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It’s Not Just COVID-19 Anymore… The Update on Influenza for the 2021-22 Season

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September 28, 2021

PHO Rounds

Disclosure

- None of the presenters have a conflict of interest to disclose.
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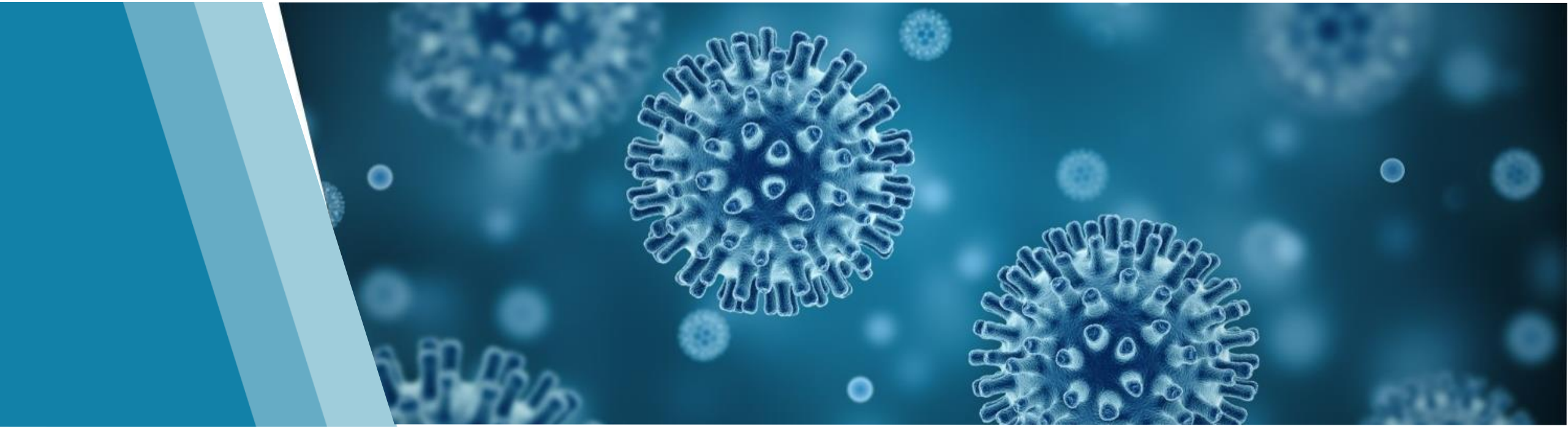
Objectives

- Describe trends in influenza and respiratory activity observed following reopening phases of the pandemic in Ontario, Canada and internationally
- Describe influenza vaccine products available as part of Ontario's Universal Influenza Immunization Program 2021-22
- Understand the use and benefits of antiviral medications for the treatment and prevention of influenza
- Understand influenza and other respiratory virus laboratory testing for the 2021-22 season

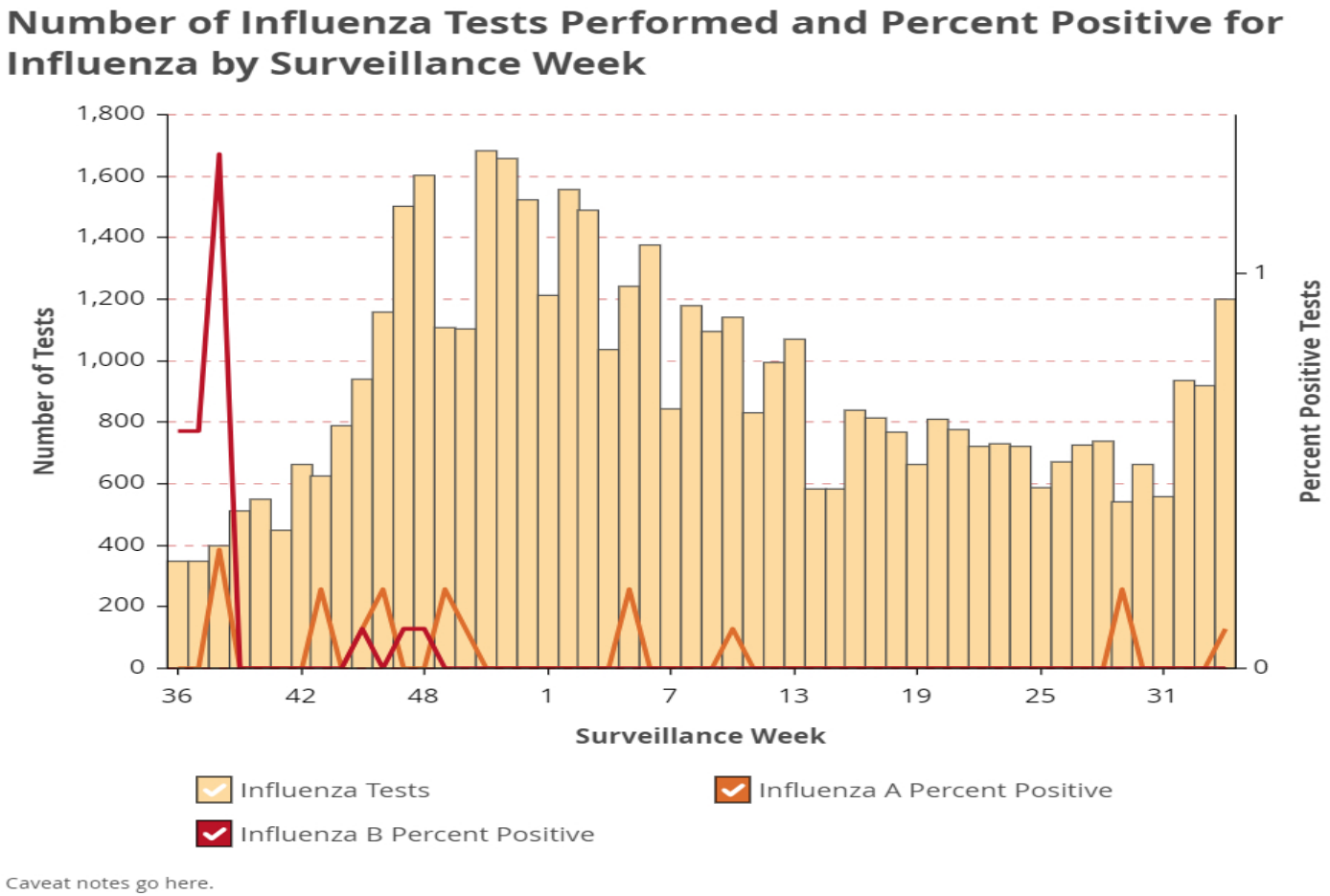
Polling Question #1

- How many laboratory confirmed cases of influenza were reported in the 2020-21 season in Ontario?

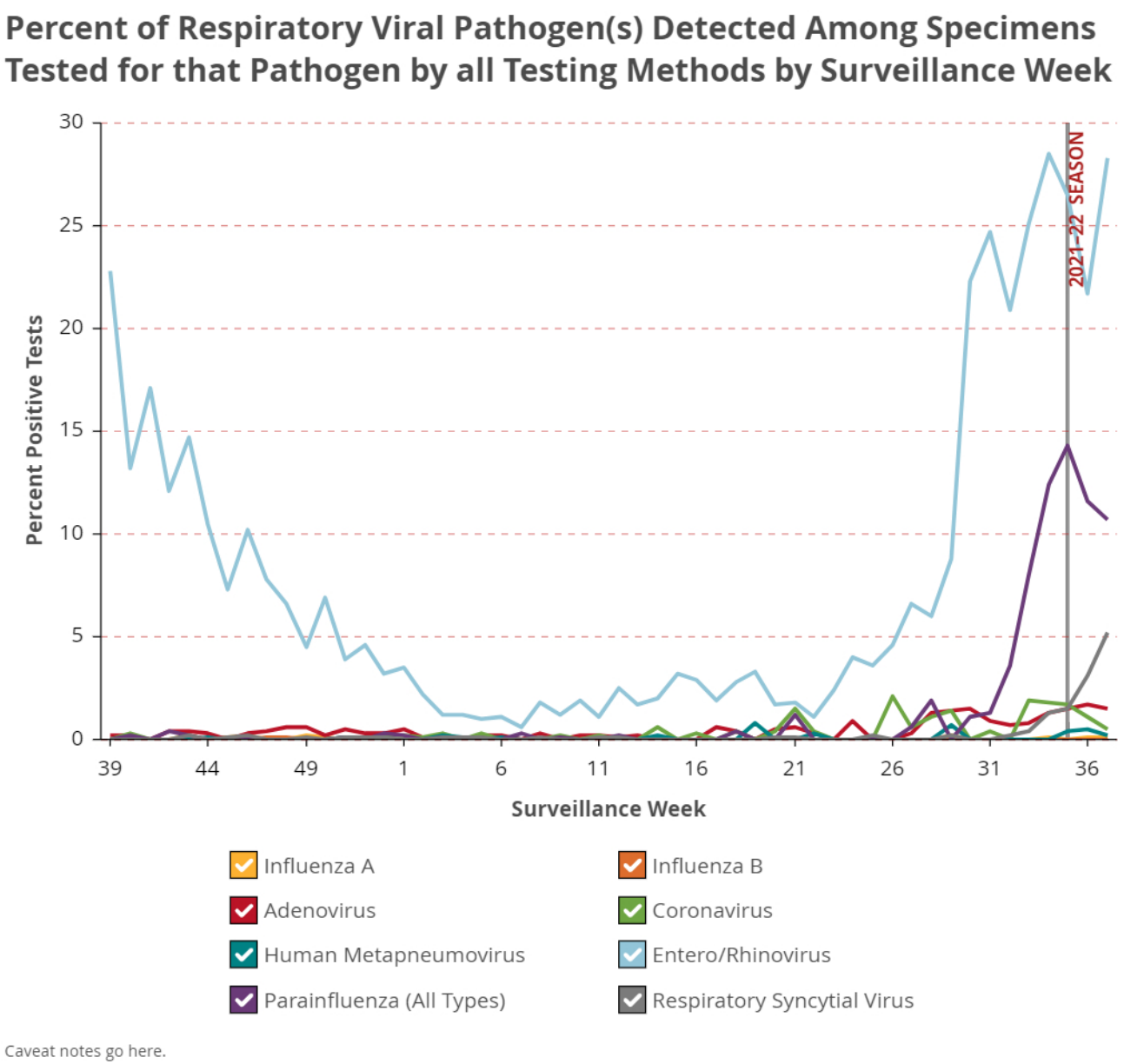
2020-21 Respiratory Virus “Season” Summary – Ontario and Canada



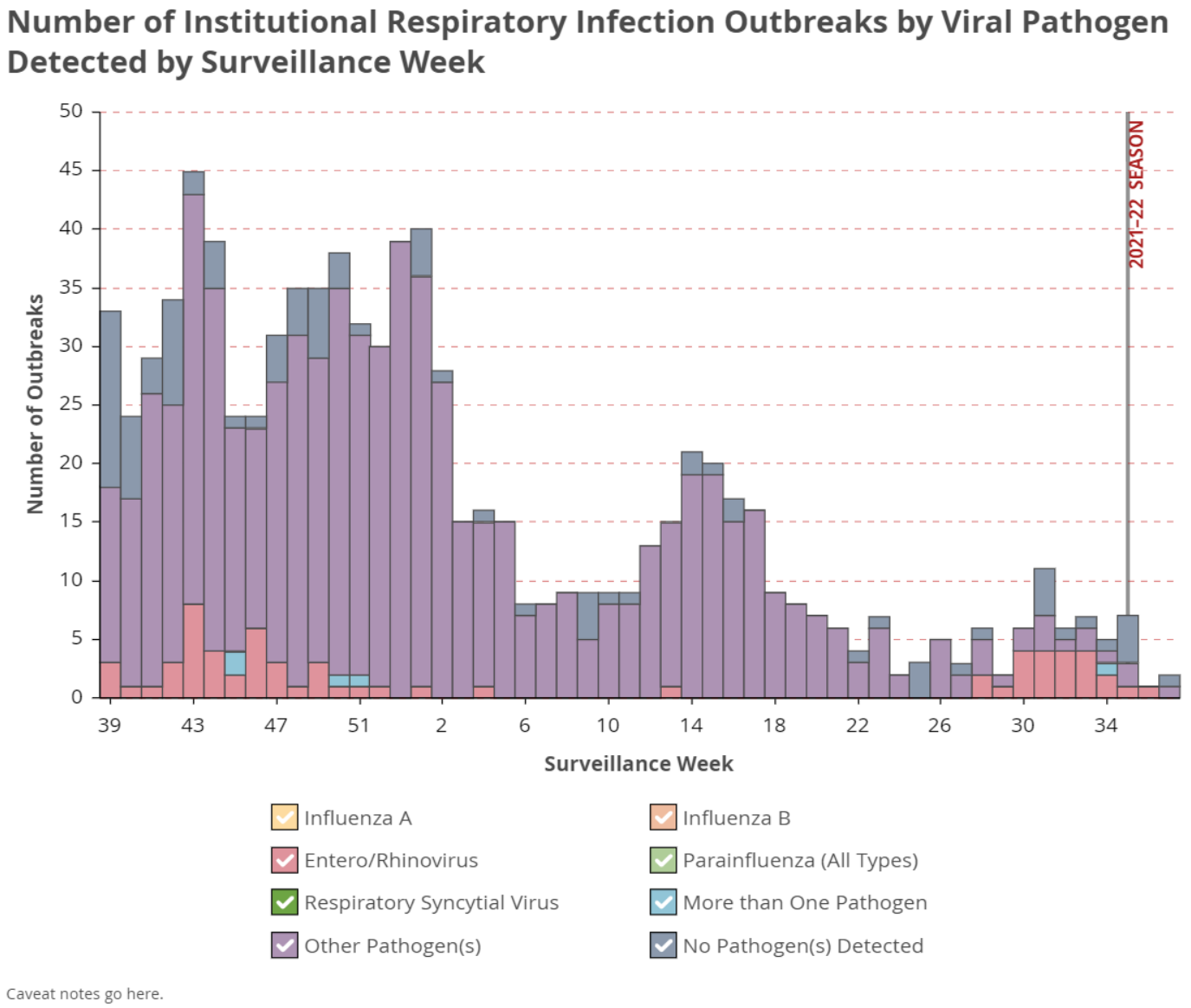
Influenza in Ontario 2020-21



Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario respiratory pathogen bulletin [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 15]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/respiratory-pathogens-weekly



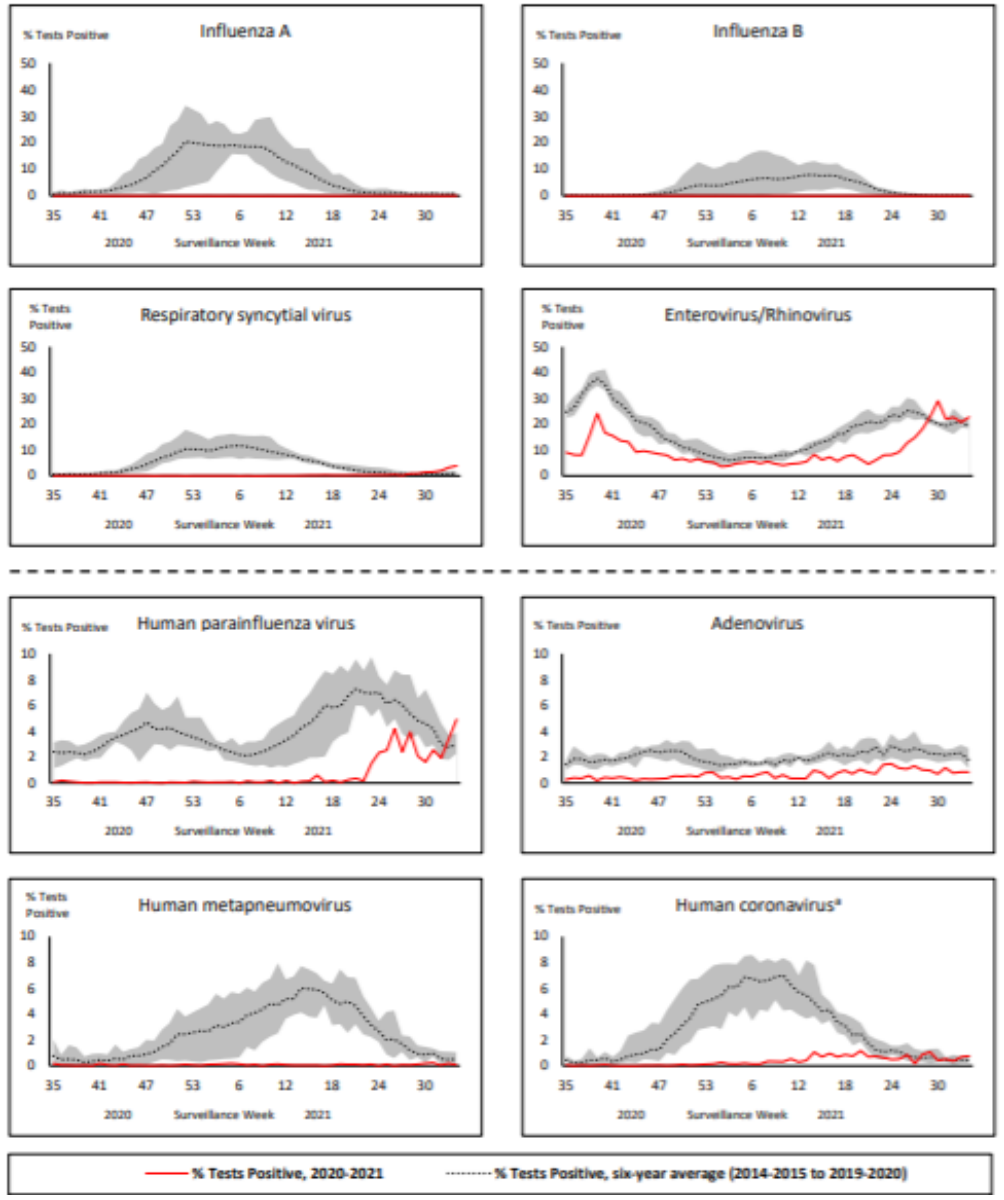
Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario respiratory pathogen bulletin [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 25]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/respiratory-pathogens-weekly



Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario respiratory pathogen bulletin [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 25]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/respiratory-pathogens-weekly

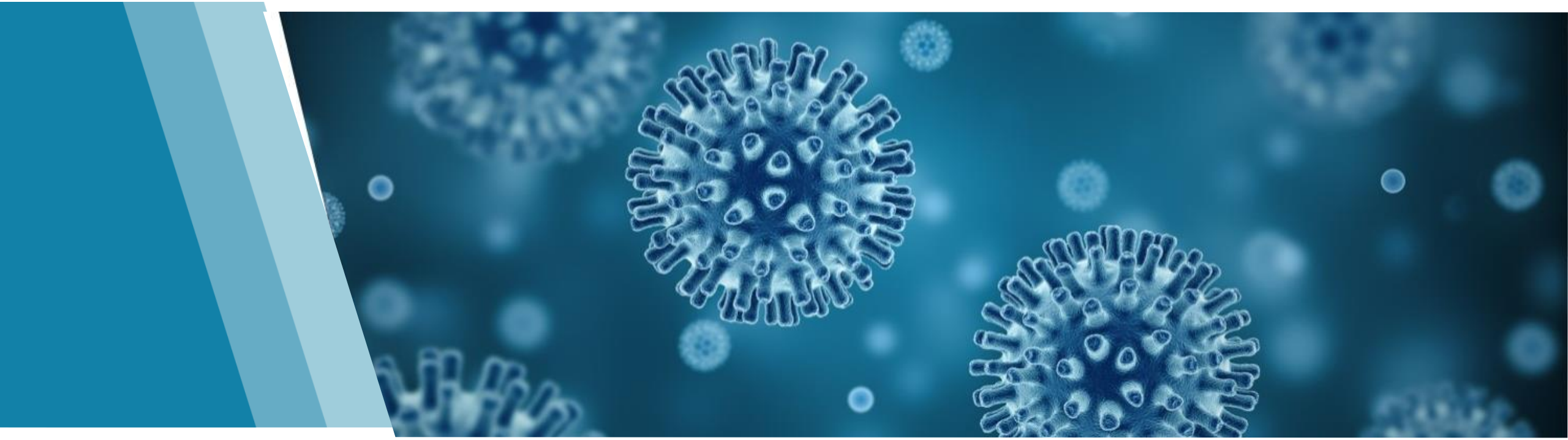
Canada – Low Circulating Virus Activity in 2020-21

Figure 1: Positive respiratory virus tests (%) reported by participating laboratories in Canada by surveillance week compared to average and range from 2014-2015 to 2019-2020 season

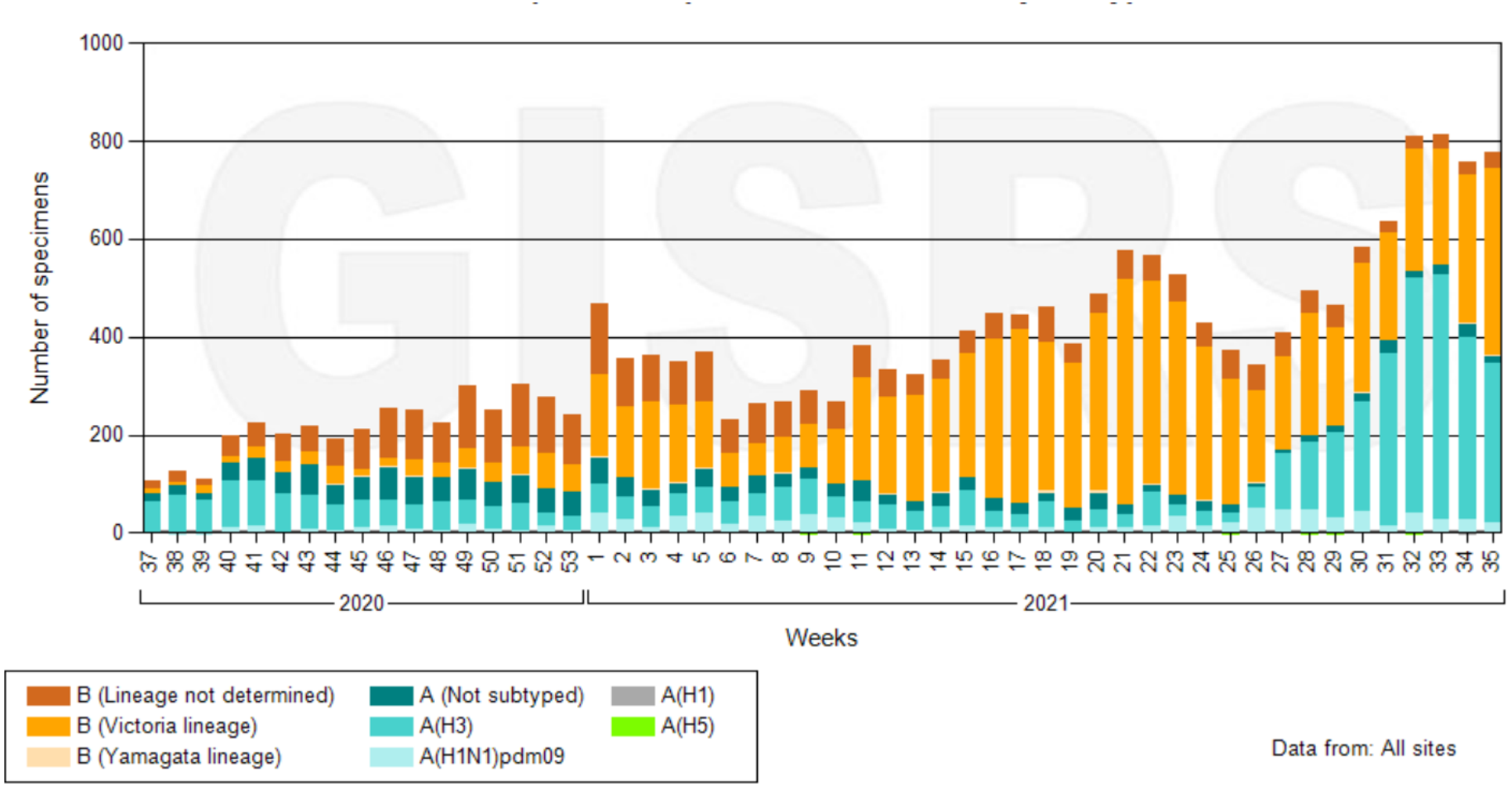


Source: Public Health Agency of Canada. Respiratory virus report, Week 34 – ending August 28, 2021 [Internet]. Ottawa, ON: Government of Canada; 2021 [cited 2021 Sep 11]. Reproduction is a copy of the version available from: https://www.canada.ca/content/dam/phac-aspc/documents/services/surveillance/respiratory-virus-detections-canada/2021-2022/week-34-ending-august-28-2021/rvdss-34-en.pdf. Used with permission available from: https://www.canada.ca/en/transparency/terms.html

Internationally – 2020-21 Respiratory Virus Activity

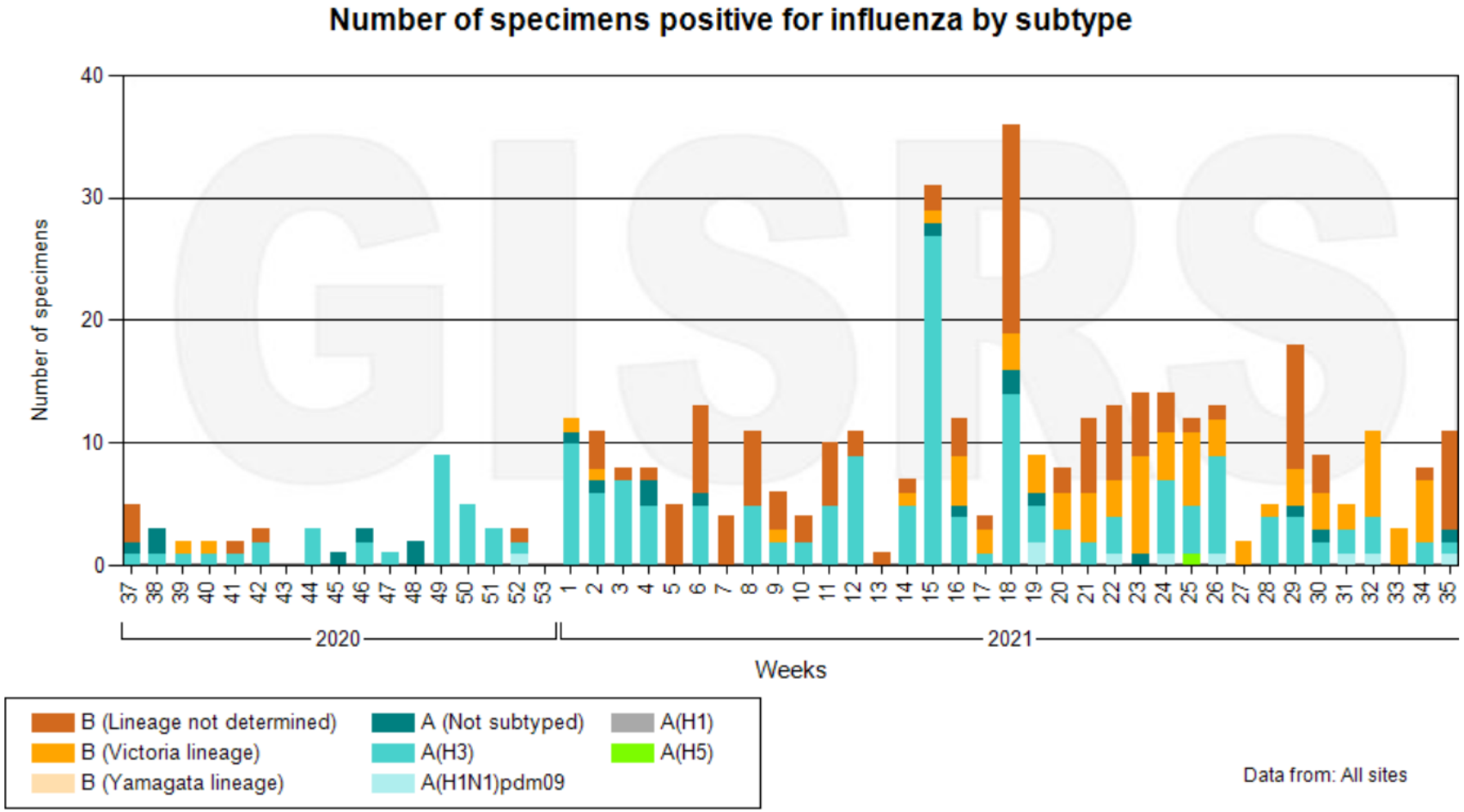


WHO Influenza Surveillance to September 11, 2021



Source: World Health Organization; Global Influenza Surveillance and Response System (GISRS). Number of specimens positive for influenza by subtype [Internet]. Geneva: World Health Organization; 2021 [cited 2021 Sep 11]. Available from: https://apps.who.int/flumart/Default?ReportNo=6

WHO Influenza Surveillance to September 11, 2021 – Southern Hemisphere Only



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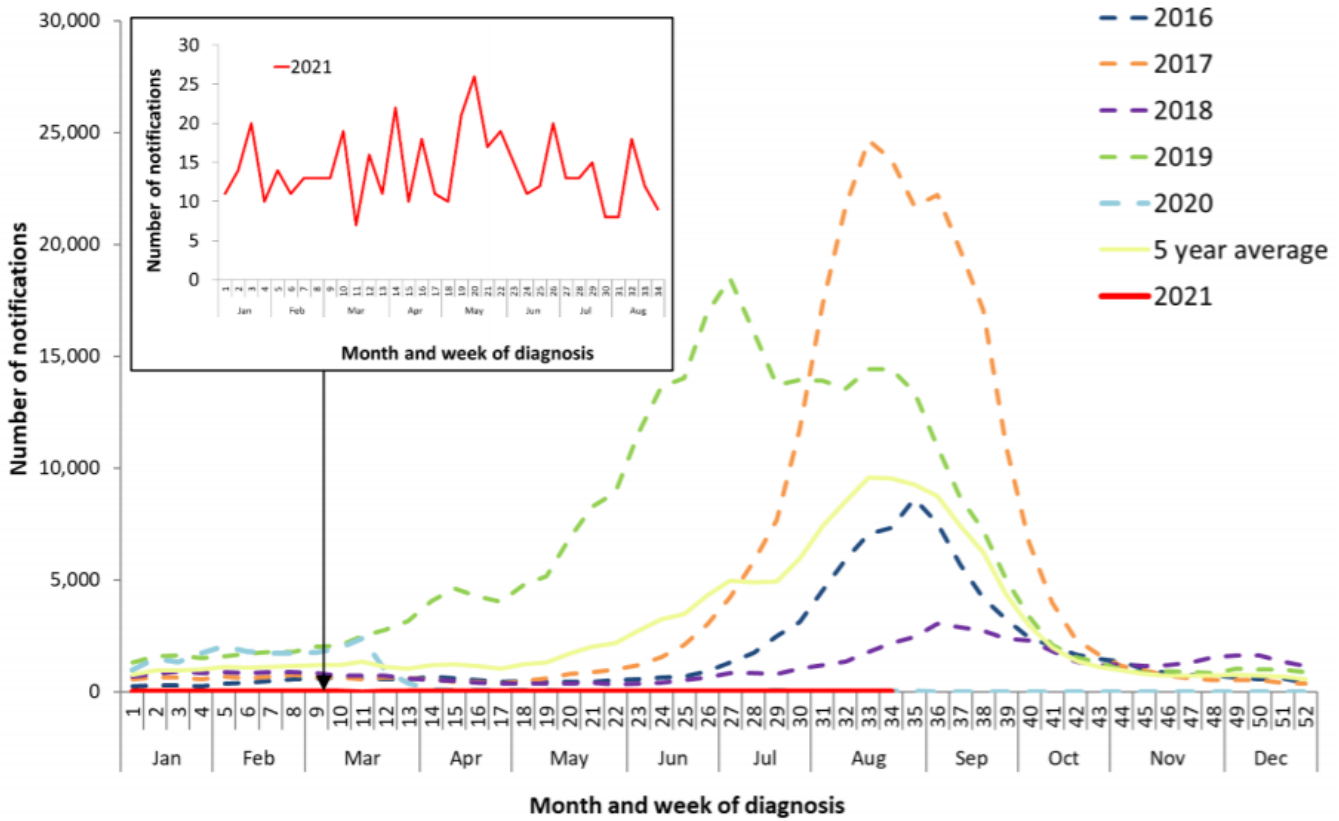
Australia Influenza Cases 2021 (Data to August 29, 2021)

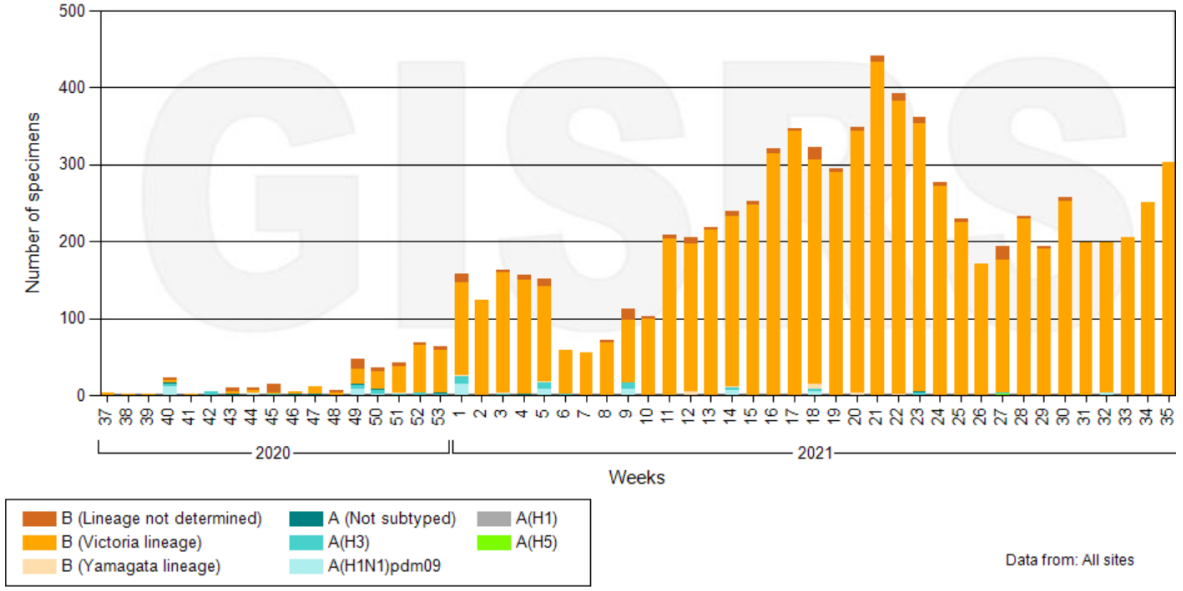
Figure 4. Notifications of laboratory-confirmed influenza, Australia, 01 January 2016 to 29 August 2021, by month and week of diagnosis*

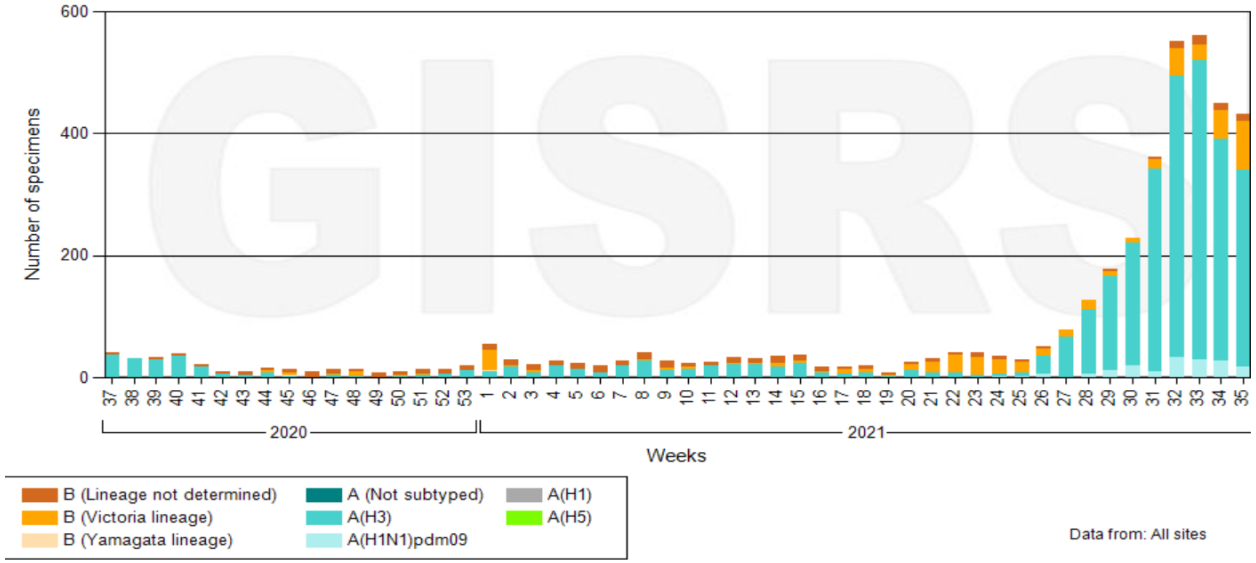


Source: NNDSS

Source: Australian Government. Department of Health. Australian influenza surveillance report: no. 11, 2021 [Internet]. Canberra: Commonwealth of Australia; 2021 [cited 2021 Sep 11]. Available from: https://www1.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ozflu-flucurr.htm/$File/flu-11-2021.pdf

Eastern Asia – Influenza B; Southern Asia – Influenza A(H3)





Source: World Health Organization; Global Influenza Surveillance and Response System (GISRS). Number of specimens positive for influenza by subtype [Internet]. Geneva: World Health Organization; 2021 [cited 2021 Sep 11]. Available from: https://apps.who.int/flumart/Default?ReportNo=6

Lack of Prior Season Information to Inform Coming Season

- Minimal influenza circulation globally to infer likely strains to be circulating in then 2021-22 season
- Insufficient influenza circulation to determine influenza vaccine effectiveness for the 2021-22 season

- Sporadic detections of travel and non-travel related influenza already occurring in Ontario, therefore influenza is likely to circulate to some degree in the 2021-22 season, and possibly have increased circulation compared to typical season.

Modelling Pre-print Studies Predict Larger Compensatory Season

- Lee et al modelled increase in influenza hospitalizations in 2021-22 with similar vaccine uptake and effectiveness.
  - A 50% increase in either uptake or effectiveness was necessary to avert the expected increase in hospitalizations.
- Krauland et al modelled 2021-22 influenza scenarios depending on cross-immunity from past infection and transmissibility of strains.
  - The most likely scenario predicted a modest increase in influenza cases over an average season.
  - Very young children may be especially at risk as they are unlikely to have had any exposure to infection.

Lee K, Jalal H, Raviotta JM, Krauland MG, Zimmerman RK, Burke DS, et al. Predicting the impact of low influenza activity in 2020 on population immunity and future influenza season in the United States. medRxiv 21262803 [Preprint]. 2021 Aug 30 [cited 2021 Sep 27]. Available from: https://doi.org/10.1101/2021.08.29.21262803

Krauland MG, Galloway DD, Raviotta JM, Zimmerman RK, Roberts MS. Agent-based investigation of the impact of low rates of influenza on next season influenza infections. medRxiv 21262185 [Preprint]. 2021 Aug 26 [cited 2021 Sep 27]. Available from: https://www.medrxiv.org/content/10.1101/2021.08.18.21262185v2

Inter-Seasonal Respiratory Syncytial Virus (RSV) Activity in 2020-21

- Australia – severe inter-seasonal RSV outbreak activity in late 2020/early 2021 in New South Wales region and Western Australia
- France – four month delay in RSV activity in 2020/21 season, and associated shift in birth cohort (by month of birth) with highest incidence
- United States – health advisory issued in June 2021 regarding increased inter-seasonal RSV activity

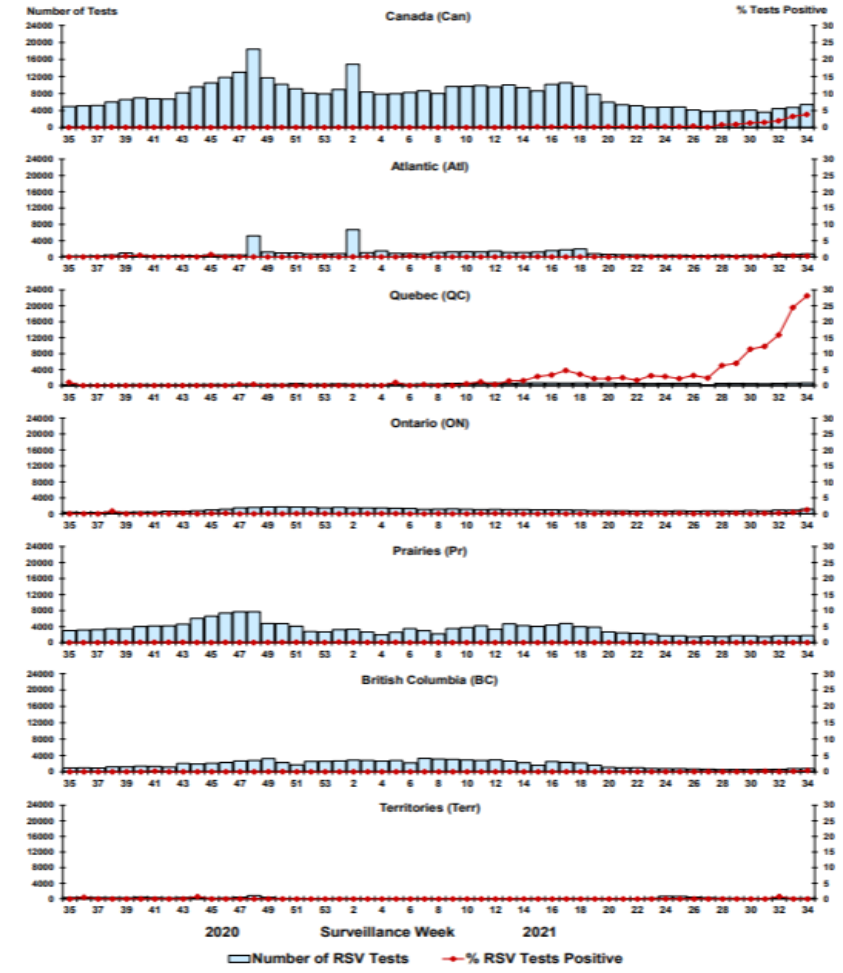
Eden J-S, Sikazwe C, Xie R, Deng Y-M, Sullivan SG, Michie A, et al. Off-season RSV epidemics in Australia after easing of COVID-19 restrictions. medRxiv 21260810 [Preprint]. 2021 Jul 24 [cited 2021 Sep 27]. Available from: https://doi.org/10.1101/2021.07.21.21260810

Centers for Disease Control and Prevention. Increased interseasonal Respiratory Syncytial Virus (RSV) activity in parts of the southern United States [Internet]. Atlanta, GA: CDC Health Alert Network, 2021 [modified 2021 Jun 10; cited 2021 Sep 27]. Available from: https://emergency.cdc.gov/han/2021/han00443.asp

Casalegno J-S, Javouhey E, Ploin D, Valette M, Fanget R, Couray Targe S, et al. Delayed start of the respiratory syncytial virus epidemic at the end of the 20/21 Northern hemisphere winter season, Lyon, France. medRxiv 21253446 [Preprint]. 2021 Mar 12 [cited 2021 Sep 27]. Available from: https://www.medrxiv.org/content/10.1101/2021.03.12.21253446v1. License: https://creativecommons.org/licenses/by-nd/4.0/legalcode

Locally in Canada – Increased Inter-Seasonal RSV in Quebec

Figure 4: Positive Respiratory syncytial virus (RSV) tests (%) in Canada by region by surveillance week



MONTREAL | News

Quebec kids' hospitals packed, not with COVID-19 but 'unprecedented' surge in other viruses

Selena Ross CTVNewsMontreal.ca Digital Reporter
@seleross | Contact

Published Friday, September 10, 2021 12:52PM EDT
Last Updated Saturday, September 11, 2021 9:40AM EDT

Source: Public Health Agency of Canada. Respiratory virus report, Week 34 – ending August 28, 2021 [Internet]. Ottawa, ON: Government of Canada; 2021 [cited 2021 Sep 11]. Reproduction is a copy of the version available from: https://www.canada.ca/content/dam/phac-aspc/documents/services/surveillance/respiratory-virus-detections-canada/2021-2022/week-34-ending-august-28-2021/rvdss-34-en.pdf. Used with permission available from: https://www.canada.ca/en/transparency/terms.html

Ross S. Quebec kids' hospitals packed, not with COVID-19 but 'unprecedented' surge in other viruses. CTV News [Internet], 2021 Sep 10 [cited 2021 Sep 27]; Montreal. Available from: https://montreal.ctvnews.ca/quebec-kids-hospitals-packed-not-with-covid-19-but-unprecedented-surge-in-other-viruses-1.5580417

Current Initial 2021-22 Respiratory Activity By Age – PHO Laboratory Report

Table 5. Current and cumulative number of specimens positive (and percent positivity) for seasonal respiratory viruses and SARS-CoV-2 detected by patient age group, PHO Laboratory, Week 37[25,26,27,28,29,30]

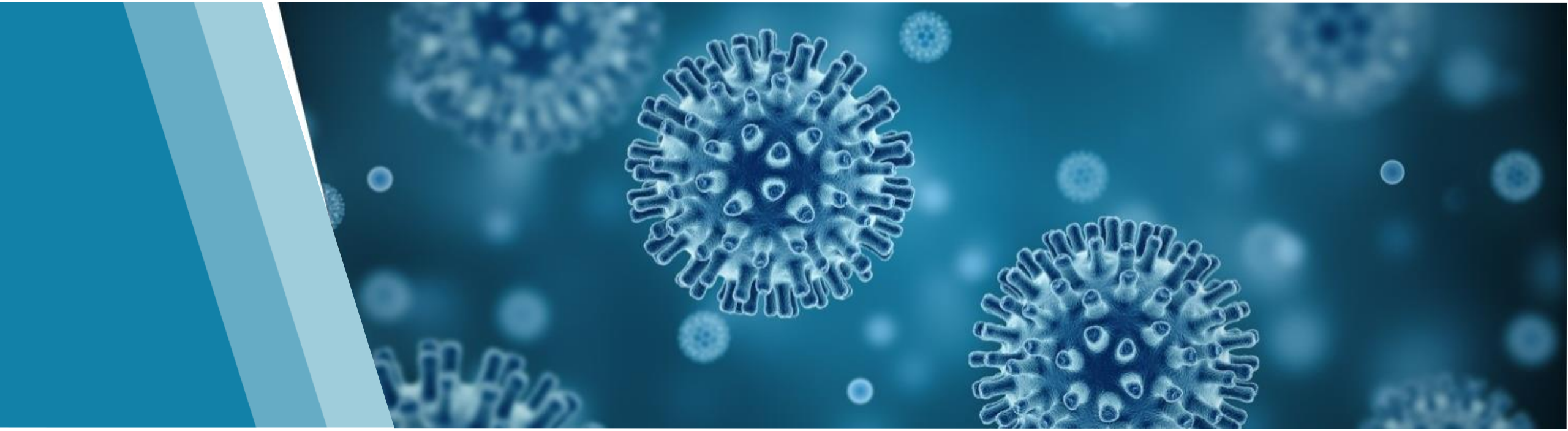
Weeks (2021-2022)	Curr. <1	Cum. <1	Curr. 1-4	Cum. 1-4	Curr. 5-19	Cum. 5-19	Curr. 20-64	Cum. 20-64	Curr. 65+	Cum. 65+	Curr. Unk	Cum. Unk
Flu A	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.2)	1 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
H3N2	0	0	0	0	1	1	0	0	0	0	0	0
H1N1 pdm09	0	0	0	0	0	0	0	0	0	0	0	0
Flu B	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
ADV	1 (2.0)	3 (1.9)	6 (3.2)	23 (4.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.7)	1 (0.3)	0 (0.0)	0 (0.0)
CV	0 (0.0)	2 (1.3)	2 (1.1)	10 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)
ERV	21 (41.2)	56 (36.4)	81 (42.6)	190 (38.1)	27 (32.5)	52 (28.4)	11 (12.2)	15 (7.3)	19 (13.9)	58 (15.9)	0 (0.0)	0 (0.0)
HMPV	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.4)	0 (0.0)	0 (0.0)	0 (0.0)	4 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
PIV	5 (9.8)	16 (10.4)	41 (21.6)	127 (25.5)	8 (9.6)	21 (11.5)	1 (1.1)	3 (1.5)	4 (2.9)	8 (2.2)	0 (0.0)	0 (0.0)
RSV	9 (17.6)	21 (13.6)	40 (21.1)	70 (14.0)	3 (3.6)	5 (2.7)	1 (1.1)	1 (0.5)	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)
SARS-CoV-2	3 (5.1)	9 (8.6)	27 (1.4)	42 (1.6)	132 (2.5)	339 (3.5)	346 (3.0)	1,062 (3.4)	62 (2.0)	159 (1.9)	0 (0.0)	0 (0.0)

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). PHO laboratory-based respiratory pathogen surveillance report: week 37 (September 12, 2021 to September 18, 2021) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/documents/surveillance-reports/respiratory/surveillance-report-respiratory-lab-wk37-2021.pdf?sc_lang=en

Anticipation for 2021-22 Season in Ontario

- Circulation of viruses other than SARS-CoV-2 already occurring and expected to continue
- Continuation of some public health measures for COVID-19 (e.g., masking, distancing) may reduce impact from other respiratory viruses
  - But to a lesser extent than in the 2020-21 season given reopening measures
- Reduced population immunity from lack of exposure over 2020-21 may increase circulation/severity in 2021-22
  - Impacts for susceptibility to influenza in young children
  - High need for influenza vaccination in young children
  - Impacts for acute care capacity planning and timing of palivizumab for RSV in high-risk infants

Influenza Vaccines for 2021-22



Influenza Vaccine Composition for Northern Hemisphere

2020-21 Northern Hemisphere Egg-based vaccines	2020-21 Northern Hemisphere Cell- based vaccines	2021-22 Northern Hemisphere Egg-based vaccines	2021-22 Northern Hemisphere Cell- based vaccines
A/Guangdong-Maonan/SWL1536/2019 (H1N1)pdm09-like virus	A/Hawaii/70/2019 (H1N1)pdm09-like virus	A/Victoria/2570/2019 (H1N1)pdm09-like virus	A/Wisconsin/588/2019 (H1N1)pdm09-like virus
A/Hong Kong/2671/2019 (H3N2)-like virus	A/Hong Kong/45/2019 (H3N2)-like virus	A/Cambodia/e0826360/2020 (H3N2)-like virus	A/Cambodia/e0826360/2020 (H3N2)-like virus
B/Washington/02/2019 (B/Victoria lineage)-like virus	B/Washington/02/2019 (B/Victoria lineage)-like virus	B/Washington/02/2019 (B/Victoria lineage)-like virus	B/Washington/02/2019 (B/Victoria lineage)-like virus
B/Phuket/3073/2013 (B/Yamagata lineage)-like virus	B/Phuket/3073/2013 (B/Yamagata lineage)-like virus	B/Phuket/3073/2013 (B/Yamagata lineage)-like virus	B/Phuket/3073/2013 (B/Yamagata lineage)-like virus

Adapted from: World Health Organization. Influenza laboratory surveillance information by the Global Influenza Surveillance and Response System (GISRS) [Internet]. Geneva: World Health Organization; 2021 [cited 2021 Sep 18]. Available from: https://www.who.int/influenza/vaccines/virus/recommendations/en/

Recommended UIIP Vaccines for 2021-22

Age	Type of Product	Product Name
6 months up to 1 year	Standard-dose quadrivalent (QIV)	FluLaval Tetra Fluzone® Quadrivalent
2 years to 4 years	Standard-dose quadrivalent (QIV)	FluLaval Tetra Fluzone® Quadrivalent Flucelvax® Quad
5 years to 64 years	Standard-dose quadrivalent (QIV)	FluLaval Tetra Fluzone® Quadrivalent Flucelvax® Quad Afluria® Tetra
65 years and over	High-dose quadrivalent (HD-QIV) Adjuvanted trivalent (TIVadj) Standard-dose quadrivalent (QIV)	Fluzone® High-Dose Quadrivalent Fluad ® Any of the four standard-dose QIV

Mammalian Cell-Culture Based Vaccine

- First non-egg based vaccine available in Canada
  - Authorized in November 2019
- Made in Madin-Darby canine kidney (MDCK) cells
- Cell-culture vaccine available in Europe since 2007 and the United States since 2012
- Quadrivalent product authorized in Canada
- New for 2021-22:
  - approved age range to include 2 to 8 years old

Public Health Agency of Canada; National Advisory Committee on Immunization (NACI). Supplemental statement – mammalian cell culture-based influenza vaccines: an Advisory Committee Statement (ACS). Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Health; 2020. Available from: https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/mammalian-cell-culture-based-influenza-vaccines.html

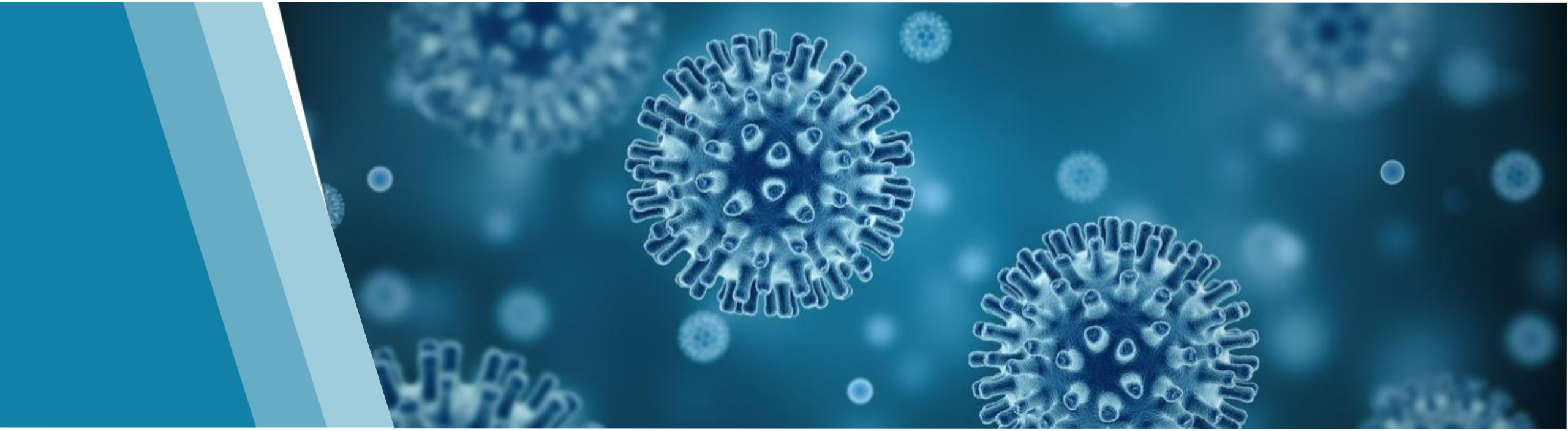
Seqirus Canada Inc. Product monograph: FLUCELVAX® Quad [Internet]. Kirkland, QC: Seqirus Canada Inc., 2019 [revised 2021 Mar 08; cited 2021 Sep 27]. Available from: https://www.seqirus.ca/-/media/seqirus-canada/docs-en/flucelvax-quad-ca-pm-2-approved-8mar2021.pdf

Benefits and Use of Cell-Culture Based Vaccines

- Does not promote egg adaptive mutations
- Similar immunogenicity, effectiveness and safety profile to egg-based vaccines
- Standard-dose quadrivalent available for those 2 years of age and over
- No concern about use in people with dog allergies
- Can be given to pregnant women
- Egg allergy not a contraindication to any influenza vaccine
  - Egg allergic people can receive egg-based or cell-culture based vaccines

Public Health Agency of Canada; National Advisory Committee on Immunization (NACI). Supplemental statement – mammalian cell culture-based influenza vaccines: an Advisory Committee Statement (ACS). Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Health; 2020. Available from: https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/mammalian-cell-culture-based-influenza-vaccines.html

Vaccines for Adults 65 Years of Age and Older



Vaccine for Adults 65 Years of Age and Older

- **High-dose quadrivalent** influenza vaccine
  - 2 A (H3N2 and H1N1) and 2 B (Victoria and Yamagata lineages)
  - 60 micrograms of hemagglutinin per strain
- **Adjuvanted trivalent** influenza vaccine
  - 2 A (H3N2 and H1N1) and 1 B (Victoria)
  - Adjuvant: MF59C.1
- **Standard-dose quadrivalent** influenza vaccines
  - 2 A (H3N2 and H1N1) and 2 B strains (Victoria and Yamagata lineage)
  - 15 micrograms of hemagglutinin per strain

National Advisory Committee on Immunizations (NACI) 2021-22 Recommendations

- **High-dose QIV should be used over standard-dose QIV**
  - Based on the burden of influenza A (H3N2) disease and the good evidence of better protection compared to standard-dose QIV in adults 65 years of age and older

- *Insufficient comparative evidence* on efficacy, effectiveness and immunogencity of adjuvanted TIV with standard-dose TIV to draw a conclusion

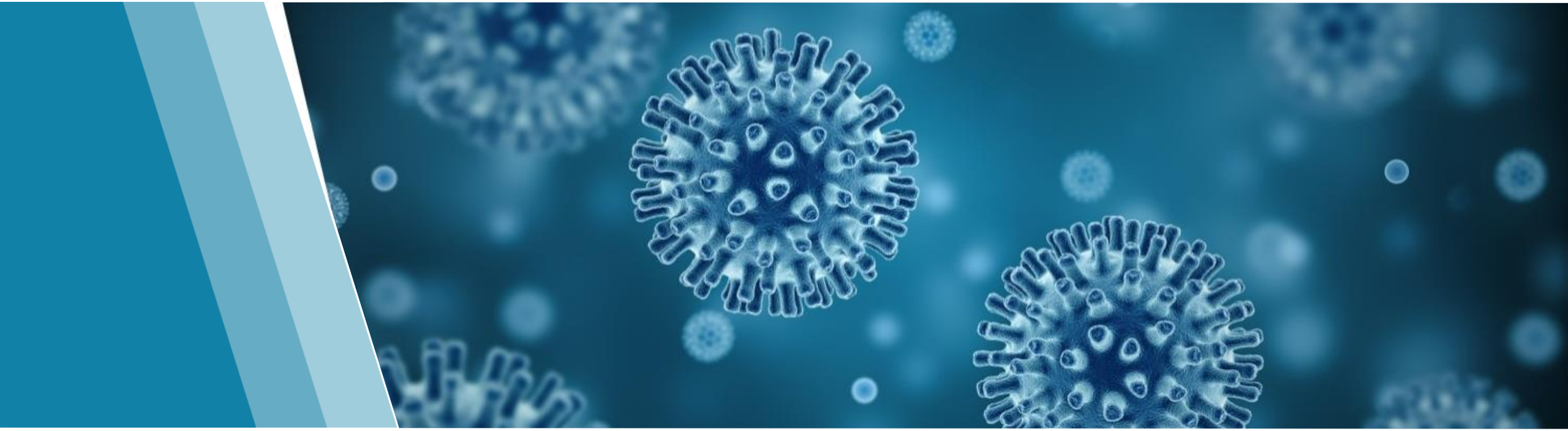
- In the absence of a specific product, any of the available age appropriate influenza vaccines should be used

Public Health Agency of Canada; National Advisory Committee on Immunization (NACI). Canadian immunization guide chapter on influenza and statement on seasonal influenza vaccine for 2021–2022: an Advisory Committee Statement (ACS). Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Health; 2021. Available from: https://www.canada.ca/en/public-health/services/publications/vaccines-immunization/canadian-immunization-guide-statement-seasonal-influenza-vaccine-2021-2022.html

Very Important to be Vaccinated this Season

- Individual protection against influenza
  - Lack of natural immunity with >1.5 years since influenza circulation
- Decreased burden on health care system
  - Anticipation of fourth wave system pressures, and impacts from other circulating respiratory viruses
- Decreased illness that can be confused with COVID-19 and need for testing
- Decreased chance of co-infection in individuals (influenza and COVID-19) and outbreaks with more than one virus
- And don’t forget your COVID-19 vaccine!

Influenza Antiviral Medications



Antiviral Medications

- Neuraminidase inhibitors
- Blocks exit of the virus from respiratory cells
- Prevents further replication of the virus
- Used for treatment and in outbreaks, also for prevention
- Use as soon as possible
  - Do not wait for laboratory confirmation when influenza is circulating

Antiviral Medications Used in Canada

Product	Administration	Use	Age
Oseltamivir	Orally	Treatment and prevention	All ages (case-by-case basis in infants)
Zanamivir	Inhalation	Treatment and prevention	7 years and over
Peramivir	Intravenous	Treatment	18 years of age and over

Indication for Treating Influenza

1. Is influenza circulating in your community?
2. Does your patient have symptoms compatible with influenza?
3. Is your patient at high risk for the complications of influenza?

OR

Does your patient have moderate, progressive, severe or complicated influenza, such as individuals who are hospitalized with influenza?

Indication for Treating Influenza

1. Is influenza circulating in your community?
2. Does your patient have symptoms compatible with influenza?

More challenging to assess if influenza and SARS-CoV-2 will be co-circulating, and similarity of symptom presentation

3. Is your patient at high risk for the complications of influenza?

OR

Does your patient have moderate, progressive, severe or complicated influenza, such as individuals who are hospitalized with influenza?

Surveillance for Influenza by Local Public Health Unit

Table 7. Current (and cumulative) number of specimens submitted and results for influenza testing by Public Health Unit, PHO Laboratory, Week 37 [38,39,40,41]

Health Unit and Region[42]	Specimens submitted	Specimens tested	Flu A positive specimens	% positivity Flu A	Flu H1N1pdm09	Flu H3N2	Flu B positive specimens	% positivity Flu B
NWR	1 (2)	1 (1)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
THB	2 (6)	1 (6)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
Total North West	3 (8)	2 (7)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
ALG	1 (5)	0 (2)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
NPS	5 (10)	4 (8)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
PQP	4 (13)	7 (14)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
SUD	13 (26)	15 (28)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
TSK	0 (0)	0 (0)	0 (0)	NA (NA)	0 (0)	0 (0)	0 (0)	NA (NA)
Total North East	23 (54)	26 (52)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
OTT	328 (662)	220 (613)	1 (1)	0.5 (0.2)	0 (0)	1 (1)	0 (0)	0.0 (0.0)
EOH	23 (48)	14 (41)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)
HPE	2 (7)	2 (4)	0 (0)	0.0 (0.0)	0 (0)	0 (0)	0 (0)	0.0 (0.0)

Weekly updates on influenza positivity

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). PHO laboratory-based respiratory pathogen surveillance report: week 37 (September 12, 2021 to September 18, 2021) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/documents/surveillance-reports/respiratory/surveillance-report-respiratory-lab-wk37-2021.pdf?sc_lang=en

Surveillance for Respiratory Viruses by Setting

Table 6. Current and cumulative number of specimens positive (and percent positivity) for seasonal respiratory viruses and SARS-CoV-2 by patient setting, PHO Laboratory, Week 37[31,32,33,34,35,36,37]

Weeks (2021-2022)	Curr. ICU	Cum. ICU	Curr. Hospital (Non-ICU)	Cum. Hospital (Non-ICU)	Curr. ER	Cum. ER	Curr. Ambulatory /No setting reported	Cum. Ambulatory /No setting reported	Curr. Institution	Cum. Institution
Flu A	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.4)	1 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
H3N2	0	0	0	0	1	1	0	0	0	0
H1N1 pdm09	0	0	0	0	0	0	0	0	0	0
Flu B	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
ADV	0 (0.0)	0 (0.0)	1 (1.0)	2 (0.9)	5 (2.1)	22 (3.3)	2 (1.8)	3 (1.2)	0 (0.0)	0 (0.0)
CV	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.5)	2 (0.8)	11 (1.6)	0 (0.0)	1 (0.4)	0 (0.0)	0 (0.0)
ERV	0 (0.0)	0 (0.0)	16 (16.7)	36 (16.2)	96 (39.8)	245 (36.6)	24 (21.4)	34 (14.2)	23 (24.7)	56 (23.2)
HMPV	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (0.3)	0 (0.0)	3 (1.3)	0 (0.0)	1 (0.4)
PIV	0 (0.0)	0 (0.0)	11 (11.6)	23 (10.4)	33 (13.7)	123 (18.4)	11 (9.8)	21 (8.8)	4 (4.3)	8 (3.3)
RSV	0 (0.0)	0 (0.0)	2 (2.1)	3 (1.4)	43 (17.8)	85 (12.7)	8 (7.1)	10 (4.2)	0 (0.0)	0 (0.0)
SARS-CoV-2	1 (5.9)	7 (17.5)	1 (0.7)	9 (1.9)	34 (4.1)	70 (3.9)	495 (2.9)	1,422 (3.4)	39 (1.1)	125 (1.4)

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). PHO laboratory-based respiratory pathogen surveillance report: week 37 (September 12, 2021 to September 18, 2021) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/documents/surveillance-reports/respiratory/surveillance-report-respiratory-lab-wk37-2021.pdf?sc_lang=en

Those at High-risk for Influenza Complications

- Adults 65 years of age and over
- Pregnant women and women up to four weeks post-partum
- Those with underlying medical conditions
- Long term care home residents

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Antiviral medications for seasonal influenza: information for health care providers, 2019 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/Q/2019/qa-antiviral-medication-influenza.pdf?la=en

Antiviral Medication Treatment and Prophylaxis Resources

- **Antiviral Medication for Seasonal Influenza: Information for Health Care providers, 2019**
  - Detailed information on the use of influenza antiviral medication for treatment and prevention, including a review of the evidence.
- **Influenza Antiviral Treatment**
  - Information on treatment of influenza-like illness with antiviral medications.
- **Antiviral Medication Use During an Influenza Outbreak: Congregate Living Settings**
  - Information for administrator and staff members of congregate living settings when influenza antiviral medications are being used in an influenza outbreak.

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Antiviral medications for seasonal influenza: information for health care providers, 2019 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/-/media/documents/q/2019/qa-antiviral-medication-influenza.pdf?la=en

Resources on Preparing for Respiratory Virus Season

- **Influenza Vaccines for the 2021-2022 influenza season**
  - Overview of the publicly-funded influenza vaccines that are available in Ontario as part of the **Universal Influenza Immunization Program** (UIIP) for the 2021–2022 influenza season. Additional information on influenza vaccines is available on **the Ministry of Health website.**
- Resources for Congregate Living Settings and Long Term Care Homes
  - Planning for Respiratory Virus Outbreaks in Congregate Living Settings
  - Comparing Key Features of Influenza, SARS-CoV-2, and Other Common Respiratory Viruses

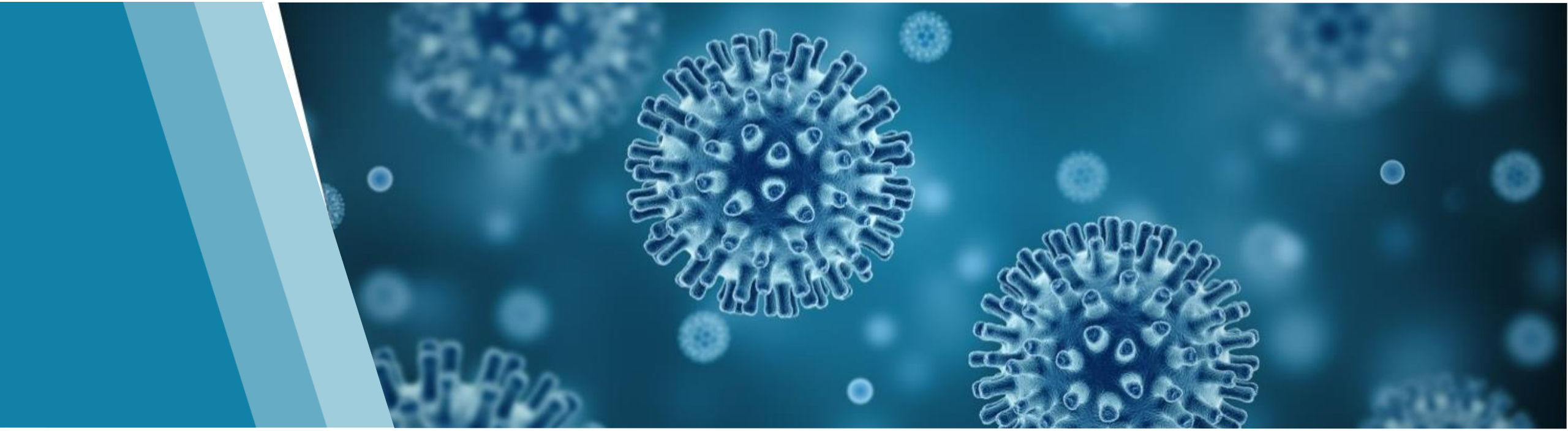
Ontario. Ministry of Health; Ontario. Ministry of Long-Term Care. 2021/2022 Universal Influenza Immunization Program (UIIP) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2008 [modified 2021 Sep 21; cited 2021 Sep 27]. Available from: https://www.health.gov.on.ca/en/pro/programs/publichealth/flu/uiip/default.aspx

Ontario. Ministry of Health; Ontario. Ministry of Long-Term Care. Immunization: fact sheets and patient tools [Internet]. Toronto, ON: Queen's Printer for Ontario; 2008 [modified 2020 Sep 01; cited 2021 Sep 27]. Available from: https://www.health.gov.on.ca/en/pro/programs/immunization/resources.aspx

Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 resources for congregate living settings [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/diseases-and-conditions/infectious-diseases/respiratory-diseases/novel-coronavirus/congregate-living-settings-resources

Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 long-term care resources [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/diseases-and-conditions/infectious-diseases/respiratory-diseases/novel-coronavirus/long-term-care-resources

Influenza and Respiratory Virus Testing 2021-22



Polling Question #2

- Which two non-SARS-CoV-2 respiratory viruses have been most commonly observed in Ontario during August and September this year?

Respiratory Virus Tests in use at PHO Laboratory

- SARS-CoV-2 PCR
- FLUVID detects: influenza A, influenza B, SARS-CoV-2 (COVID-19), and respiratory syncytial virus (RSV A + B).
- MRVP detects: influenza A, influenza A H3 subtype, influenza A H1 (pdm09) subtype, influenza B, respiratory syncytial virus (RSV A/B), parainfluenza (1 – 4), adenovirus, rhinovirus, seasonal human coronavirus (OC43, 229E, NL63, HKU1), rhinovirus and human metapneumovirus.
- **Note:** The MRVP assay detects the different RSV, parainfluenza and seasonal human coronaviruses named above but does not differentiate between them. It does not detect or cross-react with SARS-CoV-2.

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Respiratory viruses (including influenza) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 23; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/laboratory-services/test-information-index/virus-respiratory

Recent Testing Changes at PHO Laboratory - Since July 26, 2021

- **Changes to eligibility of multiplex respiratory virus PCR (MRVP) testing for children <18 years old seen in the Emergency Department**
  - To support enhanced respiratory virus surveillance, MRVP testing is available for symptomatic children (<18 years) seen in the Emergency Department (ED).
    - This testing, which is generally not required for clinical purposes, will be re-evaluated in fall/winter 2021.

- **Reinstitution of MRVP for hospitalized patients, outbreak-associated patients, and patients in institutions not in outbreak with acute respiratory illness (ARI).**

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Respiratory viruses (including influenza) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 23; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/laboratory-services/test-information-index/virus-respiratory

Respiratory Virus Testing Available at PHO Laboratory: Symptomatic Patients

Table 1a: Eligibility criteria for respiratory virus testing available at PHO Laboratory for symptomatic (ARI) patients by patient setting and outbreak status

Patient Setting	Testing Available By Request
Hospitalized (all inpatients)	SARS-CoV-2 and MRVP OR FLUVID followed by MRVP (Both combinations will provide testing for the same viruses)
Remote communities	SARS-CoV-2 and MRVP OR FLUVID followed by MRVP

- FLUVID detects: influenza A, influenza B, SARS-CoV-2 (COVID-19), and respiratory syncytial virus (RSV A + B).
- MRVP detects: influenza A, influenza A H3 subtype, influenza A H1 (pdm09) subtype, influenza B, respiratory syncytial virus (RSV A/B), parainfluenza (1 – 4), adenovirus, enterovirus, seasonal human coronavirus (OC43, 229E, NL63, HKU1), rhinovirus and human metapneumovirus.

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Respiratory viruses (including influenza) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 23; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/laboratory-services/test-information-index/virus-respiratory

Respiratory Virus Testing Available at PHO Laboratory: Symptomatic Patients

Table 1a: Eligibility criteria for respiratory virus testing available at PHO Laboratory for symptomatic (ARI) patients by patient setting and outbreak status

Patient Setting	Testing Available By Request
Institutional and other public health unit declared respiratory infection outbreaks (including school outbreaks)	Up to 4 outbreak specimens: Influenza rapid testing (will be done if PCR testing is delayed >24 hours) SARS-CoV-2 and MRVP OR FLUVID followed by MRVP Additional specimens will be tested for SARS-CoV-2 only.
Institutions (non-outbreak) (e.g. long-term care homes, correctional facilities, congregate living settings)	SARS-CoV-2 and MRVP OR FLUVID followed by MRVP

- FLUVID detects: influenza A, influenza B, SARS-CoV-2 (COVID-19), and respiratory syncytial virus (RSV A + B).
- MRVP detects: influenza A, influenza A H3 subtype, influenza A H1 (pdm09) subtype, influenza B, respiratory syncytial virus (RSV A/B), parainfluenza (1 – 4), adenovirus, enterovirus, seasonal human coronavirus (OC43, 229E, NL63, HKU1), rhinovirus and human metapneumovirus.

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Respiratory viruses (including influenza) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 23; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/laboratory-services/test-information-index/virus-respiratory

Respiratory Virus Testing Available at PHO Laboratory: Asymptomatic Patients

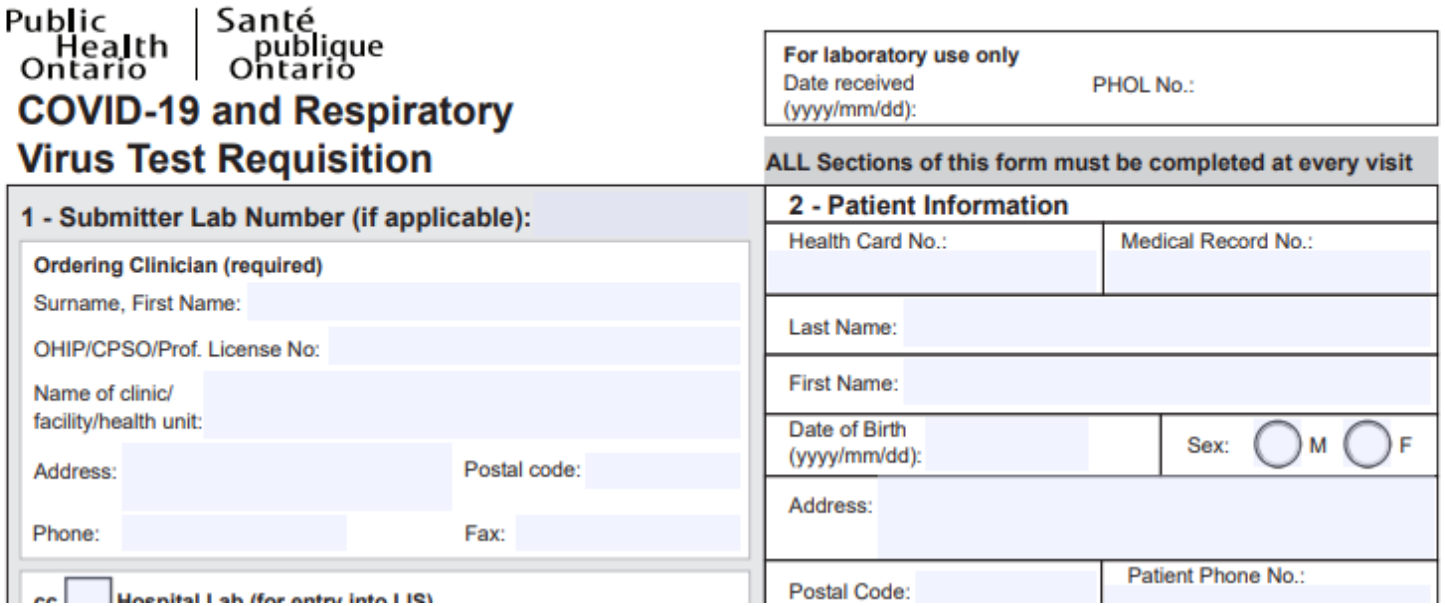
Table 1b: Eligibility criteria for respiratory virus testing available at PHO Laboratory for asymptomatic patients

Asymptomatic patients	Testing
All patient settings	SARS-CoV-2

Only SARS-CoV-2 testing will be performed on asymptomatic patients, regardless of patient setting

- The specific test being requested AND patient setting must also appear on the requisition to help with appropriate test assignment and triaging of specimens.
- If patient setting is not provided, the specimen will only be tested for SARS-CoV-2. For outbreaks or investigations, the requisition must include the assigned outbreak or investigation number.

Some Key Points to Ensure Appropriate Test Assignment:



Public Health Ontario | Santé publique Ontario

COVID-19 and Respiratory Virus Test Requisition

For laboratory use only
Date received (yyyy/mm/dd):
PHOL No.:

ALL Sections of this form must be completed at every visit

1 - Submitter Lab Number (if applicable):

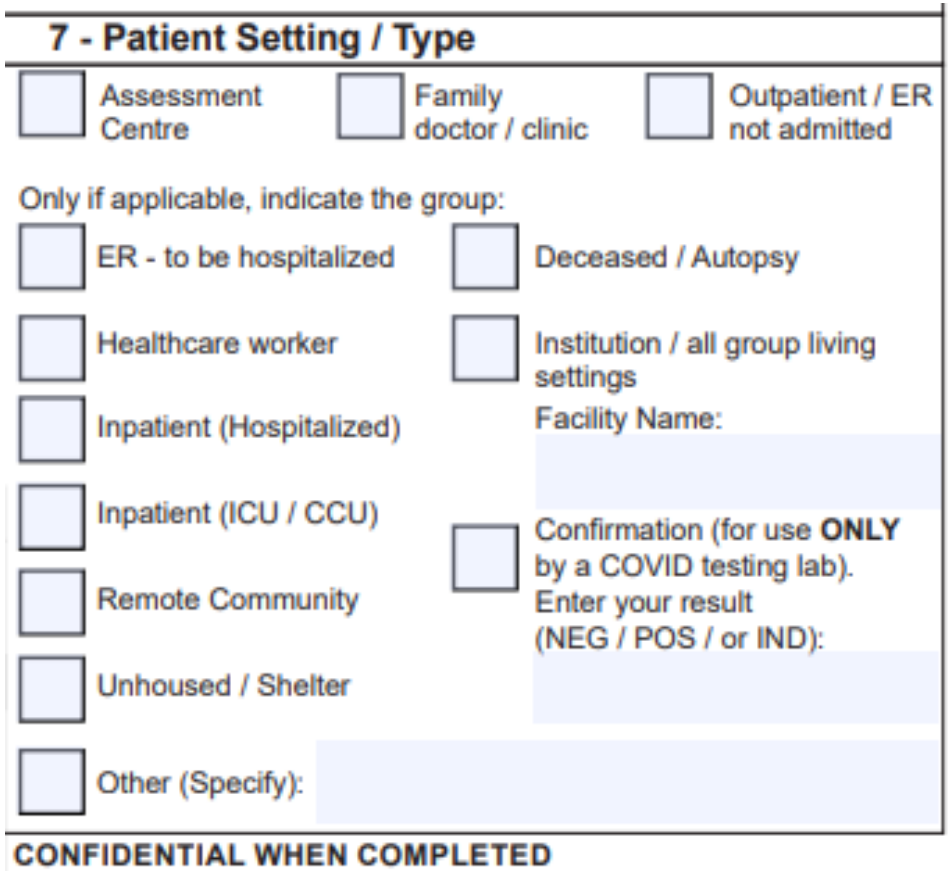
Ordering Clinician (required)
Surname, First Name:
OHIP/CPSO/Prof. License No:
Name of clinic/ facility/health unit:
Address:
Postal code:
Phone:
Fax:

2 - Patient Information
Health Card No.:
Medical Record No.:
Last Name:
First Name:
Date of Birth (yyyy/mm/dd):
Sex: M F
Address:
Postal Code:
Patient Phone No.:

The COVID-19 and Respiratory Virus Test Requisition is preferred over the General Test Requisition

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 virus test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/2019-ncov-test-requisition.pdf?la=en

Some Key Points to Ensure Appropriate Test Assignment Continued:



7 - Patient Setting / Type

- ☐ Assessment Centre
- ☐ Family doctor / clinic
- ☐ Outpatient / ER not admitted

Only if applicable, indicate the group:

- ☐ ER - to be hospitalized
- ☐ Deceased / Autopsy
- ☐ Healthcare worker
- ☐ Institution / all group living settings
- ☐ Inpatient (Hospitalized)

Facility Name:

- ☐ Inpatient (ICU / CCU)
- ☐ Confirmation (for use **ONLY** by a COVID testing lab). Enter your result (NEG / POS / or IND):
- ☐ Remote Community
- ☐ Unhoused / Shelter
- ☐ Other (Specify):

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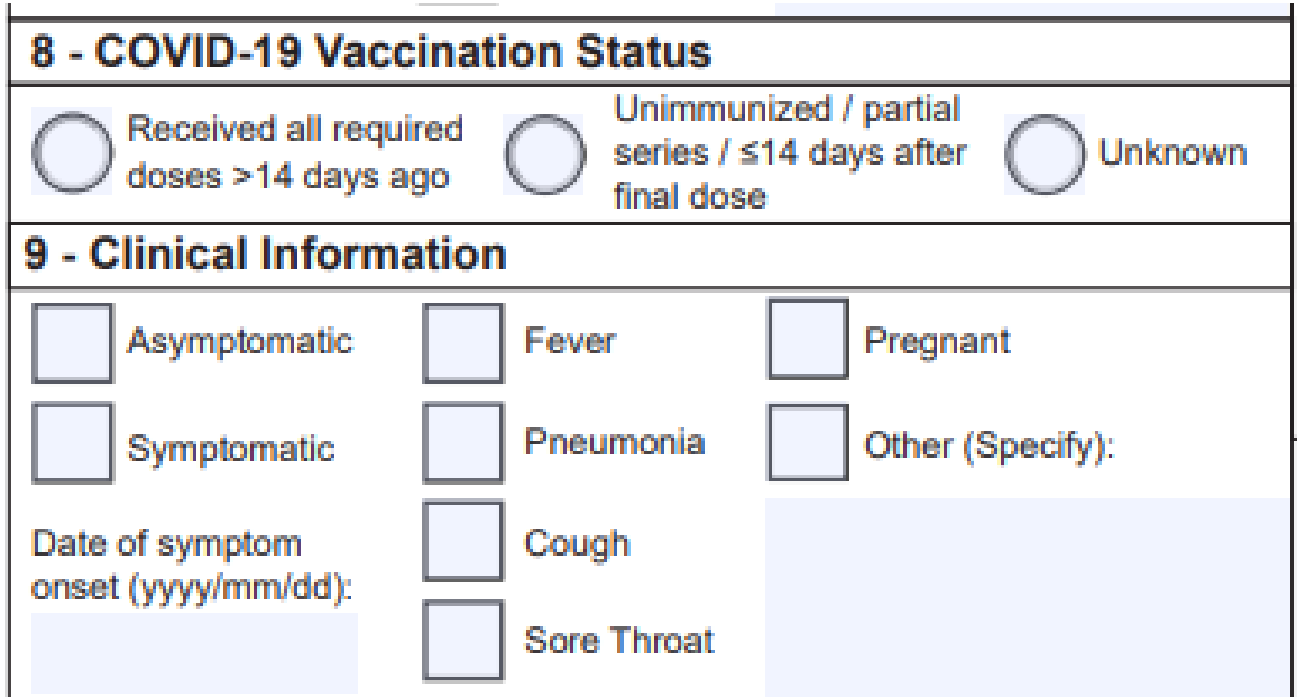
Patient setting must be indicated to help with appropriate test assignment and triaging of specimens. If patient setting is not provided, the specimen will only be tested for SARS-CoV-2.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 virus test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/2019-ncov-test-requisition.pdf?la=en

Some Key Points to Ensure Appropriate Test Assignment Continued 2:



8 - COVID-19 Vaccination Status

- ○ Received all required doses >14 days ago
- ○ Unimmunized / partial series / ≤14 days after final dose
- ○ Unknown

9 - Clinical Information

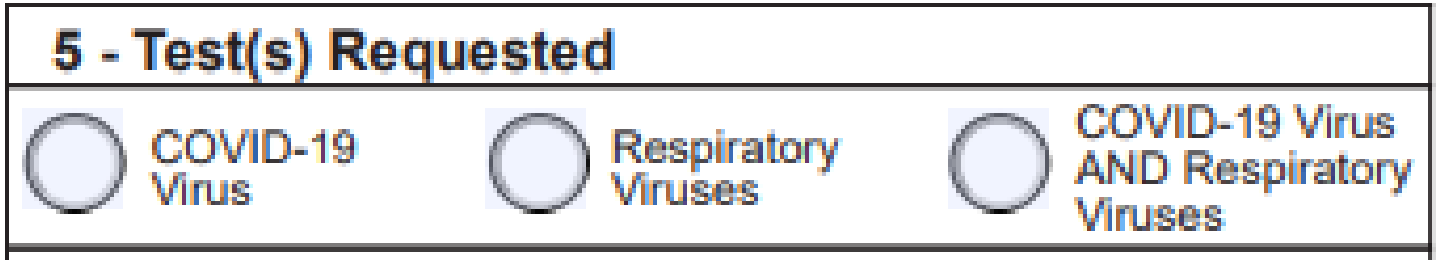
- ☐ Asymptomatic
- ☐ Symptomatic
- ☐ Fever
- ☐ Pneumonia
- ☐ Cough
- ☐ Sore Throat
- ☐ Pregnant
- ☐ Other (Specify):

Date of symptom onset (yyyy/mm/dd):

- Clinical information (in particular symptom status) must be provided.
  - Asymptomatic patients will only be tested with SARS-CoV-2 PCR.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 virus test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/2019-ncov-test-requisition.pdf?la=en

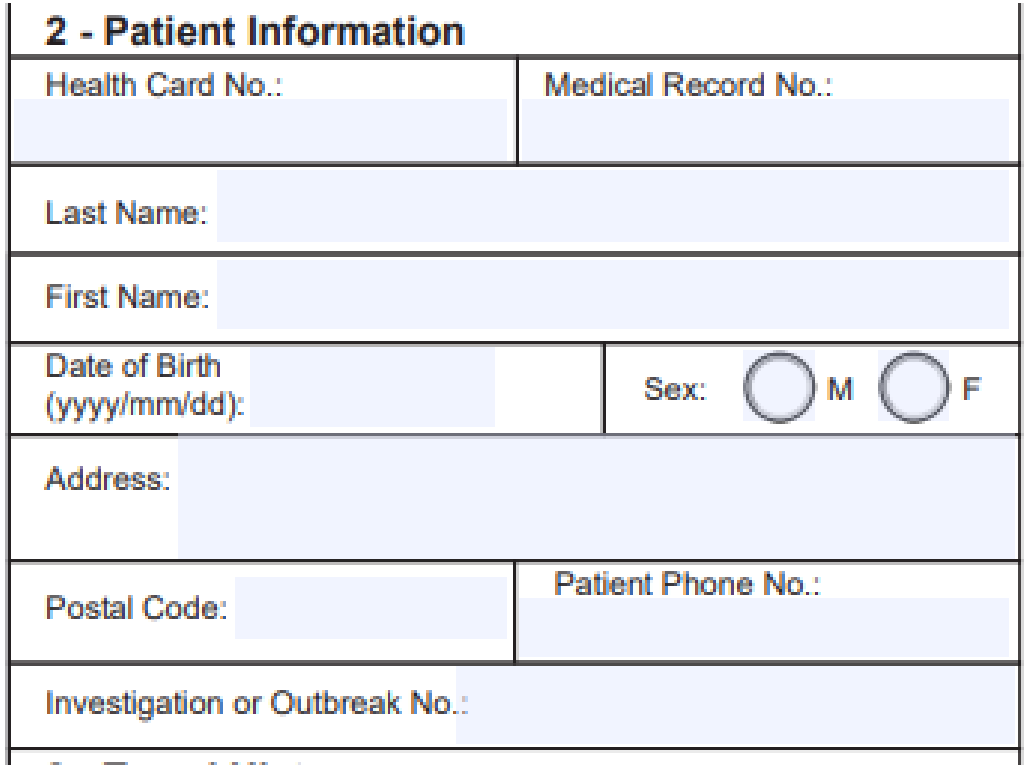
Some Key Points to Ensure Appropriate Test Assignment continued 3:



- Order the individual tests required on the patient.
- Saliva can be submitted for stand alone SARS-CoV-2 PCR testing, but is not suitable for any other respiratory virus test panels (i.e. MRVP or FLUVID).

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 virus test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/2019-ncov-test-requisition.pdf?la=en

Some Key Points to Ensure Appropriate Test Assignment Continued 4:



2 - Patient Information

Health Card No.:	Medical Record No.:
Last Name:	
First Name:	
Date of Birth (yyyy/mm/dd):	Sex: M F
Address:	
Postal Code:	Patient Phone No.:
Investigation or Outbreak No.:	

For outbreaks or investigations, the requisition must include the assigned outbreak or investigational number.

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 virus test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2020 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/2019-ncov-test-requisition.pdf?la=en

Testing Outside the Standard PHO Laboratory Algorithm

- PHO Laboratory can be consulted if considering additional testing, e.g. additional MRVP beyond the first 4 specimens on symptomatic patients in an outbreak.
- Use the General Test Requisition if only ordering non-COVID/seasonal respiratory virus tests
- For requests for additional testing in outbreak settings, contact PHO Laboratory's Customer Service Centre at 416-235-6556 or 1-877-604-4567 (toll-free).

Ontario Agency for Health Protection and Promotion (Public Health Ontario). General test requisition [Internet]. Toronto, ON: Queen's Printer for Ontario; 2019 [cited 2021 Sep 09]. Available from: https://www.publichealthontario.ca/-/media/documents/lab/general-test-requisition.pdf?la=en

For More Details see PHO Laboratory's Respiratory Viruses Test Information Sheet

Respiratory Viruses (including influenza)

Testing Indications	Specimen Collection and Handling	Requisitions and Kit Ordering
Test Frequency and Turnaround Time (TAT)	Reporting	Test Methods
Labstracts	Data and Analysis	Additional Information

Testing Indications

Public Health Ontario (PHO) Laboratory utilizes a testing algorithm for influenza and other respiratory viruses.

On July 26, 2021, PHO Laboratory implemented changes to eligibility of multiplex respiratory virus PCR (MRVP) testing for children <18 years old seen in the Emergency Department, hospitalized patients, outbreak-associated patients, and patients in institutions not in outbreak with acute respiratory illness (ARI).

Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). Respiratory viruses (including influenza) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 23; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/laboratory-services/test-information-index/virus-respiratory

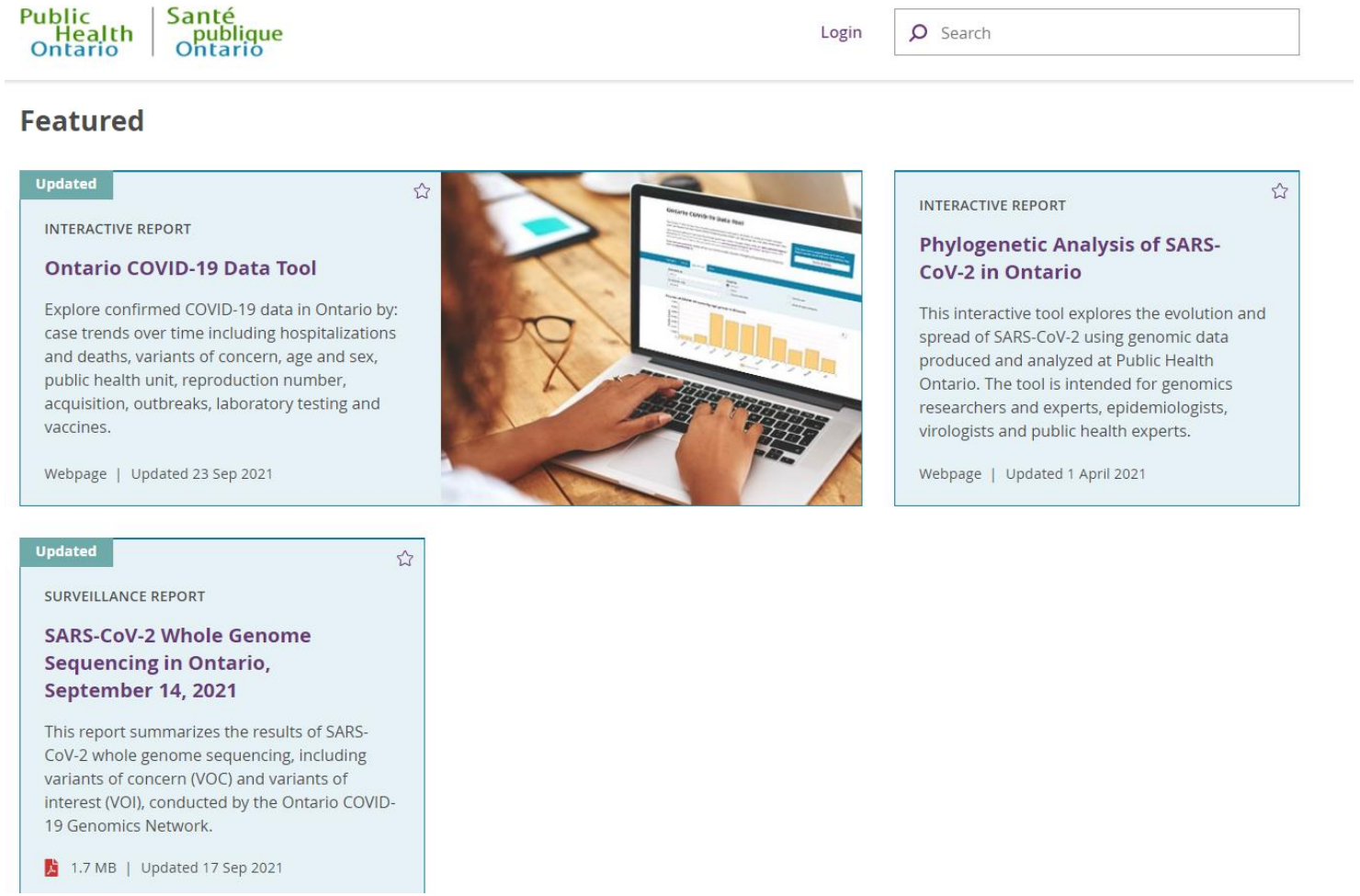
Keep on Top of What Viruses are Circulating

- Health care providers are reminded to regularly review PHO's Ontario Respiratory Pathogen Bulletin (ORPB). The ORPB is updated weekly and provides an overview of influenza and other respiratory viruses.
- Data on influenza positivity is also presented at the local public health unit level to provide jurisdiction-specific information.
- Laboratory-Based Respiratory Pathogen Surveillance Report summarizes all respiratory pathogen testing done at PHO Laboratory

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario respiratory pathogen bulletin [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jun 30; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/respiratory-pathogens-weekly

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Laboratory respiratory pathogen surveillance reports [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 May 29; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/laboratory-respiratory-pathogen-surveillance

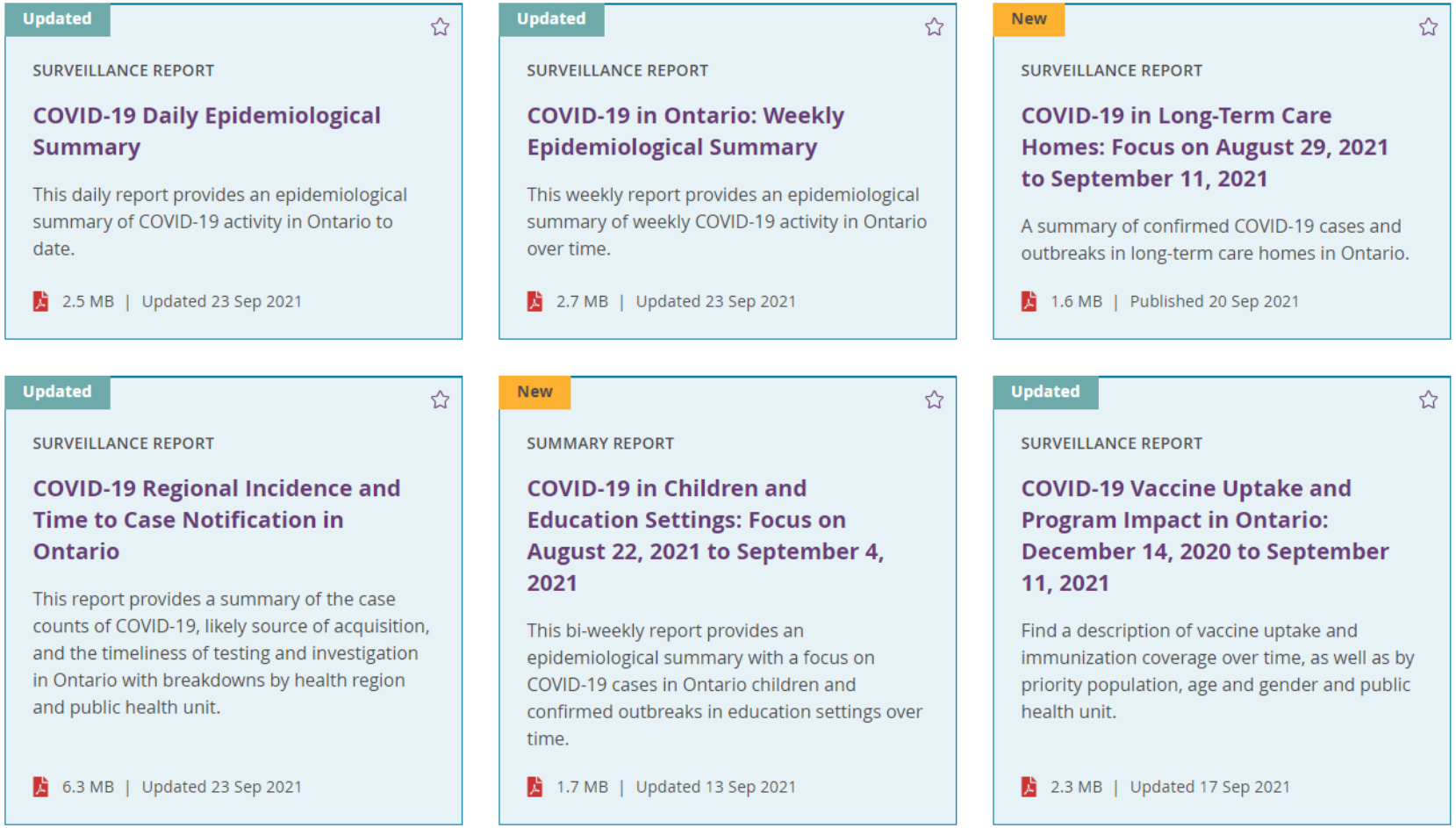
COVID-19 Ontario Data



Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 data and surveillance [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Sep 26; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/covid-19-data-surveillance

COVID-19 Ontario Data

Routine Surveillance Reports



Source: Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 data and surveillance [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Sep 26; cited 2021 Sep 27]. Available from: https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/covid-19-data-surveillance

PHO Continues to Provide Testing For:

- Novel Influenzas
- Antiviral resistance in influenza
- Middle East Respiratory Syndrome Coronavirus (MERS-CoV)
- Enterovirus D68

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- Michael Whelan
- Andrea Saunders
- Christina Renda
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