

## Notes to go along with the COVID-19: THE BASICS slide show

### SLIDE 2

COVID-19 is the name of the disease caused by the virus strain SARS-CoV-2 which is a type of corona virus. Many other viruses are also corona viruses- like the common cold. The corona refers to the spikes encircling the virus that help it attach to the ACE-2 receptor cells in the lungs.

### Slide 3

As per Dr. Richard Wenzel, editor of NEJM on 6/18/2020: some people are “super spreaders”. Chinese study using molecular fingerprinting can trace where the virus went: 20% of people caused 80% of infections. One person in a bar with a loud band: > 100 secondary cases. One person in a temple (quiet, usually no talking): > 30 people infected. As per Dr. Wenzel, probably much more aerosolized particles responsible for infection than we think; resp. droplets are heavy and fall with gravity quickly, but aerosolized particles are like “microscopic (< 5 microns) hot air balloons staying on the wind currents for 2 to 3 hours. Almost all super spreader events are indoors but events like protests with shouting, or even singing, outdoors can be risky if in close contact for prolonged period. Think of the concept of “time and dose” as a factor in infections.

As per Dr. Wenzel on 6/18/2020: “This virus is ridiculously contagious” at least twice as contagious as the seasonal flu.

### Slide 4

Why asymptomatic rates are so uncertain is because people who are asymptomatic are less likely to present for testing for a definitive diagnosis than someone who is displaying symptoms. Also the studies that have been done have had very small sample sizes which is difficult to extrapolate to the greater population. A new paper in Nature Medicine, published June 18, documents the clinical patterns of asymptomatic infections. It finds that many of the people studied developed signs of minor lung inflammation — akin to walking pneumonia — while exhibiting no other symptoms of the coronavirus. The percentage of people with asymptomatic infections is unclear. “Estimates suggest that anywhere between 6% and 41% of the population may be infected but not have symptoms,” Maria Van Kerkhove, a top World Health Organization official, said June 9.

The *Nature Medicine* paper analyzes 37 asymptomatic cases, found through the contact tracing and testing efforts of the Wanzhou District Centers for Disease Control and Prevention in central China, which screened 2,088 close contacts of coronavirus patients from February through early April.

The asymptomatic patients were hospitalized for observation. Fifty-seven percent showed lung abnormalities on a CT scan, a sensitive imaging technique that produces a three-dimensional picture of the lungs. Some showed “striped shadows,” while others presented with “ground-glass opacities” — clear signs of inflammation in the lungs.

<https://www.npr.org/sections/goatsandsoda/2020/06/23/864536258/we-still-dont-fully-understand-the-label-asymptomatic>.

As per Dr. Alan Dow from VCU 7/7/2020: an Italian study showed that symptomatic people who tested positive for Covid-19 and asymptomatic people who also tested positive for Covid-19 had the exact same viral load count: the point of the study is that asymptomatic people are not less contagious than symptomatic people.

### **Slide 5**

Fever can come and go for a long period of time; fatigue can last weeks; other residual problems after Covid-19 infection can be scarring and inflammation of the lungs, heart, kidneys and other organs. Brain is least affected organ on autopsy as per Dr. Alan Dow 7/7/2020. Can have residual blood clotting problems. Can have difficulty swallowing or talking if ventilator was used. Can have ongoing muscle weakness if in bed for many days. Some people report mental confusion and foginess and difficulty concentrating after Covid-19 infection.

### **Slide 7**

Viral shedding can last for > 20 days in an infected person (but person is no longer infectious) But if you test that person over and over you will still see a positive test result, not because that person got a new infection, but because the virus hasn't cleared completely from the body yet. Antibody testing is not being used routinely yet. Antibody takes 1 to 3 weeks to form in the body. Since this virus can mutate we do not know if the presence of antibodies confers long term immunity to getting sick again with COVID-19.

### **Slide 8**

Vaccines usually take years -- sometimes decades -- to develop, approve, manufacture and distribute globally. However, there have never been so many doctors and scientists working this hard and fast on one. Just seven months since SARS-CoV-2 was first discovered, 19 vaccine candidates are already in human trials, with 130 more still being developed. CNET's Science Editor Jackson Ryan. The short and sweet of it is that a vaccine tricks your body into thinking it's already had the disease, so your body's natural defense -- the immune system -- builds antibodies against it. Then, if you were to become infected, your body would call upon the antibodies to fight the virus before you feel sick. Vaccines typically take about 10 to 15 years to develop. That's in part because any new medical treatment needs to be thoroughly tested for safety before it can be distributed to millions or billions of people. Most health experts predict that the virus won't stop spreading until 60% to 70% of the world's population is immune, and they say the only way to reach that level of immunity without a monumental death toll is through vaccines. Operation Warp Speed is a sort of coronavirus vaccine task force that has identified 14 vaccine projects to focus on fast-tracking. The Warp Speed project has a stated goal of readying 300 million doses of vaccine to be available by January 2021, which coincides with Fauci's estimation.

### **Slide 9**

60-70% infection rate in a pop. is considered "herd immunity." Estimated probably about 30% of US pop would not take a COVID -19 vaccine.

As per Dr. Fauci 7/7/2020: 70 to 75% effectiveness of a vaccine is acceptable. But if 30% of the US pop. didn't take a vaccine then we would not be able to completely eradicate the virus.

## Slide 10

**Before clinical trials can begin:** Once a laboratory has researched and developed a potential vaccine, which includes testing it in animal models and working out manufacturing and quality control processes, it can apply to the FDA to start clinical trials.

**Phase 1 clinical trials:** The vaccine is tested for safety and effectiveness in a small number (dozens) of closely monitored subjects.

**Phase 2 clinical trials:** Various dosages of the vaccine are tested on hundreds of human subjects.

**Phase 3 clinical trials:** Thousands of subjects are enrolled to measure the overall effectiveness of the vaccine.

**If a vaccine passes all three phases:** The lab must then apply to the FDA for a license to produce and distribute the vaccine. That application is reviewed by both FDA and non-FDA scientists.

**If approved:** The lab begins producing the vaccine while the FDA closely monitors production.

**Phase 4:** Although at this point the vaccine may be released to the market, many vaccines continue with what's called Phase 4 studies, during which the FDA continues to review the safety and efficacy of the vaccine.

## Slide 11

<https://www.cnet.com/how-to/coronavirus-vaccine-are-we-close-to-finding-one-heres-whats-happening/>

As per Dr. Alan Dow from VCU on 7/7/2020: no US Phase 3 clinical trials currently. Four vaccines due to begin Phase 3 trials in Aug/September

<https://www.msn.com/en-sg/health/medical/vaccines-are-not-all-created-equal-a-variety-of-ways-to-stop-the-virus-that-causes-covid-19/ar-BB15MWBO>

## Slide 12

Storing mask in plastic bag encourages mold growth. Paper bag “breathes”

## Slide 13

Self isolation if you have Covid-19 is 10-14 days from when diagnosed or when symptoms started. Quarantine is 14 days. Remember it is “time and dose” Stay 6 feet apart from others, spend < 15 minutes in close contact if possible. As per Dr. Alan Dow 7/7/2020: no evidence that protesting increases risk for COVID-19 infection: should still wear a mask and socially distance, even if outside.