Introduction

- Measles cases have recently skyrocketed & only about 40% of Madagascar population is immune.
- Pandemics of influenza occur every few years with no knowledge of how to track their occurrence.

Reflection

- The researchers at Fogarty International Center preform extensive disease modeling research globally.
- Frequently, they collaborate with other nations in order to access their regional and national data to for example, locate the greatest disease transmission rates during an outbreak.
- I utilized Madagascar national data on measles and influenza to compare the usability of the ARGO and TSIR models on less reliable data and google trend searches.
- My tasks included generating many timeseries graphs for both national and regional data for both influenza and measles cases.
- A large portion of the time was spent cleaning the data as the average reporting rate was low combined with sporadic increases and decreases.
- TSIR modeling was done on both regional and national levels -- both proved reliable and had r-squared values of at least 0.62.
- Google trend terms for ARGO analysis were acquired in three languages – French, English, and Malagasy. Out of the three, French contained the most predictive hits.
- ARGO modeling was preformed with generated google trends terms, flu net data as well as national measles data.
- Although further analysis is needed, results prove hopeful due to the large r-squared values and ability to utilize google trends even with low search volume to track disease dynamics.

Objective of Internship

This research furthered my understanding of the ongoing health crisis occurring in other countries by directly exploring the disease dynamics and their spread as well as the lack of homogeneity throughout the world. The research hoped to illuminate the usability of internet searches in combination with national data for disease surveillance.

Work profile

- Work with collaborators from Boston in order to study the ongoing measles outbreak in Madagascar. 
- Performed disease modelling using R via the TSIR and ARGO models.
- Worked with national and regional data from Madagascar to graphically illustrate the ongoing trends.

Conclusion

Incomplete surveillance complicates ongoing epidemics within other nations. This decreased reliability of data complicates response efforts and requires further research in order to understand disease trends and susceptible dynamics.

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