This is just me keeping track of my steam of thoughts notes as I read through these, you can look and add anything if you see something I got wrong. Otherwise ignore this.

Forecasting the Spread of COVID-19 under Different Reopening Strategies

Meng Liu1,+, Raphael Thomadsen2,+, and Song Yao

\*look into the articles that they cite in the paper, could be good rescourse to get numbers for ourselves

\*\*Note this paper has not been peer reviewed yet\*\* (They says so at the bottom of pages)

They looked into the Susceptible-Exposed-Infected-Confirmed-Removed (SEIQR) model – I believe we have also earlier on.

Du, Z. et al. Risk for transportation of coronavirus disease from wuhan to other cities in china. Emerg. Infect. Dis. 26, DOI: 10.3201/eid2605.200146 (2020).

^according to article the used a SEIR model that took into account the transportation via animals, but the current article determined the original SIR model was superior for the particular aspects they wanted to look into.

Model:

Mathematically, we model transmission of COVID-19 as

y\_(i,t) 🡪 number of new infections in county i on date t,

R\_(i,t) 🡪 rate at which infectious individuals transmit the disease

S\_(i,t) 🡪 percentage of the county population that has not yet had COVID-19

Y\_(i,t) 🡪 cumulative number of individuals who have been infected by date t.

^They note they get similar results if they use (a 14 day infection time period instead of the above using a 6 day infectious time frame.

🡨 that is similar to what I was suggesting the other day causing a decreasing exponential function instead of increasing.

D, m, h 🡪 social distance, temperature, and humidity

Epsilon 🡪 error

Alpha 🡪 fixed effect for county (Demographics by county: Ethnicity, commuting, age

Beta 🡪 fixed effect for date (Day of the week travel patterns rate of testing/reporting)

Lambda (l), mu, theta 🡪 impacts of social distance, temperature, and humidity on transmission rates

Look into e GPS location data that are provided by SafeGraph for free to researchers studying COVID-19

SafeGraph Inc.

Ethnicity appears to have influence on contagion (my hypothesis is that these may be in more urban areas as well, where social distancing is more difficult)

Age does have different rates of spread, however not significantly different rates of contagion.

Social distancing/Return to normalcy percent eq:

How did they get , I believe they used a computer to generate a best fit model that produced this number, though I may have missed this in my reading on where the number came from.

Ask about: endogeneity bias, instrumental variables (IV) technique

\*\*Reminder to self: rain\*\*

The paragraph under “Data” is super important. They estimate the true number of cases to be 10 times larger than the number of reported case.

Reading: <https://www.kaggle.com/lisphilar/covid-19-data-with-sir-model>

This is a bit denser, but good data pulls. There’s a good table for proportion of population by age. The one I am noting is for global pop.

WHO PP Covid-19 06/05/2020

- Symptoms bar graph is a little difficult to read.

- Confirm incubations time: 1 – 14 days, average 5-6 days, 97% have symptoms within 14 days

- possible graph influences: Super-spreader events: Crowding, closed settings, (nosocomial?)

- R\_0 btwn 2 and 4

- Do we want to consider underlying medical conditions?

- Antibodies appear around 6-12 days after symptoms

-

Data to look up:

% ppl wearing masks

% ppl washing hands…

What qualifies as “well ventilated” can we graph this effect? Is this too narrow of a focus?

Nature Medicine – Age dependent effects in the transmission and control of Covid-19 epidemics

* under age 20 – half as susceptible to infection
* 10 to 19 years: 79% asymptomatic or paucisymptomatic (nonclinical symptoms – might not be reported)
* Over 70: 31% asymptomatic or paucisymptomatic

(coming back to this later)