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

Webinar date: **May 12, 2021**
Recording and Presentation Slides: https://ubccpd.ca/covid-19-update-expert-qa-public-health-vaccine-epidemiology-and-lab-specialists-0

Disclaimer: Information on COVID-19 is changing rapidly 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

Dr. Reka Gustafson Presentation – Global Vaccination Update

- **BC Vaccination Rates**
  - Looking at places like UK & Israel, we are following similar trajectories
  - Vaccinations are already working in BC. With increase of cases/hospitalizations during 3rd wave, did not see an increase in deaths because vaccination was already protecting the most vulnerable.
- Cases have started to come down significantly in BC, mortality has remained low and stable.
- Recent analysis shows that size of household is a risk factor for higher rates.
- Communities prioritized for vaccination that included 18+ are based on areas of highest case rates.

Dr. Manish Sadarangani Presentation – COVID 19 Vaccines

Platform	Vaccine	Dosing regimen	Reported efficacy (*vs.* any symptomatic disease)
mRNA	BNT162b2 (Pfizer/BioNTech)	0, 21 days	95% (2 doses) → 91% @6 mths [press release] 93% (1 dose)
	mRNA-1273 (Moderna)	0, 28 days	95% (2 doses) 92% (1 dose)
Viral vector	ChAdOx1-S (Oxford University/Astra Zeneca)	0, 28-84 days	65-75% (1 or 2 doses)
	Ad26.COV2.S (Janssen)	1 dose	67% (1 dose)
Protein	NVX-CoV2373 (Novavax)	0, 21 days	90% (2 doses) – press release
	Medicago	0,21 days	Currently in phase 3 trials
	Sanofi Pasteur/GlaxoSmithKline	0, 21 days	Completed phase 2 trials

Polack et al. NEJM 2020; Skowronski & De Serres. NEJM 2021; Baden et al. NEJM 2020; Voysey et al. Lancet 2020; Voysey et al. Lancet 2021; Sadoff et al. NEJM 2021; Logunov et al. Lancet 2021

- **Translating Clinical Trial Data**
  - On average, need to vaccinate ~100 people to prevent 1 case & vaccinate ~5,000 people to prevent 1 death (~1000 ppl to prevent 1 death >age 60 yo)
  - Vaccine world Comparison
    - Varicella: 34,000
    - Meningococcal Disease: 21,000
    - Influenza (65 y+): 5,000
- **Variant Efficacy**
  - B117 Variant – efficacy almost the same as wild type strain
  - P1 Variant – little clinical efficacy data, has seen some in vitro reduction
  - B1351 South Africa Variant
    - Johnson + Johnson Vaccine – comparable
    - AstraZeneca – some reduction in efficacy against variant
    - Novovax – some reduction but still ~50% efficacy
- **Effectiveness in Qatar – Pfizer**
  - Effectiveness was 90% B117 + 75% B1531
  - Severe disease – Vaccine was 100% effective against both variants

Question & Answers

Vaccines

Q: What percentage of people testing positive who have had vaccine? What is the clinical presentation?

A: We think it is under 2%. Need time for vaccine to induce immune response. Tracking whether people are not developing robust neutralizing antibodies, to see if they are getting severe disease. Individuals that are vaccinated, rapid decline in severe death.

Regarding clinical presentations, recently had an outbreak at Lion's Gate Hospital in an elderly immunized population. Looking at people who have been immunized, they are less likely to die and once you have 2 doses you are less likely to have severe illness.

Vaccines are not 100%, so we will see limited cases amongst vaccinated people.

Q: When are we planning to immunize children?

A: We have one licensed product for children (Pfizer). Planning to integrate into vaccination program within in a few weeks.

Q: What about mixing & matching vaccine? Ie AZ/Pfizer or other combinations.

A: Couple of studies going on in UK looking at AZ + Pfizer with 4 possible combinations. Second study going on in the UK looking at AZ and boosting with Moderna or Novavax. Starting a study here in Canada looking at AZ, Moderna + Pfizer trial. Will be looking at different dosing intervals.

Data from UK showing reactogenicity using a 4-week interval, in both mixed groups, there was an increase in mild reactogenicity in mild illness and fevers. Immunogenicity data expecting within the next month.

Want to make sure giving the best combination based on the data.

Q: Can a vaccinated person transmit virus?

A: The initial dose of the vaccine takes 2 weeks to take vaccine to take effect and within that time a person can still get COVID and transmit, though you are less likely to be able to transmit once vaccinated. Goal is to not necessarily eradicate COVID, but to minimize it to be like the common cold/flu. Hence, we use our other layers of protection such as distancing and masking.

Data from Israel tells us that even after the first dose, viral load are lower correlating with lower dose of transmission. Data from UK showing even with first dose, can get reduction in transmission in household 30-50%.

Q: If I had side effect with first dose, will I get a different vaccine for the second dose?

A: Mild headaches, ie headache, local reaction are anticipated. As long as no anaphylaxis within 4 hours of having vaccine, will use same one again.

The COVID-19 vaccines are fairly reactogenic vaccines compared to something like seasonal flu shot. In children, are used to this, at the vaccine clinic at BC Children's, will often see children who have had large local reactions (ie >10 cm), most of the time will still go ahead and vaccinate with same product.

If someone had a side effect the first time, will likely have something similar the second time.

Q: If given vaccine during pregnancy & breastfeeding, will it confer benefit?

A: We think only IgG antibody gets transferred & that would only occur in third trimester. IgG will last in baby for ~6 weeks-3 months. Breastfeeding is less likely of a significant transfer. Most IgA + IgG will be digested in gut before getting into systemic circulation. Breastfeeding is protective in general to respiratory infections. Immunizing mother will indirectly protect infant by reducing her risk of transmitting COVID to baby as well.

Pregnant women are at higher risk of ICU admission. Primary determination of when to vaccinate is when it is available to them. Pregnant women are now prioritized in BC for vaccination.

Q: What are you saying when you are vaccinating someone with 2nd shot and it is Moderna? What are you saying around counselling?

A: Not much difference. Efficacy is similar to others. Potential side effects are the same. All vaccines are safe and have been vetted through Health Canada. Biggest hesitancy is around Astra Zeneca.

Minor side effects are higher with Moderna than Pfizer.

Pfizer has ~30 microgram of mRNA per dose and Moderna has ~100 microgram of mRNA per dose. High level interpretation, probably Pfizer vaccine is more efficient. Lipid nanoparticle are the differences between them. They are equally effective. Minor differences in reactogenicity profile.

Q: How soon after having COVID should someone get vaccinated?

A: As long as clear from Public Health to be out in public, can get vaccinated once your turn. Previously there was a 3-month interval. We believe people are immune 3-6 months after natural infection. Some people may be choosing to wait, but to allow for the system to run smoothly everyone who is eligible should get the vaccine. The 3-month delay was to save vaccine. There was never a reason not to vaccinate them soon after infection as well. Getting vaccinated post infection: your immunity is similar to getting 2 vaccines. Memory B Cell response are also showing booster level reactions, but we know that is variable as well & that different people react differently, so can't draw any conclusions yet.

Q: Should we get 3 doses?

A: That is happening. There are people who are in early trials who are now coming up to 12 months who are now getting booster with Spike variants. Whether we need a booster, or a "seasonal vaccine" will depend on how much severe disease we have after everyone is vaccinated with the current vaccine.

Q: When will we know if we can have our second vaccine earlier than 4 months?

A: Many people will get 2nd dose in shorter than interval. Once we finish offering 18+ their first dose, we won't wait to start offering 2nd doses.

Aerosol Transmission?

Q: What does the evidence say about aerosol transmission? Should we be wearing N95 masks?

A: Discussions similar to those during H1N1. Now we have had millions of cases in our midst from SARS-COV-2 in the community, the overwhelming transmission in community is through droplet transmission.

Children are sitting in classes 6 hours together. Most of the time there is no transmission in school. If there is transmission, the median number is 2. That is consistent with a droplet spreading infection. Most transmission happens in households.

In a poorly ventilated area, transmission can happen to a larger area, but that is the exception, not the rule. Droplet precautions have been extremely effective. N95 are necessary if aerosol-generating medical procedure. More PPE is not necessarily better. Wearing the right PPE at the right time is the best way to work in the pandemic.

Hot temperature classes, spin classes, hot yoga can allow transmission to happen which is why they have been on pause.

Q: Why has the PHO and Island Health not mandated that coughing COVID positive inpatients be mandated to wear their masks in their rooms?

A: We ask patients if they can tolerate a mask in a medical setting to wear it. Cannot force a patient to wear a mask when an inpatient. Healthcare worker is protected by wearing their PPE.

Q: When will travel be allowed? If vaccinated, should we feel safe to travel on planes?

A: Restrictions on travel may come off later than others. We can't control what is happening in other places. It will likely open in a sequence, ie travel within BC, then Canada. US Canada border will likely open soon as well. Transmission on planes has always been quite low. Aircraft air circulation is HEPA-filtered. Washing, cleaning, masking in planes is quite effective.

Pre-test sensitivity from being tested within 3 days within travel is about 70% sensitive, recently positivity rate on sample on arrival is ~1%. Yield at 7-10 days is about the same.

COVID-19 Miscellaneous

Q: What is the incidence of Thrombotic effects in COVID infections?

A: In local data sets. 10% of people who are hospitalized who have COVID 19 have had some type of thrombotic event, but we should not compare this to the thrombotic events associated with Astra Zeneca Vaccines. In a systematic review it was about 1/5 for hospitalized patients (DVT or PE). Rate of mortality in those who had a thrombotic event was higher as well.

Q: Should people who have COVID be given ASA? Or post vaccination?

A: No

Q: Tell me about drug "APN01", it has completely eradicated COVID from blood. Why aren't we providing this drug?

A: It interacts with ACE binding in the virus. It is not Health Canada approved. Has to go through regulatory process. A group in BC is looking at this evidence for this. Other COVID 19 therapeutics information is on BC CDC. APN01 is undergoing clinical trials in Europe right now.

Q: In some European countries, people can buy over the counter rapid testing kits, and make determination on activities based on result. Should we be doing this here?

A: Many point of care tests, can be done in the home. They are less sensitive than lab testing, but they do allow someone to pick up cases with high amount of virus. The challenge is that, just testing someone, can get some false positives. In the UK, ~18% of kits are false positives. As you vaccinate population, viral loads will decrease and so you could use these tests, they're not 100%. You still need to have PPE. The goal should be vaccinating people. The tests can work but they are not easy to administer, and how often do you do it? It's not a simple solution.

Q: Have been anecdotal reports regarding suspected vaccine adverse events with Shingles, Guillain-Barre with COVID Vaccines, any signals identified? Are they related to vaccination?

A: Have to do a careful analysis to see if this is vaccine related or representative of background risk. No signal identified. Clots in Astra Zeneca was found by background safety surveillance at a rate of 1 in a million and has not detected signals for anything else yet. It if happens it would be incredibly rare.

We should also be concerned with COVID infection and these types of syndromes.

COVID-19 – The Future

Q: COVID19 – 4th wave predictions from "predictive modeling"?

A: Models rarely give us the answer but do help us understand the question. We know now from empirical data how these waves occur. We will have pockets in population that aren't all susceptible at the same times. Based on the fact that there is a baseline population immunity, there may be small

surges in unvaccinated populations. Don't have the conditions for a rapid, wide population spread that we had at the beginning as we don't have a population that is susceptible at the same time.

If there is a resurgence in the fall, we won't need to react the same way we have now due to high levels of immunity. There will be some clusters, some people will be hospitalized, and public health will be locally driven. Should not have to have a large societal impact as we have had.

The greater population we can get vaccinated, the smaller the 4th wave will be if it happens.

Q: What is the fall going to look like?

A: Once population is immunized, the focus will shift to testing people who are in hospital and for people who have severe disease or are within clusters. Would make sense to move away from trying to diagnose every case. In a highly immunized population we don't know what endemic transmission will be like. We also don't yet know what the role of testing, case and contact management will play in the control of COVID-19. Would make sense for people to isolate if unwell, stay home and then test for severe cases. The type of centralized testing can be reduced likely.

Public health measures will be more about how to stay safe whether you are immunized or not, wearing masks or not, as we do in influenza season.

As we open to borders, what will happen to Influenza or RSV? Do we see a stronger resurgence? Will have to monitor for that as well.

Q: I am fully vaccinated, and my friends are partially vaccinated, when can we hang out?

A: Recommendations are the same right now through public health orders. In the next few weeks to months will see an evolution of orders as we are seeing in other places of the world. We don't want to have a different set of rules for immunized vs not immunized.

COVID-19 – Data & Reporting

Q: Why don't we use a more transparent and timely approach with BC population with local prevalence of COVID 19? Is the BCCDC trying to limit from the public additional information and documents?

A: It was a local conversation between public health and epidemiologists, and was still a working document. It is on the website now and we will make it more interactive. We didn't pick the same data as other provinces as data considered was part of our "clinical chart" in public health. Previously, when data was put out too early, there was criticism for that as well.

Q: School Outbreaks, how do we explain differences? Alberta reporting high number of outbreaks in schools.

A: We suspect it is a difference in definition. We have not reported many in BC. They are not closed environments however the risk of transmission low. We have had a lot of school exposures.

Sometimes sharing too much information can lead to a mischaracterization of what is happening. In other parts of Canada, a decision was made to inform staff/public when a student/staff member was diagnosed with COVID19. As soon as two people were diagnosed within 14 days, that was considered an outbreak. The problem is that the schools are a reflection of what is happening the community. So, if community rates are higher, then there will be higher cases in schools. We have done investigations of cases and potential outbreaks which have found that 9/10 cases in schools in VCH and FH were not acquired in the school, they were acquired in the home and community. When you are able to do this contact tracing work, you don't need to declare an outbreak.

Through this investigation, we were able to demonstrate that schools are low risk environments and have been able to keep schools open as a result.

Resources:

- **BC COVID-19 Data:** http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data

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
- **Moderator: Simon Moore,** Family Physician, UBC CPD Medical Lead