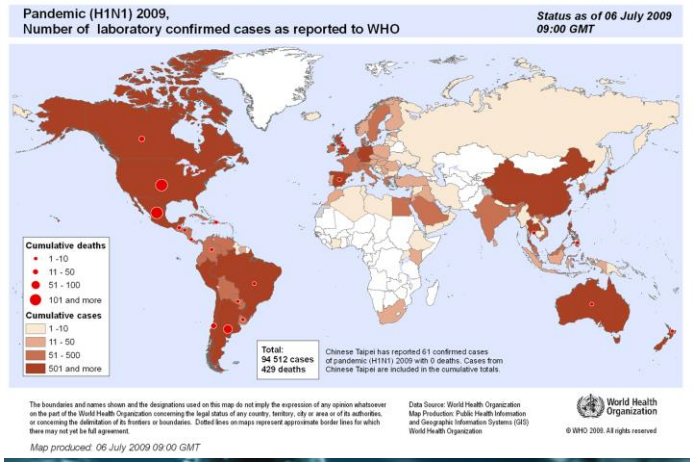
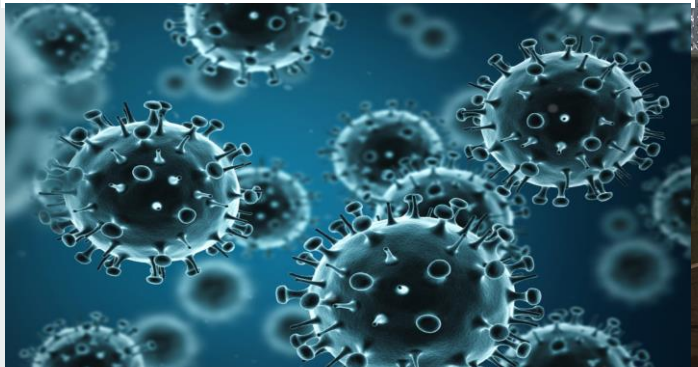
Analyzing Attributes of Global Outbreak





Group 2: Kati G., Saheed O. & Jorge R.

Questions & Analysis Topics

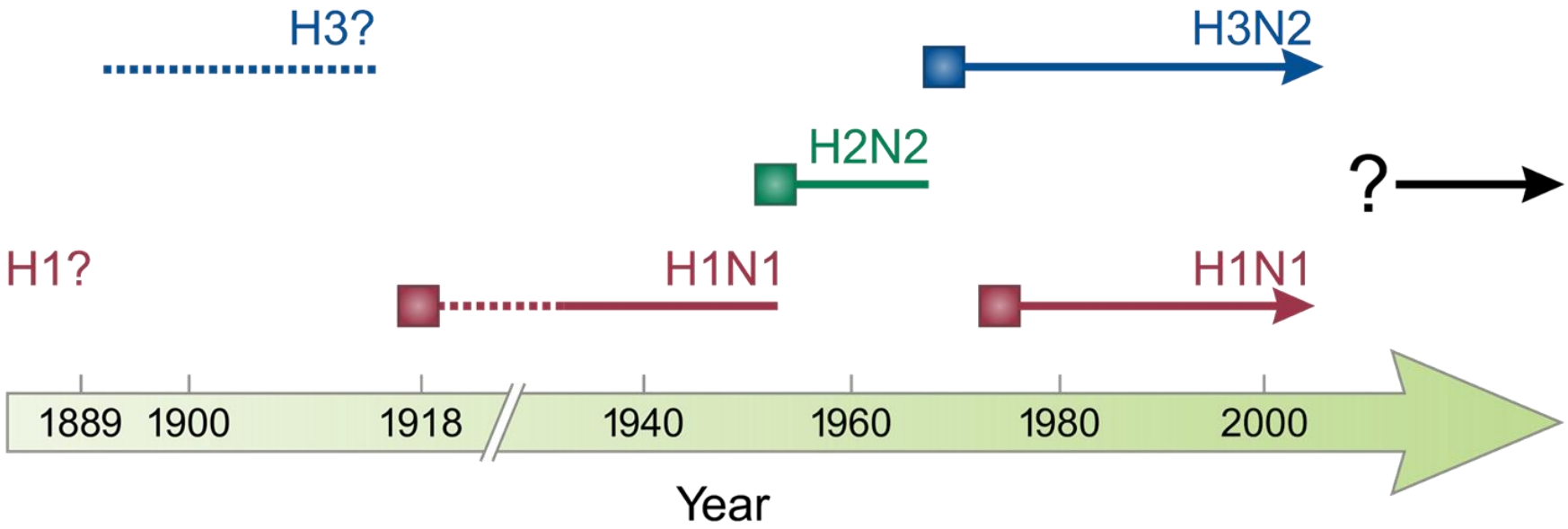
Questions Asked:

- How long would this outbreak last ?
- Why specific areas of the globe are more affected than others?
- Why are there so many cases in specific territories and not many in others?
    - What factors affect outbreaks

Analysis Topics:

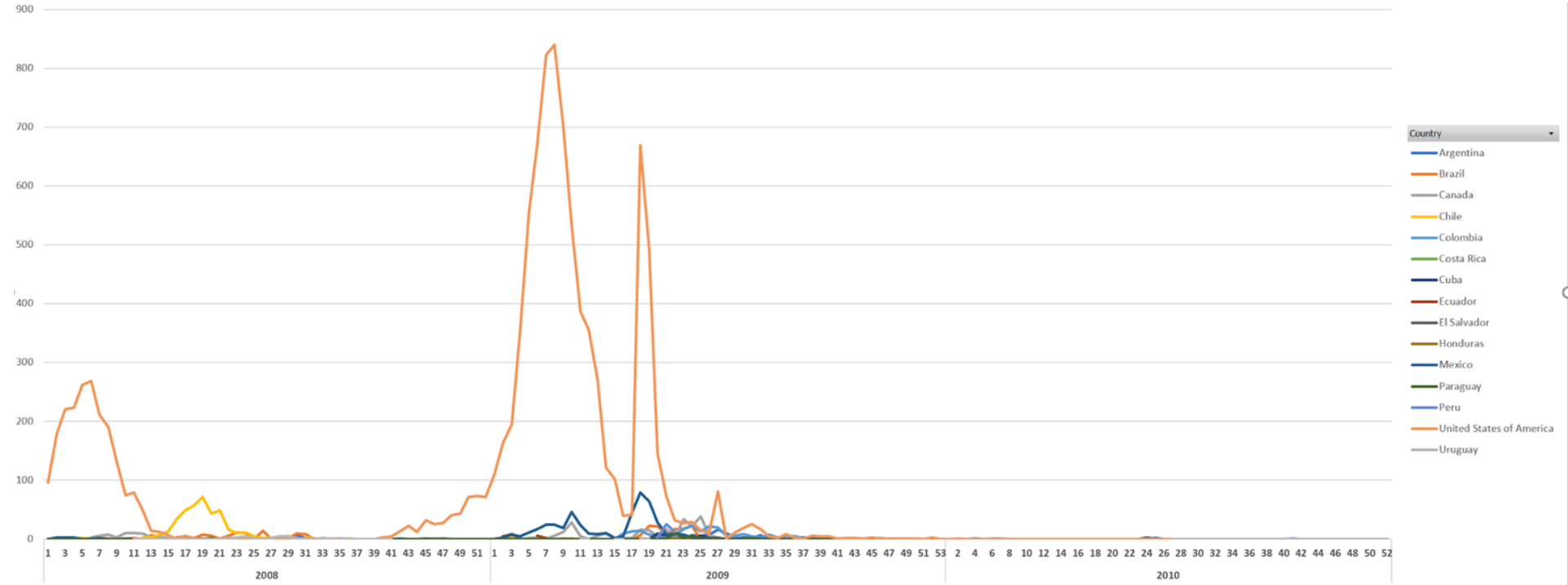
1. Outbreak cycle trends
2. Outbreak relating to population density & region proximity
3. Outbreak relating to weather

History and Background



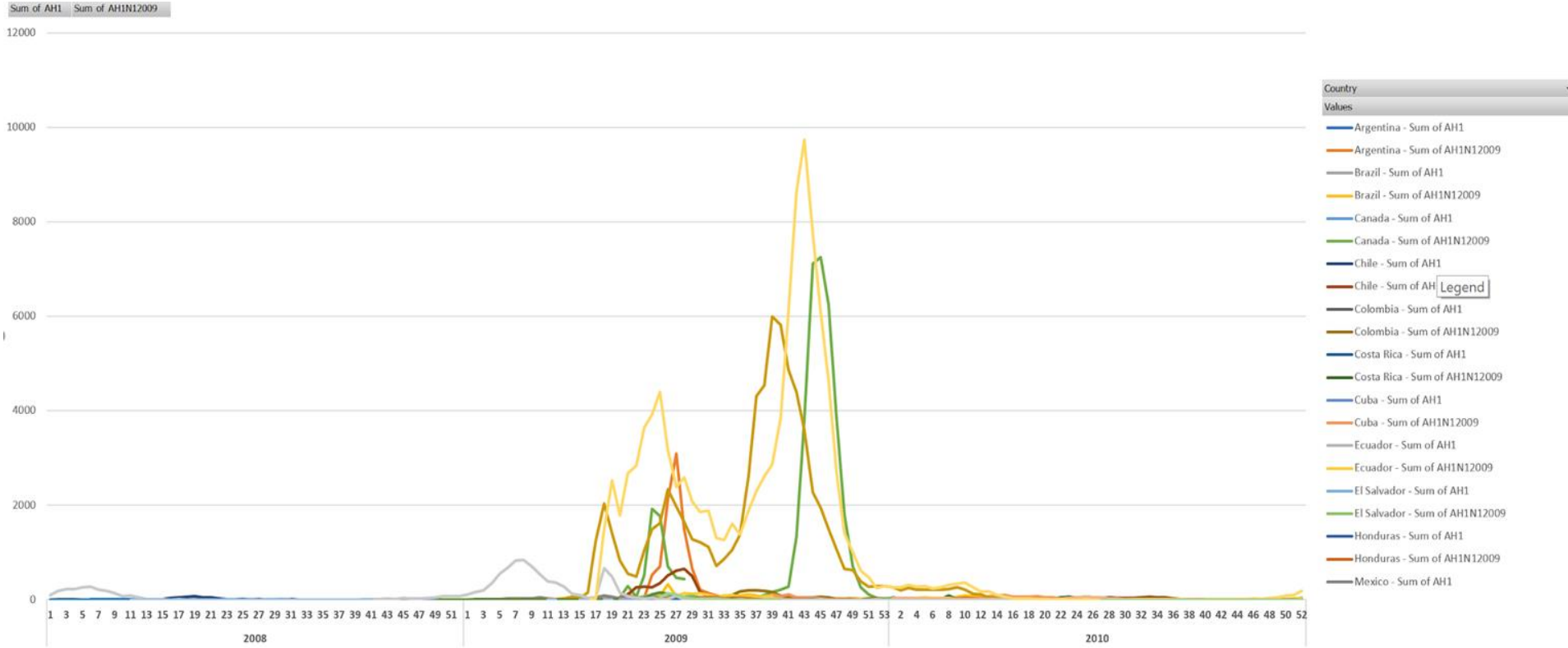
Recent Historical Outbreaks of AH1

Total Cases during 2008-2010 outbreak: 12,307

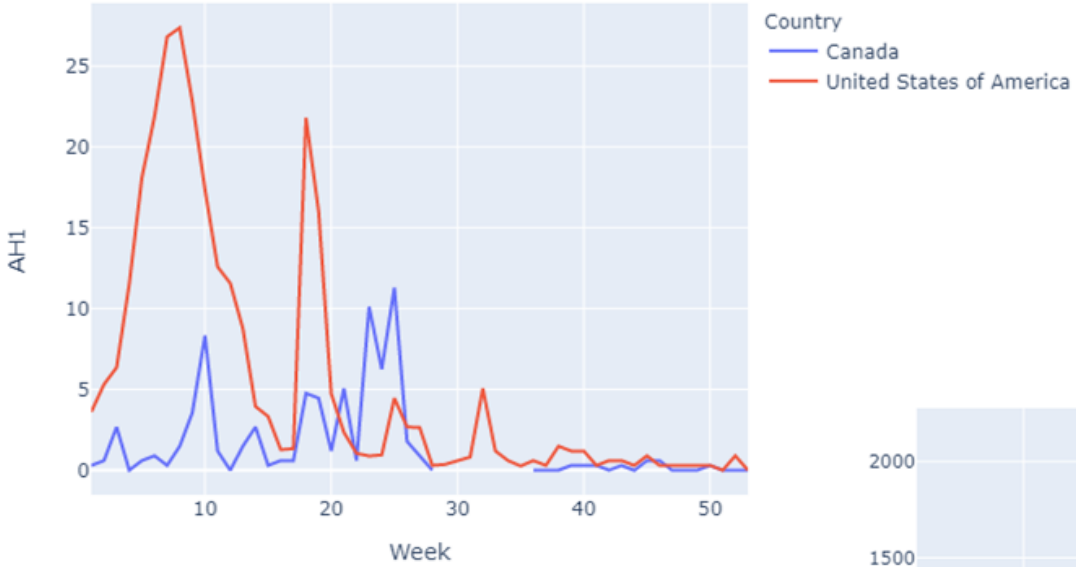


Recent Historical Outbreaks of AH1N1

Total Cases during 2008 - 2010 outbreak: 249,243

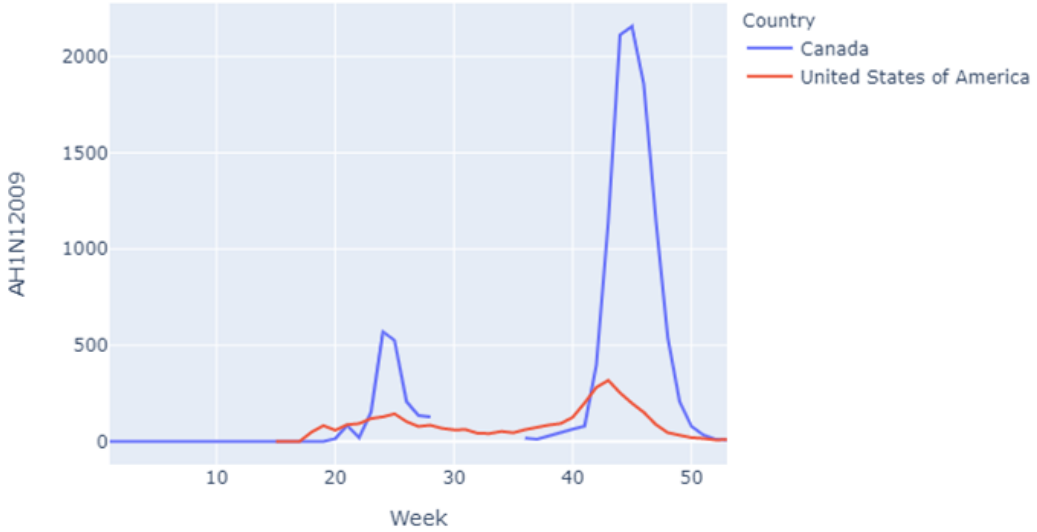


Life Cycle of Outbreaks - North America 2009

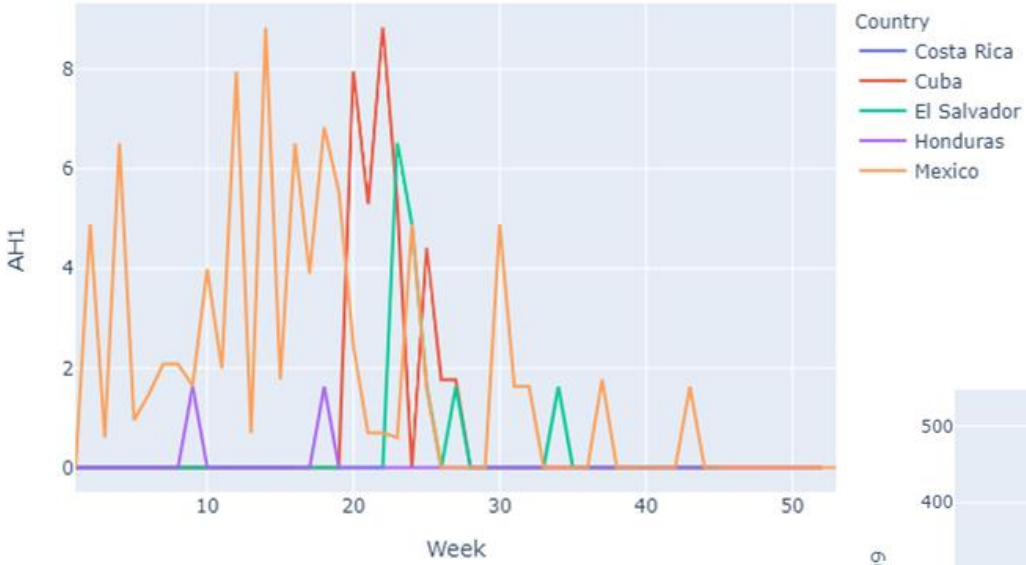


Total AH1 Cases 2009
United States : 7,947
Canada: 251

Total AH1N1 Cases 2009
United States: 105,982
Canada: 39,586



Life Cycle of Outbreaks - Central America 2009

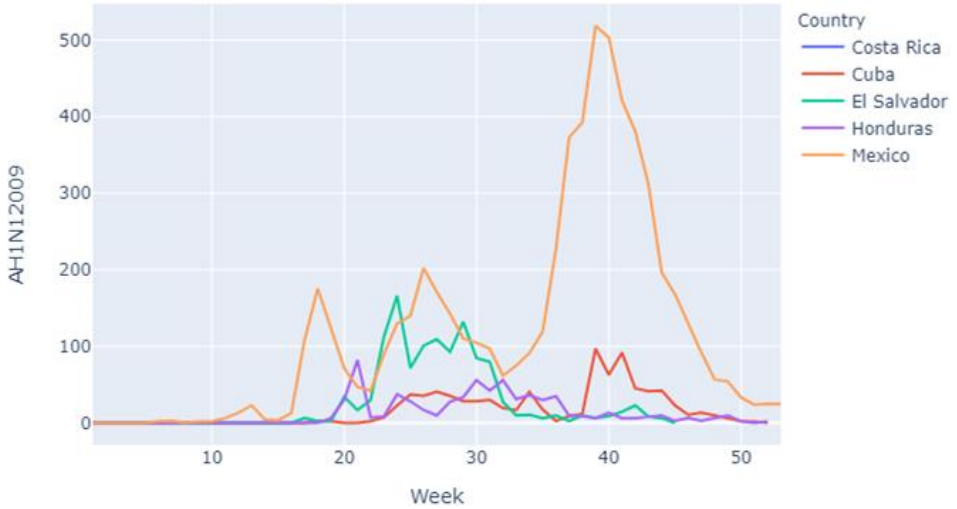


Total AH1 Cases 2009

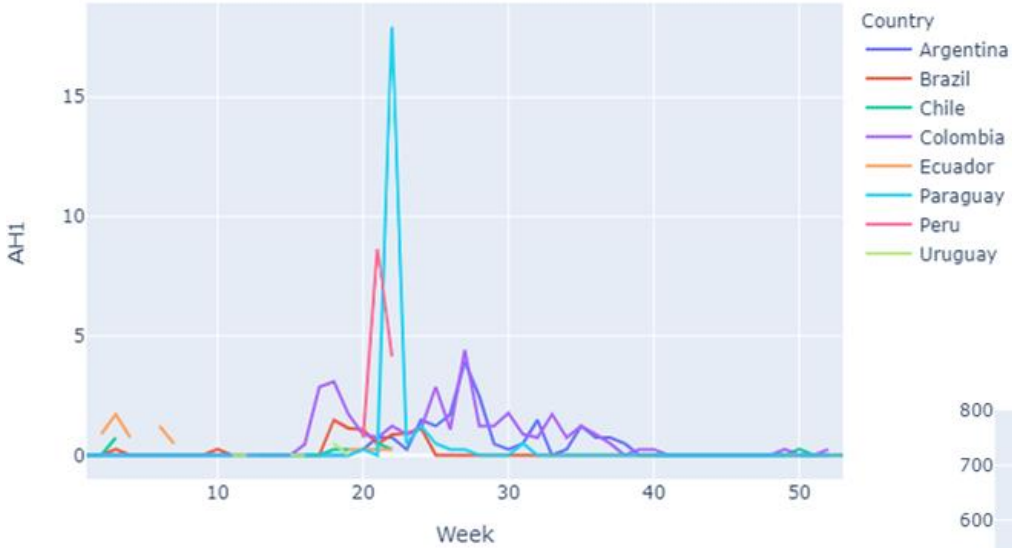
Costa Rica: 0
Cuba: 40
El Salvador: 10
Honduras: 2
Mexico: 462

Total AH1N1 Cases 2009

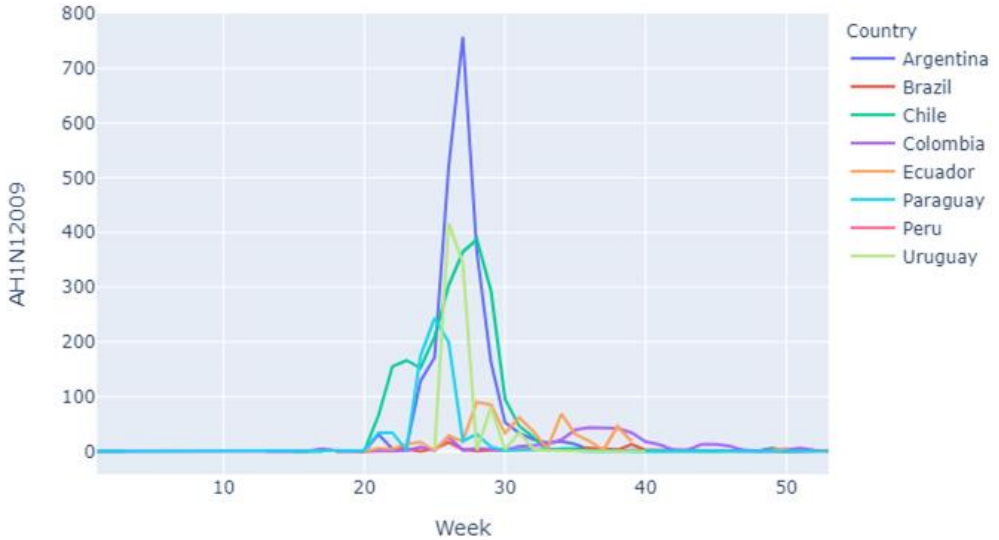
Costa Rica: 1
Cuba: 943
El Salvador: 774
Honduras: 606
Mexico: 69,922



Life Cycle of Outbreaks - South America 2009

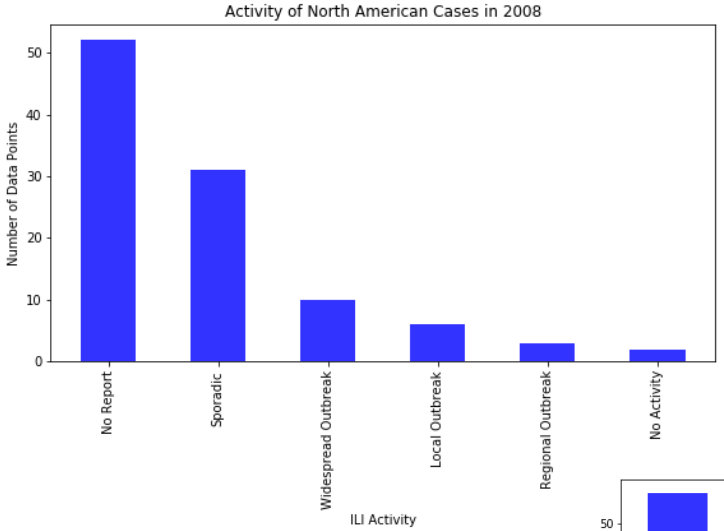


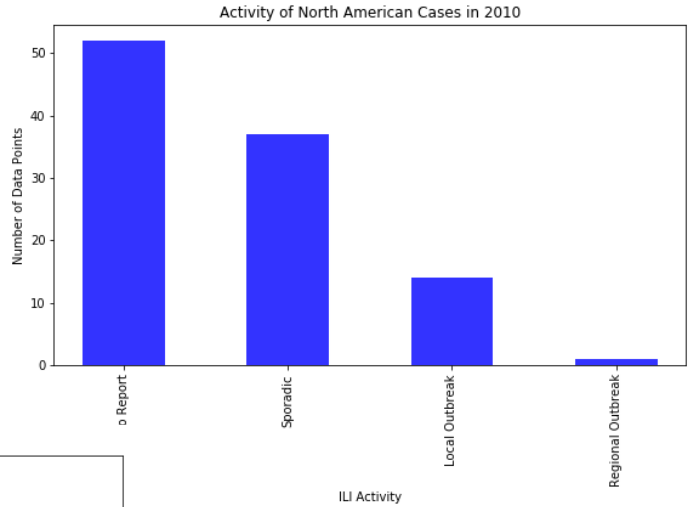
Total AH1 Cases 2009
Argentina: 77
Brazil: 117
Chile: 11
Colombia: 198
Ecuador: 25
Paraguay: 25
Peru: 40
Uruguay: 3

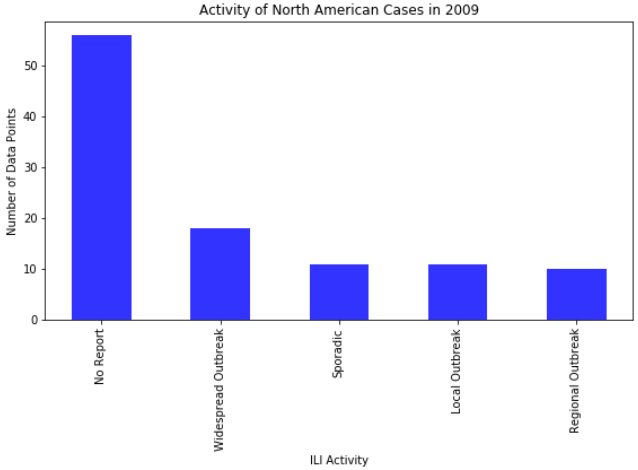


Total AH1N1 Cases 2009
Argentina: 9,514
Brazil: 1,577
Chile: 3,896
Colombia: 1,971
Ecuador: 1,302
Paraguay: 706
Peru: 0
Uruguay: 448

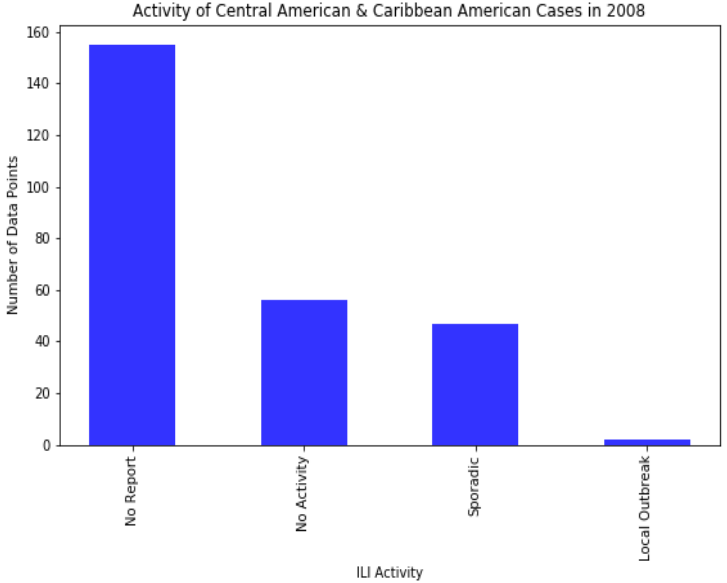
Influenza-Like Illness Activity Level- North America

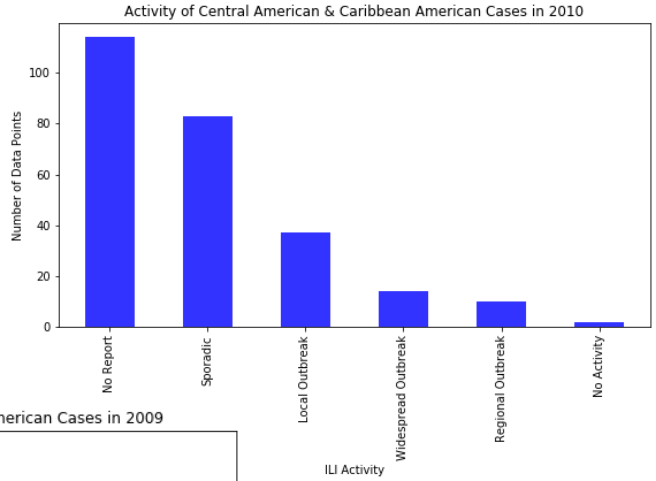


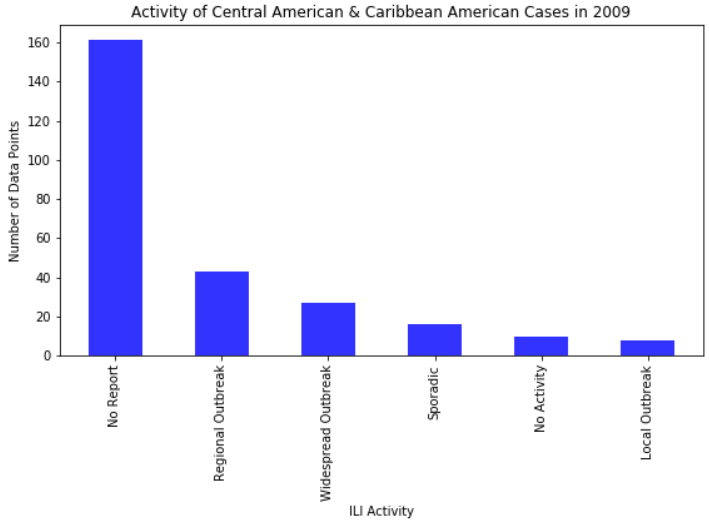




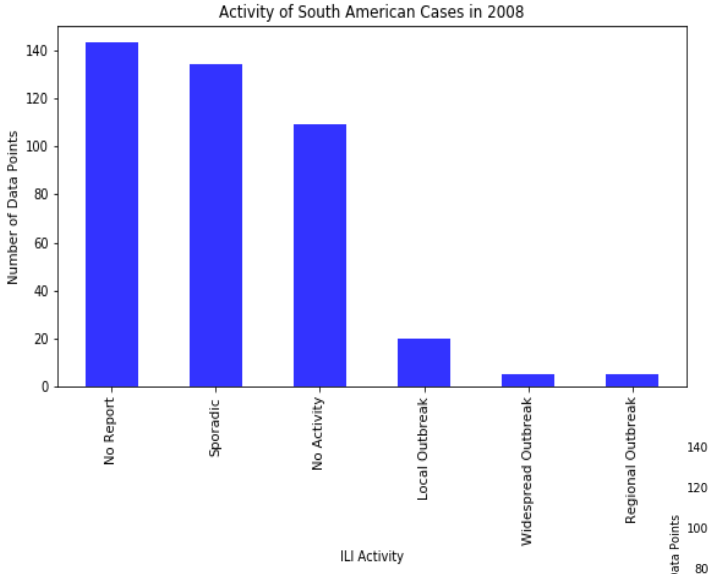
Influenza-Like Illness Activity Level - Central & Caribbean America

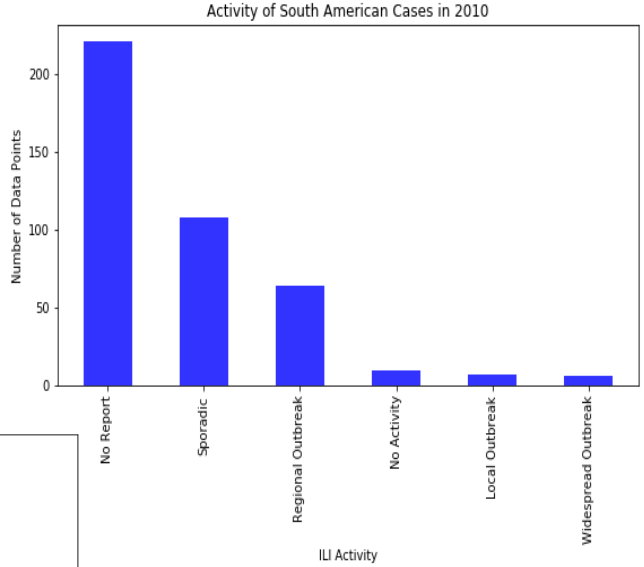


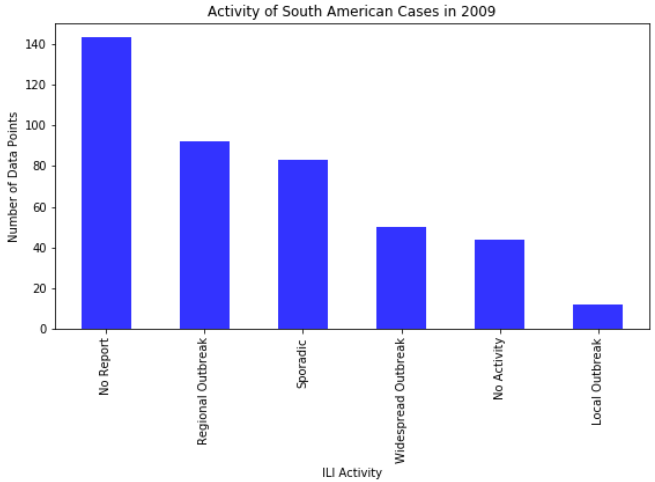




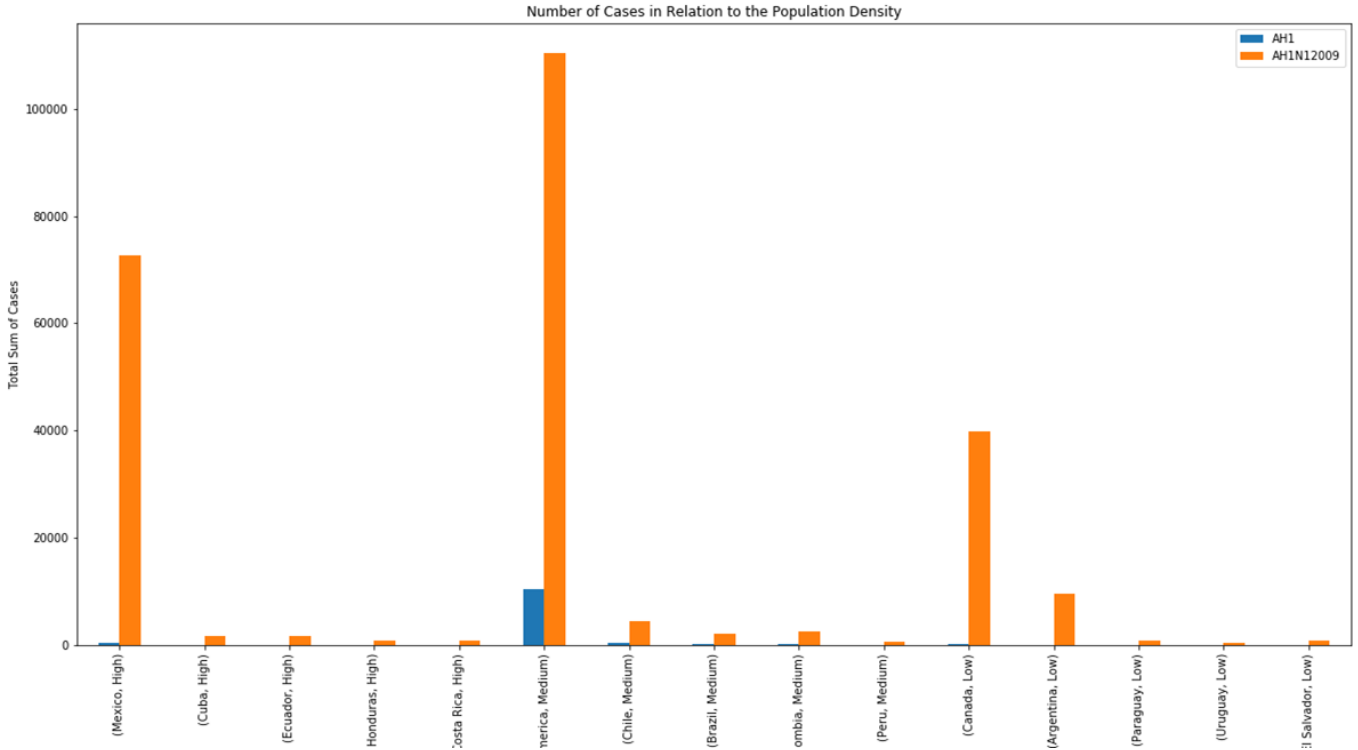
Influenza-Like Illness Activity Level- South America







Population Density Pattern Analysis



- For AH1 & AH1N1 we **do not notice any correlation between the population density and the number of cases.**
- The levels for cases could be due to the **proximity of the country.**

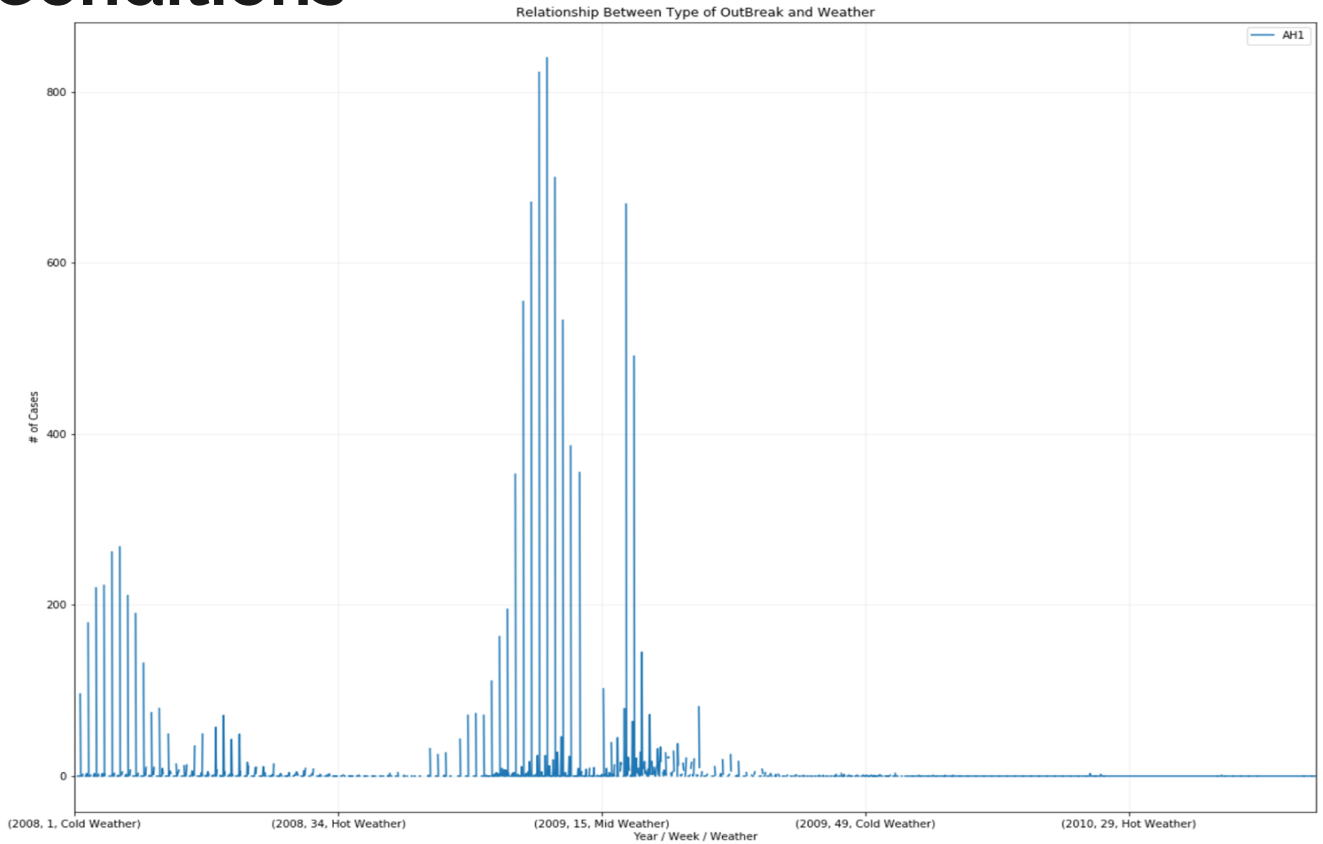
Weather Pattern Analysis

North America Temp. Pattern

Central America Temp.Pattern

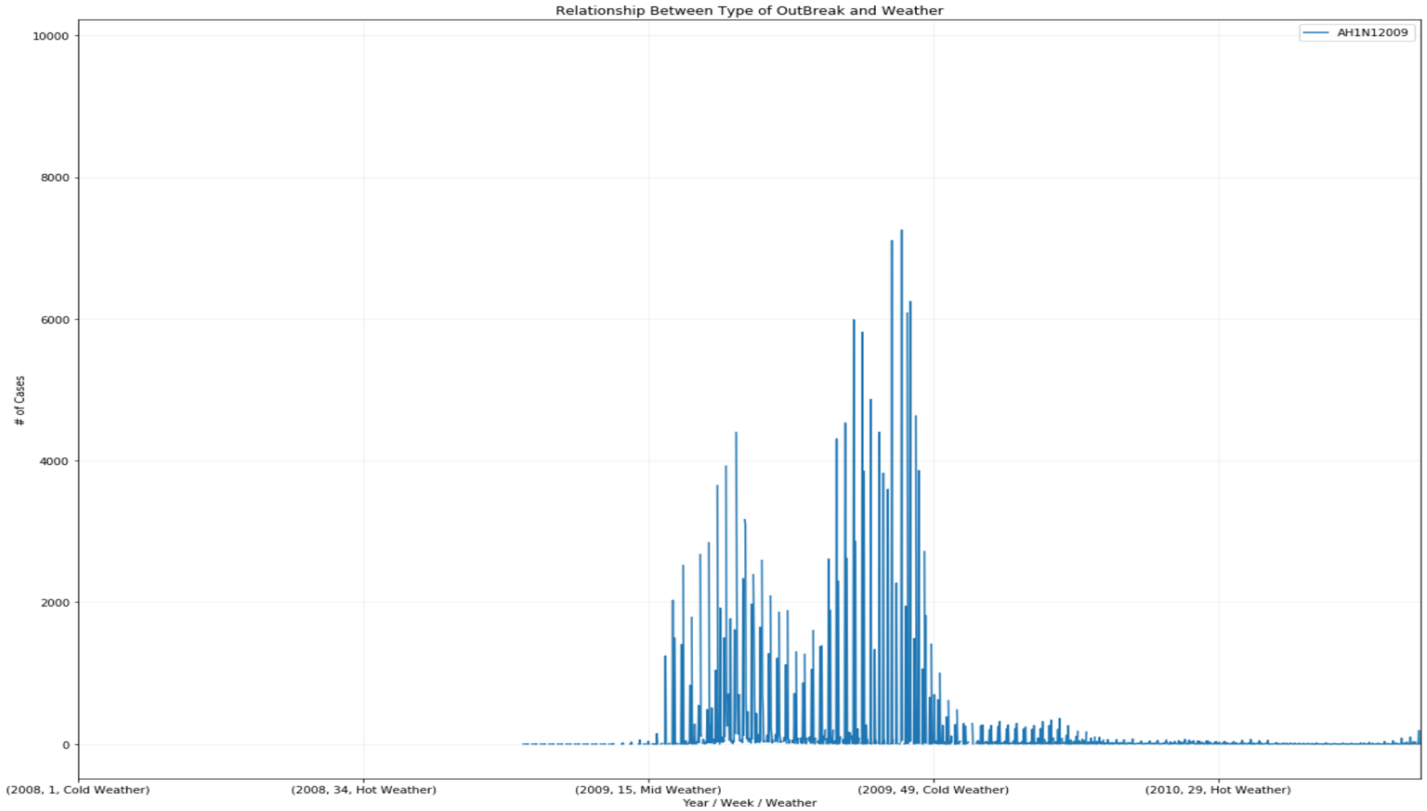
South America Temp.Pattern

Relationship Between Outbreak of AH1 Weather Conditions



- AH1 reported a considerable low rate of cases and its cyclical pattern is **closely related to extreme weather conditions** across the board.

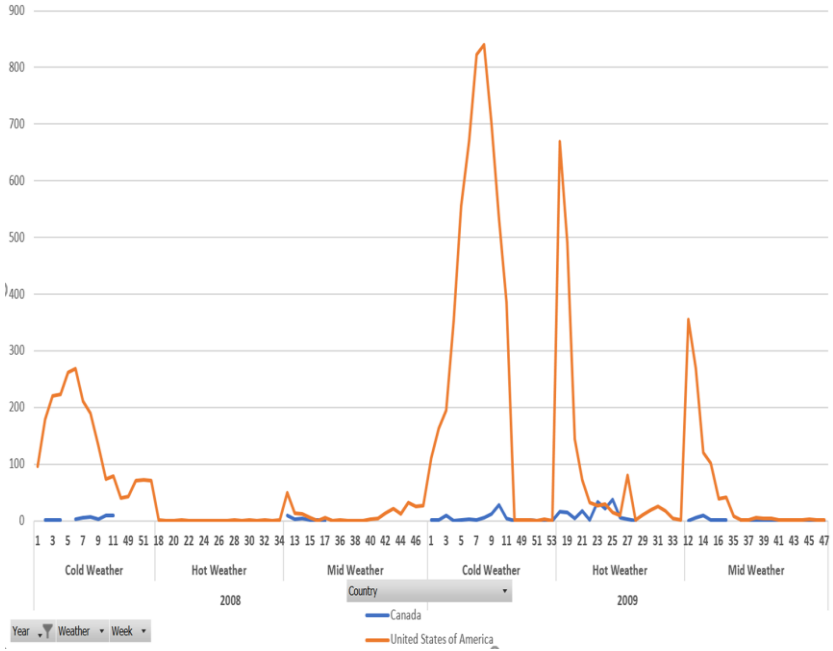
Relationship Between Outbreak of AH1N1 Weather Conditions

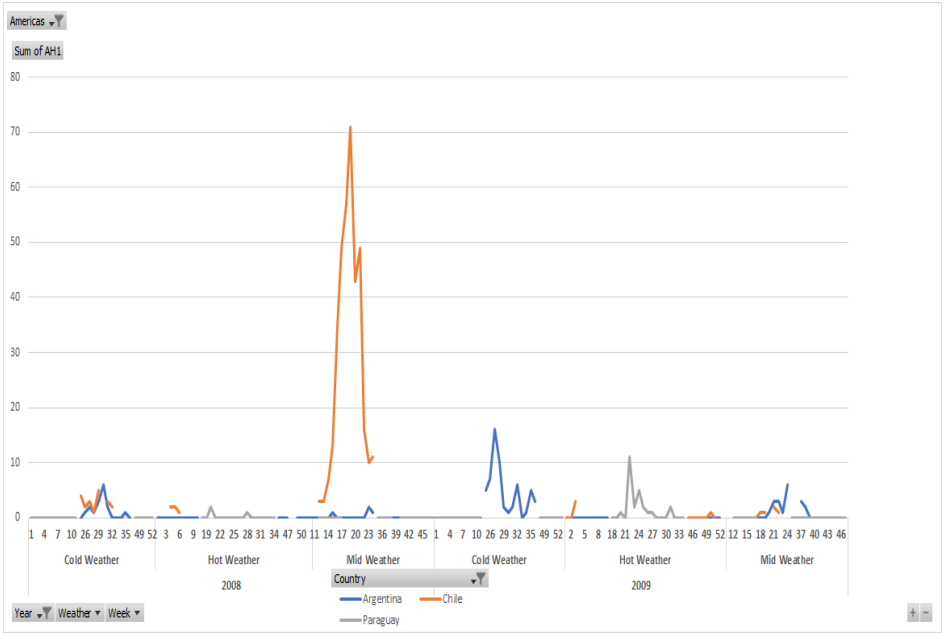


- For H1N1 we noticed the **trends replicated** and had the same pattern as AH1.

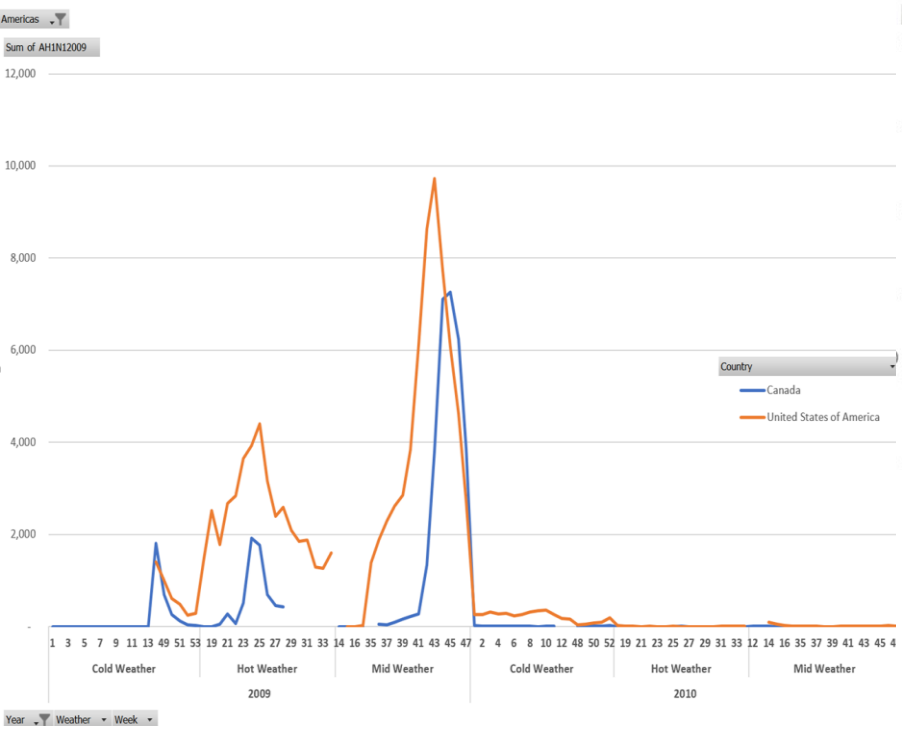
Relationship Between Outbreak of AH1 Weather Conditions by Countries

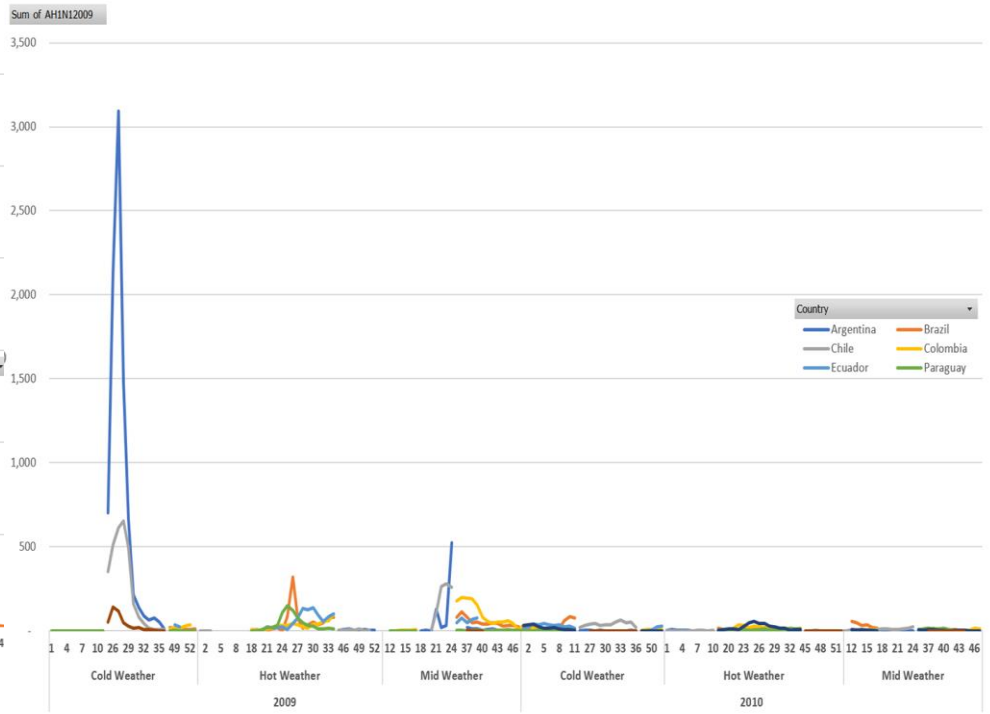
Going deeper in the information we notice how extreme weather conditions **affect some countries more than others.**





Relationship Between Outbreak of AH1N1 Weather Conditions by Country





Conclusions

1. Outbreaks follow a pattern, based on when they appear. Typically there are two spikes in a disease outbreak in its respective region.
2. There is no strong correlation between population density & number of cases. However, there is a correlation between region proximity and number of cases. One consideration we need to take into account is the amount of cases reported in its respective region.
3. There seems to be a close relationship between extreme weather conditions & disease outbreak. This is proven by the number of cases in the time frame of extreme weather conditions.

A Step Further:

1. Research economic indicators to see global outbreak effect on GDP
2. Historical data for a more detailed picture of trends

References

- WHO - Main Data Source: http://apps.who.int/flumart/Default?ReportNo=12

Supplemental Data:

- https://www.cdc.gov/flu/weekly/#VirusCharacterization
- https://gis.cdc.gov/grasp/fluview/Novel_Influenza.html
- https://www.climate.gov/maps-data/data-snapshots/averagetemp-monthly-cmb-2009-08-00?theme=Temperature
- https://data.worldbank.org/indicator/EN.POP.DNST
- Palese P (December 2004). "Influenza: old and new threats". Nature Medicine. 10 (12 Suppl): S82–87. doi:10.1038/nm1141. PMID 15577936.