THE UNIVERSITY OF BRITISH COLUMBIA
Continuing Professional Development
Faculty of Medicine

UBC CPD
The Division of
Continuing Professional Development
Faculty of Medicine
City Square, 200-555 W 12th Ave
Vancouver BC Canada V5Z 3X7
T 604.675.3777
ubccpd.ca

COVID-19 UPDATE: EXPERT Q&A WITH PUBLIC HEALTH, VACCINE, EPIDEMIOLOGY AND LAB SPECIALISTS

Webinar date: **Wednesday, March 31, 2021**
Recording and Presentation Slides: https://ubccpd.ca/covid-19-update-expert-qa-public-health-vaccine-epidemiology-and-lab-specialists

Disclaimer: Information on COVID-19 is rapidly changing and much of the research is preliminary. Assessment and management protocols are suggestions only; they do not take the place of clinical judgement. Please check with your own health authorities and local medical health officers as policies and support for the suggested approaches to patient care may vary between regions.

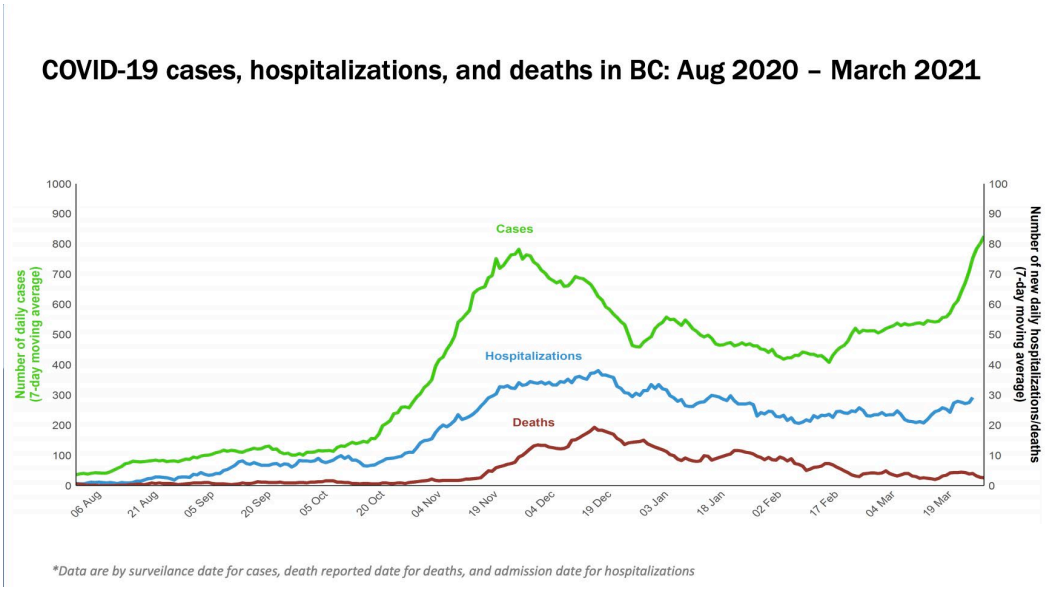
This summary was prepared by Dr. Birinder Narang and not by the speakers.

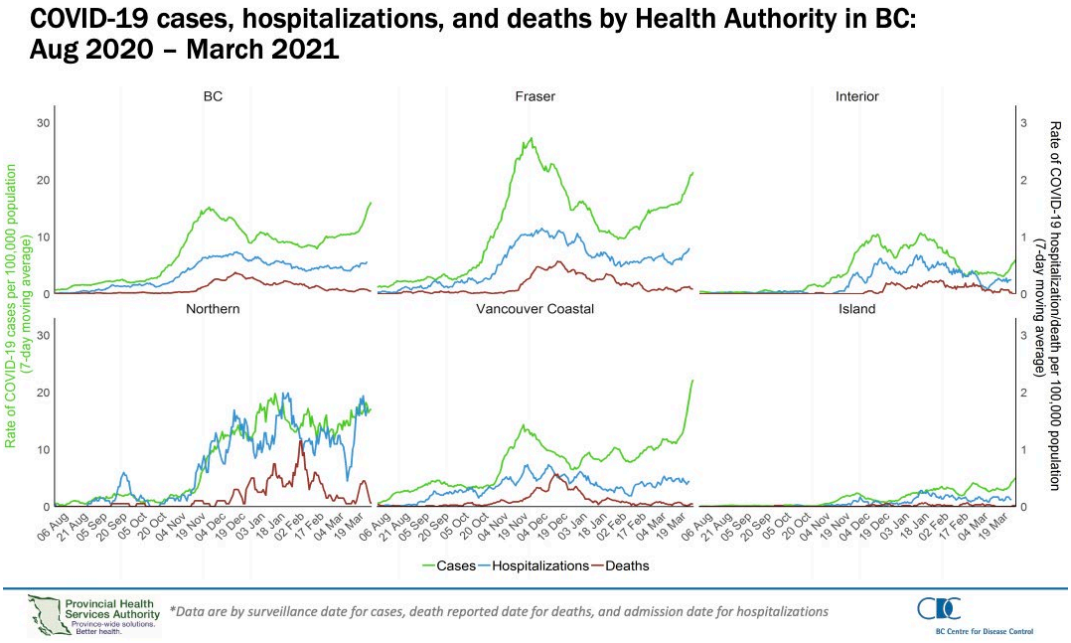
Webinar Summary

COVID Vaccine Platforms

- **Traditional routes**
  - Older technologies – take longer, need virus particle, require a slower pace
  - Weaken the virus (live attenuated) (i.e., MMR, VZV)
  - Inactivated (Kill the virus), i.e., inactivated flu vaccine
  - Use pieces of virus (subunit), hepatitis B vaccine (includes surface antigen)
- **Spike protein (target – goal to disrupt association w/ ACE2 receptor)**
  - Rapidly developed vaccines using genetic engineering
  - Embed blueprint into an adenovirus (common cold virus used as shuttle i.e. AstraZeneca vaccine)
  - RNA – embed into lipid nanoparticle (Moderna/Pfizer)
  - Embed blueprint into a DNA plasmid

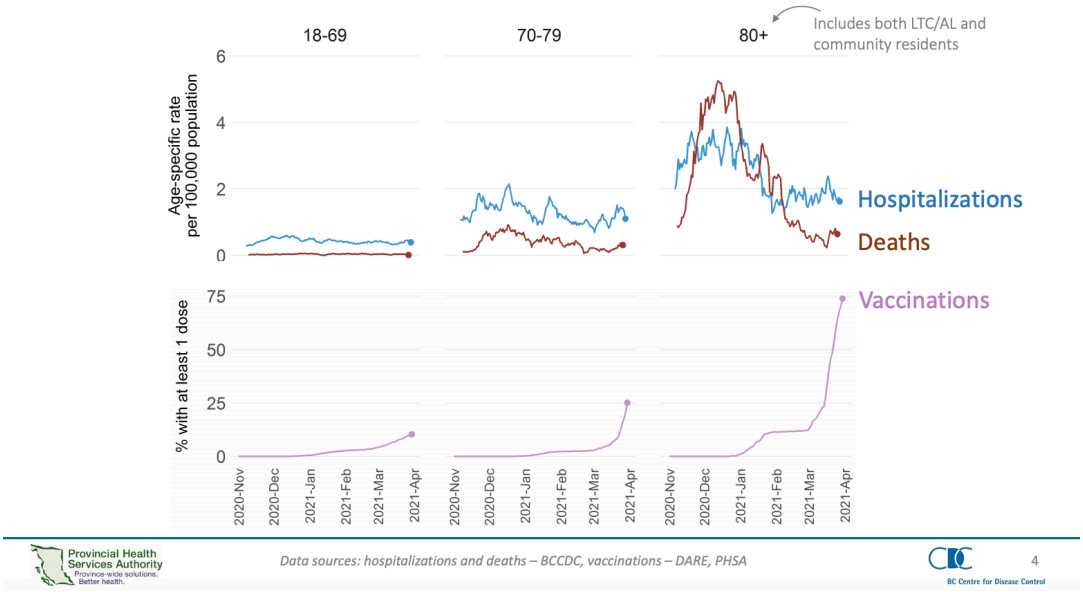
Effect of Vaccination in BC





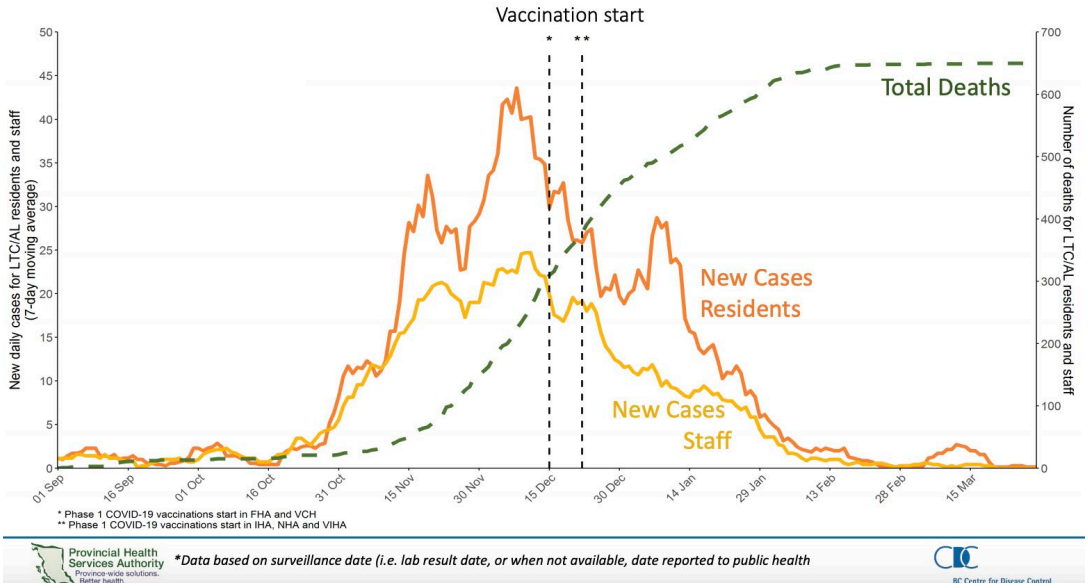
- Both charts show hospitalization is stable and deaths have declined substantially

Vaccination progress in BC by age group up to 30 March:



- Vaccine is being rolled out by age group:
  - 18-69 – hospitalizations & deaths lot less common than in older populations
  - 70-79 – starting to see a drop in hospitalizations
  - 80-89 – deaths have plummeted
  - Outbreaks in long term facilities, new cases in staff and residents and deaths have dramatically declined since the vaccination program started

Reductions in cases and deaths were observed among both residents and staff



Question & Answers – Safety:

Q: Blood Clots in AstraZeneca – What is the risk?

A: Risk measurement cannot happen without a denominator, as we only have reports. Some reports indicate clustering from 4-16 days after AZ vaccine. For example, blood clots appearing with thrombocytopenia and post-marketing surveillance has picked up these safety signals. The decision to pause was not easy and the risk/benefit is unclear. In Canada, we can pause immunization as we have other vaccines available for the population. Relative COVID transmission is low and taking a pause has allowed us to assess further risks. The risk of COVID19 infection and blood clots is established. Associated risk with AstraZeneca vaccine ranges from 1/100,000–1/1,000,000.

Q: History of DVT? SAH? Bleeding Disorders? Retinal Clots? Risk of AstraZeneca Vaccine.

A: The number of cases is small; therefore, risk factors are not yet established. The cut-off age of 55 was set as that is where the majority of cases were seen. If you are between 55-65 and have opportunity to get AstraZeneca vaccine right now, you should get it. Developing a pattern is currently difficult as risk factors are rare; therefore, a causal relationship has not been established.

Q: Any contraindication to vaccine other than allergy to PEG or known to vaccine?

A: The short answer is no—no contraindications. Have vaccine administered to breastfeeding/pregnant and immunocompromised patients. People that are being immunized currently are at high risk for disease for COVID19. There is no theoretical reason why we would be afraid to immunize other people.

Question & Answers – Special Populations:

Q: Advice for pregnant patients? Vaccine timing in stage of pregnancy? Pre-conception?

A: SOGC (Canada) + equivalents in other countries have made strong recommendations for pregnant individuals to get the vaccine. If the patient is pregnant or breastfeeding and is called for the vaccine, for most part they should get vaccinated. If patients have specific high-risk conditions, then discuss with their maternity care provider across all stages of pregnancy. In breastfeeding, the risk has to be low as it is difficult to think of biological plausibility otherwise. Lastly, it is important to remember that pregnancy does not increase COVID-19 in young women of child-bearing age.

Q: Should over 70-year-old patients living in the community have shorter interval than 16 weeks between doses?

A: The answer is no for now; individual-level benefit and population-level benefit are different. The decision to extend the interval was based on data that looked at immunizing more people and at an individual benefit. Meaning, that if a younger person gets the first shot, then there was a lower risk of the older person getting COVID-19. Younger people are more likely to transmit than older people. We can minimize disease with the vaccines available. One dose in long-term care has shown how effective it can be at reducing mortality. Media has focused their attention on some pre-print studies on immune

studies in different populations; however, there is no correlate of protection in COVID vaccines. Immunologic studies are still being done and T-cell mediated immunity and types of antibodies that are effective are not known. We now need to look at clinical endpoints for effectiveness.

Q: New Pfizer Data coming out saying 100% in protecting ages 12-15 against symptomatic disease. How far are we away from vaccinating children in BC?

A: The same process is being followed for immunizing adults as we must demonstrate safety first. Today's data was a press release and the second part showing effectiveness in children can be more difficult as data on children was <20 cases and trying to do an efficacy study using severe disease as a clinical end point in children is not practical. It can be difficult from a clinical end point to demonstrate efficacy. If we can show vaccine shows immunologic profiles similar to adults (knowing it works in adults), we would expect it to be similar effective in children. Ultimately, we would have to think about: do we need to vaccinate children, if so, who and when? We are having similar discussions for adults and questioning: what are we trying to achieve through a vaccination program? As we reduce total numbers of cases/transmission, it will be even harder to do studies for children.

Q: Demographics in hospital and ICU since vaccination began.

A: The deaths were concentrated in those >80 years old and in Long Term Care—that has changed now. However, the people being hospitalized has not made significant change. As we move through age-based cohort and vaccinate the clinically extremely vulnerable, we do expect to see a change in hospital demographics. Hospitalizations have been flat despite increasing cases.

Question & Answers – Vaccine Intervals + Effectiveness:

Q: Any risk of delaying the second vaccine?

A: The goal is to reduce disease burden and transmission as quickly as possible. The best predictions are that getting one dose to more people reduces the amount of disease that we are seeing. The end game is to convert this virus into a "common cold virus", instead of one that has such high morbidity and mortality. The virus is doing what viruses do, survival of the fittest. This is the first time a pandemic using tools that did not happen 10-15 years ago. We are seeing mutants arise, and it is not clear if you partially immunize someone whether that will stop the drive that causes variants to occur. All vaccines have a potent immunogenic component, even AstraZeneca, that show that they are all highly effective against severe illness and death. Our challenge is deploying the vaccine through public health combination of individual and population benefit, to reduce transmission and reduce severe disease. Whole world is not being immunized, so if the rest of the world is affected, we will be at risk, for example new variants that may enter the system.

Q: If we had unlimited vaccine supply, would we go back to original dosing schedule?

A: The suspicion is that we would, but there is benefit in delaying the vaccine to maximize how many people you can vaccinate. However, in our current condition the individual benefit is conferred by population level immunity as well as individual vaccination. Some modelling has looked at what would happen if we vaccinated youth first however there was an "enormous benefit" in providing more vaccinations to more people, not only to younger people however, older people are at higher risk for disease. Minimal interval and optimal interval are not always the same. Additionally, if you get natural infection (risk of morbidity/mortality), you typically protected for ~6-month amount of time. If you vaccinate someone, you produce antibody level (not purely neutralizing antibodies) that are in excess of natural infection. We do not know whether you need and additional boost, so we are learning as we go along.

Q: Data on Risk of Transmission post vaccination?

A: For Moderna, there is good evidence: can reduce transmission, but for Pfizer, initial data was not analyzed. MMWR published on March 29th 2021 highlighting in healthcare workers, dramatic impact in first dose, and some evidence of reduced transmission. The BC data shows dramatic decrease in deaths and severe disease, but if you look at our Long-Term Care facilities, the number of infections is dramatically reduced. One could assume that is some of this is because these vaccines reduce viral load. Israeli data that shows that after vaccination your viral load decreases if you are infected post vaccination.

BC Data/Experience has also showed that outbreaks that were already in progress in long term care when vaccinated, and they ended quickly. Still have exposures in long term care, but has not led to outbreaks, post vaccination.

Q: How do we get patients registered who are in the "Clinically Extremely Vulnerable" group but did not get a letter?

A: A bit too soon to know, letters are being sent out now, expected to arrive by April 15th. If someone has recently moved, they can get the attestation form from their physician. After April 15th patient can register w/ attestation form. Age is still a better indicator of risk, even more so, the conditions on this list, so list likely will not be expanded. If we expand this list too much, then slows down age-based program.

Q: Why are we not seeing statistics on new COVID cases in those who have been vaccinated, when they were vaccinated and by what vaccine?

A: There is a linked dataset that vaccinated COVID-19 cases will be monitored with. We just need to make sure that the processes to report are in place. Will hope to report once able to analyze in a meaningful way. Early data has been shown on BCCDC website, in the long-term care facility. The data is being collected in a way that should help answer future questions such as vaccine effectiveness, variant questions etc.

Q: Any data showing that vaccine may help against long COVID symptoms?

A: We are unsure about long COVID but we do not think so. We believe that the vaccine would help mainly by reducing number of COVID cases.

Q: In BC if you have had COVID – will you only be offered one shot vaccine series?

A: At this point as we are offering a deferred dose. Data from Israel that they are considering adding booster at 6 months. We still do not know how long vaccine will work. Data from other vaccines that if you defer 2nd dose, you producer stronger immunologic response with the booster. Simplest thing to say right now is that you will likely get both doses.

Q: What is happening with unused vaccine doses at end of the day?

A: No vaccine goes unused at the end of the day. From smaller sites they are being sent over to larger sites to get used there. Doses are being utilized and the policy is to use the doses on whomever is eligible as much as possible.

Q: When should you get a vaccine if you have had COVID?

A: The policy has now changed. Previously, guidelines were if you had COVID-19 in last 3 months the vaccine is not needed, however, now the guidelines are as long as you are cleared out of public health out of isolation, you will get vaccinated if eligible.

Question & Answers – Variants of Concern

Q: How concerned should we be about these variants?

A: This virus is trying to survive, the best example is the UK variant. Originated in UK, took a few months to realize that it was more transmissible (increasing R0 by 0.4). It is more transmissible in households, and more adherence to public health measures is needed as they work, but must be rigorous. Lately data that shows increases severity of disease. Extremely limited data on vaccine efficacy. The other 2 Variants of concern are from South Africa and Brazil. South African variant has a 484 mutation, which does make the neutralizing antibody less effective. Brazilian variant has a similar mutation. Does that decrease of neutralization impact the efficacy of vaccines? Unclear at this point. Will we have a vaccine escape mutant? Should I worry about having a variant of concern? Is it more severe? Increase in severity is shown at population level. At an individual level we still must protect our families and isolate for the same period. Current circulating major strain is a variant, the original Wuhan strain "died out", but the major circulating type is a variant.

Q: If had one variant, what is the risk of re-infection with another variant?

A: Brazil, based on their data, 60-70% of the population was exposed to original COVID strains that were circulating, then got replaced by P1 strain. The challenge is that from natural infection under those circumstances, people can be re-infected, although it is not that common. With vaccination, we still need to learn re protection from variants.

Q: Will we need updated vaccination every year, i.e. for variants?

A: It is hard to know right now and could potentially be like a flu shot, maybe not. The good news is that we have been able to develop effective vaccines very quickly, so if we need to do it again, should be able to.

Q: Are we going to lose the race? Are we going to live like this forever? Should we be working towards COVID-Zero?

A: Most people believe we will not eliminate this virus. There are several sister viruses to this virus that have circulated for 100s of years. A population gets more and more exposed, i.e. from natural sources or effective vaccination programs. We believe that we will get to a place where this is like a common cold and will be able to open society up again. We have a great tool to live with it through vaccination.

Q: How concerned should we be about variant that is rapidly circulating in BC?

A: We need to watch the epidemiology i.e., what are the overall number of cases, hospitalizations, and deaths. At a population level, we want to be monitoring and sampling it. Population level interventions and testing strategies and immunizations may be affected. As an individual, or even as a response to a small cluster, it's not an effective strategy against this virus to be focusing on proportion of variants. It is an important population level measure. The most important thing to do is recognize health measures, immunize people as fast as we can and observe to see if these are important for public health planning.

Question & Answers – Antibody Testing & Miscellaneous:

Q: Do we know how long immunity last after fully vaccinated? If you think you had COVID 12 months ago but tested negative with antibody test, does that mean you did not have COVID?

A: There are many different antibody tests—there are some for spike, and now there are quantitative spike antibodies. Natural infection will maintain antibody for ~6-8 months. There was a test produced that looks for nucleic acid. Initially when testing 30 days post infection sensitivity was 95%, 3 months later that dropped to <70%. Durability of antibody tests depends on the type of test being used. If you immunize someone who had previous infection, they will mount to a strong anti-spike antibody that far exceeds what natural infection produces. This spike is why people are arguing for single dose vaccine series to those who have had had natural infection already.

Q: Will lab testing be useful to determine effectiveness of vaccine? Can we quantitatively measure serology?

A: All these big trials have all had quantitative tests that can detect levels of antibody to various parts of the spike protein and able to detect antibodies to natural infection. The challenge is that we do not have perfect correlations of protection. We can get quantitative data, but we do not know yet whether there will be an immune correlate like in Rubella.

Q: Is this is a droplet spread or aerosol spread? UofT epidemiologists suggest it is. Does science support this?

A: We still believe that this is predominantly spread through droplets, so all measures are designed for that. We do know that there are aerosol generating procedures (AGP) and we handle those in specific ways. Are there other situations other than AGPs that may generate aerosols? Science may show that in laboratory testing but does not mean that is the predominant way it is spread. The measures against droplet spread for the most part protects us. The use of PPE (masks and eyewear) has been very protective to health care workers who have been in outbreak settings (pre-vaccination). If it were mainly aerosol, we would expect much higher transmission in households (especially between couples). If you watch people wearing masks, majority of the time, masks are not worn properly. Vast majority of kids who go to school who are COVID +, transmit to no one. When there is transmission, the median number of people who get infected is two. Vast majority of people transmit to 0-2 people and that data would be higher if was predominantly aerosol transmission.

Q: I had my vaccine; can we have vaccinated friends in our homes?

A: We are in a different position compared to the United States. Currently, recommendations are the same for vaccinated people as unvaccinated. In the United States, they are seeing some uptick in cases again (in places that were vaccinated) therefore, there are some concerns that restrictions were lifted too soon. If you are vaccinated, and in close contact with a case, you will be asked to isolate. It's important to keep public measures in line with social norms as well.

Q: If I am vaccinated and come to Canada, crossing a border, will I have restrictions?

A: Yes, you will have to do a 2-week quarantine.

Q: Will Physicians be able to start providing vaccines in their clinics?

A: The plan is to keep the age-based program in mass clinics, based on logistics, vaccine handling and documentation requirements. As we get more people populated and move towards second dose, our community immunizers, pharmacists and physicians will play a larger role (i.e., like seasonal influenza program)

Thanks to the speakers on the video:

- Reka Gustafson, Vice President, Public Health and Wellness and Deputy Provincial Health Officer
- Mark Lysyshyn, Deputy Chief Medical Health Officer, Vancouver Coastal Health
- Mel Krajden, Medical Director of the Public Health Laboratory, BCCDC
- Manish Sadarangani, Director, Vaccine Evaluation Center at BC Children's Research Institute
- Nomi Mate, Public Health Nurse
- Simon Moore, Family Physician, UBC CPD Medical Lead