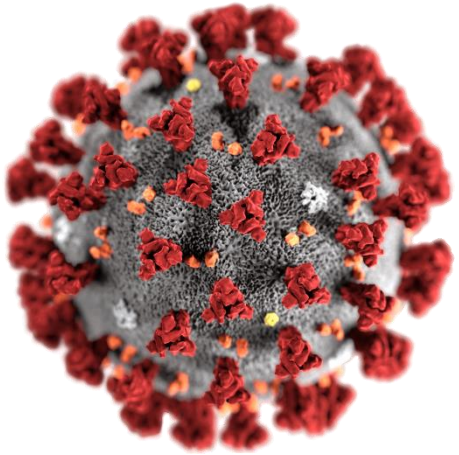
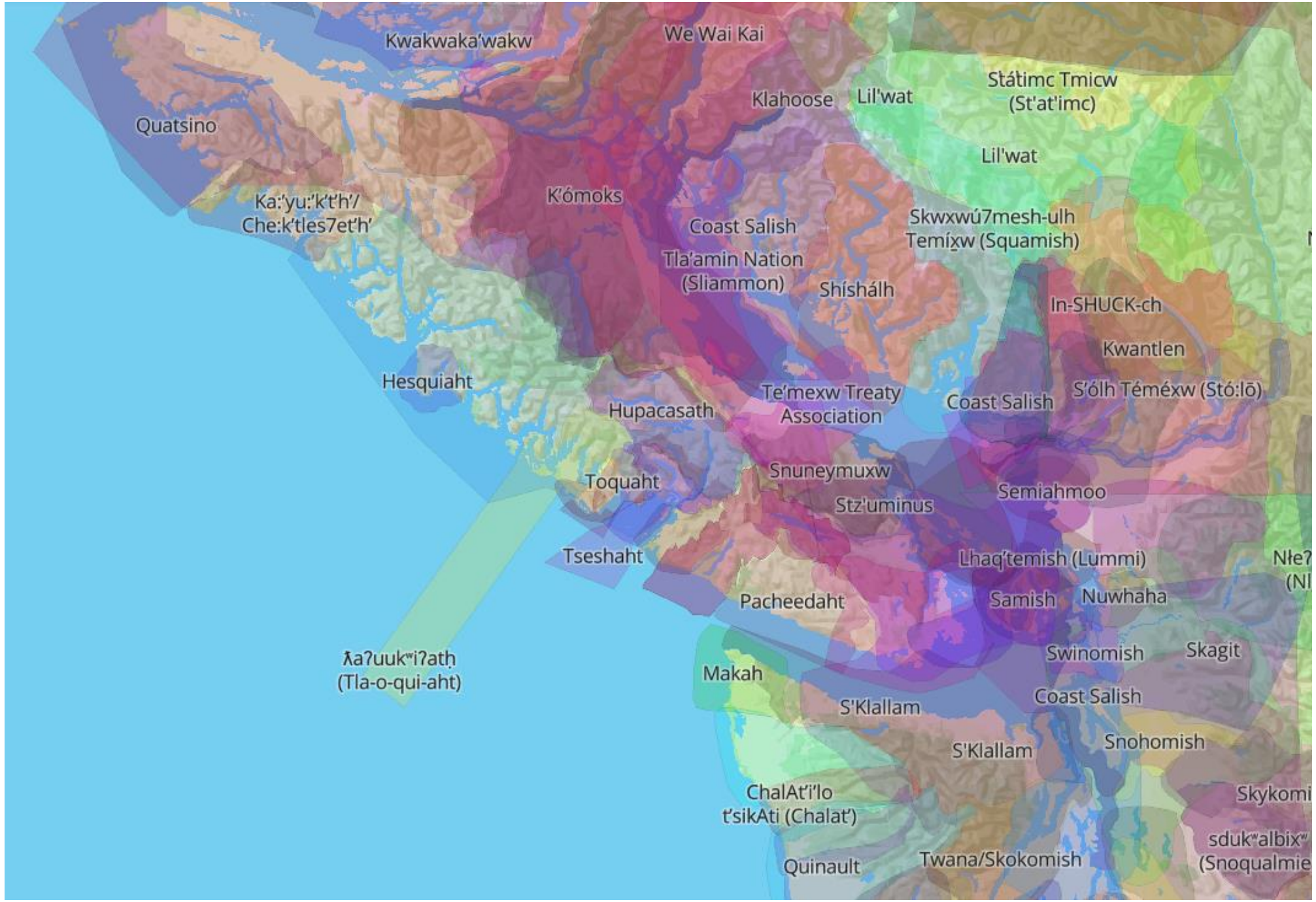
COVID-19 2021
Medical Health Officer update for Primary Care Grand Rounds

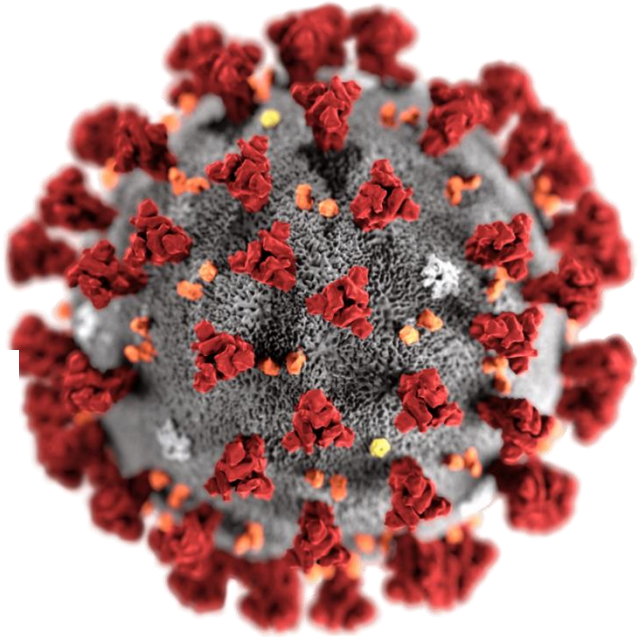
Sandra Allison MD MPH CCFP FCFP FRCPC DABPM

January 28, 2021



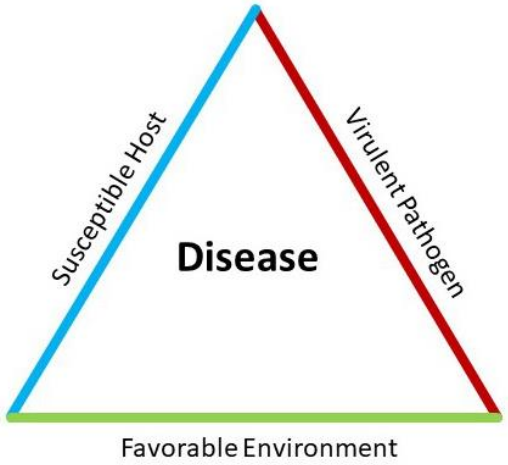

Kwakwaka'wakw
We Wai Kai
Klahoose
Lil'wat
Stát'imc Tmicw
(St'at'imc)
Quatsino
Lil'wat
K'ómoks
Ka:'yu:'k't'h'/
Che:k'tles7et'h'
Coast Salish
Tla'amin Nation
(Sliammon)
Skwxwú7mesh-ulh
Temíx̱w (Squamish)
Shíshálh
In-SHUCK-ch
Kwantlen
Hesquiaht
Te'mexw Treaty
Association
Coast Salish
S'ólh Téméxw (Stó:lō)
Hupacasath
Snuneymuxw
Toquaht
Semiahmoo
Stz'uminus
Tseshaht
Lhaq'temish (Lummi)
Pacheedaht
Samish
Nuwhaha
ƛa?uuk"i?atḥ
(Tla-o-qui-aht)
Swinomish
Skagit
Makah
Coast Salish
S'Klallam
Snohomish
S'Klallam
ChalAt'i'lo
t'sikAti (Chalat')
Skykomi
sduk"albix"
(Snoqualmie
Quinault
Twana/Skokomish

COVID-19 the virus
The Great Pandemic of 2020



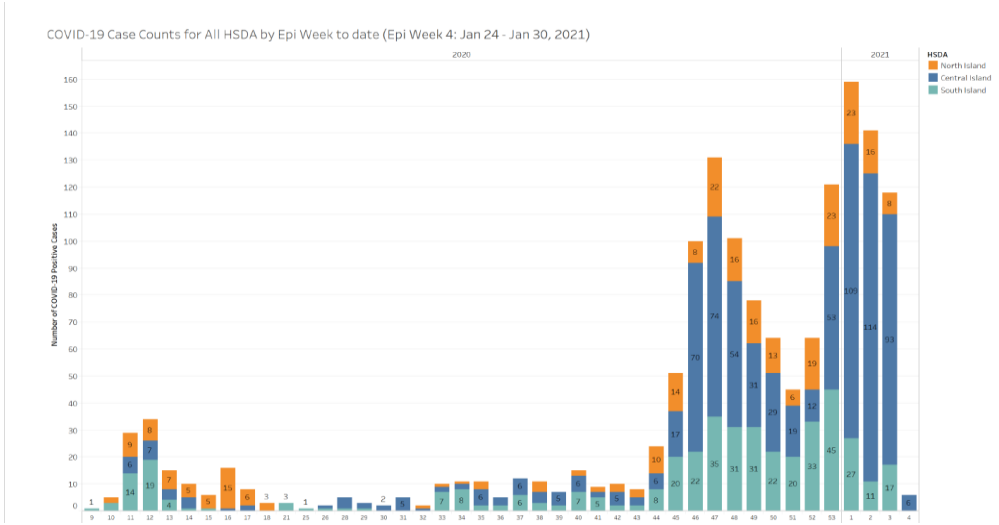
Coronaviruses

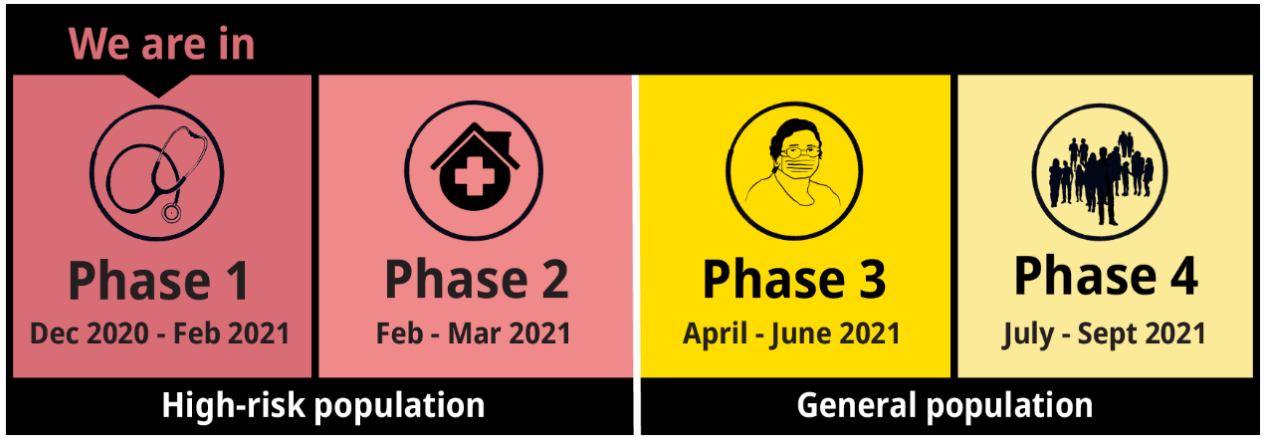
- SARS-CoV (2002)
- MERS-CoV (2012)
- SARS-CoV 2 (2019)



Outline

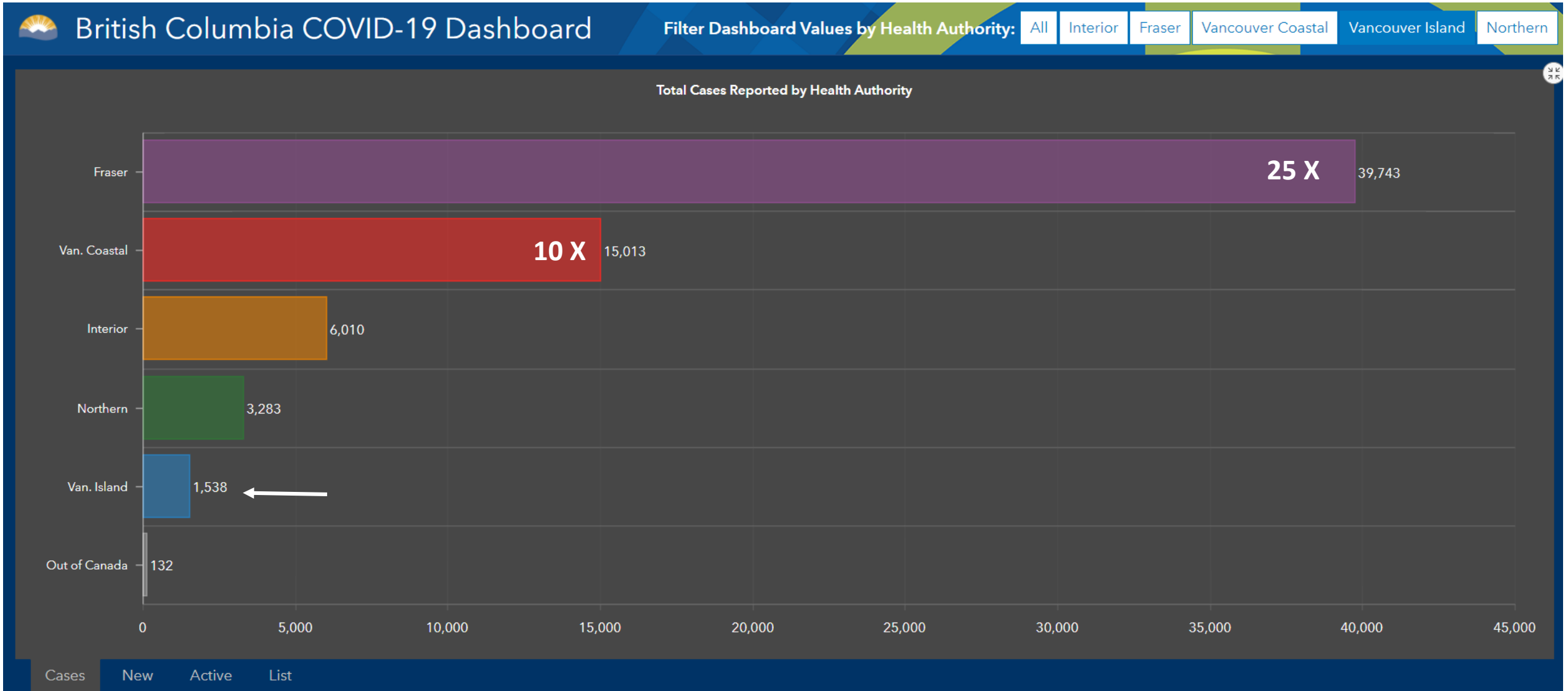
- Epidemiology
- PH Process for cases
- PH Interventions
- Immunizations
- What's next?

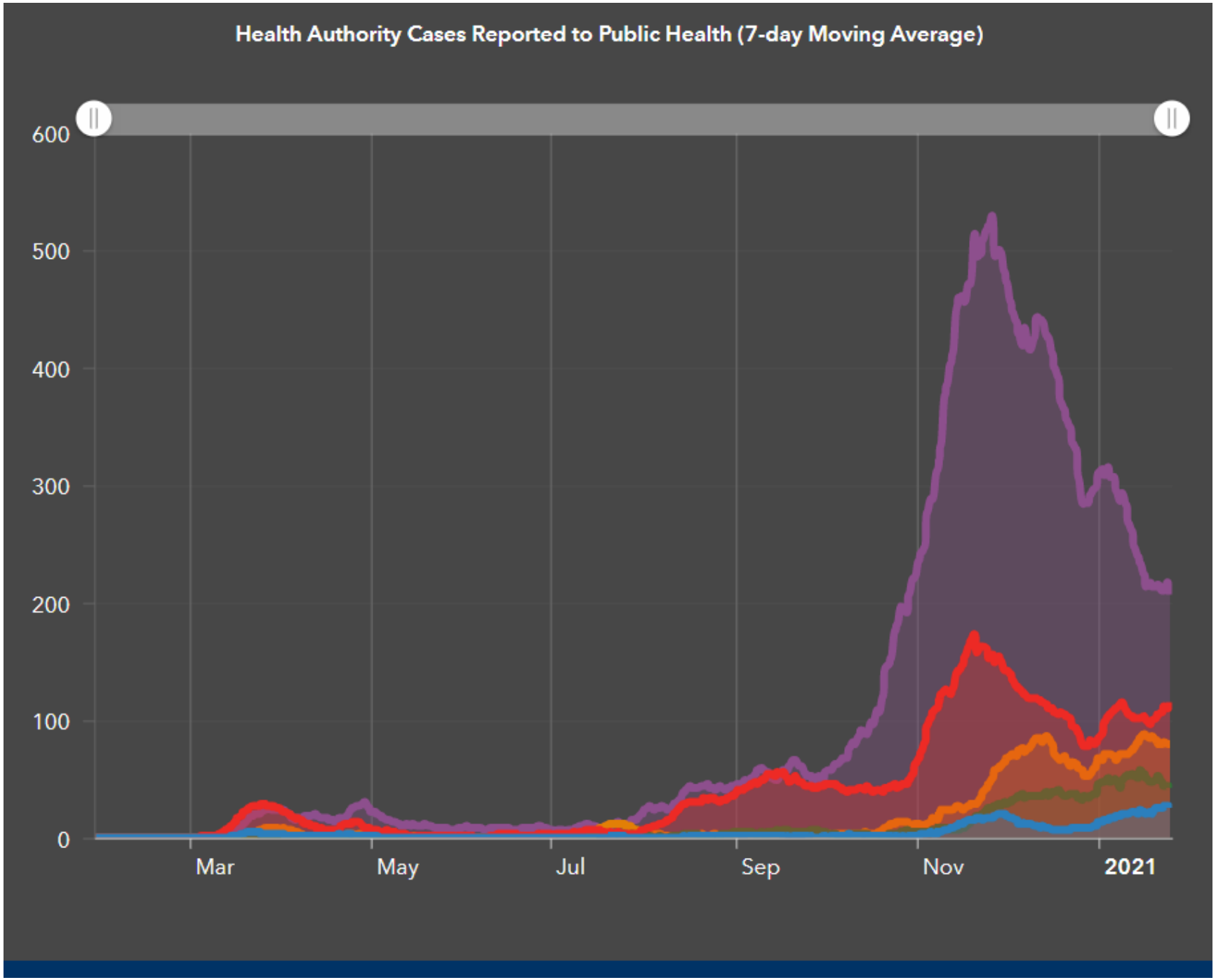




- Credits
  - BCCDC Dr. Reka Gustafson, Dr. Danuta Skowronski
  - BC Centre for Vaccine Effectiveness Dr. Manish Sadarangani

BC Cases by Health Authority
- IH cases are 2.3% of all BC cases –
(1538/65 719)




Health Authority Cases Reported to Public Health (7-day Moving Average)
600
500
400
300
200
100
0
Mar
May
Jul
Sep
Nov
2021

1538 cases in Island Health
Over 130 000 visits to TESTING sites (1.2%)

*In Person Visits to COVID-19 **Testing** Clinics (Cerner Ambulatory Registrations)* — Last Updated: 2021-01-27

Total Visits to-Date		Most Recent Week						
Testing Site	**Total Visits**	**20-Jan-21**	**21-Jan-21**	**22-Jan-21**	**23-Jan-21**	**24-Jan-21**	**25-Jan-21**	**26-Jan-21**
Alberni Clayoquot-NTC	**157**			1		1	2	
Campbell River	**7,236**	34	34	33	28	6	29	34
CFB Esquimalt	**2,197**							
Comox Valley	**10,228**	63	36	45	26	32	40	41
Cormorant Island	**250**			2				
Cowichan	**11,534**	88	53	68	80	48	72	95
Nanaimo	**18,812**	90	66	186	92	74	144	123
Oceanside	**2,302**							
Peninsula Health Unit	**15,640**	34	29	24	16	21	25	27
Port Alberni WCGH	**3,733**	13	19	5	11	8	16	14
Port Alice	**61**							
Port Hardy	**840**	3	2	2	1			2
Port McNeill	**490**	1		1				1
Qualicum Beach	**2,723**	26	21	24	14	14	42	43
Saltspring Lady Minto	**1,606**	5	7	1		4	3	1
Sointula	**29**							
Tofino	**1,117**	1	4		4	2	6	
University of Victoria	**8,744**	127	83	71	55	50	82	87
Victoria Cedar Hill	**956**							
Victoria Health Unit	**28,922**	1	66	50	42	33	68	70
West Shore	**12,488**	81	86	72	53	49	80	72
Total	**130,065**	**567**	**506**	**585**	**422**	**342**	**609**	**610**

COVID-19
When to get tested for COVID-19

Based on current evidence, some symptoms are more likely to be related to COVID-19 than others.

If you or your child have any of the symptoms listed below, follow the instructions.

SYMPTOMS	WHAT TO DO
• **Fever (above 38° C)** • **Chills** • **Cough** • **Loss of sense of smell or taste** • **Difficulty breathing**	**1 or more of these symptoms**: Get tested and stay home.
• **Sore throat** • **Loss of appetite** • **Headache** • **Body aches** • **Extreme fatigue or tiredness** • **Nausea or vomiting** • **Diarrhea**	If you have **1 symptom**: Stay home until you feel better. **2 or more of these symptoms**: Stay home and wait 24 hours to see if you feel better. Get tested if not better after 24 hours.

If you are a **close contact*** of someone who has COVID-19 and have any of the symptoms listed above:
Get tested and stay home.

Check your symptoms with the B.C. Self-Assessment Tool.

If you have any questions, or the symptoms get worse, contact your healthcare provider or call 8-1-1.

* You will be notified if you are a close contact. For more information on close contacts, go to **http://www.bccdc.ca/covid19closecontacts**

For more information on COVID-19, go to **www.bccdc.ca**

If you develop severe symptoms, such as difficulty breathing (e.g. struggling to breathe or speaking in single words) or chest pain, **call 9-1-1 or go to the nearest Emergency Department**.

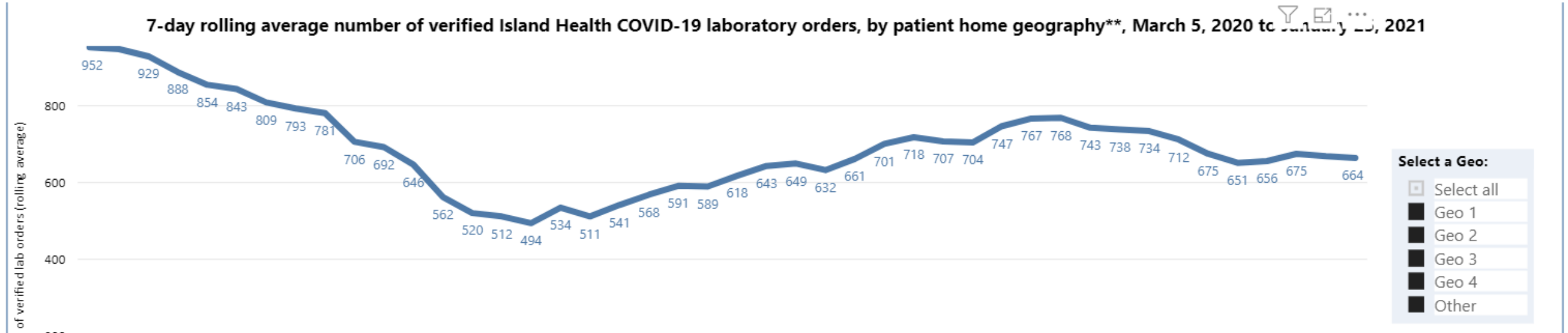
BRITISH COLUMBIA | Ministry of Health

BC Centre for Disease Control

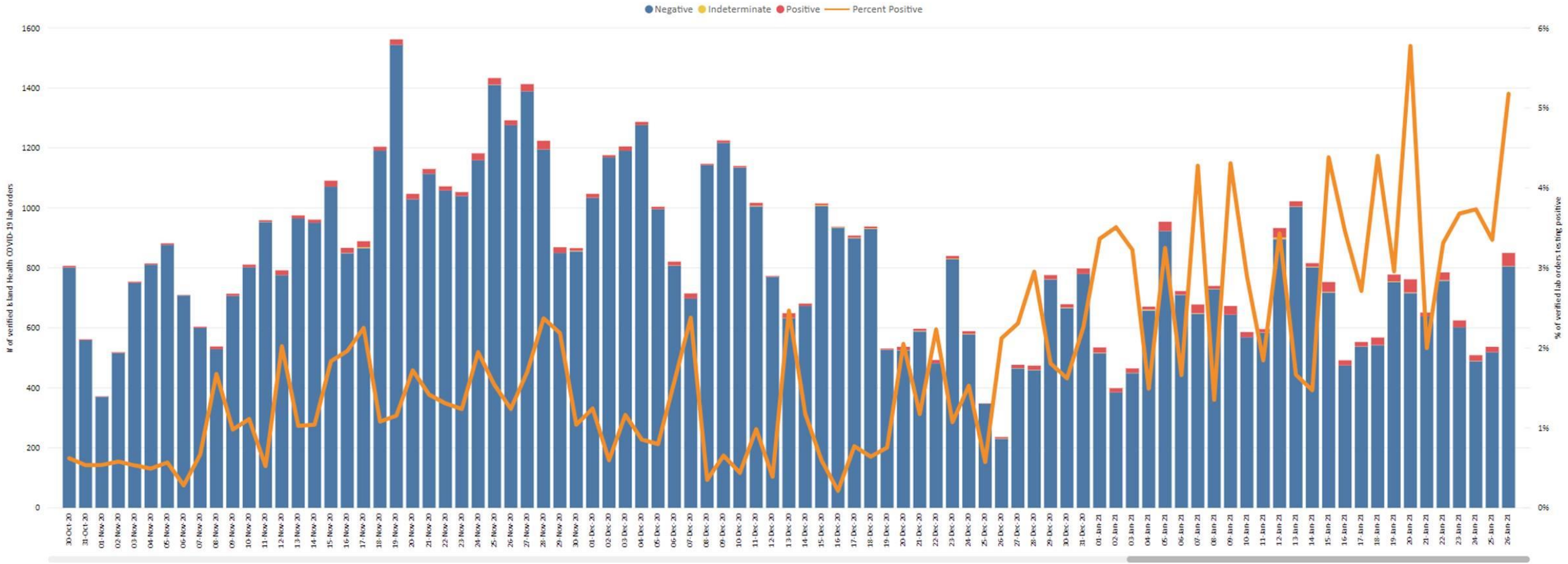
January 6, 2021

Testing Strategies

- Case finding
  - Testing Centres for symptomatic
  - Testing Outreach for hard to reach
    - Remote Communities
    - Shelters and encampments
  - Surveillance and Point Prevalence for Facilities and Congregate Settings
  - Acute care rapid access to testing



Number of verified Island Health COVID-19 laboratory orders and proportion testing positive by day and patient home geography, October 30th 2020 to January 26th 2021



British Columbia COVID-19 Dashboard

Filter Dashboard Values by Health Authority: All | Interior | Fraser | Vancouver Coastal | Vancouver Island | Northern

Total Cases
1,538
Laboratory Diagnosed: 1,524
Epi-Linked: 14

Currently Hospitalized
16
Total to Date: 92

Currently in Critical Care
4

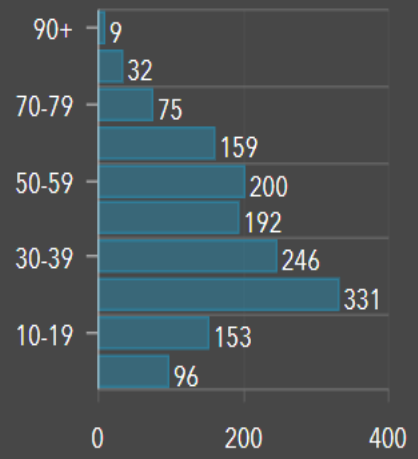
Confirmed Deaths
19

Recovered
1,288

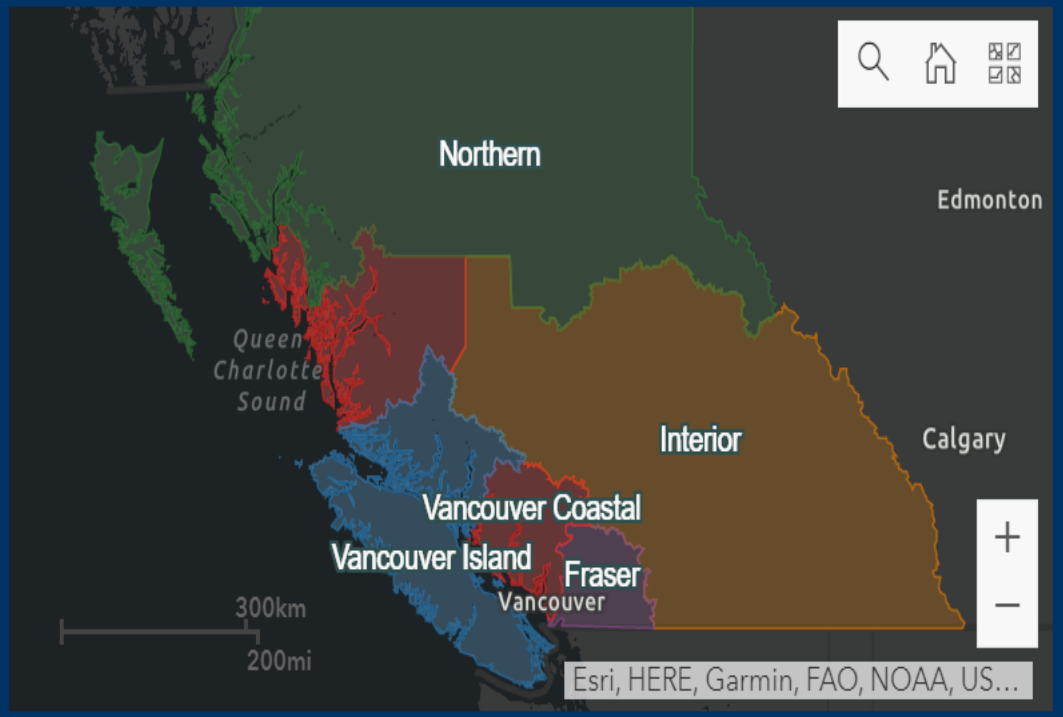
Total Vaccine Doses Administered in B.C.
124,365
Total Doses Received: 144,550

Last Update
1/27/2021, 4:30 PM

Distribution by Age



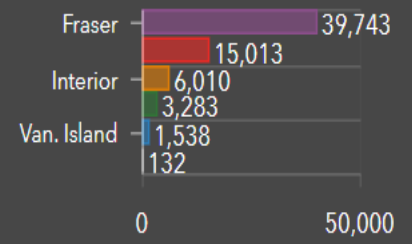
Age | Sex



Today's New Cases: 45

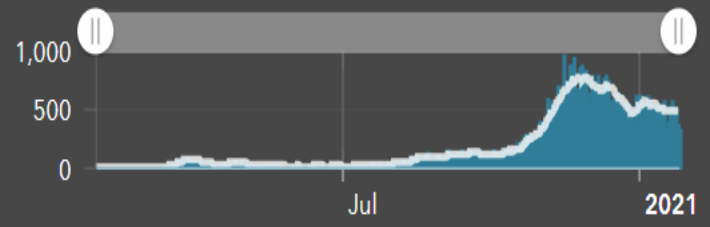
Active Cases: 220

Total Cases Reported by Health Authority

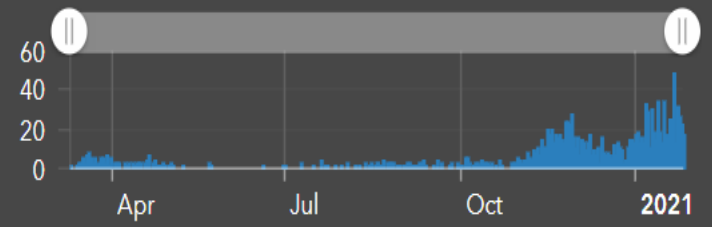


Cases

B.C. Cases Reported to Public Health



Health Authority Cases Reported to Public Health



Note: Y-axis varies between graphs.

Total Tests	New Tests
178,522	959
B.C. Testing Rate	**Canadian Testing Rate**
206,046	455,473
People per 1,000,000	People per 1,000,000

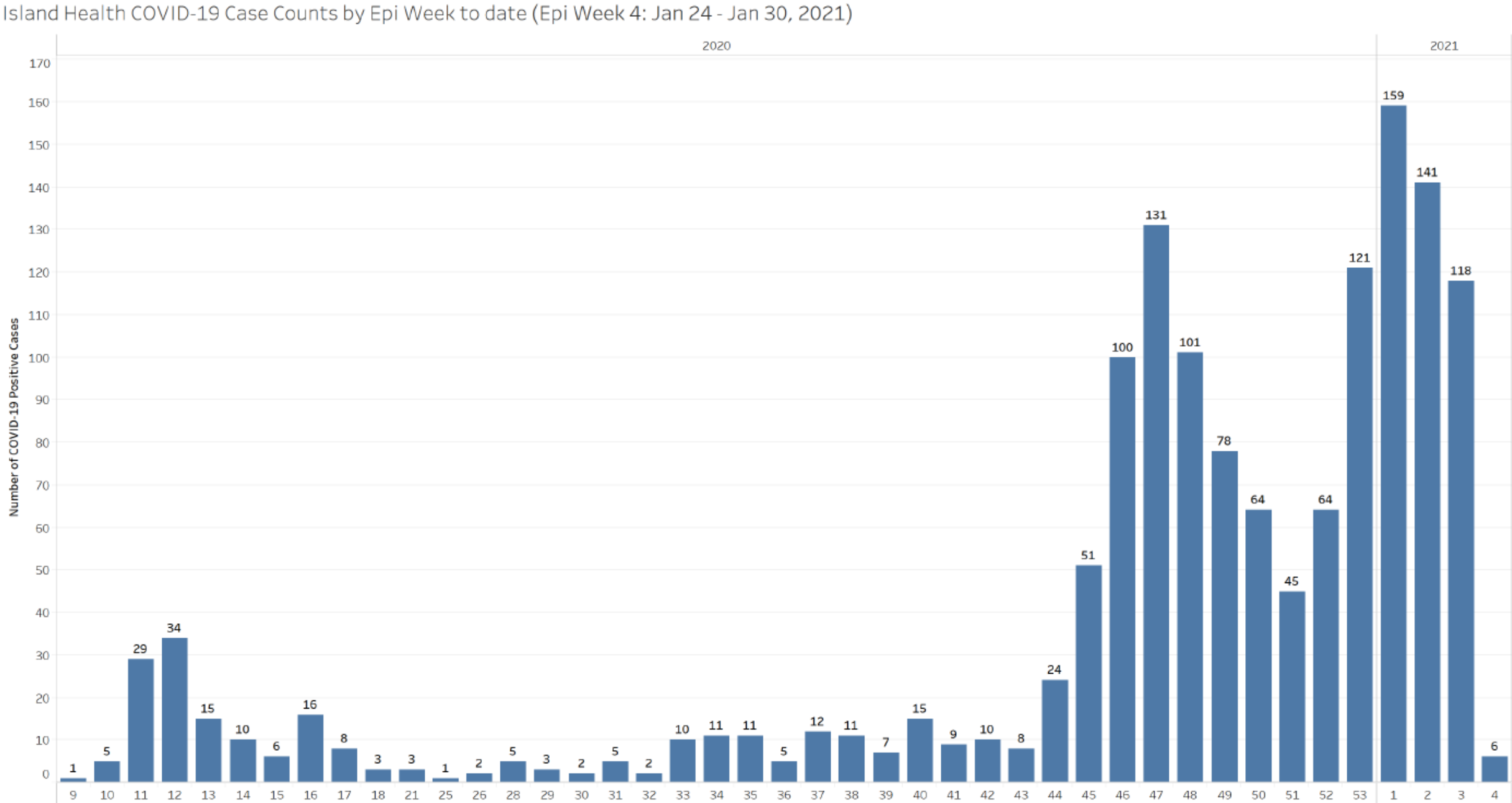
January 27, 2021: Due to a system error, some dashboard information will not be updated today. Aggregate case counts will be updated today

Note: In an effort to provide as current information as possible, "Today's New Cases" (as shown on this dashboard and reported publicly through daily media statements)

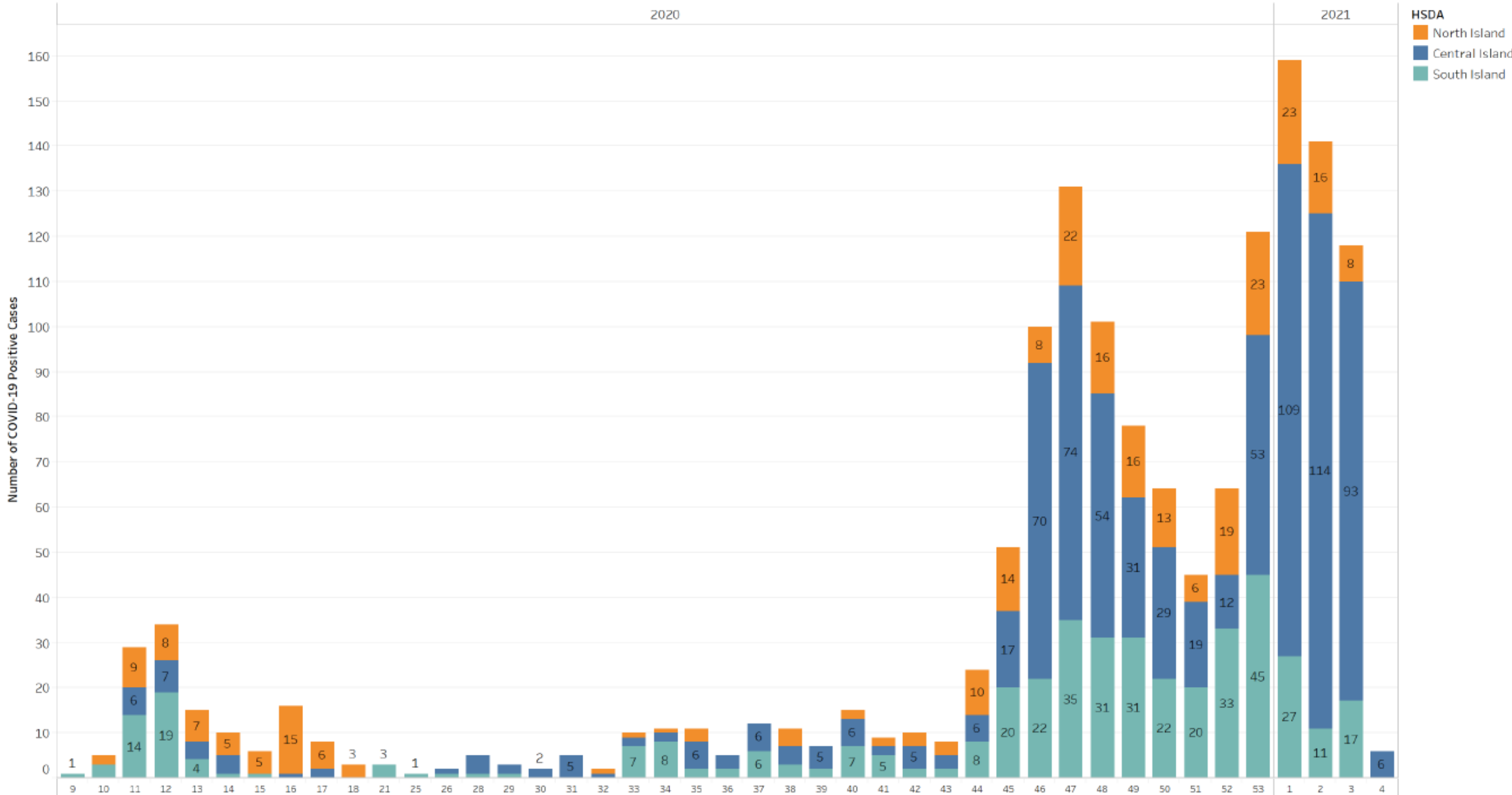
Cases by Day | Cases (Moving Avg.) | New Tests | Turn-Around | Positivity | Vaccine Information

Provincial Health Services Authority
Province-wide solutions. Better health.

BC Centre for Disease Control


Island Health COVID-19 Case Counts by Epi Week to date (Epi Week 4: Jan 24 - Jan 30, 2021)
2020
2021
Number of COVID-19 Positive Cases
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
9 10 11 12 13 14 15 16 17 18 21 25 26 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 1 2 3 4
1 5 29 34 15 10 6 16 8 3 3 1 2 5 3 2 5 2 10 11 11 5 12 11 7 15 9 10 8 24 51 100 131 101 78 64 45 64 121 159 141 118 6

COVID-19 Case Counts for All HSDA by Epi Week to date (Epi Week 4: Jan 24 - Jan 30, 2021)



Known Source for 80% of cases

Island Health Resident Exposure Category of COVID-19 Cases

Exposure	Total Cases	New Cases since 7 Snapshots Ago	New Cases between 14 and 7 Snapshots Ago
Community Exposure-BC travel only	81	6	9
Community Exposure-Canadian travel	32	0	-1
Community Exposure-Island Health region	203	22	17
International Travel	83	1	2
Linked to confirmed case or cluster	1031	107	114
Pending	91	14	32
Total	**1521**	**150**	**173**

How do we know this??

Public Health Response

Identification of CASE CONTACT SETTING OUTBREAK	Management of CASE and CONTACT	Management of CONTACT and SETTING	Release and Resolution

• **Find Cases/ Confirm result**
  • Indeterminate/OutRegion
• Implement immediate **controls**
• Identify high alert
  • LTC/HCW
  • Remote/Indigenous
  • Schools/Unsheltered
• Identify common **settings and others at risk**
	• Active **Daily Monitoring**
	  • Virtual (CVM)
	  • Daily calls
	  • Intensive Home Monitoring (IHM)
	  • Household Monitoring
	  • Referral **to higher levels of care**
	  • Return to monitoring
	• **Isolation Supports**
	  • My Safety Plan
		• **RESPONSE PODS**
		• LTC facility outbreak
		• HCW exposure
		
		• Indigenous community
		• Remote community
		
		• School/Daycare
		• Underserved/Sheltered
		• Workplace
			• **Discharge from PH monitoring**
			  • 10 days after symptom for cases
			  • 14 days past last exposure for contacts
			• **No repeat testing**
			• Clearance for travel
			• Clearance for return to work
			• **Ongoing symptom management in primary care**

• Managing surge capacity • Building team capacity	• Acute medical management in community or facility • Notification of MDs • Education and awareness for providers	• Engagement of partners and community • Providing coordinated responses to complexity	• What happens to COVID Longhaulers? • What supports do GPs need for following patients post infection?

Key Improvements and Questions

COVID-19 Cases and Contacts Monitored through COVID-19 Virtual Monitoring (CVM)

Metric	Currently Monitored	Ever Monitored
Contact - Asymptomatic	250	2,668
Contact - Symptomatic	66	944
Case	73	906
Total	**389**	**4,518**

** Does not include daily phone calls, household monitoring or intensive home health monitoring

Intensive Home Monitoring (IHM) for Patients with Mild to Moderate COVID-19 Symptoms

Metric	Currently Monitored	Ever Monitored
Intensive Home Monitoring - Case	18	75
Intensive Home Monitoring - Contact	0	2
Intensive Home Monitoring - Other	0	44
Total	**18**	**121**

In Person Visits to COVID-19 ***Assessment*** *Clinics*

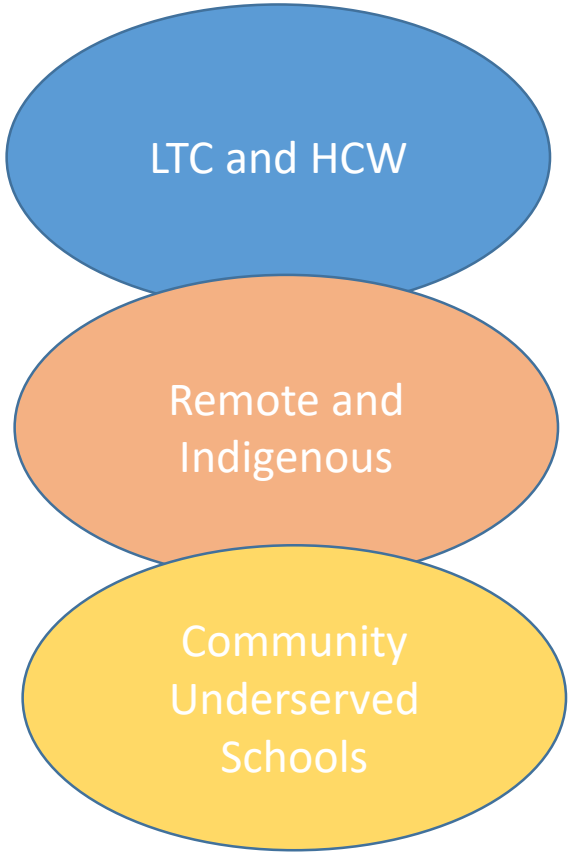
Last Updated: 2021-01-27

Total Visits to-Date		Most Recent Week						
Assessment Clinic	**Total Visits**	**20-Jan-21**	**21-Jan-21**	**22-Jan-21**	**23-Jan-21**	**24-Jan-21**	**25-Jan-21**	**26-Jan-21**
Campbell River	**448**		3					2
Comox Valley	**429**		4		1			
Cowichan	**600**	3	5	3			6	3
Nanaimo	**348**							
Oceanside	**42**							
Peninsula Health Unit	**612**		5	2				1
Port Alberni WCGH	**7**							
Port Hardy	**3**							
Port McNeill	**15**							
Saltspring Lady Minto	**5**							
Tofino	**4**							
Victoria Cedar Hill	**1,839**							
Victoria Health Unit	**381**		5	5			8	5
West Shore	**606**	10	10	6		10	8	4
Total	**5,339**	**13**	**32**	**16**	**1**	**10**	**22**	**15**

Source: CernerPM via EDW

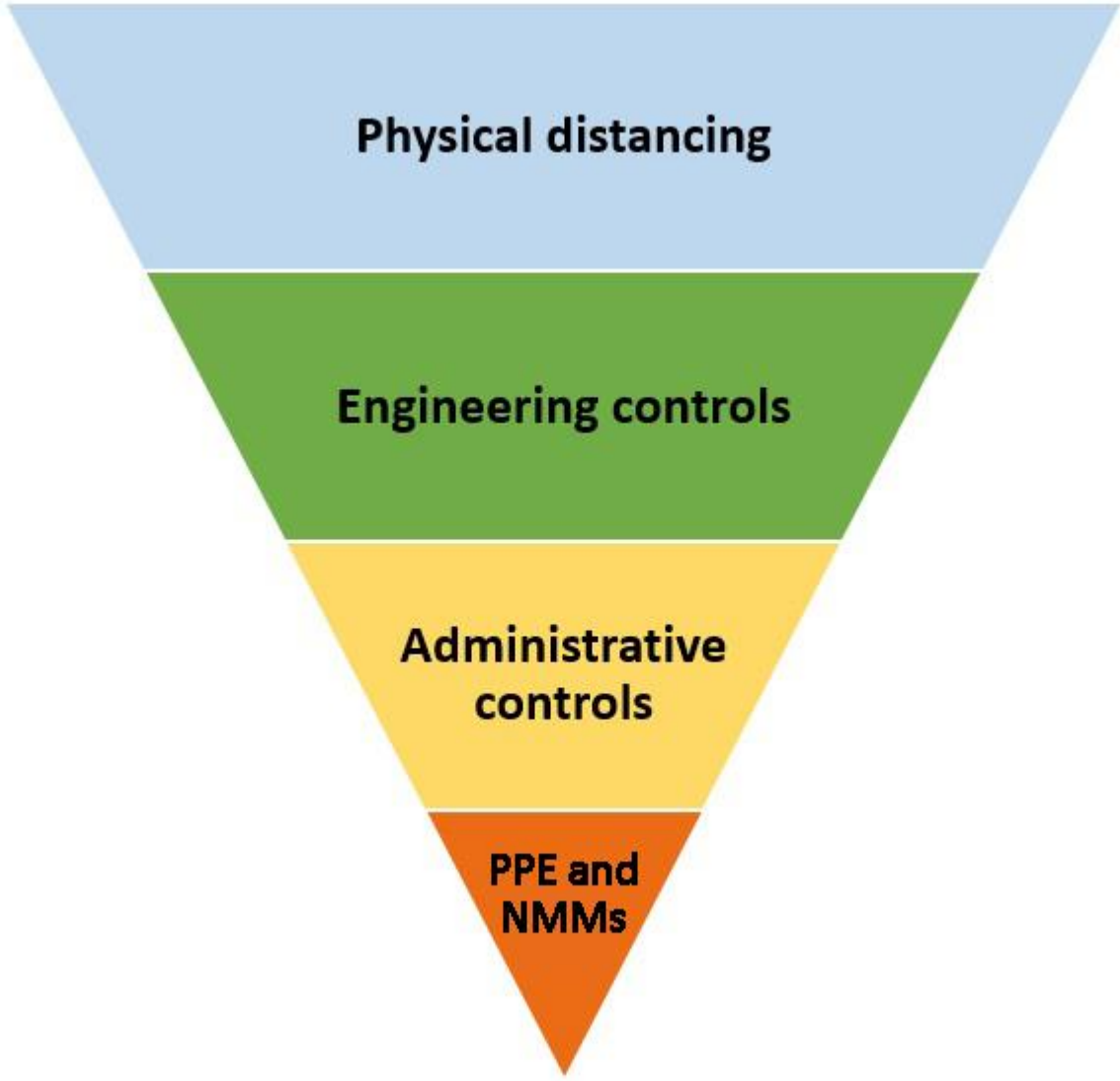
Coordinated Complex Pod Responses

- Recruit all partners
- Reinforce basic measures
- Address complex health needs of cases
- Address complex social needs of cases and contacts
- Communicate risk clearly and transparently
- Support people's health where they are at
- Implement additional strategies
- Focus on wellness and strengths



PH Measures Non-Pharmaceutical

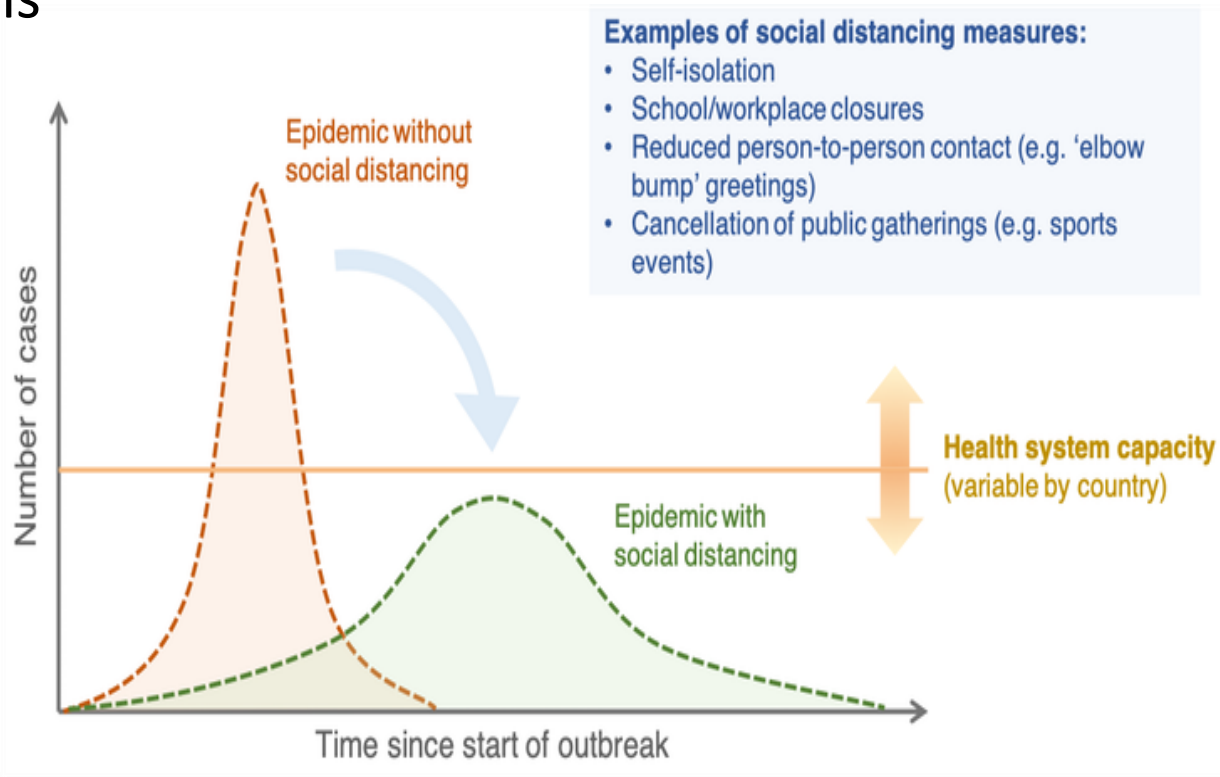
- Designed to decrease transmission by removing the hazard through separation, to reducing exposure by controlling environment and promoting individual actions
  - Hand hygiene
  - Self monitoring
  - Masks
  - Physical distancing and minimize social contacts



Provincial Health Officer – Non Pharmaceutical Interventions

Until Feb 5th at Midnight

- ✓No Gatherings in Private Residences
- ✓No Events except
  - ✓Support group meetings, underserved meals, critical services meetings, programs for children and youth, wedding, baptism funerals, but only in accordance with the order.
- ✓Limitations to Sports and Indoor exercise
- ✓Limitations to density in retail and markets
- ✓Food and Liquor service limitations
- ✓Mask Order



Article | Published: 16 November 2020

Ranking the effectiveness of worldwide COVID-19 government interventions

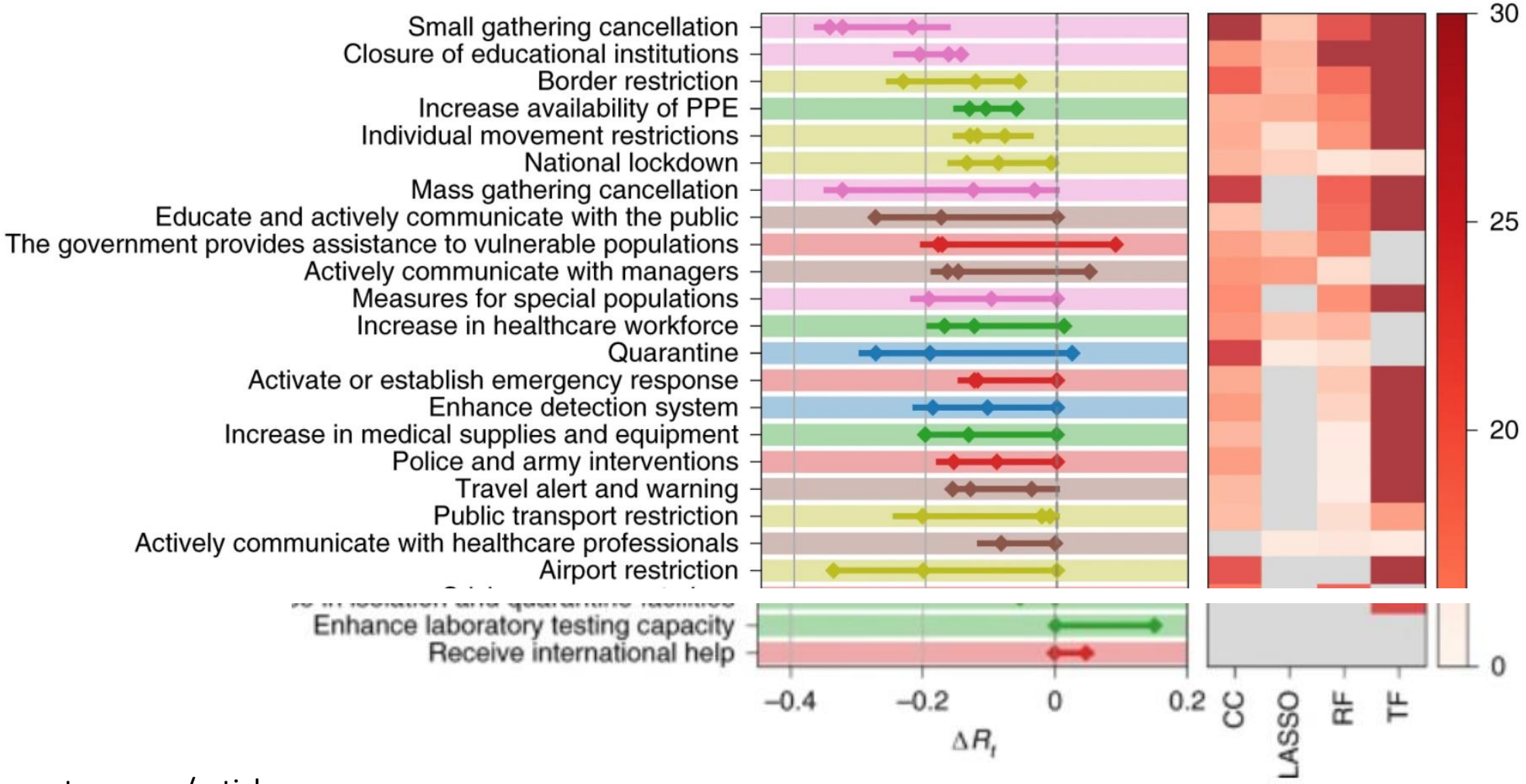
Nils Haug, Lukas Geyrhofer, Alessandro Londei, Elma Dervic, Amélie Desvars-Larrive, Vittorio Loreto, Beate Pinior, Stefan Thurner & Peter Klimek

Nature Human Behaviour **4**, 1303–1312(2020) | Cite this article

Abstract

Assessing the effectiveness of non-pharmaceutical interventions (NPIs) to mitigate the spread of SARS-CoV-2 is critical to inform future preparedness response plans. Here we quantify the impact of 6,068 hierarchically coded NPIs implemented in 79 territories on the effective reproduction number, R_t, of COVID-19. We propose a modelling approach that combines four computational techniques merging statistical, inference and artificial

Effective Non Pharmaceutical PH Measures



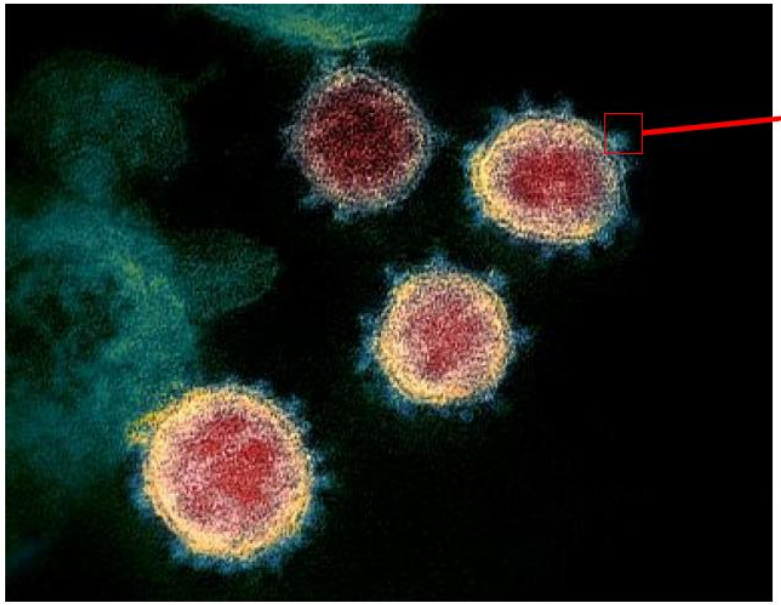
https://www.nature.com/articles

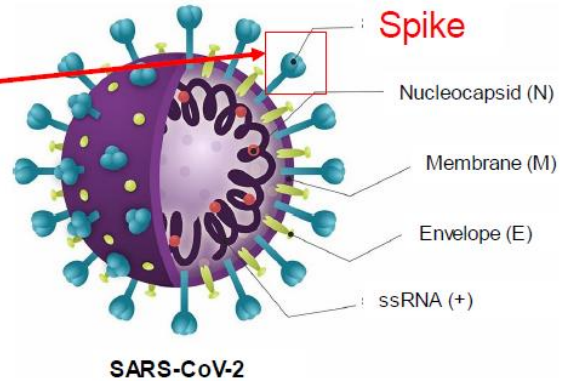
Pharmaceutical Interventions – Vaccines

Spike protein

- key role
- distinguishing feature

SARS-CoV-2 the virus that causes COVID-19



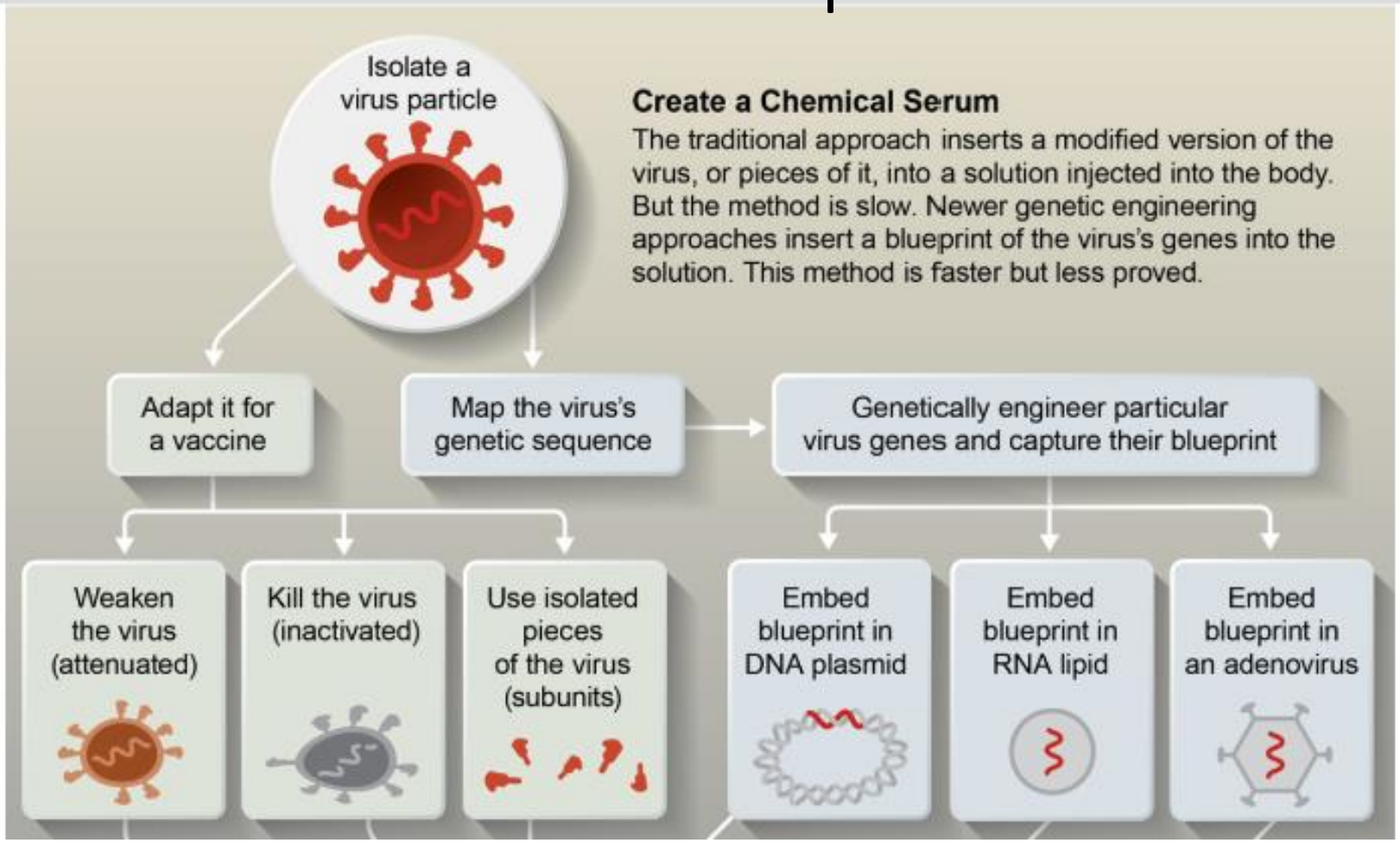


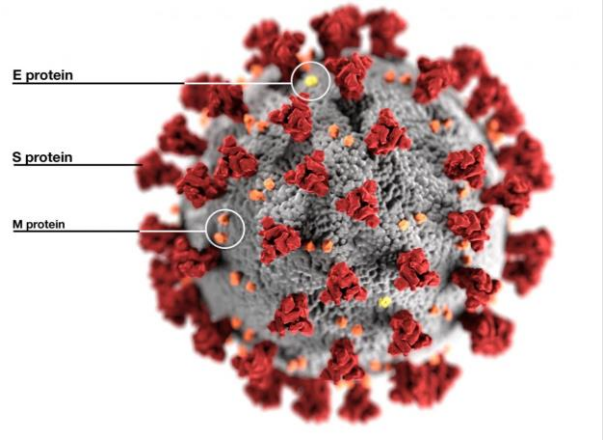
- Spike is a viral protein antigen on the surface of SARS-COV-2

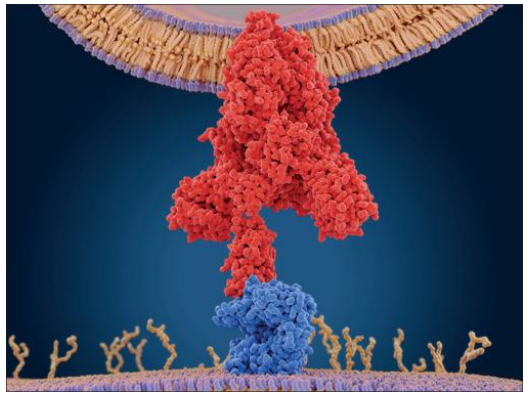
(L) Image: Transmission electron microscope image shows SARS-CoV-2, the virus that causes COVID-19, isolated from a patient in the U.S. Source: National Institutes of Health
(R) Image: de Andrade Santos et al, Review in Frontiers in Microbiology Aug 2020

Used with permission: *Dr. April Killikelly and Dr. Marina Salvadori - Public Health Agency of Canada* AMMI

COVID-19 vaccine platforms



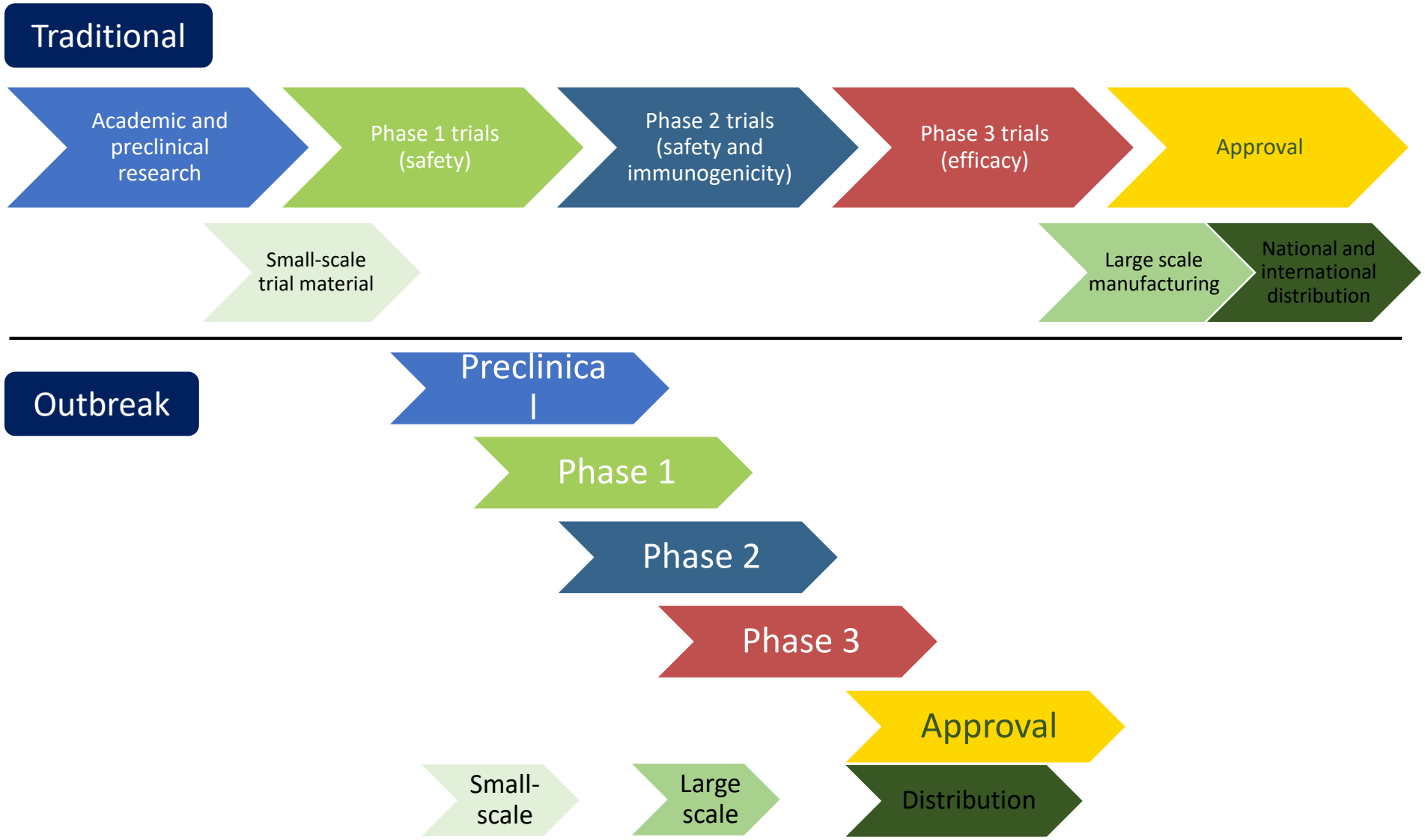




https://www.scientificamerican.com/article/genetic-engineering-could-make-a-covid-19-vaccine-in-months-rather-than-years1/

CDC; Fang et al. Lancet 2020

Vaccine development in a pandemic



Adapted from Lurie et al. NEJM 2020

In Canada

- Agreements announced with

Company	Vaccine type	Clinical phase	# doses (Canada)	Reported efficacy	Dosing Schedule
Pfizer/BioNTech	RNA	Phase 3	≥20m doses	95%	2 dose
Moderna	RNA	Phase 3	≤56m doses	95%	2 dose
Oxford University/Astra Zeneca	Viral vector	Phase 3	≤20m doses	70%	2 dose
Johnson & Johnson	Viral vector	Phase 3	≤38m doses		1 dose
Medicago	Subunit	Phase 3	≤76m doses		2 dose
Novavax	Subunit	Phase 3	≤76m doses		2 dose
Sanofi/GlaxoSmithKline	Subunit	Phase 2	≤72m doses		2 dose

Phase 3 RCTs: mRNA VE >90% with two spaced doses

Polack et al NEJM 2020 DOI: 10.1056/NEJMoa2034577

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine

Fernando P. Polack, M.D., Stephen J. Thomas, M.D., Nicholas Kitchin, M.D.,

ABSTRACT

METHODS

In an ongoing multinational, placebo-controlled, observer-blinded, pivotal efficacy trial, we randomly assigned persons 16 years of age or older in a 1:1 ratio to receive two doses, 21 days apart, of either placebo or the BNT162b2 vaccine candidate (30 μg per dose). BNT162b2 is a lipid nanoparticle–formulated, nucleoside-modified RNA vaccine that encodes a prefusion stabilized, membrane-anchored SARS-CoV-2 full-length spike protein. The primary end points were efficacy of the vaccine against laboratory-confirmed Covid-19 and safety.

RESULTS

A total of 43,548 participants underwent randomization, of whom 43,448 received injections: 21,720 with BNT162b2 and 21,728 with placebo. There were 8 cases of Covid-19 with onset at least 7 days after the second dose among participants assigned to receive BNT162b2 and 162 cases among those assigned to placebo; BNT162b2 was 95% effective in preventing Covid-19 (95% credible interval, 90.3 to 97.6). Similar vaccine efficacy (generally 90 to 100%) was observed across subgroups defined by age, sex, race, ethnicity, baseline body-mass index, and the presence of coexisting conditions. Among 10 cases of severe Covid-19 with onset after the first dose, 9 occurred in placebo recipients and 1 in a BNT162b2 recipient. The safety profile of BNT162b2 was characterized by short-term, mild-to-moderate pain at the injection site, fatigue, and headache. The incidence of serious adverse events was low and was similar in the vaccine and placebo groups.

CONCLUSIONS

A two-dose regimen of BNT162b2 conferred 95% protection against Covid-19 in persons 16 years of age or older. Safety over a median of 2 months was similar to that of other viral vaccines. (Funded by BioNTech and Pfizer; ClinicalTrials.gov number, NCT04368728.)

Two spaced doses

VE = 95%
(95%CI: 90.3-97.6)

Baden et al NEJM 2020 DOI: 10.1056/JENJoa2035389

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine

L.R. Baden, H.M. El Sahly, B. Essink, K. Kotloff, S. Frey, R. Novak, D. Diemert,

ABSTRACT

METHODS

This phase 3 randomized, observer-blinded, placebo-controlled trial was conducted at 99 centers across the United States. Persons at high risk for SARS-CoV-2 infection or its complications were randomly assigned in a 1:1 ratio to receive two intramuscular injections of mRNA-1273 (100 μg) or placebo 28 days apart. The primary end point was prevention of Covid-19 illness with onset at least 14 days after the second injection in participants who had not previously been infected with SARS-CoV-2.

RESULTS

The trial enrolled 30,420 volunteers who were randomly assigned in a 1:1 ratio to receive either vaccine or placebo (15,210 participants in each group). More than 96% of participants received both injections, and 2.2% had evidence (serologic, virologic, or both) of SARS-CoV-2 infection at baseline. Symptomatic Covid-19 illness was confirmed in 185 participants in the placebo group (56.5 per 1000 person-years; 95% confidence interval [CI], 48.7 to 65.3) and in 11 participants in the mRNA-1273 group (3.3 per 1000 person-years; 95% CI, 1.7 to 6.0); vaccine efficacy was 94.1% (95% CI, 89.3 to 96.8%; P<0.001). Efficacy was similar across key secondary analyses, including assessment 14 days after the first dose, analyses that included participants who had evidence of SARS-CoV-2 infection at baseline, and analyses in participants 65 years of age or older. Severe Covid-19 occurred in 30 participants, with one fatality; all 30 were in the placebo group. Moderate, transient reactogenicity after vaccination occurred more frequently in the mRNA-1273 group. Serious adverse events were rare, and the incidence was similar in the two groups.

CONCLUSIONS

The mRNA-1273 vaccine showed 94.1% efficacy at preventing Covid-19 illness, including severe disease. Aside from transient local and systemic reactions, no safety concerns were identified. (Funded by the Biomedical Advanced Research and Development Authority and the National Institute of Allergy and Infectious Diseases; COVE ClinicalTrials.gov number, NCT04470427.)

Two spaced doses

VE = 94%
(95%CI: 89.3-96.8)

Pfizer Efficacy: One Dose (93%) vs Two Dose (95%)

Table 1. Efficacy of BNT162b2 by interval from specified dose

Analysis period	Number (n) of cases by group		Vaccine efficacy	95% CI
	Vaccine (N=21,669)	Placebo (N=21,686)		
Between Dose 1 and Dose 2 (as per [3,4])	39	82	52.4%	29.5 to 68.4%
From 7 days after Dose 1 up to Dose 2 (derived)[a]	18[b]	57[c]	68.4%	46.3 to 81.4%
From 14 days after Dose 1 up to Dose 2 (derived)[a]	2[d]	27[e]	92.6%	68.9 to 98.2%
From 7 or more days after Dose 2 (as per [3,4])	9	172	94.8%	89.8 to 97.6%

a. As derived from data reported by the manufacturer in Figure 2, page 11 of [3]. Vaccine efficacy derived as: 1 - ($Risk_{vaccinated}/Risk_{unvaccinated}$), with denominators including those remaining at risk by the specified analysis period.

b. There were 21 cases that accrued before day 7 in the vaccine group

c. There were 25 cases that accrued before day 7 in the placebo group

d. There were 37 cases that accrued before day 14 in the vaccine group

e. There were 55 cases that accrued before day 14 in the placebo group

See Polack et al NEJM 2020 DOI: 10.1056/NEJMoa2034577 Available: https://www.nejm.org/doi/full/10.1056/NEJMoa2034577
and pg. 30: https://www.fda.gov/media/144246/download

Moderna Efficacy: One Dose (92%) vs Two Dose (94%)

See pg. 28: https://www.fda.gov/media/144434/download

Table 15. Vaccine Efficacy[a] of mRNA-1273 to Prevent COVID-19 From Dose 1 by Time Period in Participants Who Only Received One Dose, mITT Set

First COVID-19 Occurrence After Dose 1	Vaccine Group N=996 Case n (%)	Placebo Group N=1079 Case n (%)	VE (%) (95% CI)*
After dose 1	7/996 (87.5)	39/1079 (96.7)	80.2% (55.2%, 92.5%)
After dose 1 to 14 days after dose 1	5/996 (38.0)	11/1079 (41.1)	50.8% (-53.6%, 86.6%)
>14 days after dose 1**	2/983 (87.2)	28/1059 (96.2)	92.1% (68.8%, 99.1%)

Surveillance time in person years for given endpoint across all participants within each group at risk for the endpoint
* VE is calculated as 1-ratio of incidence rates (mRNA-1273/Placebo). The 95% CI of VE is calculated using the exact method conditional upon the total number of cases, adjusting for person-years
**Participants who were not at risk (cases or censored at prior time period) are excluded from this analysis
[a] Based on interim analysis: Novemer 7, 2020 efficacy data cutoff.

The NEW ENGLAND JOURNAL of MEDICINE

Baden et al NEJM 2020 DOI: 10.1056/JENJoa2035389

ORIGINAL ARTICLE

Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine

L.R. Baden, H.M. El Sahly, B. Essink, K. Kotloff, S. Frey, R. Novak, D. Diemert,

ABSTRACT

METHODS

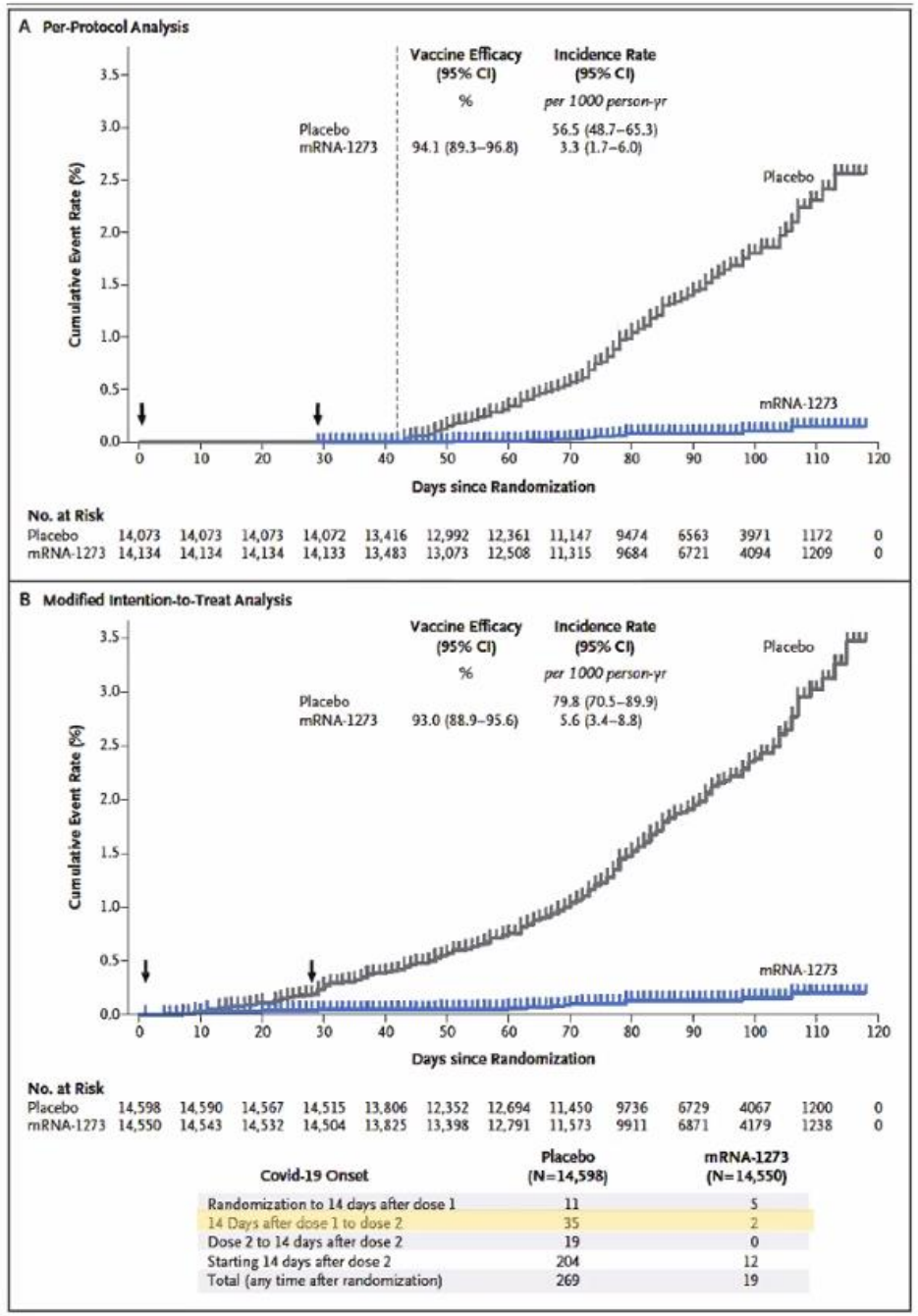
This phase 3 randomized, observer-blinded, placebo-controlled trial was conducted at 99 centers across the United States. Persons at high risk for SARS-CoV-2 infection or its complications were randomly assigned in a 1:1 ratio to receive two intramuscular injections of mRNA-1273 (100 μg) or placebo 28 days apart. The primary end point was prevention of Covid-19 illness with onset at least 14 days after the second injection in participants who had not previously been infected with SARS-CoV-2.

RESULTS

The trial enrolled 30,420 volunteers who were randomly assigned in a 1:1 ratio to receive either vaccine or placebo (15,210 participants in each group). More than 96% of participants received both injections, and 2.2% had evidence (serologic, virologic, or both) of SARS-CoV-2 infection at baseline. Symptomatic Covid-19 illness was confirmed in 185 participants in the placebo group (56.5 per 1000 person-years; 95% confidence interval [CI], 48.7 to 65.3) and in 11 participants in the mRNA-1273 group (3.3 per 1000 person-years; 95% CI, 1.7 to 6.0); vaccine efficacy was 94.1% (95% CI, 89.3 to 96.8%; P<0.001). Efficacy was similar across key secondary analyses, including assessment 14 days after the first dose, analyses that included participants who had evidence of SARS-CoV-2 infection at baseline, and analyses in participants 65 years of age or older. Severe Covid-19 occurred in 30 participants, with one fatality; all 30 were in the placebo group. Moderate, transient reactogenicity after vaccination occurred more frequently in the mRNA-1273 group. Serious adverse events were rare, and the incidence was similar in the two groups.

CONCLUSIONS

The mRNA-1273 vaccine showed 94.1% efficacy at preventing Covid-19 illness, including severe disease. Aside from transient local and systemic reactions, no safety concerns were identified. (Funded by the Biomedical Advanced Research and Development Authority and the National Institute of Allergy and Infectious Diseases; COVE ClinicalTrials.gov number, NCT04470427.)



Covid-19 Onset	Placebo (N=14,598)	mRNA-1273 (N=14,550)
Randomization to 14 days after dose 1	11	5
14 Days after dose 1 to dose 2	35	2
Dose 2 to 14 days after dose 2	19	0
Starting 14 days after dose 2	204	12
Total (any time after randomization)	269	19

VE derived from 14 days after dose 1 to dose 2 =
94.3% (95%CI: 76.2-98.6)
[before dose 2]

VE reported by Moderna from 14 days after dose 1 =
95.2% (95%CI: 91.2-97.4)
[includes dose 2]

2nd Dose Deferral? Skeptical or Curious Some Principles… Now you decide…

- Roles and Interest
  - Manufacturer
  - Regulators (Assess evidence)
  - Vaccinologists and Vaccine Effectiveness researchers
- Vaccinology
  - Prime and Boost immune response science
  - Immune response mechanism to SARS-CoV-2 – adaptive, T cell, B cell, innate, cytokine
  - Development of vaccine
    - Short release, heightened safeties, longer studies in the future
  - Post market analysis
    - Opportunity to learn from other countries

https://mediasite.audiovisual.ubc.ca/Mediasite/Play/b2bbb12d019e44d2acf4a8dc84ca8e1c1d Dr. Skowronski's webinar

First and second dose interval

- **Minimum intervals between 1st and 2nd dose are generally specified (i.e. no shorter than …)**
  - For most vaccines of the Canadian immunization schedule minimum interval is 4 weeks
  - For some, minimum interval recommended is 8 weeks, 3 months or 6 months

- **Max intervals between 1st and 2nd dose are <u>not</u> generally specified (i.e. no longer than …)**
  - In general, longer interval between first and second doses results in higher antibody responses which are associated with longer lasting protection
  - Examples:
    - **Pandemic influenza vaccine candidates:**
      - Beran J et al Clinical Therapeutics 2010;32(13):2186-97 [MF59 H5N1 vaccine]
      - Belshe RB et al J Infect Dis 2011;203:666-73 [H5 heterologous responses]
      - Ledgerwood JE J Infect Dis 2013;208:418-22 [H5 DNA vaccine]
    - **Pneumococcal vaccine (PPSV23):**
      - Kawakami K et al Human Vaccines & Therapeutics 2018;14(8): 1931-38
    - **Measles, mumps, rubella, varicella:**
      - Rümke HC et al Vaccine 2011;29:3842-49
    - **Human papillomavirus (HPV):**
      - Widdice LE et al Vaccine 2018;36(6):881-89

Recommendations elsewhere: interval of 12 weeks or more

- Joint Committee on Vaccination and Immunisation (JCVI), United Kingdom, December 30, 2020:
  - "…given data indicating high efficacy from the first dose of both Pfizer-BioNTech and AstraZeneca vaccines, the Committee advises that delivery of the first dose to as many eligible individuals as possible should be initially prioritised over delivery of a second dose. This should maximize the short-term impact of the programme. **The second dose of the Pfizer-BioNTech vaccine may be given 3 to 12 weeks following the first dose. The second dose of the AstraZeneca vaccine may be given between 4 to 12 weeks following the first dose**."
  - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/948338/jcvi-advice-on-priority-groups-for-covid-19-vaccination-30-dec-2020.pdf
- Quebec Immunization Committee (QIC), December 31, 2020:
  - Deferral of second dose until all members of their six priority groups have had opportunity to receive at least one dose
  - Reassess based on field evaluation of vaccine performance; recent Ministry announcement of 90 day interval
  - https://www.inspq.qc.ca/publications/3098-strategie-vaccination-2e-dose-covid

Recommendations elsewhere: interval of 6 weeks

- World Health Organization, January 8, 2021
  - Interval between doses may be extended up to 42 days (6 weeks) on the basis of available clinical trial data
  - Countries should ensure that any such program adjustments to dose intervals do not affect the likelihood of receiving the second dose
  - https://assets.documentcloud.org/documents/20445916/who-2019-ncov-vaccines-sage_recommendation-bnt162b2-20211-eng.pdf

- European Medicines Agency
  - Interval between first and second doses of the mRNA vaccines should not exceed 42 days (adopted by France, Denmark, Netherlands)
  - https://www.bmj.com/content/372/bmj.n18

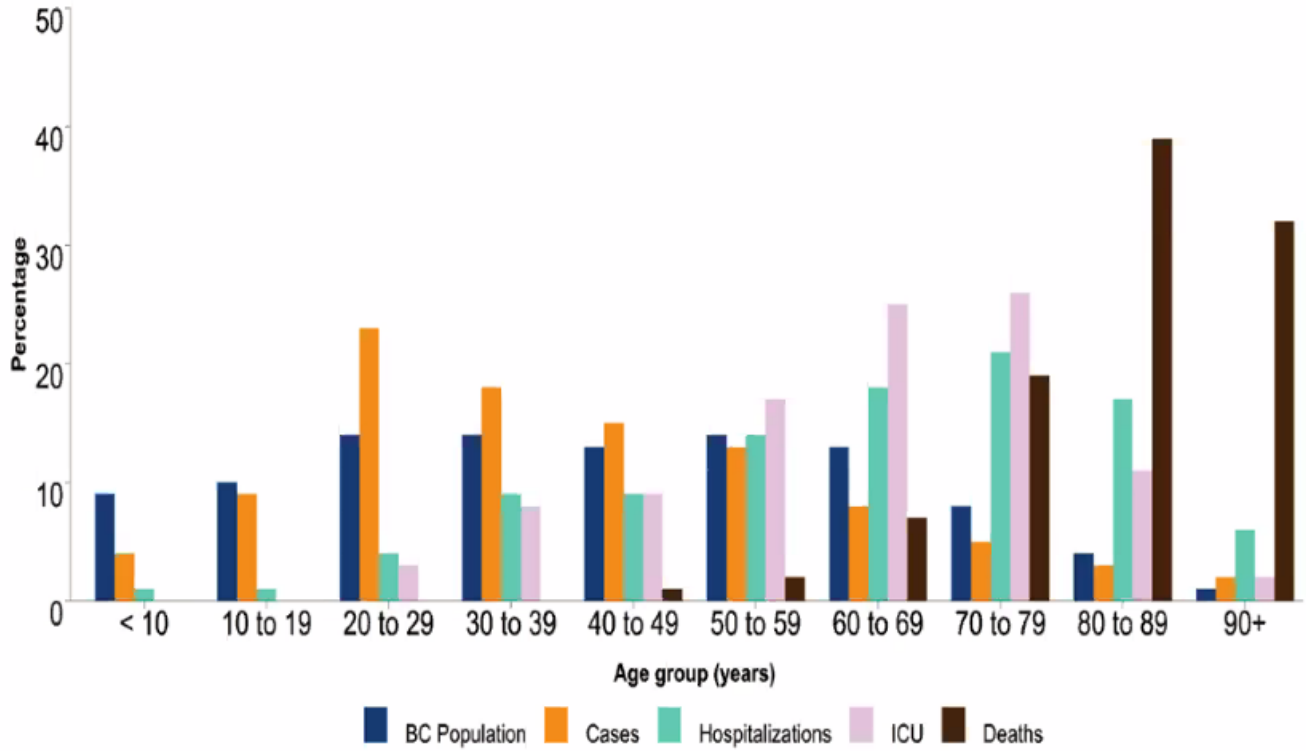
- Canadian National Advisory Committee on Immunization, January 8, 2021
  - Options for extending the interval based upon local epidemiology and vaccine supply, preferably 42 days
  - https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/recommendations-use-covid-19-vaccines.html

COVID Vaccination

- Goals
  - Protect the most vulnerable from serious illness and death
  - Sustain health care system capacity
- Strategy
  - Considers epidemiology and burden
  - Resources
  - Ethics, evidence, logistics
- Impact
  - Depends on Vaccine Efficacy and Coverage rates

High-risk groups

- LTCF / ALF residents: ~60% of deaths
- Health care workers [4% of BC population 20-64 years; 10% of COVID-19 cases]
  - Implications for health care system capacity and caring for others
- 80+ years [5% population; 5% cases]
  - 17% of hospitalizations
  - 11% of ICU admissions
  - 71% of deaths
- 70-79 years [5% population; 5% cases]
  - 21% of hospitalizations
  - 26% of ICU admissions
  - 19% of deaths
- 60-69 years [13% population; 8% cases]
  - 18% of hospitalizations
  - 26% of ICU admissions
  - 19% of deaths



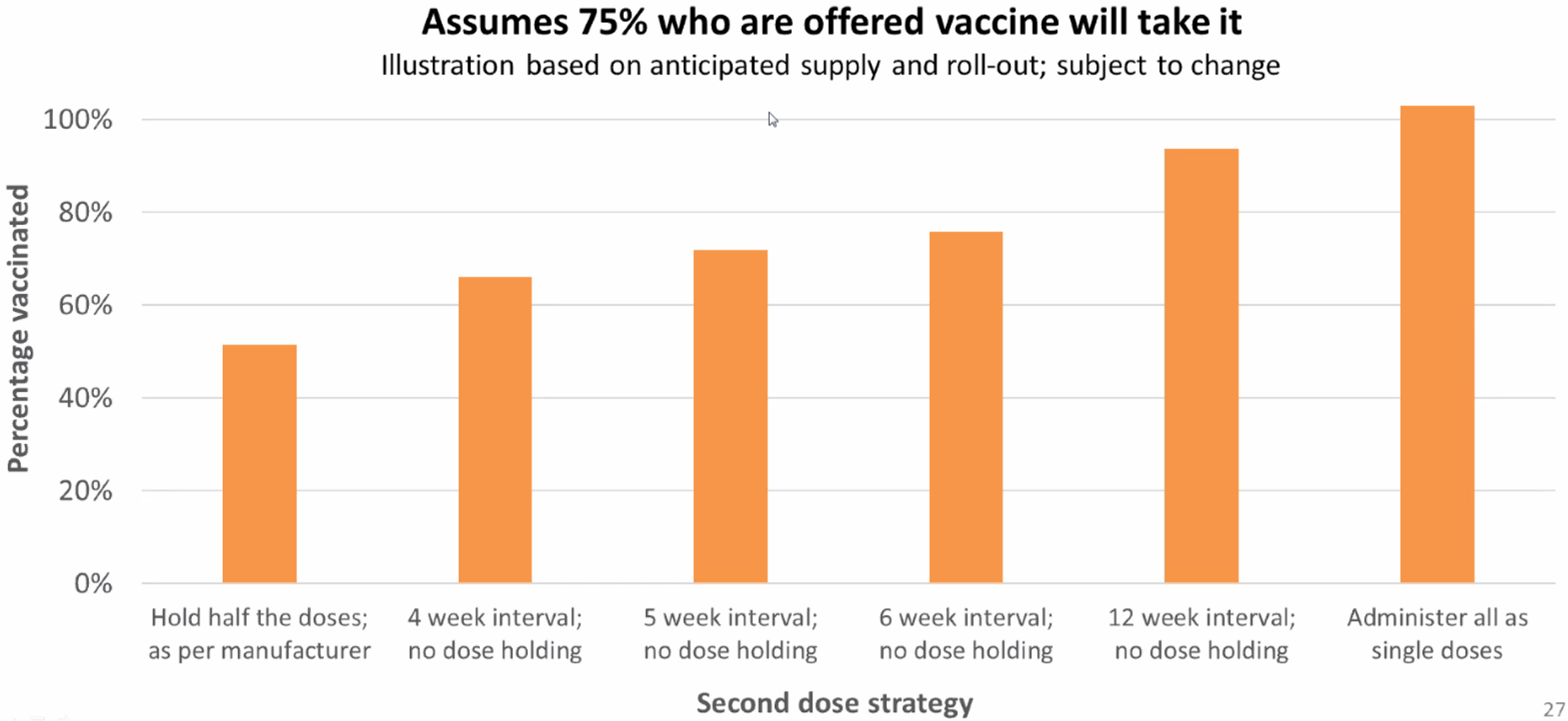
See: http://www.bccdc.ca/Health-Info-Site/Documents/COVID_sitrep/Week_2_2021_BC_COVID-19_Situation_Report.pdf

In December: 180 hospitalizations, 47 ICU admissions and 35 deaths due to COVID-19 among community-dwelling 70-79 yos in BC

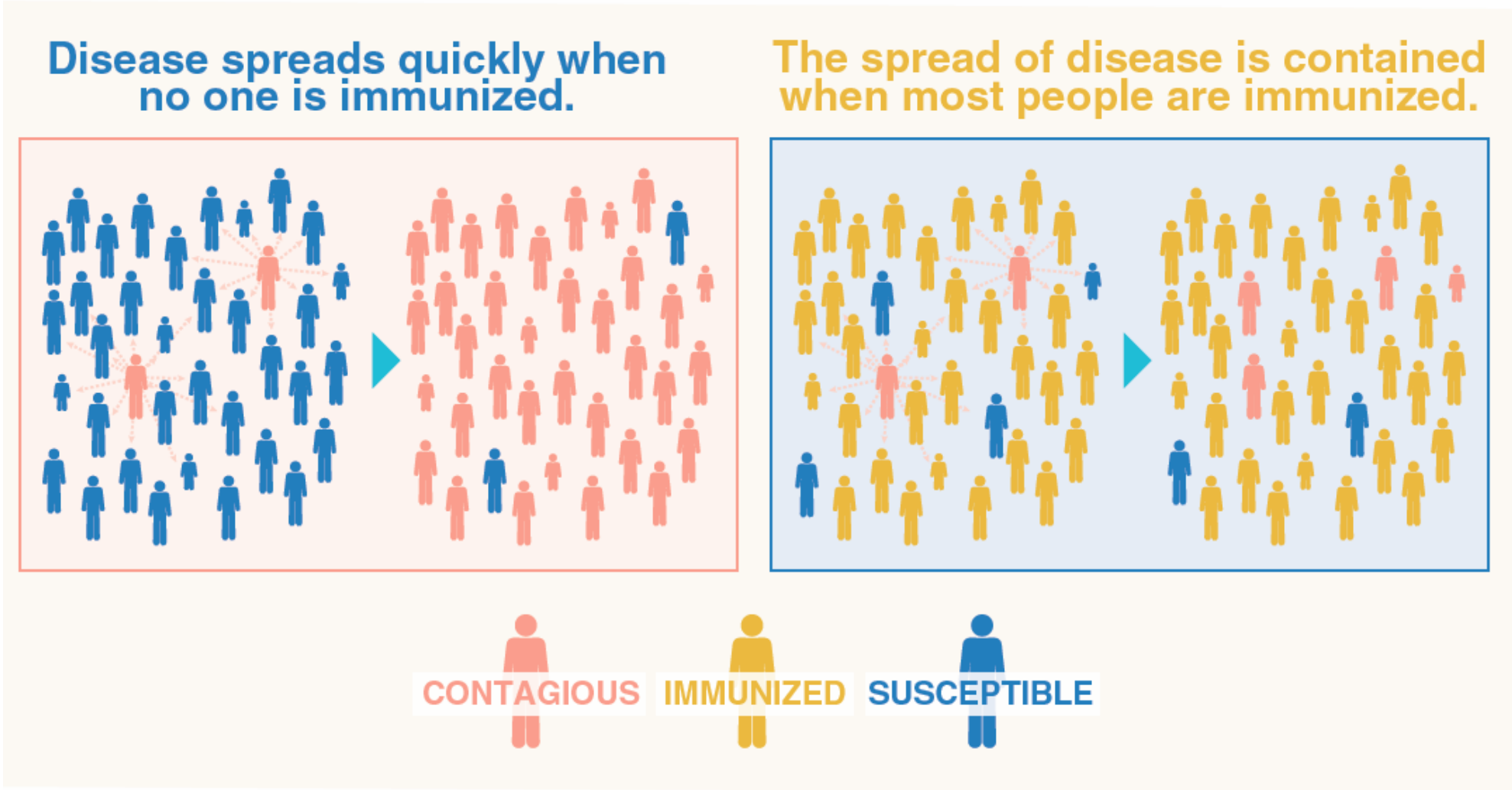
- **Compared to those 80+ years:**
  - Similar number of hospitalizations and more ICU admissions
  - Fewer deaths
  - A larger proportion of severe outcomes involve non-LTCF/ALF

Age in years	LTCF / ALF residents			Non-LTCF/ALF			Total		
	Hospitalized	ICU	Death	Hospitalized	ICU	Death	Hospitalized	ICU	Death
80+	53	3	221	173 (77%)	23 (88%)	71 (24%)	226	26	292
70-79	16	2	44	180 (92%)	47 (96%)	35 (44%)	196	49	79

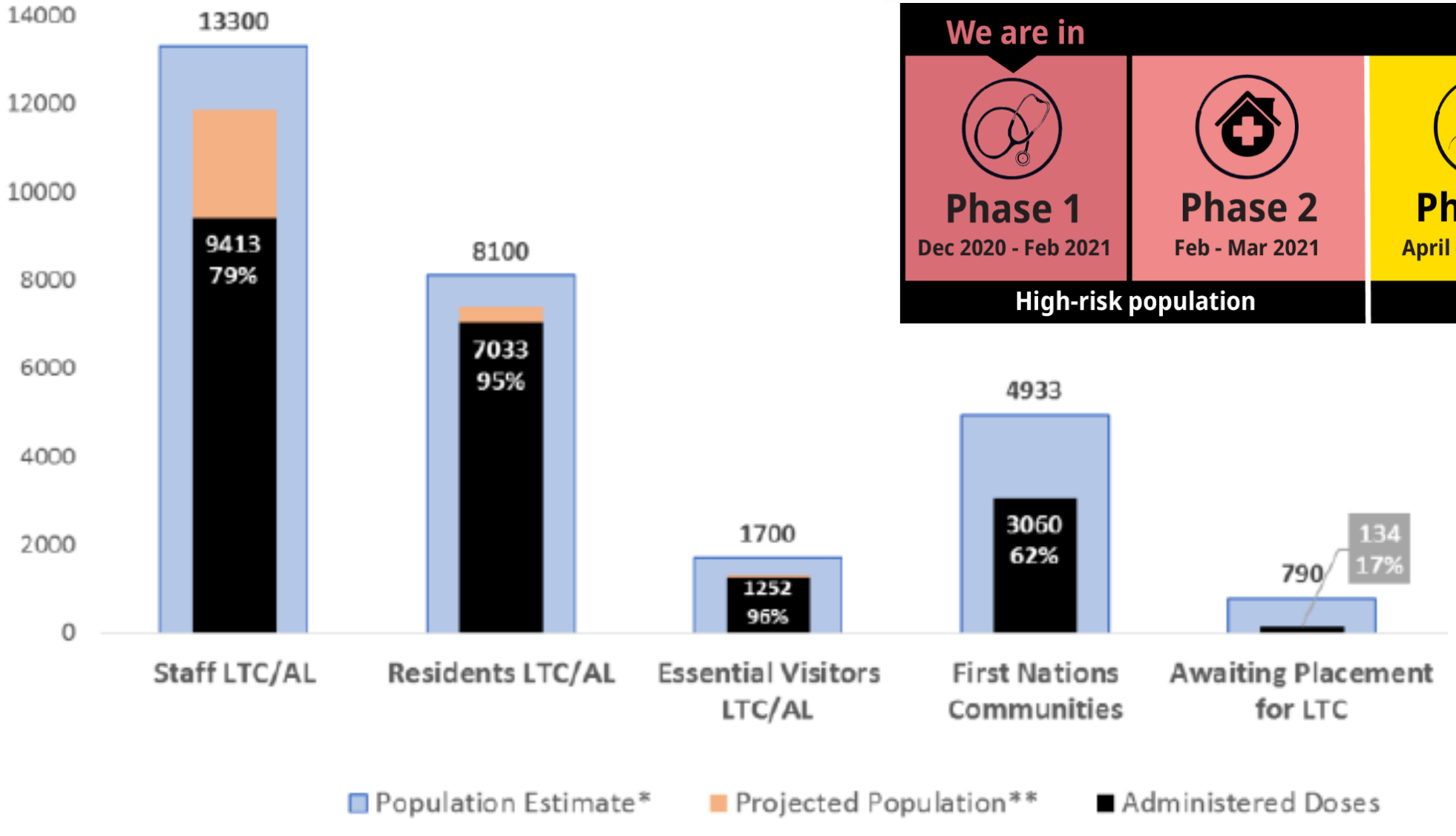
Percent of priority individuals who could be vaccinated by end of March 2021, inclusive of elderly adults 70-79 years



How community immunity works



Administered Doses for Priority Populations



Phase 1

Phase 1 (Current phase)

Timeline: December 2020 to February 2021

- Residents and staff of long-term care facilities
- Individuals assessed for and awaiting long-term care
- Residents and staff of assisted living residences
- Essential visitors to long-term care facilities and assisted living residences
- Hospital health care workers who may provide care for COVID-19 patients in settings like Intensive Care Units, emergency departments, paramedics, medical units and surgical units
- Remote and isolated Indigenous communities

Phase 2

Phase 2

Timeline: February to March 2021

- Seniors aged 80 and over who are not immunized in Phase 1
- Indigenous (First Nations, Métis and Inuit) seniors age 65 and over, Elders and additional Indigenous communities not immunized in Phase 1
- Hospital staff, community general practitioners (GPs) and medical specialists not immunized in Phase 1
- Vulnerable populations living and working in select congregated settings
- Staff in community home support and nursing services for seniors

What’s next?

- Getting ready for mass immunization.
  - Preparing for nurse, pharmacist and physician immunizers on large scale
  - Immunization competency courses available at BCCDC for CME credit
- Prepare to counsel patients.
  - Immunization readiness and hesitancy
  - Considerations prior to immunization
- Respond to adverse events following immunization
  - Reporting guidance in BCCDC Immunization Manual Chapter 5

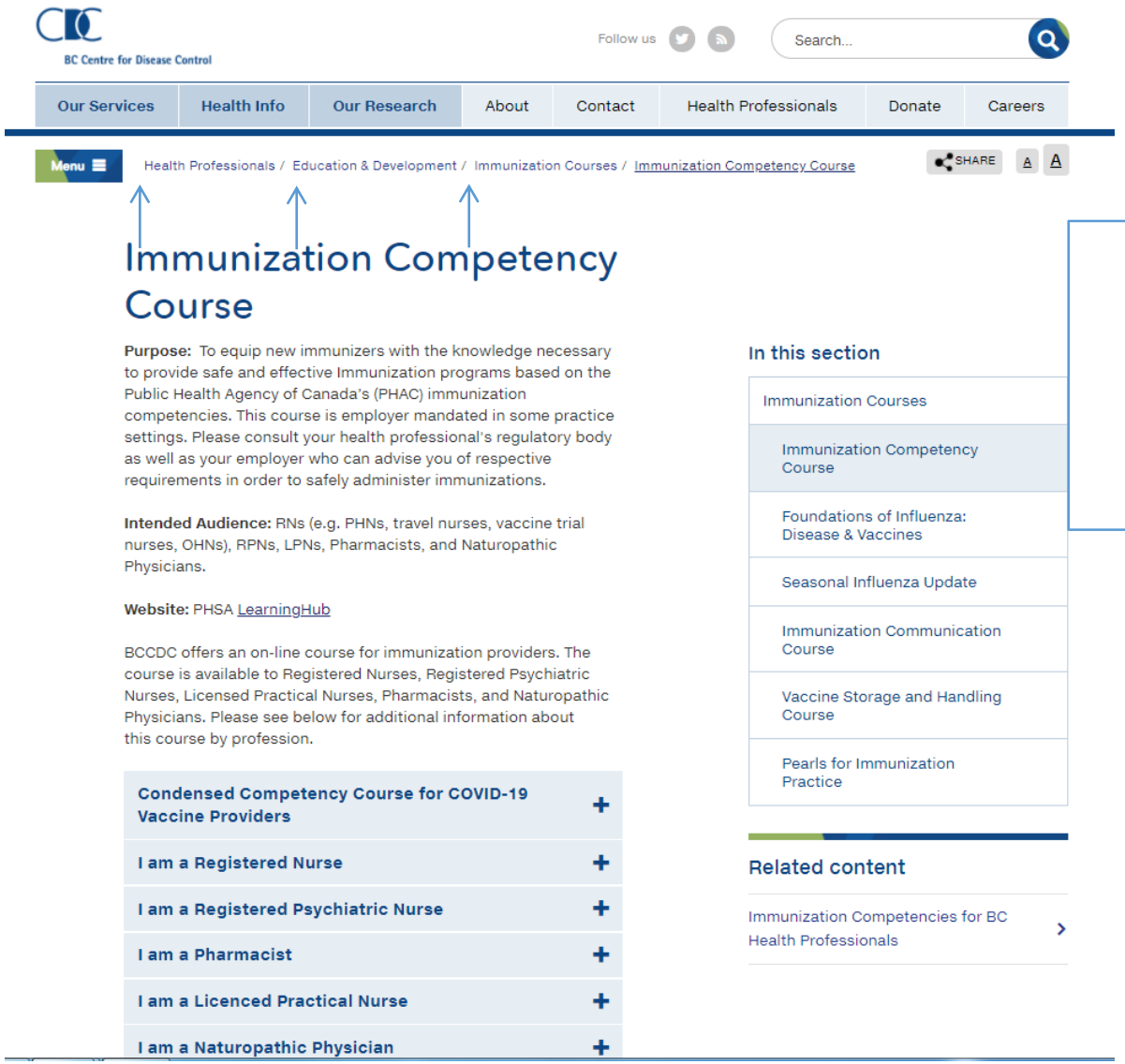
Immunization Competency Courses

BCCDC

- Immunization Competency Course
  - Comprehensive course
  - Knowledge necessary to provide safe and effective immunization programs

Canadian Pediatric Society (CPS)

- Education Program for Immunization Competencies (EPIC) course
  - Condensed immunization competency process for **NEW vaccine providers**
  - Administration of COVID-19 vaccine only



Immunization Competency Courses

HealthLinkBC file for informed consent

Immunization has saved more lives in Canada in the last 50 years than any other health measure.

What are the COVID-19 mRNA vaccines?

The COVID-19 mRNA vaccines protect against infection from the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that causes COVID-19. The vaccines cause your body to produce antibodies that will protect you from getting sick if exposed to the virus. Health Canada approved the vaccines.

Who should get the vaccines?

The vaccines are being provided to those who are at increased risk of exposure to the virus and those most at risk of serious complications. The vaccines will only be available for certain groups of people at first due to limited supply of the vaccines. As the vaccine supply increases other groups of people will be able to get the vaccine. For information on when a vaccine will be

immunization record when returning for your second dose.

What should I do after I get the vaccine?

After you get the vaccine, continue to follow public health recommendations such as:

- Wash your hands or use hand sanitizer
- Physical distance
- Wear a mask where required

You should not receive any other vaccines until 28 days have passed after you receive the second dose of the COVID-19 vaccine.

What are the benefits of the vaccines?

The vaccine are the best way to protect you against COVID-19 which is a serious and sometimes fatal disease. In clinical trials, those who received the vaccines were about 95% less likely to become sick with COVID-19. When you get immunized, you help protect others as well

Addressing vaccine hesitancy

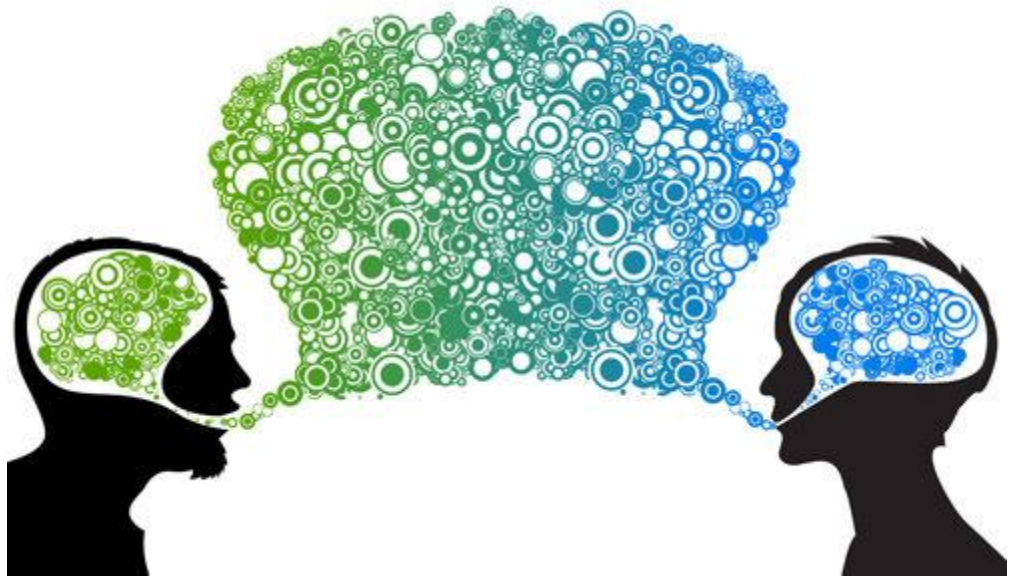
- Understand concern and question
- Respond using short & simple key messages
- Present risks and benefits of the vaccine fairly
- Use a presumptive statement
- Remember that the strength of a HCPs recommendation can help move someone who is hesitant toward acceptance of vaccination

Key considerations

Communication is key

- Cultural safety
- Trauma informed
- Language equity

- ✓ Consider knowledge, attitudes, and beliefs
- ✓ Provide clear, concise messages
  - ✓ language considerations
- ✓ Direct to evidence-based resources



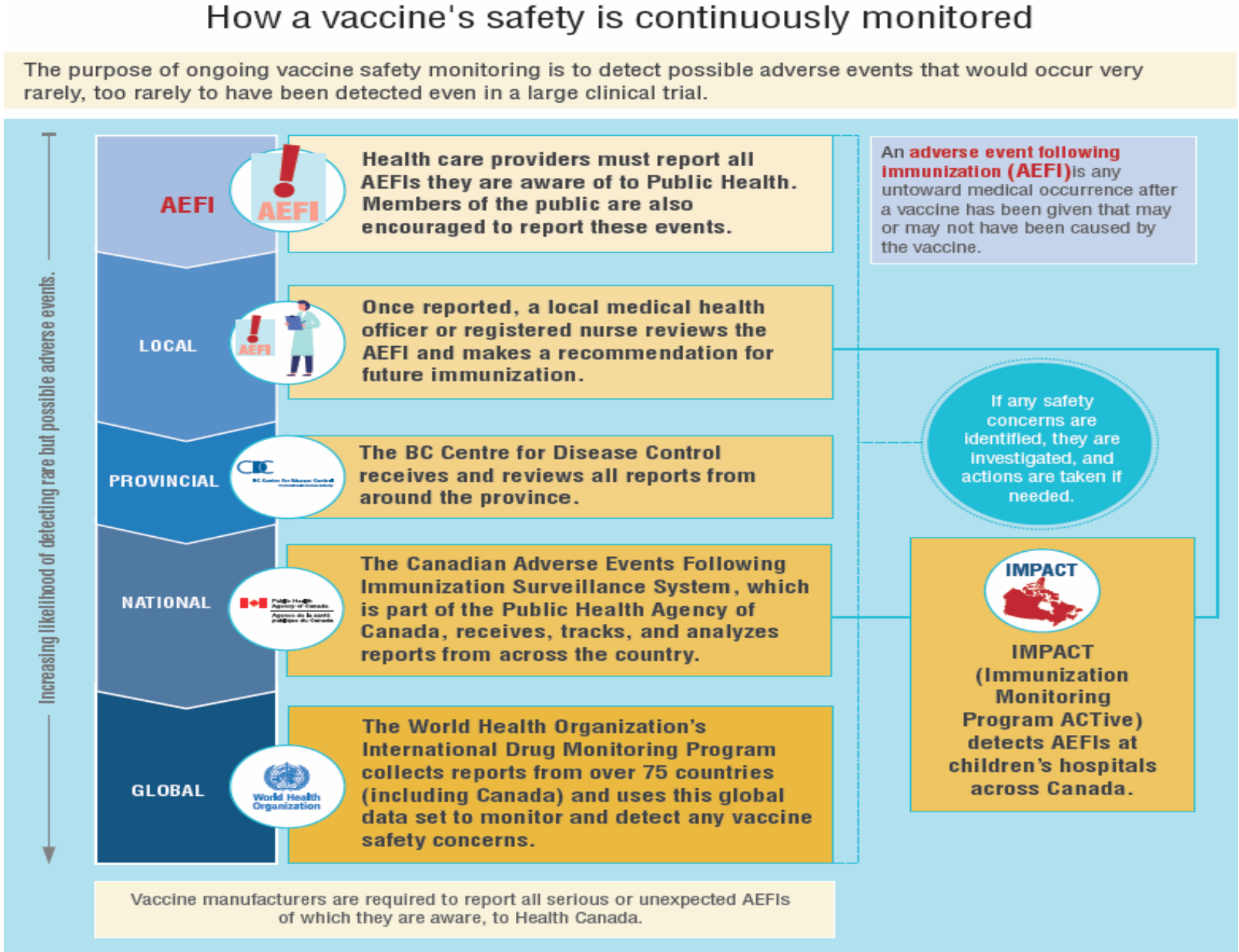
Discretionary NACI recommendations

- Persons with an autoimmune condition
  - COVID-19 vaccine may be offered to individuals with an **autoimmune condition** if a risk assessment deems that the **benefits outweigh the potential risks** for the individual, and **if informed consent includes discussion about the insufficiency of evidence on the use of COVID-19 vaccine in these populations**
- Immunosuppressed persons
  - COVID-19 vaccine may be offered to individuals who are **immunosuppressed due to disease or treatment** if a risk assessment deems that the benefits outweigh the potential risks for the individual, and if informed consent includes discussion about the absence of evidence on the use of COVID-19 vaccine in this population
- Pregnancy and breastfeeding
  - COVID-19 vaccine may be offered if a risk assessment deems that the benefits outweigh the potential risks for the **individual and the fetus/infant**, and if informed consent includes discussion about the absence of evidence on the use of COVID-19 vaccine in this population

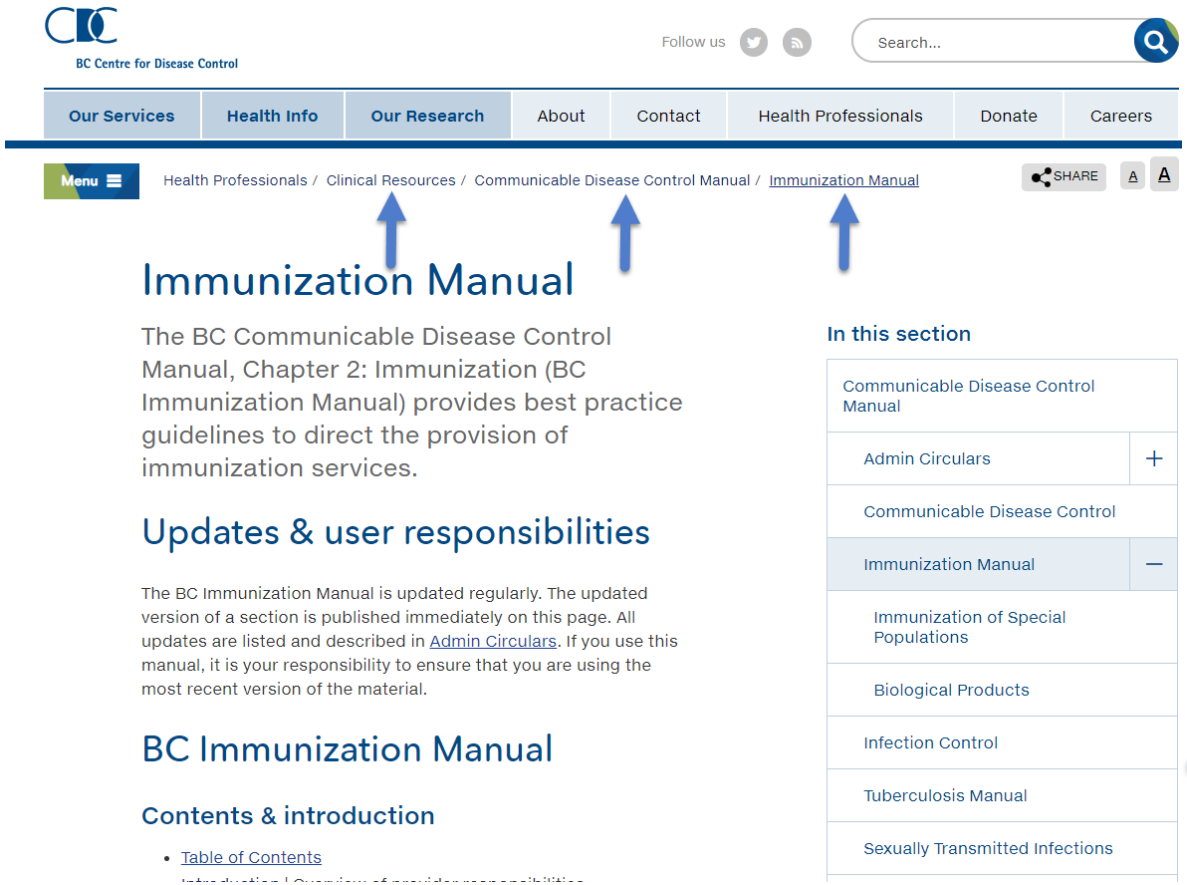
Discretionary NACI recommendations

- There are no data on COVID-19 vaccination in individuals who are immunosuppressed/pregnant/breast feeding and limited data for autoimmune conditions
- No safety signals of concern have been noted in non-immunosuppressed participants with an immunocompromising condition (e.g., stable HIV infection)
- Immunocompromised persons may have a diminished immune response
- In general, non-replicating vaccines may be administered to immunocompromised and pregnant people because the antigens in the vaccine cannot replicate
- People living with HIV that are considered immunocompetent may be vaccinated
- There is a theoretical risk of exacerbation of some autoimmune conditions
- No theoretical concerns about these vaccines and breastfeeding
- To date no evidence of harm in pregnancy from animal studies
- Balance of benefits and risks must be made case-by-case

Vaccine safety monitoring



Adverse events following immunization (AEFI)



Parts 1-5

- Part 1: Immunization Schedules | Routine immunization schedules by age, use of minimum intervals between vaccine doses, management of vaccine administration errors
- Part 2: Immunization of Special Populations | Immunization of individuals at high risk, immunocompromised individuals, chronic medical conditions, occupation, lifestyle & other high-risk conditions
- Part 3: Management of Anaphylaxis in a Non-Hospital Setting | Recognition, management & reporting of anaphylaxis
- Part 4: Biological Products (Vaccines & Immune Globulins) | Product-specific information on vaccines & immune globulins including eligibility, dosing & scheduling
- Part 5: Adverse Events Following Immunization | Recognition & reporting of an adverse event following immunization & implications for future immunization

Adverse Events Following Immunization

Reporting Adverse Events Following Immunization | For BC Community Vaccine Providers

BC Centre for Disease Control

DO YOUR PART IN REPORTING ADVERSE EVENTS!

1 **Advise patients** to inform you if they experience a concerning adverse event after vaccination.

2 Report to public health any reportable event using BC's Adverse Events Following Immunization (AEFI) Case Report Form.

3 **Follow up with your patient** to advise about whether they can proceed with future immunizations.

4 Contact your local public health unit if you have any questions about AEFI reporting.

Questions & Answers

What is an AEFI?
An adverse event following immunization (AEFI) is any untoward medical occurrence following the administration of a vaccine which may or may not be caused by the vaccine.

What type of AEFIs should be reported?
Any event which may be related to receipt of a vaccine, as outlined in

Why is it important to report AEFIs?
AEFI reporting provides vital information needed to monitor vaccine safety. This type of surveillance can detect rare side effects and identify safety signals not detectable through clinical trials.

What happens after AEFIs are reported?

Who should report AEFIs?
Health professionals who are aware of an adverse event following immunization must report that event to the local public health unit using BC's AEFI Case Report Form.

What do I tell my patients about AEFIs?
Patients should be made aware of potential vaccine side effects and

In general, the following events <u>should not be reported:</u>

- Local injection site reactions
- Non-specific systemic reactions
- Events that have another obvious cause (for example, co-existing conditions)

A detailed table of reportable AEFIs with temporal criteria can be found of page 7 of the BCCDC AEFI guide: https://bit.ly/39b8E9I

BC Immunization manual

Part 4: Biological Products

BC Centre for Disease Control
Provincial Health Services Authority

COVID-19 (mRNA)
COVID-19 mRNA Vaccine mRNA-1273 Supplier: Moderna

INDICATIONS:

- Vaccination will occur in phases. Sequencing of populations for whom the vaccine is currently indicated in British Columbia is available on the BCCDC COVID-19 Vaccine Eligibility page.

The vaccine is not approved for use in those less than 18 years of age.

DOSES AND SCHEDULE:
Adults 18 years of age and older: 2 doses given as 0.5 mL IM, 28 days apart.[A, B, C]

ADMINISTRATION:
No reconstitution required.

Storage and Handling:

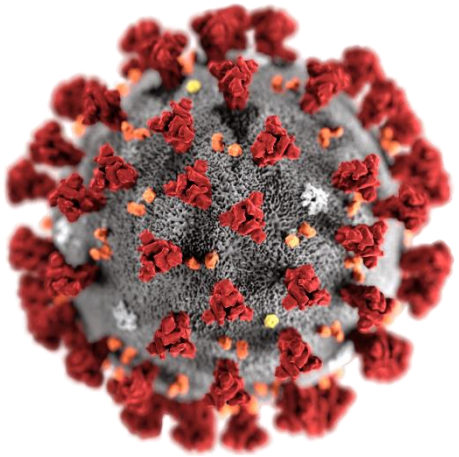
- The vaccine can be stored at:
  - -20°C (-25°C to -15°C) up to the end of its expiry date, kept in the original packaging and protected from light. Do not store on dry ice.
  - +2°C to +8°C for up to 30 days prior to first use, protected from light.
  - Room temperature (up to +25°C) for up to 12 hours.
  - After first vial puncture, the vaccine must be used **within 6 hours.**
  - The vaccine can be pre-loaded into a syringe for up to 6 hours.
  - Ensure that the vial/syringe is clearly labelled with the date and time of first vial entry.
- Product should be thawed/held prior to use, in one of the following three ways:
  - From the freezer to room temperature; will require 1 hour to thaw
  - From the freezer to the refrigerator; will require 2 hours and 30 minutes to thaw, and then requires at least 15 minutes at room temperature prior to administration.
  - Swirl the vial gently after thawing and between each withdrawal. Do not shake.
- Do not refreeze thawed vials.

COVID-19 vaccine resources for HCPs

- Healthcare provider Q&A
- Screening checklist

COVID-19 resources for the public

i. Aftercare sheet
ii. BCHealthfile

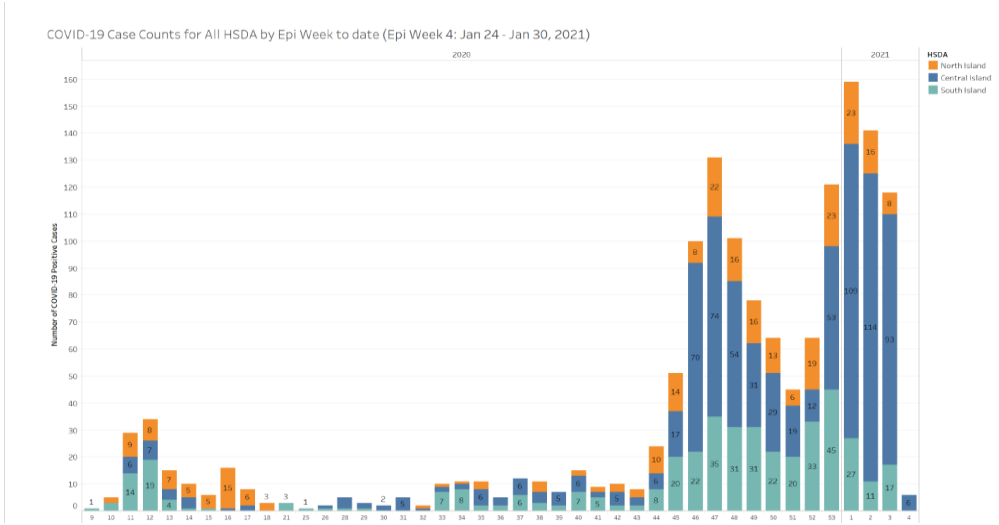


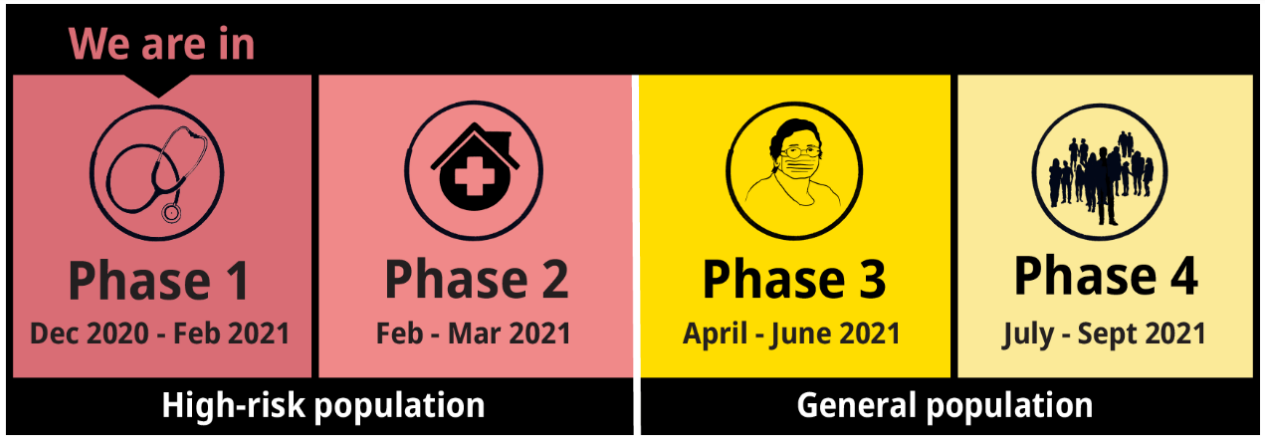
Outstanding questions = we don’t know the answers

- Mechanism of protection
- Duration of protection, including 1 *vs.* 2 doses
- Effectiveness against new variant strains
- Safety, immunogenicity and effectiveness in populations outside trials
  - Extremes of age
  - Multiple/severe comorbidities
  - Immunocompromised
  - Pregnancy and breast feeding

Outline

- Epidemiology
- PH Process for cases
- PH Interventions
- Immunizations
- What's next?





- Credits
  - BCCDC Dr. Reka Gustafson, Dr. Danuta Skowronski
  - BC Centre for Vaccine Effectiveness Dr. Manish Sadarangani

Weighing certainty and uncertainty in the midst of a crisis

- **Certainty**
  - Pandemic activity remains elevated and the vast majority of high-risk individuals remain susceptible
    - Absent more drastic measures, there is a clear and present danger with respect to the risk of COVID-19 and associated hospitalizations and deaths
    - Given protective vaccine, comparable with one or two doses, more hospitalizations and deaths could be prevented on the short term through second dose deferral
- **Uncertainty**
  - Duration of protection with available COVID-19 vaccines is unknown for one or two dose schedules (follow up for up to four months)
    - Antibody decay unlikely to be sudden; gradual waning
    - Longer intervals between second doses generally preferred