Global Health Security (GHS) Index

- As A Measurement of Countries' Performance Under The Covid-19 Pandemic

Lingbo Ye

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Introduction

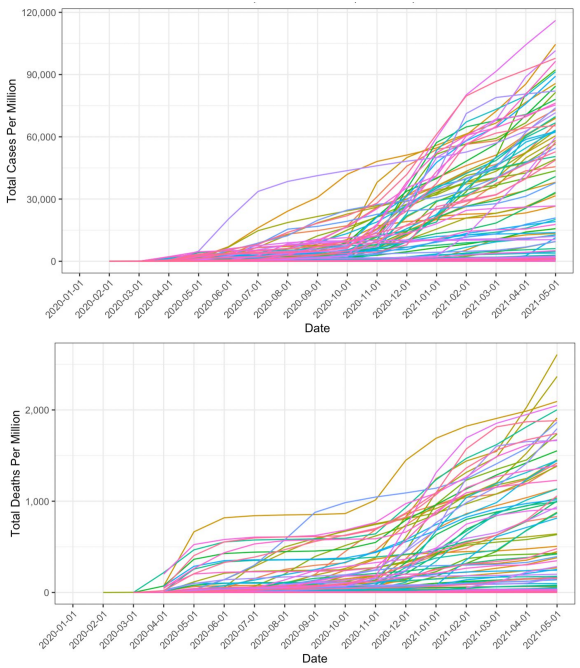
- The Global Health Security (GHS) Index:
  - Built in 2019 for assessing whether countries are *prepared* and whether countries are *capable* of facing emergencies and spreading pathogens.
  - There are 140 questions included in 6 categories to calculate the overall GHS index.
  - Just looking at the overall GHS Index is not representative and not very helpful because the questions and weights assigned to questions of interest to assess the GHS index are by *rule of thumb*
- *Objectives:*
  - Analyze the association between factors used to assess the GHS index, and whether the index is good for assessing the health system in terms of the countries' performance during the pandemic with respect to the number of Covid-19 cases and death per million.

Data Sources

- Global Health Security Index Dataset:
  - Measured on 195 countries in 2019.
  - Contains country names, the rankings of the countries, and the index scores for each of the 140 questions of the countries.
  - A score of 100 in the Index does not indicate that a country has perfect health security conditions, and a score of 0 does not mean that a country has no health security capacity. Instead, scores of 100 and 0 represent the highest or lowest possible scores, respectively.

Data Sources

- Covid-19 Dataset:
  - Contain 230 countries and range from January 1st, 2020 to May 14th 2021
  - 168 available countries overlapped with the GHS index dataset



Methods

Model:

- Model[1]:
  - $y_i = \beta_0 + \beta_1 Date_i$
  - Compare rank of rates of increase of cases (deaths) per million over time with overall and subcategories of GHS Index rankings
- Model 2:
  - $y_i = \beta_0 + \beta_1 I\{rank_i \leq 84\} + \beta_2 Date_i + \beta_3 I\{rank_i \leq 84\} * Date_i$
  - $H_0 : \beta_3 = 0$

The categories and weights investigated in this study are listed below:

1. Prevention of the emergence or release of pathogens (16.3%)
2. Early detection and Reporting for epidemics of potential international concern (19.2%)
3. Rapid response to and mitigation of the spread of an epidemic (19.2%)
4. Sufficient and robust health system to treat the sick and protect health workers(16.7%)
5. Commitments to improving national capacity (15.8%)
6. Overall risk environment and country vulnerability to biological threats (16.8%)

Results and Conclusions

Results:

- Model 1:
  - There are about 78% of the countries having difference between rank of the rates and rank of the overall GHS index score greater than 20.
  - There are about 85% (L: 82%, H: 90%) of the countries having the difference between rank of the rates and rank of each categories of GHS index score greater than 20.
- Model 2:
  - All p-values smaller than 0.001
  - Strong evidence to against the null hypothesis and conclude that there is difference in trends among two groups

Conclusions:

The GHS index is **NOT** good for assessing the health system in terms of the countries' performance during the Covid-19 pandemic in terms of rankings, but can perform well in terms of clustering.