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SARS-CoV-2 Seroprevalence among People Living with HIV in Ontario:

Findings from the COVID-HIV Evaluation of Serology and Health Services (CHESS) Study

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ESTIMATE

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UNIVERSITY OF TORONTO

ONTARIO HIV TREATMENT NETWORK

the CTN CIHR Canadian HIV Trials Network

COVID-19 IMMUNITY TASK FORCE

CIHR IRSC Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

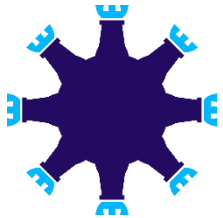
Conflict of Interest Disclosure

In the past 2 years I have been an employee of: **University of Toronto**

In the past 2 years I have been a consultant for: **St-Michael's Hospital (Unity Health Toronto)**

In the past 2 years I have received research support (grants) from: **Canadian Immunization Research Network**

There are relationships to disclose: **No**



SARS-CoV-2 Serologic Testing

- People living with HIV may be at higher risk of SARS-CoV-2 infection and COVID-19 illness
- Many may be infected with SARS-CoV-2 and not experience COVID-19 symptoms
- **Serologic (blood sample) testing:** presence of SARS-CoV-2 antibodies in both **symptomatic** and **asymptomatic** individuals.
- **Seroprevalence:** proportion of the sample that has developed antibodies to SARS-CoV-2 (due to infection and/or vaccination)

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Rationale: Little is known about SARS-CoV-2 seroprevalence (due to infection and/or vaccination) among people living with HIV within the Canadian context during the Omicron Era

Objective: To measure SARS-CoV-2 seroprevalence among people living with HIV in Ontario during the Omicron Era

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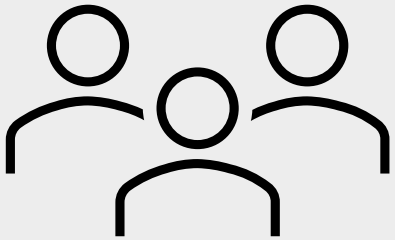
Methods

Participant Recruitment



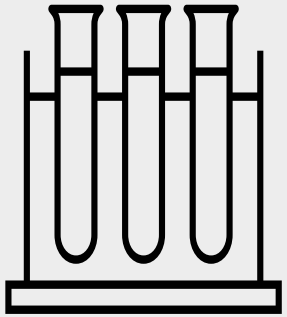
Up to **1,000** active participants of the Ontario HIV Treatment Network Cohort Study (OCS) were invited between **February 2022 and April 2023**

Study Procedures

Brief COVID-19 Questionnaire

Dried Blood Spot (DBS) Sample

Serologic Testing



Testing for the presence of SARS-CoV-2 IgG antibodies against RBD, S, N

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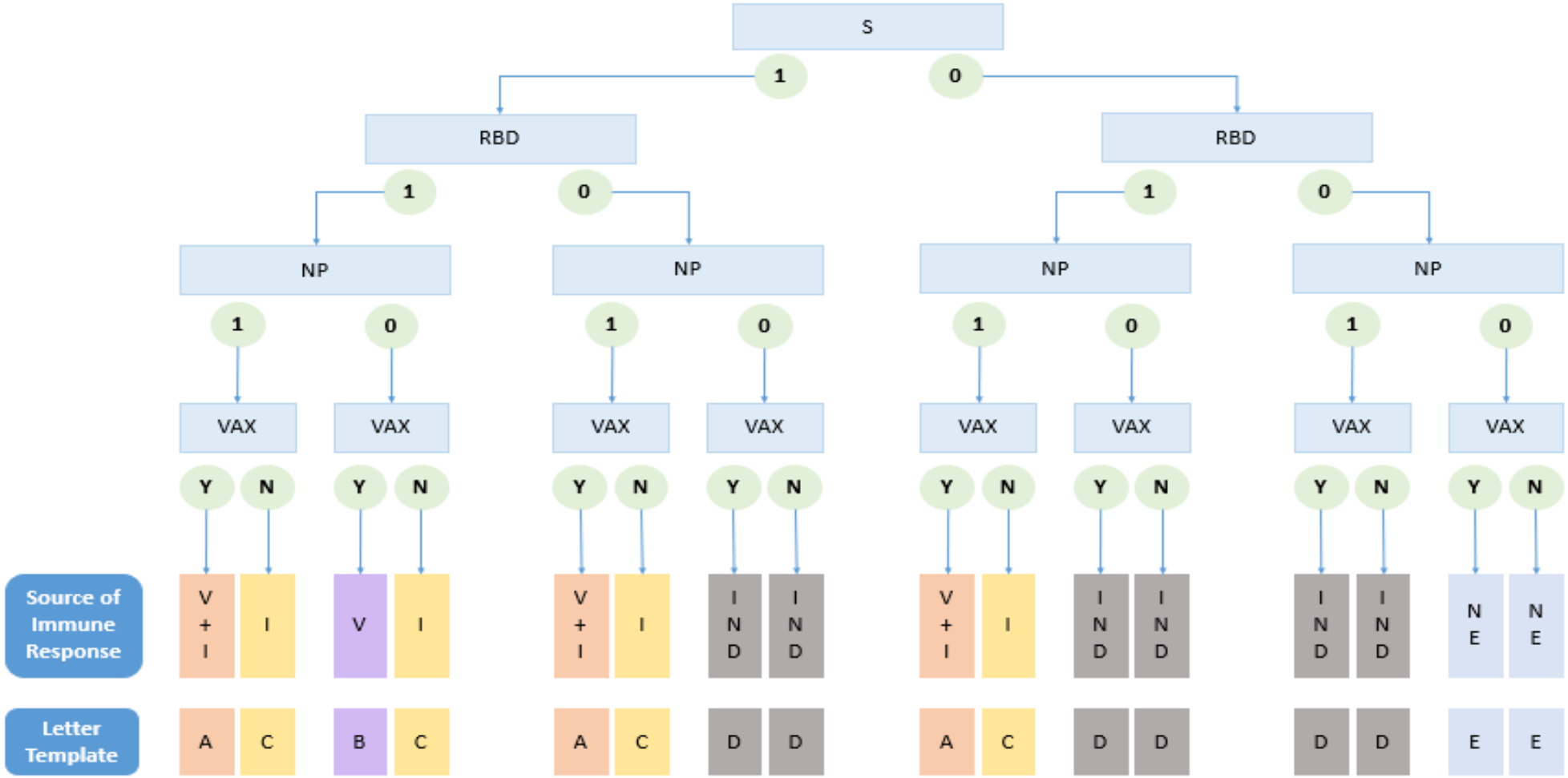
Results Algorithm



SARS-CoV-2 antigens: S = spike protein; RBD = receptor binding domain of spike protein; NP = nucleocapsid protein
VAX: self-reported COVID-19 vaccination history (Yes/No)

1 = signal-to-cutoff ratio >1
0 = signal-to-cutoff ratio <1

V + I = Humoral Immune Response Due to Vaccination and Previous Infection

I = Humoral Immune Response Due to Previous Infection

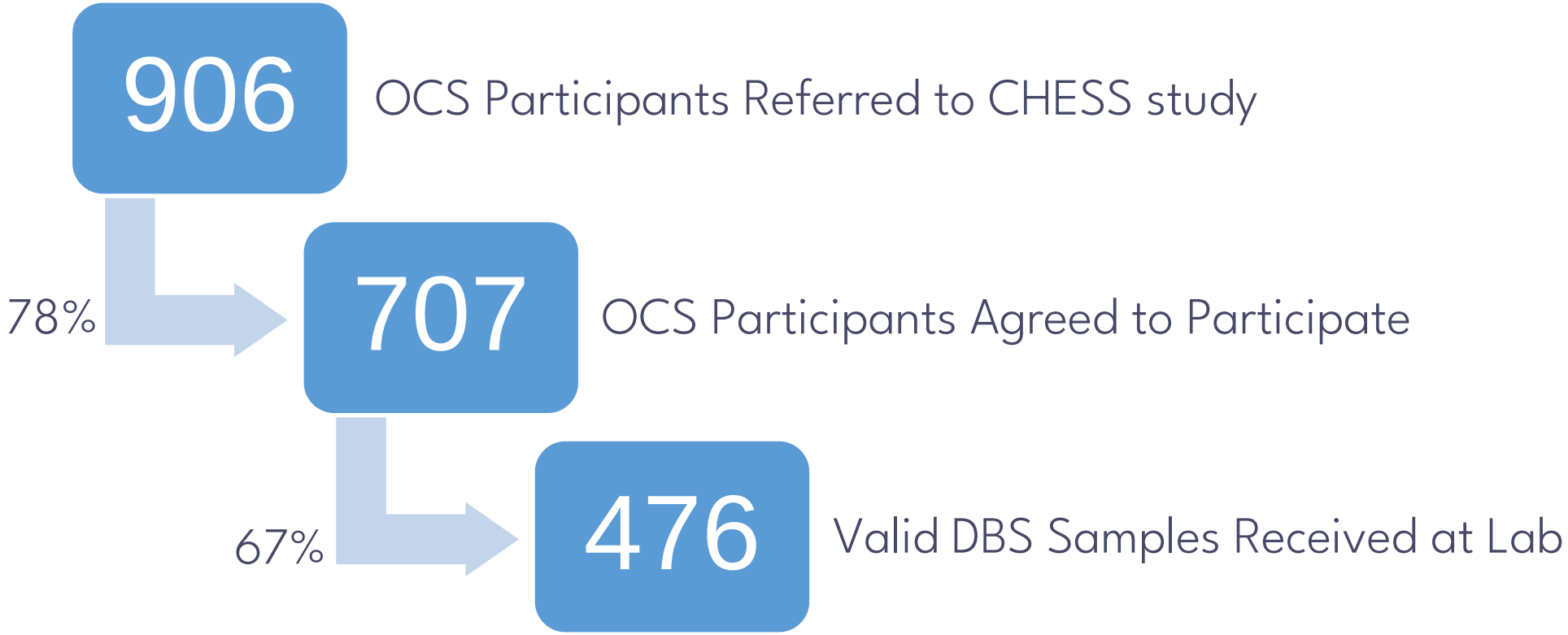
V = Humoral Immune Response Due to Vaccination (previous infection can't be excluded)

IND = Indeterminate

NE = Negative - No Evident Humoral Immune Response detected (no antibodies detected)

Algorithm developed from
Duarte et al, 2022

CHESS Recruitment



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CHESS Serology Results

Total Samples:
476

Immunity due to **Vaccination and Infection (Hybrid):**	Immunity due to **Vaccination Only:**	Immunity due to **Infection Only OR No Immunity:**	**Indeterminate:**
149 (31%)	**308 (65%)**	**8 (2%)**	**11 (2%)**

>96% vaccinated

→ ≥ 2 doses: 100%
→ ≥ 3 doses: 92%

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Characteristics of Hybrid vs Vaccine-Only Groups

	Hybrid (n=149)	Vaccine Only (n=308)	p-value
Age Categories, %			
34 years or less	7	4	0.101
35 to 44 years	19	12	
45 to 54 years	21	23	
55 to 64 years	37	39	
65 year or more	16	23	
Sex, %			
Male	87	88	0.743
Female	13	12	
Race, %			
White	62	76	0.008
Black	18	7	
Latin American	4	5	
Asian (East/South East)	5	4	
Other*	10	8	
Immigration Status, %			
Born in Canada	62	74	0.009
Not Born in Canada	38	26	

*Other Race includes categories: Arab/West Asian, Indigenous, Multi-race, Other, South Asian (categories combined due to small cells, n<6)

Characteristics of Hybrid vs Vaccine-Only Groups

	Hybrid (n=149)	Vaccine Only (n=308)	p-value
Occupation Type, %			
Essential Workers*	35	26	0.032
Other Workers	23	19	
Not Working	42	55	
Gross Household Income, %			
<$20,000	11	18	0.268
$20,000-$40,000	18	16	
$40,000-$60,000	17	13	
$60,000-$80,000	9	11	
$80,000-$100,000	9	6	
>$100,000	26	29	
Prefer not to answer/Don't Know	11	8	
Education Level, %			
Secondary degree or less	21	18	0.356
Post-secondary education	79	82	

*Essential Worker includes: Hospital or Health Care Facility, First Responder (Paramedic/Firefighter/Police Officer), Childcare Worker, Correctional Officer, Teacher or Other School Staff, Transit Driver, Food Service Industry, Grocery Store, Pharmacy, Hairdresser or Barber, Aesthetician, Flight Attendant, Factory/Warehouse Worker, Self-Identified 'Other Essential Worker' category.

Essential workers were more likely to be among racialized groups

Race	White	Black	Latin American	Asian (East/South East)	Other Race*
Essential Worker**	36%	64%	50%	55%	44%

*Other Race includes categories: Arab/West Asian, Indigenous, Multi-race, Other, South Asian (categories combined due to small cells, n<6).

**Essential Worker includes: Hospital or Health Care Facility, First Responder (Paramedic/Firefighter/Police Officer), Childcare Worker, Correctional Officer, Teacher or Other School Staff, Transit Driver, Food Service Industry, Grocery Store, Pharmacy, Hairdresser or Barber, Aesthetician, Flight Attendant, Factory/Warehouse Worker, Self-Identified Other Essential Worker category.

Limitations

- Sample of people living with HIV engaged in care who volunteered to participate in CHESS DBS component → results may not be generalizable to all people living with HIV in Ontario

- Waning anti-N levels over time may be impacting serologic groupings → will be investigated in upcoming analyses

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Conclusions

- Large majority of CHESS participants had vaccine-induced immunity (>96%) → about 1/3 had hybrid immunity

- Those in the hybrid immunity group were more likely to identify as Black, to not be born in Canada, and be essential workers, compared with those with vaccine-induced immunity alone

- Continued monitoring of SARS-CoV-2 seroprevalence among people living with HIV is critical for informing immunization and clinical guidelines, especially as booster vaccines continue to be rolled out and SARS-CoV-2 viral variants continue to evolve

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Acknowledgements

Nominated Principal Investigator
Ann Burchell, St. Michael's Hospital

Co-Principal Investigators
Abigail Kroch, OHTN
Curtis Cooper, Ottawa Hospital
Marc-Andre Langlois, UOttawa

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Anita Benoit, Women's College Hospital
Sarah Buchan, PHO
Catharine Chambers, UofT
Claire Kendall, UOttawa
David Knox, Maple Leaf Clinic
Jeff Kwong, ICES
Lawrence Mbuagbaw, McMaster
Rahim Moinheddin, UofT
Nasheed Moqueet, PHAC
Sergio Rueda, CAMH
Vanessa Tran, PHO
Nisha Andany, Sunnybrook Research Institute
Philippe El-Helou, Hamilton Health Sciences Centre
David Knox, Maple Leaf Clinic
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Michael Silverman, London Health Sciences Centre
Sharon Walmsley, UHN
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In memory of Ron Rosenes. We recognize his contributions and leadership of this work.

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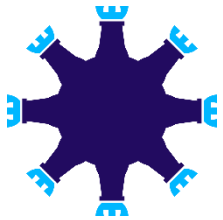
CIRN CANADIAN IMMUNIZATION RESEARCH NETWORK

Cassandra Freitas holds a CIRN Trainee Scholarship



Thank You!

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