is Being Measured

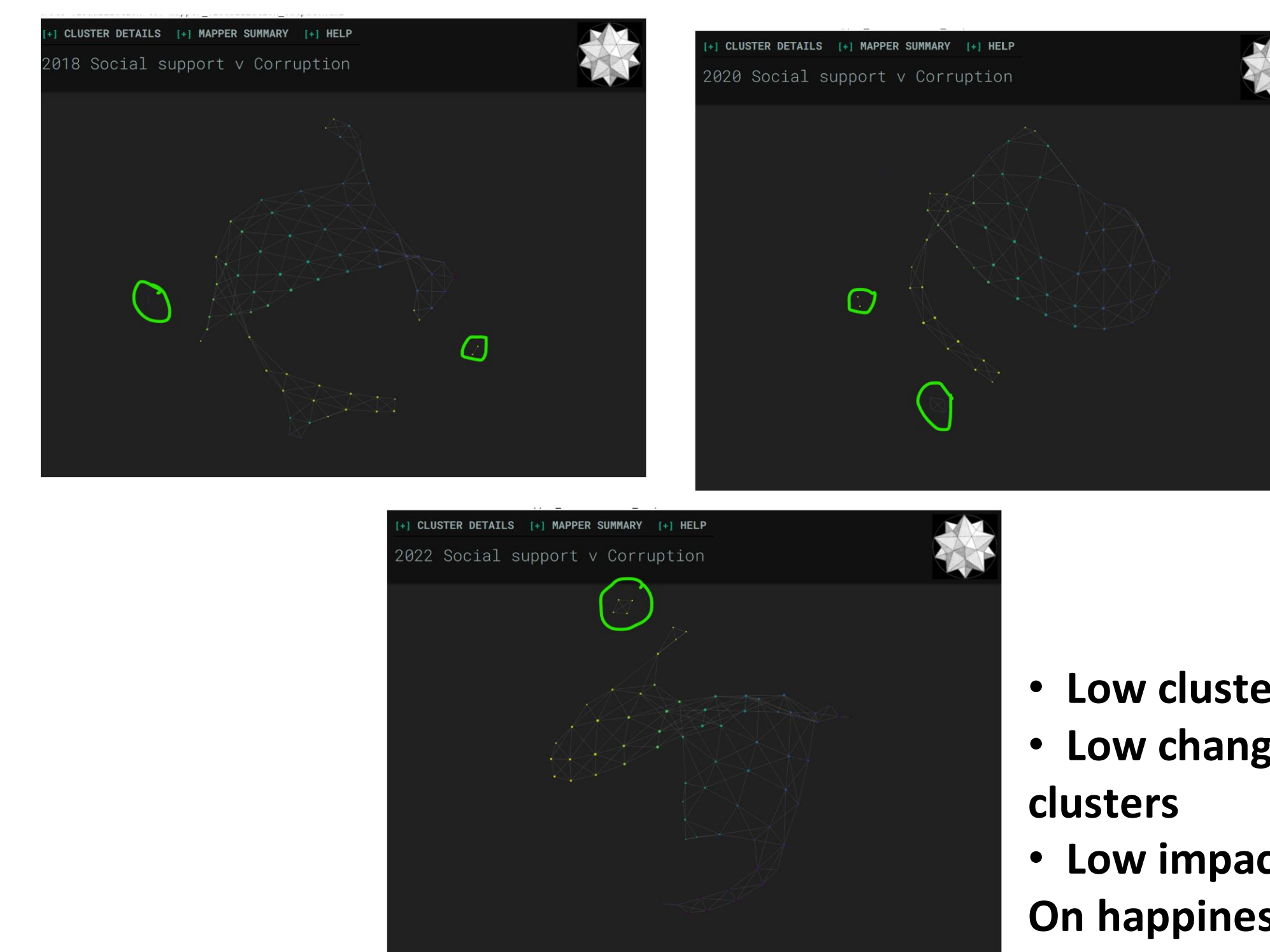
- Happiness scale – 0-10 with 10 being the happiest and 1 being the least happy from the Cantril ladder[3]
- GDP – "Gross Domestic Product" Per Capita in thousands of US dollars.[3]
- Social Support – Binary response of 0 or 1 to the question "If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?".[3] Along with other binary responses to multiple questions. Some of the questions came from other categories such as freedom and corruption.
- Freedom – Binary response of 0 or 1 to the question "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?"[3]
- Corruption – Average of the binary responses for the questions "Is corruption widespread throughout the government or not?" and "Is corruption widespread within businesses or not?"[3]

- Luxembourg, Singapore, Hong Kong and Rwanda all consistently outside the large cluster of most countries.
- In 2020, we find less number of clusters because further analysis shows that in 2020, most countries were closer to the average Corruption score of that year relative to the other years.



- removing the corruption variable = less clusters
- countries average corruption was closer to the average corruption of the world in 2020.
- GDP is a large contribution towards holding clusters together
- removing corruption variable; three outliers, Benin, Luxembourg, and Central African

Happy vs Corruption



- Low clusters
- Low change in clusters
- Low impact On happiness

Limitations

Some countries did not provide data for certain categories. To remediate this, we proceeded to set their score as zero for missing data. This could have slightly skewed our data and results. We believe this data is self-reported, which may result in biased responses. We also did not evaluate all the reported variables from the World Happiness Report in our research.

Citations

- [1] Ache, Machurin. "World Happiness Report up to 2022". Edited by John Helliwell et al., *Kaggle*, 19 March 2022, www.kaggle.com/datasets/mathurinache/world-happiness-report?select=2018.csv.
- [2] "GDP Per Capita, Current Prices". *International Monetary Fund*, www.imf.org/external/datamapper/NGDPDPC@WEQ/OEMDC/ADV/EC/WEOWORLD/ALB.
- [3] "Happiness, Benevolence, and Trust during COVID-19 and Beyond." *The World Happiness Report*, www.worldhappiness.report/ed/2022/happiness-benevolence-and-trust-during-covid-19-and-beyond/. Accessed 25 May 2023.