Introduction

COVID-19 is caused by infection with a new coronavirus (called SARS-CoV-2). This novel coronavirus was first emerged from seafood and poultry market in the Chinese city of Wuhan in 2019. Community transmission of COVID-19 was first detected in the United States in February 2020. By mid-March, all 50 states, the District of Columbia, New York City, and four U.S. territories had reported cases of COVID-19.

Coronavirus Epidemiology

**Modes of Transmission:** Respiratory infections can be transmitted through droplets of different sizes as it can be transmitted between people through respiratory droplets and contact routes. The duration of the indoor activity and the increased production of respiratory droplets through loud speech and singing, likely increased the risk of transmission. Poor ventilation in confined airways is associated with increased risk of transmission of respiratory infections.

**Incubation Period:** The median incubation period was estimated to be 5.1 days and 97.5% of those who develop symptoms will do so within 11.5 days.

**Reservoirs:** It is anticipated that there is probable zoonotic origin of COVID-19, based on the large number of infected people who were exposed to the wet animal market in Wuhan City where live animals are routinely sold. The COVID-19 genome sequence analysis showed its 88% identity with two bat-derived severe acute respiratory syndrome (SARS)-like coronaviruses suggesting that bats are the most likely link between COVID-19 and humans.

Coronavirus Treatments

VIR ending drugs (antiviral):

- Remdesivir: Used in standard care treatments and has a widespread of use, in stage three trials, prevents copying, replication, and decreases viral reproduction and Found to reduce lung hemorrhage and viral lung titers in a lung infection model with MERS-CoV
- Arbidol/Umifenovir: In phase three trials, is an IL-6 (interleukin 6) inhibitor (act as an inflammatory or anti-inflammatory enzyme)
- Oseltamivir/Tamiflu: Used in a stage three trial and reduces viral reproduction

**Coronavirus Vaccines**

Serina Cabrera, Alexander Carter, Kelsey Centurino, Dirk Tolson. Faculty Advisor: Dr. Omayra Ortega

Challenges

- Reliance on refrigerated transport of solution-based vaccine
  - makes it nearly impossible for under-developed and developing nations with tropical climates
- First vaccine candidate entered clinical development as of June 1st, 2020
- Any vaccine is still months-to-years away from clinical reality
  - COVID-19 may serve as an impetus for the scientific community

**Coronavirus Social Implications**

Dr. Whitney Pirtle of UC Merced explains how social condition is a basic fundamental cause of coronavirus disparities by examining the following four criteria:

- The disease interacts with multiple other diseases to influence a poor health outcome
- An increase in multiple risk factors affects the disease outcome
- Access to flexible resources can be used to minimize the outcome of the disease
- The outcome of the disease has been replicated in historical patterns from past pandemics where social conditions were a factor

Because coronavirus meets all of the above criteria, it is crucial to acknowledge that the divisive racial and socioeconomic status of many countries contributes to the disparities of those impacted by the varius.

The chart to the left represents the proportion of individuals belonging to each ethnicity represented in the population as well as coronavirus cases in the state of California.