This will be focused in the United States as it's easier to find information on the United States rather than the whole world.

https://www.washingtonpost.com/wp-srv/special/health/how-ebola-spreads/ a possible idea of how to run our simulation

Coronavirus (Trial section) -
world infection rate map provided by john hopkins university
https://coronavirus.jhu.edu/map.html

329,877,505
in the united states currently

12,126,076 infected in the united states so far
4,529,700 recovered from the virus
237,608 deaths in the US

How to calculate the infection rate of the disease
http://health.utah.gov/epi/diseases/HAI/resources/Cal_Inf_Rates.pdf

https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html

The numbers below are from a point in time from the john hopkins covid 19 live map

$\frac{8,706,456}{331,002,651}$ X 100 = 3.7% infection rate in the US

$\frac{225,765}{8,706,456+3,460,455}$ X 100 = 1.8% case fatality ratio in the US

$\frac{3,460,455}{8,706,456}$ X 100 = 40% chance of recovery (note this means of people already infected...not that they're gonna die. People are gonna get better eventually some will die)

The incubation period for COVID-19 is thought to extend to 14 days, with a median time of 4-5 days from exposure to symptoms onset.[1-3] One study reported that 97.5% of persons with COVID-19 who develop symptoms will do so within 11.5 days of SARS-CoV-2 infection.[3]

https://calculate.org.au/wp-content/uploads/sites/15/2018/10/spread-of-disease.pdf

The Website we can use above with various formulas we can use in our own data.

Side effects that may occur after recovering from covid.

Mild to moderate (mild symptoms up to mild pneumonia): 81%

Severe (dyspnea, hypoxia, or >50% lung involvement on imaging): 14%

Critical (respiratory failure, shock, or multiorgan system dysfunction): 5%

influenza (Flu) infection facts and ideas in the US
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3278149/

influenza is a highly contagious respiratory illness that is responsible for significant morbidity and mortality.

Infection rate is between 3 to 8% per year. *We should use 5.5% as a rough guess-estimate*

The time from when a person is exposed and infected with flu to when symptoms begin is about 2 days, but can range from about 1 to 4 days.

People with the flu are most contagious in the first 3-4 days after their illness begins.

Some otherwise healthy adults may be able to infect others beginning 1 day **before** symptoms develop and up to 5 to 7 days **after** becoming sick.

https://www.goodrx.com/blog/flu-vs-coronavirus-mortality-and-death-rates-by-year/

mortality is usually well below 0.1%

The Black Death

450 million before the plague started 350 to 375 million in the 1400's

$\frac{50,000,000}{450,000,000}$ = 1.11% infectivity rate or well almost guaranteed given the living conditions of the 1400's.

30 to 60% mortality rate

Note that you only have 24 hours to get treated

The case-fatality ratio of 30%-100% if left untreated

https://www.cdc.gov/plague/faq/index.html

Ebola Virus

https://www.sciencedirect.com/science/article/pii/S2214999615000107

The incubation period (the period between infection and first symptoms) is usually 4 to 10 days but can be as short as 2 days and as long as 21 days

Transmission via inanimate objects contaminated with infected bodily fluids (fomites) is possible.The principal mode of transmission in human outbreaks is person-to-person transmission through direct contact with a symptomatic or dead EVD case

the average EVD case fatality rate is around 50%

Chicken Pox

It takes about 2 weeks (from 10 to 21 days) after exposure to a person with chickenpox or shingles for someone to develop chickenpox.

4 million cases of chickenpox were reported annually before the vaccine was first created

Common Cold

More than **3 million** US cases per year

Symptoms usually begin 2 or 3 days after infection and last 2 to 14 days.

0.9% infection rate

No mortality rate

spread

By airborne respiratory droplets (coughs or sneezes).

By touching a contaminated surface (blanket or doorknob).

By saliva (kissing or shared drinks).

By skin-to-skin contact (handshakes or hugs).

Scholarly articles talking about the effects of physical distancing and face masks to prevent the spread of disease!

https://www.cdc.gov/coronavirus/2019-ncov/more/masking-science-sars-cov2.html

An investigation of a high-exposure event, in which 2 symptomatically ill hair stylists interacted for an average of 15 minutes with each of 139 clients during an 8-day period, found that none of the 67 clients who subsequently consented to an interview and testing developed infection. The stylists and all clients universally wore masks in the salon as required by local ordinance and company policy at the time

In a study of 124 Beijing households with ≥ 1 laboratory-confirmed case of SARS-CoV-2 infection, mask use by the index patient and family contacts before the index patient developed symptoms reduced secondary transmission within the households by 79%

A retrospective case-control study from Thailand documented that, among more than 1,000 persons interviewed as part of contact tracing investigations, those who reported having always worn a mask during high-risk exposures experienced a greater than 70% reduced risk of acquiring infection compared with persons who did not wear masks under these circumstances.

A study of an outbreak the aboard USS Theodore Roosevelt, an environment notable for congregate living quarters and close working environments, found that use of face coverings on-board was associated with a 70% reduced risk

Investigations involving infected passengers aboard flights longer than 10 hours strongly suggest that masking prevented in-flight transmissions, as demonstrated by the absence of infection developing in other passengers and crew in the 14 days following exposure

Reductions in risk
Wearing a mask 70%
Washing hands
Distancing

Equation for determining the result: multiply the percentages of stuff.