Annual General Meeting

Toronto, Ontario

Tuesday, May 13th, 2025 – Wednesday, May 14th 2025

Meeting Contributors

CIRN Management Committee

Scott Halperin, NPI
Julie Bettinger
Matthew Muller
Joanne Langley
Bahaa Abu Raya
Shelly McNeil
Melissa Andrew
Karina Top
Juthaporn Cowan
Eve Dubé
Devon Greyson
Shannon MacDonald
Jeff Kwong
Sarah Buchan
Shelly Bolotin
Todd Hatchette
Jane Heffernan
Ellen Rafferty
Kimberly Huyser
Jeanna Parsons Leigh
Terra Manca
Emmanuel Marfo

Network Management Office

Allison Young
Jenna Hastings
Joey LeBlanc
Emily Albert

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Agenda

MONDAY MAY 12th			
Time	**Activity**	**Presenter**	**Place**
16:00-17:30	Registration	Jenna Hastings	Lobby area, Novotel Toronto Centre
TUESDAY MAY 13th			
Time	**Activity**	**Presenter**	**Place**
07:00-08:30	Registration	Jenna Hastings/Joey LeBlanc	Champagne Ballroom
08:00-09:00	***Breakfast***		Champagne Ballroom Foyer
09:00-09:05	Welcome	Scott Halperin	Champagne Ballroom
09:05-09:25	*"I'm scared- what if more side effects come out?": Pediatric vaccination decisions in South Asian parents*	Cindy Jardine	
09:25-09:45	*The effect of age at first dose of measles vaccination on measles immunity: a retrospective cohort study*	Archchun Ariyarajah	
09:45-10:05	*Partnering With Young Men Who Have Sex with Men to Co-Design A User-Centered Digital Health Literacy Tool to Support Human Papillomavirus Vaccine Decision Making*	Noah Doucette	
10:05-10:25	***Break – Light Refreshment***		Champagne Ballroom Foyer
	CIRN Abstract Presentations	CIRN Researchers	Champagne Ballroom
10:25-10:45	*Modelling Immunity from COVID-19 Vaccination in Different Population Groups*	Jecy Yu	
10:45-11:05	*Machine Learning Reveals Distinct Immunogenic Signatures of Th1 Imprinting in ART-Treated Individuals with HIV Following Repeated SARS-CoV-2 Vaccination*	Chapin Korosec	
11:05-11:25	*Vaccination and social media: Analysis of discussions in virtual communities of Canadian parents*	Benjamin Malo	
11:25-11:45	*A North American Pertussis Controlled Human Infection Model*	May ElSherif	
11:45-12:30	***Poster Presentation Session***	CIRN Researchers	Champagne Ballroom Foyer
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13:50-14:10	*Recovery of vaccine coverage among school-aged children in Alberta: COVID-19 pandemic-related declines and catch up*	Laura Reifferscheid	
14:10-14:30	*Healthcare Costs and Resource Utilization for Acute Respiratory Syncytial Virus Pediatric Hospitalizations in Canada*	Nirma Vadlamudi	
14:30-14:50	***Break – Light Refreshment***		Champagne Ballroom Foyer
	CIRN Abstract Presentations (con't)	CIRN Researchers	Champagne Ballroom
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15:30-15:40	Day one closing remarks and housekeeping	Scott Halperin	
15:45-16:45	***CIRN Management Committee Meeting (Network Co-Leads and Champions)***	Scott Halperin	
18:30 – 20:30	***CIRN Social Hour***		Reception Area, Novotel Toronto Centre

WEDNESDAY MAY 14th			
Time	**Activity**	**Presenter**	**Place**
08:30-09:30	***Breakfast***		Champagne Ballroom Foyer
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	CIRN Abstract Presentations (con't)	CIRN Researchers	Champagne Ballroom
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	Updates from CIRN Partners and Network Co-Leads		Champagne Ballroom
10:00-10:30	Canadian Institutes of Health Research (CIHR)	Marisa Creatore	
10:30-10:40	The Canadian Association for Immunization Research, Evaluation, and Education (CAIRE)	Manish Sadarangani	
10:40-10:50	Clinical Trials Network (CTN)	Joanne Langley/Bahaa Abu Raya	
10:50-11:00	Serious Outcomes Surveillance (SOS) Network	Melissa Andrew	
11:00-11:10	Social Sciences and Humanities Network (SSHN)	Devon Greyson	
11:10-11:30	***Break – Light Refreshment***		Champagne Ballroom Foyer
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11:50-12:00	Real-world Evidence on Vaccines using Existing Data (REVivED) Network Update	Shannon MacDonald/Jeff Kwong	
12:00-12:10	Modelling and Economics Research Network (ModERN) Update	Jane Heffernan/Ellen Rafferty	
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CIRN SUB-NETWORK MEETINGS

TUESDAY MAY 13th			
Time	**Meeting**	**Presenter**	**Place**
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12:30-13:30	CTN Network Meeting	Joanne Langley/Bahaa Abu Raya	Alsace Room
WEDNESDAY MAY 14th			
Time	**Meeting**	**Presenter**	**Place**
08:00-09:00	SIC Network Meeting	Karina Top	Alsace Room
08:15-09:00	CT24 Investigator meeting	Joanne Langley	Provence Room

ORAL PRESENTATION

Cindy Jardine
University of the Fraser Valley

"I'm scared- what if more side effects come out?": Pediatric vaccination decisions in South Asian parents

AUTHORS: Cindy Jardine, Ashleigh Rushton, Kusum Soni

AFFILIATION: University of the Fraser Valley, BC, Canada

INTRODUCTION: On November 19, 2021, Health Canada approved the Pfizer COVID-19 vaccine for use in children 5 to 11 years of age. The South Asian diaspora represents the largest Canadian immigrant population, but little was known about their specific decision-making processes and vaccine uptake for their children.

METHODS: We conducted focus groups on Zoom with 51 people of South Asian heritage from January 30 to March 17, 2022. All participants lived in the Fraser Valley region of BC and had at least one child aged 5-11 years. People participated in the language of their choice (English or Punjabi). Participants discussed their own COVID-19 vaccine decisions, the decisions they had made for vaccinating their children, and the information they relied upon in their decisions.

RESULTS: The majority of participants (98%) had received at least two doses of a COVID-19 vaccine. However, only 45% of participants were definitely going to or had vaccinated their young children. Many (42%) were unsure about vaccinating their children, with most waiting to see if there were any unforeseen side effects. Some parents were concerned about possible myocarditis or long-term effects on fertility. Seven parents (14%) were adamant they would not vaccinate their children.

CONCLUSIONS: Parents' decisions on COVID-19 vaccinations may be different than those they make for their children. They are generally more cautious about taking a deliberate action that might harm their child, believing that the risk of the vaccine is greater than the risk of the disease. Experiences of others were often more persuasive than official messaging, and misinformation gained credence when repeated by family and friends. These insights are important for better understanding pediatric vaccine decision-making for all types of vaccines, including routine vaccinations for measles, mumps and rubella.

ORAL PRESENTATION

Archchun Ariyarajah
York University

The effect of age at first dose of measles vaccination on measles immunity: a retrospective cohort study

AUTHORS: Archchun Ariyarajah[1,2,3], Natasha S. Crowcroft,[1,2] Kevin A. Brown,[1,3,4] John Wang,[3,5] Jeffrey C. Kwong,[1,2,3,4,5,6**] Shelly Bolotin[1,2,4,7**]

** Co-last authors

AFFILIATION: [1]Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada, [2]Centre for Vaccine Preventable Diseases, University of Toronto, Toronto, ON, Canada, [3]ICES, Toronto, ON, Canada, [4]Public Health Ontario, Toronto, ON, Canada, [5]Department of Family and Community Medicine, University of Toronto, Toronto, ON, Canada, [6]University Health Network, Toronto, ON, Canada, [7]Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, ON, Canada

INTRODUCTION: Two-dose measles vaccination programs have reduced measles cases globally. However, recent disruptions, including the COVID-19 pandemic, have led to a resurgence of cases. The first dose of measles-containing vaccine (MCV1) is currently scheduled at 12 months of age in Canada. The optimal timing of MCV1 is critical, as it may affect lifelong immunity. This study examines the effect of age at MCV1 on measles IgG concentration and seronegativity using a serology testing database from a large public health laboratory.

METHODS: We conducted a retrospective cohort study in Ontario, Canada linking diagnostic measles IgG test results to health administrative data, which included physician immunization billing codes. We used negative binomial and logistic regression models to predict mean measles IgG concentration and measles seronegativity.

RESULTS: The study included 33,557 individuals tested 1-17 years post-MCV1 for those born after elimination and 15-23 years post-MCV1 for those born before elimination. A one-month increase in age at MCV1 was associated with a 7-8% increase in measles IgG concentration and a 19-29% decrease in the odds of seronegativity, controlling for sex and time since MCV1 and depending on the threshold of protection used and measles elimination status at birth. Using the lowest seronegativity threshold (<120mIU/mL) and the longest follow-up of 23 years post-MCV1, 6.6% (95%CI, 5.8-7.6%) of individuals vaccinated at 12 months and 2.5% (95%CI, 2.0-3.2%) vaccinated at 15 months were predicted to be seronegative.

CONCLUSIONS: Increased age at MCV1 is associated with higher measles IgG concentrations. In a hypothetical population with only vaccine-derived immunity and all individuals vaccinated at 12 months, herd immunity (92-95%) may not be achieved two decades post-MCV1. However, delaying MCV1 to 13-15 months may increase infection risk due to imported cases and travel. Optimizing age at MCV1 may be critical to sustaining measles elimination.

ORAL PRESENTATION

Noah Doucette
Dalhousie University

Partnering With Young Men Who Have Sex with Men to Co-Design A User-Centered Digital Health Literacy Tool To Support Human Papillomavirus Vaccine Decision Making

AUTHORS: Noah Doucette, Liam Sutherland, Donna Halperin, Chantal Rytz, Sofia Ahmed, Eve Dube, Ramandip Grewal, Scott Halperin, Jeanna Parsons Leigh, Audrey Steenbeek, Stephana Julia Moss

AFFILIATION: Dalhousie University, Halifax, NS, Canada

INTRODUCTION: Human papillomavirus (HPV) infection is the most prevalent sexually transmitted infection that causes approximately 630,000 cancers worldwide annually. HPV vaccination is feminized—when an issue's social construction focuses on females—resulting in biases and inequities for HPV-related diseases. The initial development and implementation trajectory of HPV vaccination programs focused primarily on females as testing and marketing were aimed to prevent cervical cancer. This remains the predominant discourse, aligning with the World Health Organization's 90-70-90 targets toward eliminating cervical cancer. Young adulthood (YA, 18-26 years) is a transitional period that is key for promoting preventive measures including immunization. HPV vaccine coverage among YAs increases when YAs are meaningfully involved in vaccine decision making. Addressing low HPV vaccine coverage among MSM may be possible through an upstream approach that targets young MSM (YMSM) before they transition beyond the age most recommended for HPV vaccines. This approach requires YMSM-driven interventions to enhance their knowledge and awareness about HPV vaccines to support their vaccine decision-making. Digital interventions are well-established modalities perceived to be useful and acceptable among YAs.

METHODS: We are conducting an interconnected, multi-phased program, partnering with YMSM community members and content experts in vaccinology, sex and gender science, and mixed methods research in Canada. Our objective is to enhance vaccine acceptance as a barrier to HPV vaccine coverage among YMSM with a YMSM-driven, digital health literacy intervention to reduce the burden of HPV-related diseases, decrease transmission in the broader community, and promote equitable and inclusive vaccine uptake.

CONCLUSIONS: Improving HPV immunization coverage among YMSM is a public health priority as vaccination is an effective and proven intervention to decrease the burden of HPV-related diseases. This research has the potential to reduce HPV-related disease burden, decrease transmission within the broader community, and support Canada's public health goals for equitable and inclusive healthcare. This research will be relevant for other vital vaccines, such as Mpox, critical for high-risk groups like YMSM.

ORAL PRESENTATION

Jecy Yu
York University

Modelling Immunity from COVID-19 Vaccination in Different Population Groups

AUTHORS: Zhe Si (Jecy) Yu, Chapin Korosec, Jane Heffernan

AFFILIATION: York University, Toronto, ON, Canada

INTRODUCTION: Quantitative models can be used to assess and quantify immune response activity upon vaccination. This study uses in-host mathematical modeling to analyze the immune response following COVID-19 vaccination. Using longitudinal data from the COVID Immunity Task Force (CITF) and published studies of COVID-19 vaccination (using Pfizer, Moderna and Astrazeneca vaccines), we investigate, using our mathematical models, how antibody responses vary across different population groups based on key covariates such as age, sex, and vaccine type.

METHODS: We have developed a mathematical model of COVID-19 vaccination that considers vaccine dose size, time between doses, and different components of the humoral and cell-mediated immune responses. We employ mixed-effect modelling in Monolix to fit our mathematical model to seven vaccination datasets (primary series plus one booster dose). The model fits estimate immune system parameters by using antibody and interleukin data.

RESULTS: We quantify the model parameters for every vaccination dataset. We show that there is substantial heterogeneity in the immune responses between the different datasets. We also find that the antibody accrual and decay rates are significantly different between different age groups, but we find that there are only small differences between males and females of the same age.

CONCLUSIONS: Immune system activation varies between COVID-19 vaccine type and age. There are very small differences between sexes in immune system rates in our model.

ORAL PRESENTATION

Chapin Korosec
York University

Machine Learning Reveals Distinct Immunogenic Signatures of Th1 Imprinting in ART-Treated Individuals with HIV Following Repeated SARS-CoV-2 Vaccination

AUTHORS: Chapin S. Korosec, Jane M. Heffernan

AFFILIATION: York University, Toronto, ON, Canada

INTRODUCTION: Machine learning (ML) has the potential to enhance the study of immune responses to vaccination by identifying key predictive features from complex datasets. We will discuss how we apply ML techniques to classify immune responses to SARS-CoV-2 vaccination in people living with HIV (PLWH) and HIV-negative individuals, using 64 biomarker immune features. Identifying immune correlates of vaccine response remains challenging due to high-dimensional data and sampling limitations. We explore synthetic data generation methods to improve model generalizability and address data scarcity in immunology.

METHODS: We analyzed immune responses from 91 individuals (HIV+ and HIV−) who received SARS-CoV-2 vaccines. Feature selection was performed using random forests (RFs), and supervised classification models were trained to distinguish vaccine responses between groups. To address class imbalances, we generated synthetic data using Gaussian Mixture Models (GMM), Multivariate Normal (MVN), k-Nearest Neighbors (KNN), and Synthetic Minority Oversampling Technique (SMOTE), evaluating their effectiveness via Kullback-Leibler divergence (KLD) and principal component analysis (PCA).

RESULTS: Our findings underscore the potential for ML-driven insights to inform personalized vaccine strategies. IL2 and IFNg were the most discriminative features in classifying vaccine responses. Synthetic data improved model robustness but exhibited varying performance: GMM minimized KLD but distorted PCA structure, while SMOTE best preserved feature distributions in RF models. Hybrid approaches combining GMM and SMOTE showed promise in maintaining global and local data structure.

CONCLUSIONS: ML-driven analysis identified key immune signatures differentiating vaccine responses in PLWH. Synthetic data generation can improve model validation and parameter identifiability.

ORAL PRESENTATION

Benjamin Malo
Université Laval

Vaccination and social media: Analysis of discussions in virtual communities of Canadian parents

AUTHORS: **Authors:** Malo, B.[1], Bettinger, J.[2], Driedger, M.[3], Graham, J.[4], Greyson, D.[2], MacDonald, N.[4], MacDonald, S.[5], Meyer, S.[6], Dubé, E.[1]

AFFILIATION: [1]Université Laval, Ville de Québec, QC, Canada, [2]University of British Columbia, Vancouver, BC, Canada, [3]University of Manitoba, Winnipeg, MB, Canada, [4]Dalhousie University, Halifax, NS, Canada, [5]University of Alberta, Edmonton, AB, Canada, [6]University of Waterloo, Waterloo, ON, Canada

INTRODUCTION: The quality of online health information is a concern to us all. Misinformation, not expert science, is posing consequences for our public's health. Social media platforms have been identified as a key driver of vaccine hesitancy and acceptance. Parents are using virtual spaces such as forums and Facebook groups to obtain health information, which may significantly influence their decisions. Unlike most studies of exclusively antivaccine communities, this research explored the content and exchanges about vaccination among virtual communities of Canadian parents. Here, we describe the co-production, sharing, and consumption of information from *within* these communities.

METHODS: We conducted an online ethnography of 15 Canadian virtual communities of parents for 12 months (October 2021 to October 2022), exploring what individuals shared online about vaccination and how they interacted with one another. Our research involved observing vaccine-related discussions in private Facebook groups (n=10), public forums (n=4), and a subreddit (n=1).

RESULTS: Our 12-month online ethnography observed 265 conversations on vaccination. We found that online parents were generally pro-vaccination across all observed communities. Wanting to know more about vaccination, parents looked to virtual communities for information, experiences, and support. In keeping with the time of this study, COVID-19 vaccines during pregnancy were the most frequently discussed, followed by vaccines administered to infants under 12 months of age. Transmission of antibodies to the infant, either during pregnancy or through breast-feeding, was an important rhetoric to justify the need for vaccination. Biomedical providers were the most trusted source of information mentioned within these communities. However, trust was never blindly given and was the result of critical research conducted by parents. Crucially, the data analyzed contained very little misinformation.

CONCLUSIONS: Our study highlights the generally positive nature of online discussions on vaccination in Canada. It also shows that parents prefer personalized information, rooted in real-life experiences. Lastly, it demonstrates that trust in medical professionals is still very high.

ORAL PRESENTATION

May Elsherif
Dalhousie University

A North American Pertussis Controlled Human Infection Model

AUTHORS: May ElSherif [1,2,3], Kara Redden[1,4], Lingyun Ye[1,2], Wade Blanchard[1,2], Jillian Filliter[1,2,4], Todd Hatchette[1,2,3], Jason LeBlanc[1,2,3], Shelly McNeil[1,2,3], Joanne Langley[1,2,4], Susan Hariri[5], Lucia Pawloski[5], Panagiotis Maniatis[5], Tami H. Skoff[5], LeAnne Fox[5], Scott Halperin[1,2,4]

AFFILIATION: [1] Canadian Center for Vaccinology, Halifax, NS, Canada, [2] Dalhousie University, Halifax, NS, Canada, [3]Nova Scotia Health, Halifax, NS, Canada, [4]IWK Health, Halifax, NS, Canada, [5]US Centers for Disease Control and Prevention, Atlanta, GA, U.S.A.

INTRODUCTION: *Bordetella pertussis* (*Bp*) remains a significant cause of mortality and morbidity with worldwide resurgence. As a poorly controlled, strictly human disease for which novel, effective vaccines and/or vaccine schedules are needed, *Bp* is amenable to the development of a Controlled Human Infection Model (CHIM).

METHODS: Using a dose escalation design, healthy adults aged 18-40 years were challenged with the pertactin-producing D420 US strain to find a safe, reproducible *Bp* dose that elicits 70-90% attack rate of mild catarrhal symptoms. Half-log doses above and below were tested for confirmation. PCR, culture, and solicited symptoms were used to assign clinical outcomes: non-infected (PCR- and culture-negative), asymptomatic infection (PCR- or culture-positive, asymptomatic), or symptomatic infection (PCR- or culture-positive, symptomatic). The effect of participant's infant priming status, whole-cell pertussis (wP) vs. acellular pertussis (aP) vaccine, was compared. All participants received azithromycin as rescue/eradication therapy.

RESULTS: A ˜73% attack rate of mild symptoms was reached at 10^7 colony forming units (cfu) which a total of 22 (11 aP-primed, 11 wP-primed) participants received Outcomes were 14% non-infected, 14% asymptomatic infection, and 73% symptomatic infection; aP-primed individuals exhibited higher bacterial shedding; No challenge-related safety events were observed. Azithromycin effectively cleared infection. Clinical outcomes correlated with challenge dose levels as corroborated by flanking doses.

CONCLUSIONS: This study confirms that mild symptomatic pertussis CHIMs in adults are safe and achievable. A well-developed, symptomatic pertussis CHIM may facilitate deeper understanding of pertussis immunity and expedite vaccine development. This symptomatic pertussis model compared clinical endpoints by wP and aP vaccine priming status.

ORAL PRESENTATION

Bernice Ramos

A reverse vaccinology approach to identifying novel protein vaccine candidates against Streptococcus pneumoniae

AUTHORS: Bernice Ramos, Bhavjinder Dillon, Alyssa Golden, Irene Martin, Nicholas Brousseau, Manish Sadarangani

AFFILIATION: University of British Columbia, Vancouver, BC, Canada

INTRODUCTION: Despite widespread use of pneumococcal conjugate vaccines (PCVs) in childhood immunization programs, *Streptococcus pneumoniae* remains a global health concern due to the emergence of non-vaccine serotypes. Approved PCVs effectively reduce severe disease and transmission, but cover up to 21 of ~100 disease-causing serotypes. Protein vaccines could provide broader protection by targeting conserved proteins present in all serotypes, but amino acid (AA) variations may impair vaccine effectiveness if they lead to escape from vaccine-induced immunity. We developed a reverse vaccinology pipeline to identify protein vaccine candidates and tested it on proteins previously studied in clinical trials: pneumolysin (Ply), pneumococcal histidine triad protein D (PhtD), pneumococcal surface protein A (PspA), and pneumococcal surface antigen A (PsaA).

METHODS: Whole genome sequencing data from 994 *S. pneumoniae* isolates from IPD cases across Canada (2018-2020) from children and adults were obtained by the National Microbiology Lab (NML). A core genome (core=100%) was bult using Roary. Protein alignments were conducted using Clustal-Omega. AA variation was assessed using Standard Shannon entropy scores and mapped to AlphaFold 3D protein structures using PyMOL. Protein localization, adhesion, and transmembrane topology were predicted using PSORTb, SPAAN, and DeepTMHMM.

RESULTS: The core genome comprised 1734 genes (77% of the total genome). The selected proteins were present in 80.7% (PhtD) to 99.6% (PsaA) of isolates. PhtD and PspA showed the highest AA variation across the whole protein while Ply displayed relatively low AA variation, with a peak at position 380 (entropy=0.99). PsaA showed minimal AA variation with peaks at positions 26 and 83(entropy=0.52 and 0.38). PSORTb correctly placed PhtD and PsaA in the cytoplasmic membrane and Ply and PspA extracellularly. SPAAN correctly identified PspA (score=0.82) and PsaA (score = 0.80) as adhesins and Ply (score=0.41) and PhtD (score-0.19) as non-adhesins. None were transmembrane proteins.

CONCLUSIONS: Our pipeline identified AA variation and correctly predicted protein features. Targeting highly conserved proteins (i.e., PsaA), conserved regions, or using multiple protein variants may inform future pneumococcal vaccine strategies.

ORAL PRESENTATION

Laura Reifferscheid
University of Alberta

Recovery of vaccine coverage among school-aged children in Alberta: COVID-19 pandemic-related declines and catch-up

AUTHORS: Laura Reifferscheid, Shannon E. MacDonald

AFFILIATION: University of Alberta, Edmonton, AB, Canada

INTRODUCTION: The COVID-19 pandemic caused interruptions in school-based vaccine delivery, resulting in significant decreases in coverage among school-aged children. We sought to: (1) evaluate changes in vaccine coverage among cohorts scheduled for school-based vaccination since the start of the pandemic; and (2) assess patterns in recovery over time among school-aged children in Alberta.

METHODS: This retrospective cohort study used linked administrative data to compare vaccine coverage for three pandemic school-year cohorts (2019-20, 2020-21, 2022-23) to coverage in a pre-pandemic cohort. We evaluated monthly cumulative coverage for vaccines routinely offered in Grade 1 (e.g. measles [MMR]-containing), Grade 6 (e.g. human papillomavirus [HPV]), and Grade 9 (e.g. meningococcal [MenC]) for each cohort from the start of the school year to the end of the study period (July 2024). For each pandemic cohort, we compared cumulative monthly coverage to the corresponding month for the pre-pandemic group.

RESULTS: Compared to pre-pandemic levels, cumulative coverage at end of grade 1 was lower by 5-8 percentage points in all pandemic cohorts, and remained below at end of study period (3-8 points lower). All Grade 6 pandemic cohorts had lower coverage at the end of the school year (3-65 points lower), though coverage had increased to pre-pandemic levels by the end of follow-up. Coverage among the grade 9 pandemic cohorts was lower than pre-pandemic levels throughout the study period (3-14 points lower at end of follow-up). At study end, 21% of the entire Grade 9 pandemic cohort remained unvaccinated with MenC; 50% of this unvaccinated group had graduated high school.

CONCLUSIONS: Partial recovery of vaccine coverage was found for cohorts impacted by interruptions to school-based programming. Further efforts to alleviate coverage deficits among Grade 1 cohorts may be addressed in routine Grade 6 programs, while targeted efforts in post-secondary institutions may be required to address delays in MenC vaccination.

ORAL PRESENTATION

Nirma Vadlamudi
University of British Columbia

Healthcare Costs and Resource Utilization for Acute Respiratory Syncytial Virus Pediatric Hospitalizations in Canada

AUTHORS: Nirma Khatri Vadlamudi[1,2], Kyle Gomes[1], Ethan Chow[1], Malou Bourdeau[3], Joanne Embree[4], Scott A. Halperin[5], Taj Jadavji[6,] Kescha Kazmi[7], Joanne M. Langley[5], Nicole Le Saux[8], Dorothy Moore[3], Shaun K. Morris[7], Jeffrey M. Pernica [9], Joan Robinson[10], Manish Sadarangani[1,2], Julie A. Bettinger[1,2] for the Canadian Immunization Monitoring Program Active (IMPACT) Members[†]

[†] A list of IMPACT Members appears below.

AFFILIATION: [1]Vaccine Evaluation Center, BC Children's Hospital Research Institute, University of British Columbia, Vancouver, BC, Canada, [2]Department of Pediatrics, University of British Columbia, BC, Canada, [3]Faculty of Medicine, McGill University, Montreal, QC, Canada, [4]Department of Pediatrics, University of Manitoba, Winnipeg, MB, Canada, [5]Canadian Center for Vaccinology, IWK and Nova Scotia Health, Dalhousie University, Halifax, NS, Canada, [6]Infectious Diseases, Department of Pediatrics, Alberta Children's Hospital, University of Calgary, Calgary, AB, Canada, [7]Division of Infectious Diseases, Department of Pediatrics, Hospital for Sick Children, University of Toronto, Toronto, ON, Canada, [8]Division of Infectious Diseases, Department of Pediatrics, Children's Hospital of Eastern Ontario, Ottawa, ON, Canada, [9]Division of Infectious Diseases, Department of Pediatrics, McMaster's University, Hamilton, ON, Canada, [10]Department of Pediatrics, University of Alberta, Edmonton, AB, Canada

INTRODUCTION: Respiratory syncytial virus (RSV) is a major cause of bronchiolitis and pneumonia in pediatric populations, especially in infancy. The overall and age-specific incidence of RSV- associated hospitalization and healthcare resource use throughout childhood in Canada is not well understood.

METHODS: Data were retrieved from a national administrative dataset, which captured hospitalizations with ICD codes from participating Canadian hospitals (Canadian Institute for Health Information, CIHI), and from an active surveillance program in tertiary care pediatric hospitals (the Canadian Immunization Program ACTive, IMPACT). Children aged 0-16 years with RSV in November 2017 through April 2023 were eligible. We estimated overall and age-specific RSV hospitalization incidence, healthcare resource use (length of stay, mechanical ventilation (MV) use), and costs by age group (0-5, 6-11, and 12-23 months, and 2-4 years, 5-9 years, 10-16 years). Costs were adjusted to 2022 Canadian dollars (CAD). The population denominator for age-specific RSV incidence estimates was retrieved from Statistics Canada.

RESULTS: An estimated 29,277 RSV hospitalizations occurred, with an average of 5,831 cases/year in pre-pandemic years (November 2017- June 2020). Infants aged <6 months old accounted for 44.2% of cases for study duration (November 2017- April 2023). RSV incidence among infants aged <6 months increased from 1,250 per 100,000 in November 2017-June 2018 to 2,393 per 100,000 in July 2022-April 2023. The average annual cost of RSV was $66,267,950 CAD. Infants <6 months old accounted for 49.0% ($32,471,296 CAD) of annual average RSV healthcare costs.

CONCLUSIONS: Although RSV occurs throughout childhood, the high RSV hospitalization incidence in infants younger than 6 months of age highlights an urgent need for prevention strategies in this population to alleviate the health burden in this population and economic burden on healthcare systems.

ORAL PRESENTATION

Adhiba Nilormi
Bruyère Health Research Institute

Breaking barriers in COVID-19 vaccination: insights from Ontario's long-term care workers

AUTHORS: Adhiba Nilormi[1], Joy Kim[2], Tanzima Hossain[1], Justin Presseau[3], Carrie Heer[1], Kathryn May[4], Maya Murmann[1], Amy T. Hsu[1]

AFFILIATION: [1]Bruyère Health Research Institute, Ottawa, ON, Canada, [2]Princess Margaret Cancer Centre, Toronto, ON, Canada, [3]Ottawa Hospital Research Institute, Ottawa, ON, Canada, [4]The Ottawa Hospital, Ottawa, ON, Canada

INTRODUCTION: Vaccination against COVID-19 is crucial for long-term care (LTC) workers to protect themselves and LTC residents from severe illness. Despite this, vaccination rates among LTC workers have declined significantly post-pandemic, even as COVID-19 continues to pose a threat to public health. This study explored factors influencing LTC workers' current perception of the XBB.1.5 COVID-19 vaccine and discuss potential strategies to support vaccine uptake.

METHODS: We conducted semi-structured interviews with LTC workers from 19 urban and rural LTC homes across Ontario to capture their perspectives on the XBB.1.5 COVID-19 vaccine and intentions for future vaccinations. Participants were recruited via flyers posted within LTC homes and onsite engagement led by the research team. The interview guide was informed by the Theoretical Domains Framework (TDF). Directed content analysis was performed, applying the TDF, to understand factors and motivations influencing individuals' behaviours.

RESULTS: We interviewed 30 LTC workers (median age = 41 years), including 22 females (73%) and 8 individuals (27%) from visible minority groups. Eleven participants (37%) had received the XBB.1.5 vaccine. Five main barriers to vaccination were identified across four TDF domains: knowledge (misconceptions about lasting immunity and the role of the latest dose), beliefs about consequences (perceived lower risk of infection, long-term safety concerns), social influence (mixed messaging from family and colleagues) and environmental context (lack of clear, consistent, and credible vaccination guidance). Six main facilitators spanned five domains: knowledge (vaccination information in plain language), beliefs about consequences (protection for family and residents, protection against current strains), environmental context (workplace vaccination programs), social/professional role (viewing vaccination as a professional responsibility) and social influence (recommendations from trusted sources).

CONCLUSIONS: Our study identified barriers and facilitators influencing LTC workers' current acceptance of the updated COVID-19 vaccine. These determinants can help to inform the design of tailored strategies to address hesitancy and increase future vaccine uptake.

ORAL PRESENTATION

Sheila O'Brien
Canadian Blood Services

iCARE National measles serosurvey results from nine provinces, 2023

AUTHORS: Sheila O'Brien[1], Steven Drews[1], Joanne Hiebert[2], Alberto Severini[2], Elizabeth MacLachlan[2], Christian Renaud[3], Antoine Lewin[3], Heili Poolsaar[5], Vanessa Tran[4,5], Sarah Buchan[4,5], Sarah Wilson[4,5], Shelley Deeks[5,6], Agatha Jassem[7], Scott A. Halperin[8,9], Todd Hatchette[8,9], Shelly Bolotin[4,5]

AFFILIATION: [1]Canadian Blood Services, Ottawa, ON, Canada, [2]Public Health Agency of Canada National Microbiology Laboratory, Winnipeg, MB, Canada, [3]Héma Québec, Montréal, QC, Canada, [4]Public Health Ontario, Toronto, ON, Canada, [5]University of Toronto, Toronto, ON, Canada, [6]Nova Scotia Health, Halifax, NS, Canada, [7]BC Centre for Disease Control, Vancouver, BC, Canada, [8]Canadian Center for Vaccinology, Halifax, NS, Canada, [9]Dalhousie University, Halifax, NS, Canada

INTRODUCTION: Although Canada eliminated measles in 1998, it is still endemic in many parts of the world, which threatens Canada's elimination status due to repeated importations from abroad with subsequent spread within Canada. Assessing measles population immunity is key to identify susceptible population groups and monitor our elimination status. We conducted a national measles serosurvey using residual specimens collected by Canadian Blood Services (CBS) and Héma Québec (HQ). Here we present CBS results for nine provinces.

METHODS: We aimed to test 8,874 residual specimens collected in 2023 from individuals >16 years, with equal number of specimens between males and females and by province.

Testing was performed at the National Microbiology Laboratory (NML) using the BioRad BioPlex 2200 MMRV IgG enzyme immunoassay, retesting equivocal results using a plaque reduction neutralization test (PRNT), as previously validated by our group.

RESULTS: We tested 8,776 specimens. Seropositivity increased with age-group, ranging from 74.0% in individuals aged 17-29 years to 98.5% in individuals aged ≥60 years. Seropositivity was slightly higher in females compared to males, at 82.4% and 79.9%, respectively. Of those who self-reported to be white, 81.8% were seropositive, compared to 78.3% of those who self-reported to be racialized. Seropositivity did not differ greatly by material deprivation quintiles, ranging between 80.0% and 81.0% for the quintiles 1 (most deprived) and 5 (least deprived), respectively, and peaking at 82.4% for quintile 3.

CONCLUSIONS: Our estimates were similar to our previous Canadian measles serosurvey performed using nationally-representative specimens collected between 2009 – 2013. Findings related to material deprivation and ethnicity were novel, leveraging CBS capabilities to collect these data. Although many estimates were <95%, the threshold of protection thought to be required to sustain measles elimination, the low population immunity we observed does not currently coincide with a high number of measles cases in the general population. Future analyses will include generating weighted estimates using the 2021 Canadian Census data for, and applying post-stratification weights to regression analyses to account for differences in age, sex, provincial-level geographic distributions.

ORAL PRESENTATION

Pierre-Philippe Piché-Renaud
University of Toronto

Revaccination of Individuals with Cardiac Adverse Events Following COVID-19 Vaccination: A Canadian Immunization Research Network study

AUTHORS: Pierre-Philippe Piché-Renaud[1,2,3], C. Arianne Buchan[4,5], Catherine Burton[6], Hugo Chapdelaine[7], Aamir Jeewa[8], Shaun K. Morris[1,2,3,9,10], Jeffrey M. Pernica[11], Anne Pham-Huy[12], Manish Sadarangani[13,14,15], Marina I. Salvadori[16,17], Sneha Suresh[6], Tahir S. Kafil,[18] Juthaporn Cowan[4], Karina A. Top[6,19] for the Special Immunization Clinic Network investigators*

AFFILIATION: [1]Division of Infectious Diseases, The Hospital for Sick Children, Toronto, ON, Canada, [2]Department of Pediatrics, University of Toronto, Toronto, ON, Canada, [3]Child Health Evaluative Sciences, SickKids Research Institute, Toronto, ON, Canada, [4]Division of Infectious Diseases, Department of Medicine at The Ottawa Hospital, University of Ottawa, Ottawa, ON, Canada, [5]Ottawa Hospital Research Institute, Ottawa, ON, Canada, [6]Stollery Children's Hospital, and Department of Pediatrics, University of Alberta, Edmonton, AB, Canada, [7]Centre Hospitalier Universitaire de Montréal, Université de Montréal, Montréal, QC, Canada, [8]Division of Cardiology, Labatt Family Heart Centre, The Hospital for Sick Children, Toronto, ON, Canada, [9]Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada, [10]Center for Global Child Health, The Hospital for Sick Children, Toronto, ON, Canada, [11]Department of Pediatrics, McMaster University, Hamilton, ON, Canada, [12]Division of Infectious Diseases, Immunology and Allergy, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, ON, Canada, [13]British Columbia Children's Hospital, University of British Columbia, Vancouver, BC, Canada, [14]Vaccine Evaluation Center, BC Children's Hospital Research Institute, Vancouver, BC, Canada, [15]Department of Pediatrics, University of British Columbia, Vancouver, BC, Canada, [16]Public Health Agency of Canada, Ottawa, ON, Canada, [17]Department of Pediatrics, Faculty of Medicine, McGill University, Montréal, QC, Canada, [18] Department of Cardiovascular Medicine, Mayo Clinic, Rochester, MN, U.S.A., [19]Department of Pediatrics, Dalhousie University and Canadian Center for Vaccinology, IWK Health, Halifax, NS, Canada

INTRODUCTION: Myocarditis and pericarditis are well-described rare adverse events following immunization (AEFI) associated with COVID-19 mRNA vaccines. Safety data on revaccination among people with previous cardiac AEFIs are lacking. This study assessed outcomes of COVID-19 revaccination among participants assessed for cardiac AEFIs.

METHODS: The Special Immunization Clinic Network database, containing data from consented participants across twelve sites, was analyzed. Cases were classified following the Brighton Collaboration Case Definitions (BCCDs) for mutually exclusive diagnoses of myocarditis, myopericarditis or pericarditis. Subjects with cardiac symptoms not meeting the BCCD and with no alternative diagnosis were categorized as chest pain/other cardiac diagnosis. Revaccination recommendations were based on physician judgment, informed by national guidelines. Participants were followed up to 42 days after revaccination to capture AEFI recurrence.

RESULTS: Between January 1, 2021 and February 23, 2023, 114 participants were enrolled, including 46 with myocarditis (40.4%), 26 (22.8%) with myopericarditis, 11 (9.6%) with pericarditis, and 21 (18.4%) with chest pain/other cardiac diagnosis. Twenty-seven of 71 participants (38.0%) who required further COVID-19 vaccine doses were recommended for revaccination. Sixteen participants were revaccinated: two with myocarditis, two with myopericarditis, two with pericarditis and 10 with chest pain/other cardiac diagnosis. Four adults had recurrent symptoms of the AEFI: 2/10 with previous chest pain/other cardiac diagnosis, one participant with previous pericarditis and multiple comorbid conditions, and one participant with previous myopericarditis who required hospitalization.

CONCLUSIONS: COVID-19 mRNA revaccination may be considered for individuals with chest pain not meeting criteria for myocarditis but caution is warranted in adults with prior confirmed myopericarditis post-COVID-19 mRNA vaccination.

Poster Presentations

1. **Jo Lin Chew:** Varicella Immunogenicity and Safety in Children and Youth with Solid Organ Transplants
2. **Noah Doucette:** Exploring the Intersectional determinants of Human Papillomavirus (HPV) vaccine uptake in Nova Scotia, Canada: Towards Equity and Inclusivity
3. **Christine Huel**: The everyday experiences of people enhancing their children's health after declining vaccines: An exploratory synthesis
4. **Agatha Jassem**: Seroprevalence of mpox infection in urban male STI clinic clients in British Columbia, Canada
5. **Marilou Kiely**: Safety of COVID-19 vaccines among pregnant individuals in Quebec, Canada: A population based retrospective cohort study using hospital administration data
6. **Alex Krug-Mushey:** Triad of Trust: Vaccine Decision-Making in Pregnancy
7. **Sarah Machado-Marques**: Considering the effects of pair formation dynamics on mpox and HIV co-infection in the gbMSM community
8. **Erin McConnell**: Improving influenza vaccine uptake amongst adult kidney transplant recipients: A mixed-method study
9. **Adhiba Nilormi**: Strategies for Increasing Vaccine Coverage in Long-Term Care Workers: A Systematic Review
10. **Bernice Ramos**: Phylogenetic analysis of Streptococcus pneumoniae isolates from cases of invasive pneumococcal disease in Canada, 2018-2020
11. **Peter Robertson:** Investigating the Transcriptional Regulation and Structural Variation of Capsular Polysaccharides in Streptococcus pneumoniae
12. **Janna Shapiro**: Vaccine-induced T cell memory in children with acute lymphoblastic leukemia
13. **Zhou Zhou**: Bayesian Hierarchical Modeling of multi-site data to estimate pneumococcal conjugate vaccine effectivness. A Canadian Immunization Research Network Study
14. **KD King:** Keeyoukaywin ahci lii kaansayr kipihtinaant - (Visiting with cancer prevention) - a study of Métis families experiences of HPV vaccination in Alberta
15. **Melissa Andrew:** How well is messaging about the importance of vaccination for people living with dementia being communicated? A jurisdictional scan of National Immunization Technical Advisory Groups and dementia advocacy organizations
16. **Antoine Garnier:** Trust in Childhood Vaccination in Nunavik: A qualitative analysis
17. **Marie Lan:** Protocol: Attributable Costs to RSV Hospitalization in Young Children in Ontario
18. **Haila Kottwitz**: Recruitment, Retention, and Rapport: a success story in conducting a Controlled Human Infection Model trial
19. **Umar Yunusa**: Consent process for adolescent vaccination: Current practices and considerations for alternative approaches in Canada (preliminary results)
20. **Addisu Zeleke:** Population-Level Impact of HPV Vaccination: Preliminary Results of a Global Systematic Review of Observational Studies