**STAT701 – Covid in Brazil and associated variables**

**Report structure**

* + **Executive summary (1 page)**
    - Goal of the study
    - Data
    - Findings
  + **Introduction**
    - **The Covid problem in Brazil**
      * Qualitative description
      * Plot of cases and deaths over time
      * Comparison of relevant stats to that of other countries
    - **Structural facts about Brazil**
      * Geo - 27 states, 5570 cities
      * Population and Economy (comment main highlights)
        + Heterogeneous population distribution, concentrated in coasts in SE and NE
        + Age, relatively young, older population in S and SE
        + Education, explain levels
        + Mainly urban, rural in peripherical areas
        + Races, predominantly 'pardos' (non-white)
        + Highly unequal

GDP concentrated in SE

Still very poor in peripherical areas,

Housing problem (small size, many residents, access to water/sewage, etc.)

Bolsa-família

* + - * + Etc
      * Health infrastructure
        + SUS vs ANS
        + SUS - universal access system, capillary but running deficit
        + ANS - different types of private coverage
        + Etc.
    - **Covid response**
      * Qualitative description (late, disorganized, limited, etc.)
      * Direct investments of the federal government
      * Increase of assistance network
      * Emergency aid
      * Vaccine program
    - **Objective**
      * Understand how structural (geographic, population, economic) and covid response variables are associated with covid cases and deaths, at city level
  + **Data**
    - Structure (geo, pop, econ, health and covid)
    - Sources
    - Table of all variables used
  + **Exploratory and descriptive analysis**
    - Covid data vs main proxies (selected variables)
      * Plot of cases and deaths over time by state (spaghetti plot)
      * Plot (or chart) map of cases and deaths per 100k inhabitants by city (or state)
      * [population proxy] Plot (or chart) of urban population density by city (or state)
      * [econ proxy] Plot (or chart) of GDP per capita by city (or state)
      * [health proxy] Plot (or chart) of hospital beds per 100k inhabitants by city (or state)
  + **Regression**
    - Results of regression of covid vs population variables
      * Identify relevant variables and impact (positive or negative)
    - Results of regression of covid vs economic variables
      * Identify relevant variables and impact (positive or negative)
    - Results of regression of covid vs health variables
      * Identify relevant variables and impact (positive or negative)
    - Results of regression of covid vs population + health + economic variables
      * Identify relevant variables and impact (positive or negative)
      * Select and final model
      * Classify cities according to predicted results vs real results (proxy to evaluate if they are doing better or worst than predictions)
  + **Conclusion**