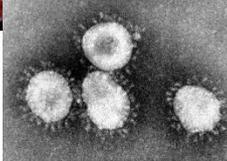
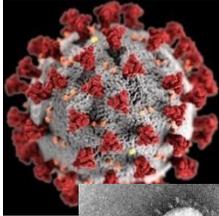
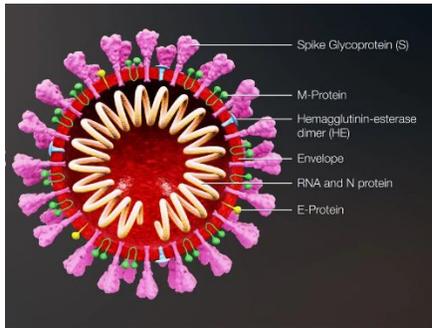


Coronavirus Infection – an Overview

(Robert Collins, M.D, March 2020)



Covid-19 is the official name for the particular coronavirus causing the current pandemic. Other single stranded RNA coronaviruses causing a respiratory illness include influenza, SARS, MERS, & Ebola. The RNA gene was isolated and sequenced in Wuhan, China, and given to WHO and labs around the world in January for developing tests and to begin developing vaccines. The U.S. government chose not to participate.

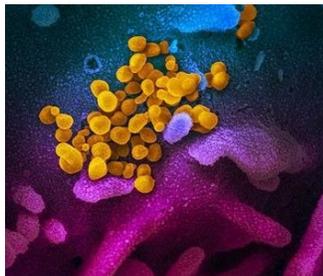


The pink protein spikes attach the virus to cells.

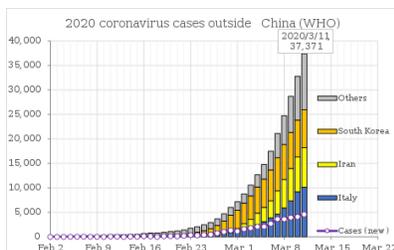
The blue surface protein (HE) gets the virus inside the cell. These surface proteins will be used to make a vaccine.

The red envelope is lipid, which dissolves in 60% alcohol-based sanitizers and soaps.

The internal yellow coil is RNA which uses the cells mechanics to make new virus for rapid excretion.

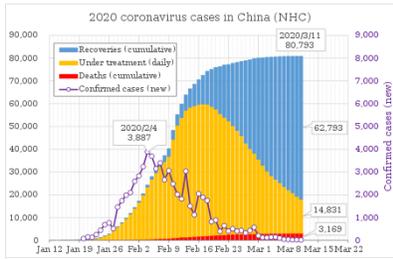


Thousands of new viruses exit each infected cell. Each individual person becomes primed to infect 2-3 other individuals in about 7 days. From the virus' point of view this is a total success.

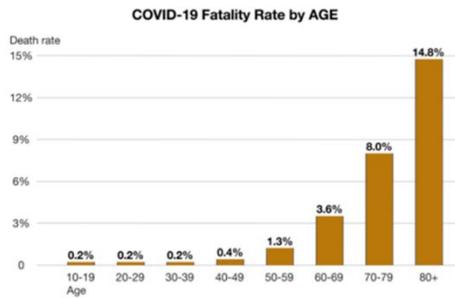


The fast replication rate, the high infectivity, and the lack of any immune response from prior exposure make the caseload double in less than a week.

Each single case becomes 2-3cases, then 256 in two months, then 4,096 in 3 months. This logarithmic growth curve has been seen in every country studied, including Washington state.

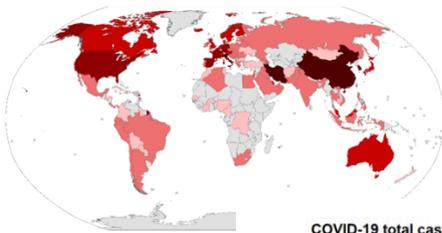


Data from China now indicate new covid-19 infections taper off after 4-6 weeks. This reflects the 'draconian' (successful) measure of sealing off Wuhan province from the rest of China. Isolation, containment and mitigation will slow and decrease virus spread wherever these measures are practiced.

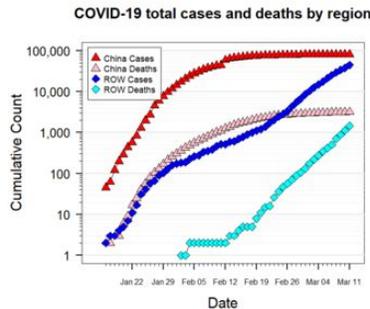


The rate of infection (# infected/# exposed) is unknown, but complete testing of all Princess cruise ship passengers could answer this.

The case fatality rates of symptomatic cases are known from every country studied. For patients below 50yo it is less than 1%. 60 -> 70 = 3.6%; 70-> 80 = 8%; over 80 =14.8%. Fatality rates are highest in the elderly with diabetes, heart/lung disease, and other conditions. The mortality rate of common influenza is 0.1%.



Corvid-19 has spread worldwide. New cases and deaths in China seem to have levelled off (red and pink lines). The rest of the world continues upward on an exponential curve (blue and aqua). The pandemic will stop when there are no more people to infect. Some scientists estimate there will be 100,000,000 total cases in the US, a third of the population. 2-3 million may die.

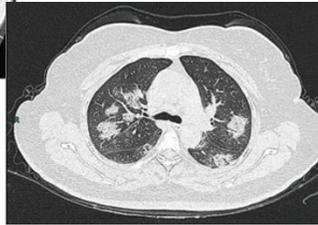




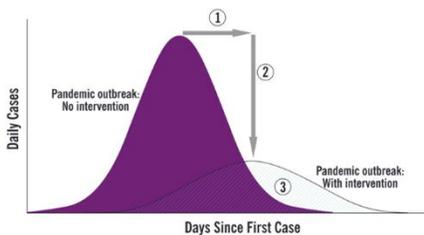
Testing is done by taking a mouth swab and using a genetic test called reverse-transcriptase polymerase chain reaction. High school students could perform this procedure and achieve results in two hours. In south Korea they do 10,000 tests/day, some by drive-through. To date the US has performed 10,000 tests total, but the government has said they are ramping up.



Here you see chest CT scans showing bilateral interstitial pneumonia - the hallmark of Covid-19 pneumonia. The characteristic pattern is a positive diagnostic test. This lung infection can rapidly explode and cause death in 7 days from onset of symptoms, particularly in the elderly.



There is no treatment for Covid-19. Prevention is focused on personal measures: avoid infected people; exercise personal cleanliness; use disposable gloves while shopping in public places; practice and respect social distancing. Aerobic exercises like walking, swimming and bicycle riding will improve heart and lung fitness to combat infection.



Institutional measures focus on mitigation: closing schools, institutions, and cancelling crowded events. China sealed off an entire province. Italy has initiated mitigation for the whole country, closing all stores but food and pharmacies. Mitigation 1) delays peak onset and 3) spreads (flattens) out the timing of infections giving hospitals more capacity.

Snapshots from around the world. Governments in action. Moral leadership. World solidarity.



China, public sign: Early detection; early reporting; early quarantine; early diagnosis; early treatment



Japan sign: Be Strong China!



Iran: Chinese flag projected onto a bridge.



Panama City, Albrook Mall: 3,000meals/day, now 30.



Italy: *Tutti in casa*. Everyone stay home. A country now in isolation from itself.



Italy. Government coronavirus taskforce. Large, inclusive, transparent, responsible for the best science.



U.S. Government coronavirus taskforce. Small. Requires security clearance. Seemingly responsible for political agenda. Here Tony Fauci speaks truth to power.

Conclusions for all of us.

1. A tidal wave of infection seems about to break all across our country. We are only now getting real testing data to examine this. Thus, this conclusion is based upon the logarithmic growth of cases in hard hit countries: China, Italy, Iran, and France. The expectation is that our country will also be hard hit.
2. The life and death focus of taking personal measures and instituting widespread mitigation is to protect people over 60 where the fatality rate is 3-> 15%. Younger cases are mostly self-limited.
3. Lacking clear, truthful and consistent leadership from Washington, our governors, mayors, business leaders, hospitals and individuals are crafting the best possible response.
4. Our free and vibrant social life will become constrained for the near future. We should not let 'an abundance of caution' lead to social isolation. Continue to meet with family and friends you trust.
5. Further reading:
<https://medium.com/@tomaspueyo/coronavirus-act-today-or-people-will-die-f4d3d9cd99ca>