**COVID-19 Update, Fall 2020**

Hi everyone. Now that we are well into the predicted Fall wave of COVID-19, I thought an update would be a good idea. I’m going to focus on :

what we have learned since March, some good news about treatment and death rates, some thoughts about how we can make a difference, COVID fatigue and some recommended sources of information.

I’ve put this PowerPoint in Teams so you can refer to it if you want and get any links you want. The link to the Powerpoint is also in the chat.

**First of all, what we have learned.**

Despite the belief of a minority that this pandemic is a hoax, we know that it’s an extremely significant public health crisis. The impact of COVID-19 is shown by what is called excess deaths, in other words more deaths than are normally expected. So far, there have been almost 10,000 excess deaths in Canada since COVID-19 started. More than a million deaths worldwide have been attributed to this pandemic. That’s a really big deal.

We have learned that thanks to incredible supply chain management, we don’t need to hoard toilet paper. We’ve stopped worrying about getting things like face masks and hand sanitizer.

How about COVID and pets? Despite initial concerns about the virus being transmitted to, and then by, other animals, we are certain now that it is overwhelmingly a human infection. There have been only rare cases of infection in pets. The species for us to watch remain the same - ferrets first, then cats. Dogs seem to be protected from actual illness even though they can be infected. Dr. Scott Weese has just put an update on his blog if you want more detail. His advice remains the same: Take reasonable precautions and treat the pets the same way you treat other members of the family when there is COVID exposure. He is no longer concerned about community cats becoming a reservoir of COVID-19, which is really good news.

We also know that the coronavirus is overwhelmingly transmitted through the air. The main way it is transmitted is through large droplets, as this graphic illustrates. When people cough, sneeze, shout or sing, these are transmitted through the air and land up to 6 feet away, or sometimes even further. Because they are heavy, they fall almost immediately and don’t build up in the air. But look at these smaller particles over there on the right. These are the aerosols that have been getting attention lately. They are small and light, and float in the air. In large spaces or outdoors, or for short periods, they are not a particular concern.

But if infected people are in closed, confined, poorly ventilated spaces for 15 minutes or longer, these tiny particles build up in the air, and this is where aerosol transmission can occur. This is why there is so much concern about schools, bars, gyms and restaurants.

If you think about someone smoking, when you watch them exhale, you can see how far that smoke goes, and it builds up in the air over time if they are smoking in an enclosed space. That’s the best way to understand how aerosols build up.

We **know** that masks are an essential tool to prevent transmission, and that they may be as effective as a vaccine. It’s incredibly annoying that there is still resistance to masks by some people. This image shows how masks prevent airborne transmission of both large and small droplets.

If you still need convincing, watch this insane video that Phil told me about, where a crazy guy called Uncle Rob uses a blowtorch to demonstrate the effectiveness of masks.

We also know that this virus is not significantly spread through surfaces. There’s no need to bleach the grocery bags, wipe down door handles every five minutes and so on. It’s still important to wash or sanitize your hands when you have touched a potentially contaminated object or surface. This helps protect you not just from the coronavirus but also from other infections.

All predictions are that the fall wave to be bigger than the spring wave. So unfortunately it looks like we are headed into Scenario 2 in this projection. This is because as the weather gets colder, we will be stuck in confined spaces more, giving the virus more opportunities to spread. People are also moving around more, seeing more people, going to work, doing more shopping and so on. The more contacts there are between people, the more the infection will spread, and we have seen that since the start of Phase 3 in Toronto.

A fascinating thing we have learned is that most people won’t spread the infection, or will only spread it to one or two other people. On the left here, the “B” shows an outbreak from a bar, and the two clusters in the middle are from a wedding and a temple. You can see how those cases spread the infection to a lot of other people. On the right, there are a lot of tiny little clusters where people spread the infection to only a few other people.

Even if a person is shedding a ton of virus, they can’t spread it if they are at home on their own. On the other hand, superspreader events like the one from this bar require a suitable infected person as well as the right circumstances and lots of contacts. So if you stay away from high-risk indoor gatherings, you will be protected from those kinds of superspreader situations and you can’t become a superspreader yourself. Also remember that not all indoor gatherings are high risk. Risk depends on a number of factors.

Scientists have also discovered that there **is** a reasonable immune response to the virus so vaccination is feasible. We don’t yet know how effective the vaccines will ultimately be, but it’s reasonable to hope that they will be something like the flu shot – they will decrease disease transmission, severity of disease, and death. This is pretty much how our cat vaccines work - they don’t prevent upper respiratory infection completely but they reduce severity.

We know that there are many candidate vaccines in advanced trial stages and there’s a general sense that at least one might be approved by the end of the year or early next year. It’s very unlikely that vaccines will get to you or me before the summer, though. But it’s still worth bearing in mind that this will be the fastest modern vaccine development process in history.

This is not because companies are taking short cuts. It’s because this traditional development process, that takes up to 15 years, has been replaced by this one, where stages overlap each other, regulatory agencies are moving very quickly, and scientists have been able to use the knowledge they gained from MERS and SARS to get into vaccine development very quickly.

**Some good news about treatments and death rates**

The medical profession has learned better ways to treat severe COVID-19. One big improvement has been that people are no longer put on ventilators if they can be treated with nasal oxygen or CPAP. Being on a ventilator introduces all kinds of risks, so that’s very good news. The second main change is good evidence that dexamethasone decreases deaths in severe cases. This is a steroid drug that has been around forever and that many of you have seen at THS. It’s very cheap and very potent.

Here is a graph of case rates and death rates for Canada. The cases are on the top and the maximum has been 4,000 in a day. At the bottom are deaths, and there the maximum has been just over 200 in a day.

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The big thing to look at here is the relationship between the death rates in April to June, compared with now. Even though cases have climbed higher now, the hospitalization and death rates are still much lower. Hospitalization and death are lagging indicators, meaning cases go up first, then hospitalizations, and then deaths, with deaths increasing a few **weeks** after cases go up. So we may still see the medical system being overwhelmed and the death rates could climb significantly. However the graph is not showing that trend right now. The general sense is that, with more cases in younger people and with better treatment, there is a reasonable chance that the medical system will be able to cope and that more people with severe illness will survive.

If the medical system is overwhelmed, death rates from COVID and other medical conditions will increase. Whether or not that happens is largely up our leaders and to us as individuals.

**So here are some thoughts about what we do can make a difference**

The main thing we can do is avoid getting infected and avoid infecting other people. That means doing what we’ve been doing for months - physical distancing, wearing a mask, and avoiding prolonged periods in closed, poorly ventilated spaces close to other people.

This kind of approach can have really dramatic effects. Remember the R number. The R naught is how many people get infected if no preventive measures are taken. The R0 for this virus is about 2.5, meaning that if no measures are in place, each person will infect 2.5 other people over a 5 day period. With prevention measures in place 1 person infects fewer than 1 other person and the Rt drops below one, which is what we saw as case numbers dropped earlier in the year.

Our Rt in late September when I drew this graph was about 1.3. Than means that on average, 1 person was infecting 1.3 other people.

So that doesn’t sound like a lot. Why are numbers increasing so fast then? That’s because the starting number is high. In this example, using very simplified calculations, if each person were to infect 1.3 people, and there are only 15 people infected to start with (at the bottom), in 5 days there would be 20 infected people and 72 people in 30 days. But if the starting point is 1,500 people, which was the case when I made this graph, then in 5 days there would be 1,950 and more than 7,000 at 30 days. The math just works that way.

However, and this is the really cool thing, if you can reduce the amount of contacts between people, we can reduce transmission very quickly. If we could change the R number from 1.3 to 0.7, magical things could happen. In this example, with the exact same starting point of 1,500 cases, and an R number of 0.7, the new case numbers would be 1,050 in 5 days and only 176 after 30 days. **That’s the power and the responsibility we all have as a society.**

Another thing we can do to help ourselves and others is get the flu shot. Influenza is a much bigger deal than people realize and to have influenza with COVID-19 could be disastrous for both individuals and the health care system. Children and older people are rightly getting priority right now, so these shots are quite hard to find. You can subscribe to a list at myflushot.ca that will let you know when your local pharmacy has the shots available.

**COVID fatigue**

We are all really tired of this. But of course the virus doesn’t get tired, it’s a virus. Just a couple of comments on why this matters so much and what we’ve already done in the past month.

Projections about a month ago were that case numbers could skyrocket if people continued to increase their numbers of contacts, which is shown by the orange box and line. The grey shows what would happen if we did nothing and the blue at the bottom shows the result of decreasing our numbers of contacts. The green arrow shows the point where we actually are, only a short time after the Province introduced restrictions in Toronto, Peel and Ottawa. So we are not doing too badly even though we could have done better if action had been taken sooner.

So we really need to hang in there, do what we’ve been doing, and concentrate on getting through this winter and out the other side.

**Lastly, where should we be getting our information?**

I’d suggest same thing I did in February, that you find a couple of reliable sources of information and stick to those. In general, it’s best to avoid Twitter, Facebook and social media because they can be very negative and inaccurate. But there are some great experts to follow as well.

Here are some good sources: Toronto Public Health has good information and a dashboard showing a range of important measures like neighbourhood figures, ICU capacity and PPE stocks. Ryan Imgrund, a biostatistician, Dr. Jennifer Kwan and Dr. Andrew Morris are good people to follow on Twitter. Dr. Morris publishes a weekly email update about COVID-19, that anyone can subscribe to. It’s quite long, but a pretty easy read, and clears up all the confusion that has built up during the previous week.

Thanks for listening and happy to answer questions if I can.