Using administrative data to support Ontario's COVID-19 response

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PopData BC – ICES Webinar March 23, 2022



Objectives

- To provide an overview of the ICES reports and analytics generated to support public health decision-making during the COVID-19 pandemic, and the data sources and novel analytic methods we used
- 2. To describe the role of these reports and analytics in helping shape COVID-19 testing and vaccination policy and practice in Ontario
- 3. To summarize how ICES adapted its practices to respond to the urgent need for information and share some of the challenges and lessons learned



About ICES

ICES is a not-for-profit research institute encompassing a community of research, data and clinical experts, and a secure and accessible array of Ontario's health-related data

Our mission is translating data into trusted evidence that makes policy and health care better and people healthier.



Our values

- We strive for excellence demonstrated by the quality, innovation and rigour of our work.
- We behave with integrity expressed through independence, transparency and impartiality.
- Our work is relevant by providing actionable and timely analyses that lead to improved health equity, outcomes and value and are responsive to health priorities.
- We collaborate through effective partnerships, accessible data and a spirit of openness.
- We are respectful exemplified by inclusiveness and appreciation of each other, trust data stewardship, meaningful public engagement and alignment with Ontarians' values and accountability for our funding.

About ICES

Our researchers use a VaSt and Secure array of data to produce evidence that improves health and health service delivery :

18 billion records for over 20 million Ontarians

(that's all health card holders past & present)

that means 500 billion data points

soon expected to grow to over 1 trillion



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ICES in Numbers: 2020/21



38%



5572 scienti and sta 277 scientists (5% INCREASE FROM 2019/20)

295 staff (5% INCREASE FROM 2019/20)

43% of scientists work from sites other than ICES Central

697

graduate, medical and post-graduate trainees mentored by ICES scientists

other than ICES Central

774

of research staff work from sites

graduate students accessing ICES data sites across Ontario



B research programs

108

data holdings

298 new data sharing agreements and amendments

primary data collection studies involving 15 hospitals

37% overall grant success rate on

252 grant submissions

44% of grant submissions were on COVID-19-related topics

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ICES' Applied Health Research Question (AHRQ) Program

"An AHRQ is a question posed by a health system policy maker or provider in order to obtain research evidence to inform planning, policy and program development that will benefit the entire Ontario health system."

- Ontario Ministry of Health (MoH)
- ICES commits to undertaking an agreed number of AHRQs funded by an annual grant from the MoH
- ICES well positioned to respond to AHRQs that directly involve ICES data holdings and expertise
- 29 COVID-19-related AHRQs undertaken to date



Overview of Primary COVID-19 AHRQ

Knowledge Users:

- Ontario Ministry of Health
- Ontario Health
- Public Health Ontario
- Public Health Units

Initial Objectives:

- Identify the sociodemographic and clinical characteristics of COVID-19 test recipients (vs non-recipients), cases (vs noncases) and whether these vary geographically
- Identify risk factors for COVID-19 infection and severity
- Describe short-term health outcomes of COVID-19 infection
- Describe above for those who reside in long-term care facilities and other high-risk congregate settings (vs not)



Early Data Challenges

- Ontario's health system faced unprecedented challenges with urgent need to understand the virus' impact
 - Which groups are at greatest risk?
- Historical data on hospitalizations and ICU admissions needed:
 - To estimate hospital surge capacity
 - To model impact of public health interventions, scenarios for health care resources
- Timely data and rapid analyses needed, but...
 - SARS-CoV-2 testing data were de-centralized
 - Historical annual, quarterly feeds of key administrative data sources were too infrequent for near real-time analysis
 - Important data sources missing from ICES repository



ICES' Response to Challenges

- Worked with existing data providers to receive more frequent feeds of routinely available datasets
 - E.g., CIHI DAD, NACRS received monthly instead of quarterly
- Modified internal workflows to perform data cleaning, standardization and quality assessments more frequently
 - E.g., Vital statistics dataset updated monthly instead of bi-monthly
- Established new agreements to receive new data holdings critical to COVID-19 reporting
 - E.g., SARS-CoV-2 testing, Public Health case management, COVID-19 vaccination



Overview of COVID-19-related Data Sources

Ontario Laboratories Information System (OLIS)

- Beginning April 2020 ICES received daily extracts of SARS-CoV-2 test results from Ontario Health
 - After 1st wave, frequency reduced to weekly
 - Initially cumulative, later 'delta' files
- ICES previously received a quarterly feed of other laboratory test results (e.g., HbA1C, lipids, etc)
 - Developed expertise in working with its complex data structure
 - Frequency, volume, and text-based format of SARS-CoV-2 results created new challenges



Ontario Laboratories Information System (OLIS)

- Developed Python code to parse SARS-CoV-2 lab results
 - Work to clean results on respiratory viruses (e.g., influenza) in OLIS was already underway
 - Adapted code for SARS-CoV-2
 - Converted text-based source data to more analytical-friendly format
- Collaborated with teams from Ministry of Health, Digital Services at Ontario Health and subject matter experts (e.g., microbiologists, infectious disease specialists)
- Validated code by comparing aggregate daily number of confirmed SARS-CoV-2 cases derived using OLIS vs. number of daily cases reported by the province (which uses CCM – described below)

Ontario Laboratories Information System (OLIS)

- 1st SARS-CoV-2 dataset received April 7, 2020; Python code published under open-source license April 15, 2020
 - <u>https://github.com/icescentral/COVID19-Lab-Results</u>
 - Adoption of code by Ministry of Health and Ontario Health enabled consistent interpretation of SARS-CoV-2 results and uniform reporting of COVID-19 metrics

Input string: COVID-19 Virus Detection:\.br\COVID-19 virus RdRp gene: Not detected\.br\COVID-19 virus Envelope gene: Not detected\.br\COVID-19 virus Nucleocapsid gene: Detected\.br\Interpretation:\.br\[COVID-19] virus DETECTED by real-time PCR based on ...

Cleaned string: covid 19 virus detection covid 19 virus rdrp gene not detected covid 19 virus envelope gene not detected covid 19 virus nucleocapsid gene detected interpretation covid 19 virus detected by real time pcr based on ...

Tokens with labels: ['v_covid', 'connecting', 'v_unk', None, 'v_covid', 'connecting', 'v_unk', None, 't_pcr', 'r_neg', 'r_pos', 'v_covid', 'connecting', 'v_unk', 'v_covid', 'v_covid', 'r_neg', 'r_pos', 'v_covid', 'connecting', 'v_unk', 'v_covid', 'v_covid', 'r_pos', 'final', 'v_covid', 'connecting', 'v_unk', 'r_pos', 'v_unk', 'connecting', None, 't_pcr', None, None]

Initial result [virus, result, test, final?]: [['v_covid', 'r_neg', 't_pcr', False], ['v_covid', 'r_neg', 't_pcr', False],
['v_covid', 'r_pos', 't_pcr', False], ['v_covid', 'r_pos', 't_pcr', True]]

Final result: covid = 'P'

Interpretation (at the test result level): Tested positive for COVID-19.

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Ontario Laboratories Information System (OLIS)

Input string: COVID-19 Virus Detection:\.br\COVID-19 virus RdRp gene: Not detected\.br\COVID-19 virus Envelope gene: Not
detected\.br\COVID-19 virus Nucleocapsid gene: Detected\.br\Interpretation:\.br\[COVID-19] virus DETECTED by real-time PCR
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Tokens with labels: ['v_covid', 'connecting', 'v_unk', None, 'v_covid', 'connecting', 'v_unk', None, 't_pcr', 'r_neg', 'r_pos', 'v_covid', 'connecting', 'v_unk', 'v_covid', 'v_covid', 'r_neg', 'r_pos', 'v_covid', 'connecting', 'v_unk', 'v_covid', 'v_covid', 'r_pos', 'final', 'v_covid', 'connecting', 'v_unk', 'r_pos', 'v_unk', 'connecting', None, 't_pcr', None, None]

```
Initial result [virus, result, test, final?]: [['v_covid', 'r_neg', 't_pcr', False], ['v_covid', 'r_neg', 't_pcr', False],
['v_covid', 'r_pos', 't_pcr', False], ['v_covid', 'r_pos', 't_pcr', True]]
```

Final result: covid = 'P'

Interpretation (at the test result level): Tested positive for COVID-19.



Public Health Case & Contact Management (CCM) Solution

- Beginning May 2020 ICES received weekly feeds of the COVID-19 module of the Integrated Public Health Information System (iPHIS).
 - CCM since replaced iPHIS for COVID-19 tracking
- Contains information on confirmed COVID-19 cases
 - **Risk factors** (e.g., occupation, congregate setting, self-reported comorbidities)
 - Some information not in ICES administrative databases
 - Clinical outcomes (e.g., hospitalizations, death)
 - More timely information for real-time reporting

COVaxON

- Provincial database for COVID-19 vaccine administration and documentation, which is managed by the Ministry of Health
- Public Health Ontario (PHO) provides ICES with a cumulative file of vaccinated individuals **weekly**.



Using COVID-19 Data for Reporting & Research

Using COVID-19 Data for Reporting & Research



Using COVID-19 Data for **Reporting & Research**





Age

Using COVID-19 Data for Reporting & Research



Using COVID-19 Data for Reporting & Research

Immigration status Recency & category of immigration Country of origin

Individuals tested/ confirmed positive/ vaccinated for COVID-19 (OLIS, CCM, COVAXON) Immigrant, Refugee and Citizenship Canada (IRCC) Permanent Resident File



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Using COVID-19 Data for Reporting & Research



Using COVID-19 Data for Reporting & Research

Individuals tested/ confirmed positive/ vaccinated for COVID-19 (OLIS, CCM, COVAXON)

Other congregate setting residents (Using address recorded at the time

of testing/vaccination)

- Residents of congregate care settings were identified as high-risk groups for COVID-19.
 - Challenging to identify residents of these facilities using administrative data
- Existing algorithm to identify long-term care (LTC) home residents and widely used in ICES studies
 - Physician and pharmacist billings, RAI-HC assessments in LTC
- COVID-19 datasets contained address information
 - Questionable accuracy (e.g., address of resident or place of test/vaccination?)
 - Non-standardized, text-based format



- Compared patient-level address information recorded in COVID-19 datasets with "master" lists of congregate facilities
 - Retirement home addresses from Retirement Homes Regulatory Authority (RHRA)
 - LTC facility addresses from Ministry of Health
- Data pack for address verification in DataFlux:
 - Canada Post SERP (Canada Post data pack)
 - Built in Quality Knowledge Base (QKB) data and logic files for defining data management operations
 - Match codes alphanumeric representation for fuzzy matching data
 - Clustering ability to group records based on multiple conditions



Address Field 1		Non-standardized addresses recorded in OLIS	"Master" list of congrego setting addresses			
Address Field 1	PRINCES	SS GARDENS, 100 CHARLOTTE	100 Cha	lotte Street		
Address Field 2	100 CHA	RLOTTE ST, SUITE 000				
City	PETERBO	OROUGH	Peterbo	rough		
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Postal	code	K9K0G4	K9J 7L4	201		
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		+		• /		
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	Data	Facility	
Address Field 1 Field	PRINCESS GARDENS, 100 CHARLOTTE	100 Charlotte Street	
Address Field 2 Field 2	100 CHARLOTTE ST, SUITE 000		
City	PETERBOROUGH	Peterborough	
Postal code	K9K0G4	K9J7L4	

		\sim	
Cleaned address	100 CHARLOTTE ST, SUITE 000	100 CHARLOTTEST	
Postal code	K9K0G4	K9J 7L4	

Verified address Verifed postal code	Cleaned & prepared ac raw data	dresses from
Standardized address Standarized postal code	100 Charlotte St К9J 7L4	100 Charlotte St K9J 7L4
		4
Address matchcode	\$200J2&YW@~4~\$\$\$\$\$\$\$	\$
Postal code matchcode	3-CIWS\$\$\$\$\$\$\$	3-CIWS\$\$\$\$\$\$\$
	LINKED TO FACILITY - Princess Gardens Reti	irement Residence

	Data	Facility				
Address Field 1	PRINCESS GARDENS,100 CHARLOTTE	100 Charlotte Street				
Address Field 2	100 CHARLOTTE ST, SUITE 000					
City	PETERBOROUGH	Peterborough				
Postal code	K9K0G4	K9J7L4				
ned address	100 CHARLOTTE ST, SUITE 000	100 CHARLOTTE ST				

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ed postal code K9J7L4		K9J 7L4		
Standardized address Standarized postal code	Verified addresses usi Post data pad	ing Canada ck.		
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	LINKED TO FACILITY - Princess Gardens Retire	ement Residence		

Address Field 1 Address Field 2	PRINCESS GARDENS,100 CHARLOTTE 100 CHARLOTTE ST. SUITE 000	100 Charlotte Street	
City	PETERBOROUGH	Peterborough	
Postal code	K9K0G4	K9J7L4	
Cleaned address		100 CHARLOTTE ST	
Postal code	K9K0G4	K9J 7L4	
Verified address	100 CHARLOTTE ST SUITE 000	100 CHARLOTTE ST	
Verified address Verifed postal code	100 CHARLOTTE ST SUITE 000 K9J7L4	100 CHARLOTTE ST	
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	Data	Facility	
Address Field 1	PRINCESS GARDENS,100 CHARLOTTE	100 Charlotte Street	
Address Field 2	100 CHARLOTTE ST, SUITE 000		
City	PETERBOROUGH	Peterborough	
Postal code	K9K0G4	K9J7L4	
	100 CHARLOTTE ST, SUITE 000	100 CHARLOTTE ST	
Postal code	K9K0G4	K9J /L4	
Postal code Verified address	100 CHARLOTTE ST SUITE 000	100 CHARLOTTE ST	
Postal code Verified address Verifed postal code	100 CHARLOTTE ST SUITE 000	100 CHARLOTTE ST	

~\$\$\$\$\$\$\$	\$	SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS	Address matchcode
	3-CIWS\$\$\$\$\$\$\$	3-CIW\$\$\$\$\$\$\$\$\$	Postal code matchcode
	/		
3	rement Residence	LINKED TO FACILITY - Princess Gardens Reti	
	rement Residence	LINKED TO FACILITY - Princess Gardens Reti	

ICES COVID-19 Reporting and Impact

COVID-19 Testing Metrics

- Key metrics generated with ICES data holdings
 - Percent positivity
 - Per capita testing
- Generated weekly since May 2020
 - Province-level
 - Public Health Unit (PHU)-level
 - Municipality-level
 - Neighbourhood-level for selected PHUs
 - Defined by postal codes, census-tracts
 - Aligned with areas used for existing health promotion and community outreach
 - Forward Sortation Area (FSA)-level
 - In congregate care settings
 - By age groups



COVID-19 Testing Metrics

Percent positivity

Number of individuals <u>testing positive</u> for COVID-19 Number of individuals tested

- Measure of both testing capacity and virus prevalence, community transmission
- Per capita testing

Number of individuals <u>tested</u> for COVID-19 Total number of individuals in population

- Measure of rate of testing in a population
- Together with percent positivity, can be used to evaluate whether level of testing is adequate relative to number of cases



Testing in Congregate Care Settings

- Used algorithm to identify LTC care residents, reported testing metrics by LTC facility
 - April 17, 2020: First report send to Ontario COVID-19
 Command Table
 - April 21, 2020: Enhanced testing started in LTC facilities
- Used fuzzy address matching techniques with address recorded in OLIS, reported on case counts and percent positivity by retirement home



Public Reporting of SARS-CoV-2 Testing Data

- First public report released May 2020
 - COVID-19 Laboratory Testing in Ontario: Patterns of Testing and Characteristics of Individuals Tested as of April 30, 2020
 - <u>https://www.ices.on.ca/Publications/Atlases-and-</u> <u>Reports/2020/COVID-19-Laboratory-Testing-in-Ontario</u>
- Reported on SARS-CoV-2 testing trends by:
 - Sociodemographic characteristics (e.g., marginalization indices)
 - Comorbidities
 - Long-term care residence







Neighbourhood sociodemographic characteristic



Overview of COVID-19 testing in Ontario, as of April 30, 2020



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COVID-19 confirmed positive in Ontario per 100,000 population

Number of individuals in Ontario confirmed positive for COVID-19 per 100,000 population, by Public Health Unit of residence, as of June 6, 2020



Public Reporting of Testing Data

Posted on ICES COVID-19 Dashboard



Public Reporting of Testing Data

Acquired Tableau to enable more interactive visualizations



Overall Ontario population

Weekly percent positivity for COVID-19 in Forward Sortation Areas (FSA)¹ in Ontario

C/ES

PHU Uptake of Weekly Testing Data



COVID-19 percent positivity by age group, Toronto

	August	September				November				
	Aug 30	Sep 6	Sep 13	Sep 20	Sep 27	Oct 4	Oct 11	Oct 18	Oct 25	Nov 1
: 4	0.44%	0.36%	0.46%	0.85%	1.29%	1.83%	3.01%	2.85%	3.08%	3.639
1-13	1.27%	1.18%	1.42%	1.06%	1.07%	1.64%	2.43%			
14-17	1.96%	2.32%	3.11%	3.60%	4.42%	4.47%	4.84%	7.43%	7.58%	
18-23	1.31%	2.35%	3.77%		5.98%	4.31%	6.72%	6.88%	6.16%	
24-39	0.97%	1.65%	2.43%	3.74%	4.04%	3.54%	4.94%	4.85%	4.89%	
10-69	0.69%	0.98%	1.64%	2.65%	3.08%	3.15%				
70+	0.27%	0.40%	0.79%	2.18%	2.74%	2.72%	2.93%	3.48%		

This map shows percent (%) positivity, by neighbourhood, for a defined wee number of individuals with a COVID-19 positive test result. per 100 individual



Public Uptake of Weekly Testing Data

ICES COVID-19 dashboard is leveraged with the help of local and social media

- Twitter impressions: 38,000+ with release of FSA-level data
- Media interviews in broadcast and print: **150+ media** hits per week
- Potential media viewership: > 180 million, with top performing articles reaching nearly 60 million



Public Reporting of Testing Data

- Second ICES report released Sept 2020
 - COVID-19 in Immigrants, Refugees and Other Newcomers in Ontario: Characteristics of Those Tested and Those Confirmed Positive as of June 13, 2020
 - <u>https://www.ices.on.ca/Public</u> <u>ations/Atlases-and-</u> <u>Reports/2020/COVID-19-in-</u> <u>Immigrants-Refugees-and-</u> <u>Other-Newcomers-in-Ontario</u>

COVID-19 in Immigrants, Refugees and Other Newcomers in Ontario: Characteristics of Those Tested and Those Confirmed Positive, as of June 13, 2020

September 2020



Immigrants more likely to test positive, especially those who are members of racialized communities and those who arrived as refugees and more recently



COVID-19 Vaccine Coverage

- Key metrics generated with ICES data holdings
 - Vaccine coverage (at least 1, 2, 3 doses)
- Challenges for population denominators
 - Who is currently residing in the province and eligible for vaccination?
 - Are people without evidence of health service use over multiple years still residents?
 - How accurate are 2016 Census projections at small areas?
- Generated weekly (then monthly) since March 2021 by:
 - Age group
 - Geographical area
 - Priority risk conditions
 - Sociodemographic characteristics
 - Neighbourhood-level COVID-19 risk

 Vaccine coverage by age group and neighbourhood (FSA) COVID-19 risk



Science Briefs Ontario Dashboard Key Resources Glossary About Us Our Partners Contact & Subscribe

Category: Health Equity & Social Determinants of Health

A Strategy for the Mass Distribution of COVID-19 Vaccines in Ontario Based on Age and Neighbourhood

Kevin A. Brown, Nathan M. Stall, Eugene Joh, Upton Allen, Isaac I. Bogoch, Sarah A. Buchan, Nick Daneman, Gerald A. Evans, David N. Fisman, Jennifer L. Gibson, Jessica Hopkins, Trevor Van Ingen, Antonina Maltsev, Allison McGeer, Sharmistha Mishra, Fahad Razak, Beate Sander, Brian Schwartz, Kevin Schwartz, Arjumand Siddiqi, Janet Smylie, Peter Jüni on behalf of the Ontario COVID-19 Science Advisory Table

Version 1.1 | https://doi.org/10.47326/ocsat.2021.02.10.1.0





- Vaccine coverage by age group and neighbourhood COVID-19 risk
 - March 23, 2021: Received request from Ontario COVID-19
 Science Advisory Table
 - *March 24*: Analytical team prepared initial output
 - March 26: ICES shared initial report with Science Advisory Table, Public Health Ontario, and Ministry of Health (MOH)
 - *April 1*: Updated analysis using more recent data presented at a Science Table Brief



Vaccination is not reaching the highest risk populations

Figure excludes long-term care vaccination

		Neighbourhood Risk [*]											
	1 = high incidence of COVID-19 infections				10 = low incidence of COVID-19 infection				fections				
Age group	1	2	3	4	5	6	7	8	9	10	Overall		
80+	50%	55%	59%	66%	66%	66%	65%	72%	69%	70%	64%		
75-79	37%	43%	43%	46%	45%	46%	40%	40%	30%	29%	39%		
70-74	13%	19%	19%	18%	19%	21%	17%	17%	10%	9%	16%		
65-69	8%	10%	10%	11%	10%	11%	10%	10%	7%	8%	9%		
60-64	18%	23%	22%	21%	21%	21%	19%	18%	14%	20%	20%		
55-59	7%	9%	9%	10%	11%	11%	10%	11%	10%	12%	10%		
50-54	6%	7%	7%	8%	9%	8%	9%	9%	10%	11%	8%		
45-49	6%	7%	6%	8%	8%	8%	8%	9%	10%	11%	8%		
40-44	5%	6%	6%	7%	8%	7%	8%	8%	9%	10%	7%		
16-39	4%	5%	5%	6%	6%	6%	6%	6%	7%	8%	6%		
Overall	8%	10%	10%	11%	11%	12%	11%	12%	11%	13%	13%		





High-risk areas have lowest vaccination rates among elderly in Ontario, new data show

KELLY GRANT > HEALTH REPORTER



- Vaccine coverage by age and neighbourhood risk level
 - April 2, 2021: ICES receives media requests for FSA-level data
 - April 5: ICES shares FSA-level data with MOH, PHO, public health units and media
 - April 6 (AM): Premier announces rollout to those aged 50+ y in COVID-19 'hotspots'
 - April 6 (PM): ICES posts FSA-level data as downloadable file on COVID-19 Dashboard
 - *April 7*: Premier announces rollout to those aged 18+ y in hotspots



Percentage of Ontarians who have received at least 1 dose of a COVID-19 vaccine (vaccine coverage) by age group and neighbourhood COVID-19 infection risk as of April 19, 2021^{*}

		Neighbourhood Risk ⁺											
	1 = high incidence of COVID-19 infections 10 =							= low incidence of COVID-19 infections					
Age group	1	2	3	4	5	6	7	8	9	10	Overall		
80+	67%	70%	74%	77%	77%	80%	81%	82%	84%	84%	78%		
75-79	67%	71%	74%	76%	78%	79%	80%	80%	80%	78%	77%		
70-74	64%	69%	71%	72%	73%	74%	75%	74%	71%	61%	70%		
65-69	57%	61%	59%	53%	53%	53%	55%	50%	41%	33%	50%		
60-64	53%	55%	52%	47%	46%	45%	47%	40%	37%	37%	45%		
55-59	35%	38%	35%	33%	31%	32%	33%	31%	28%	26%	32%		
50-54	28%	32%	25%	21%	17%	16%	16%	16%	16%	17%	20%		
45-49	13%	21%	12%	14%	14%	13%	13%	14%	14%	16%	14%		
40-44	10%	13%	10%	12%	12%	12%	12%	13%	13%	15%	12%		
16-39	7%	8%	8%	9%	9%	9%	9%	10%	10%	11%	9%		
Overall	20%	25%	22%	23%	23%	24%	24%	23%	25%	25%	28%		

0%					30%						>80%
Vaccine coverage (per 100 population)											





- ICES COVID-19 Dashboard
 - <u>https://www.ices.on.ca/DAS/AHRQ/COVID-19-Dashboard</u>
 - Updated weekly
 - **Downloadable files** with FSA-level vaccine coverage
 - Used by journalists to inform stories, create visualizations

DATA DOWNLOADS & REPORTS

- Forward Sortation Areas (FSAs) and their percent positivity from November 28 to March 12
- Age group percent positivity for each Public Health Unit (PHU) from November 28 to March 12
- Vaccine coverage estimates as of March 6 for selected age groups by Forward Sortation Areas (FSAs)
- Full list of vaccine coverage estimates by priority groups, up to March 6, 2022
- Vaccine coverage for adults with developmental disabilities, up to February 6, 2022
- Report: Vaccine Coverage by Neighbourhood COVID-19 Risk in Immigrants, Refugees, and other Newcomers, up to April 26, 2021



Vaccine Coverage by Priority Group¹

Age 5-64

with vaccination events up to March 6, 2022

Individuals with

Any highest-risk condition[‡]

At least 1 vaccine dose: 89% At least 2 doses: 87% 3 doses: 67% †Excluding pregnancy

History of solid organ transplant At least 1 dose: 89% At least 2 doses: 88% 3 doses: 69%

Hematological malignancy diagnosed < 1 year ago At least 1 dose: 90% At least 2 doses: 87% 3 doses: 63% History of hematopoetic stem cell transplant At least 1 dose: 88% At least 2 doses: 85% 3 doses: 64%

Chronic kidney disease (with recent chronic dialysis) At least 1 dose: 92% At least 2 doses: 90% 3 doses: 71%

Neurological diseases that may compromise respiratory function At least 1 dose: 85% At least 2 doses: 82% 3 doses: 57%

Pregnancy* At least 1 dose: 82% At least 2 doses: 79% 3 doses: 37% *Pregnancy accounts for 75% of all individuals with highest-risk conditions

Any high-risk conditions

At least 1 vaccine dose: 79% At least 2 doses: 73% 3 doses: 39%

Any at-risk conditions

At least 1 vaccine dose: 85% At least 2 doses: 82% 3 doses: 48%

Any risk conditions

At least 1 vaccine dose: 85% At least 2 doses: 82% 3 doses: 47%







- Challenges
 - Awareness of pressing policy topics and flexibility to rapidly prepare and add new relevant exhibits
 - E.g., With Omicron surge and push for 3rd doses, what proportion of the population was eligible for and not yet received a 3rd dose?
 - Creating public-friendly messaging and visualizations



Numerous ad hoc requests from Knowledge Users

- PHU- and neighbourhood-level reports on testing and vaccination in immigrants, newcomers & refugees
- Numerous other customized reports to support targeted testing and vaccination efforts in various risk groups
 - E.g., 'naturally occurring retirement communities', pregnant individuals, immunocompromised, developmentally disabled
- Population denominators for vaccine planning/monitoring by:
 - PHU, age, marginalization indices (to assess equity)
 - Various geographic areas
- Model inputs for vaccine rollout of 2nd doses in Delta hotspots





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Thank you!

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