Safety of co-administration of COVID-19 and seasonal influenza vaccines in individuals with autoimmune diseases: a study from the Canadian National Vaccine Safety Network (CANVAS) of the Canadian Immunization Research Network (CIRN)

Dr. Phyu Mar Soe, Dr. Otto Vanderkooi, Dr. Manish Sadarangani, Dr. Monika Naus, Dr. Matthew Muller, Dr. James Kellner, Prof. Hubert Wong, Prof. Jennifer Isenor, Dr. Gaston De Serres, Dr. Louis Valiquette, Dr. Allison McGeer, Ms. Kim Marty, Prof. Julie Bettinger

Introduction/background: CANVAS conducted active safety surveillance for COVID-19 and/or influenza vaccines from September to December 2022. This analysis evaluated health events associated with the administration of bivalent mRNA-COVID-19 vaccine, influenza vaccine, or co-administration among individuals with autoimmune diseases.

Methods: We recruited vaccinated and unvaccinated participants from seven provinces and territories, and collected self-reported health events on day 8 following vaccination or for an 8 day period in unvaccinated controls. This subgroup analysis focused on individuals who self-reported having autoimmune diseases. Multivariable generalized linear regression models, adjusted for age group, sex, health status, and province, were conducted to assess the association between co-administration of vaccines and health events that disrupted daily activities, caused work absenteeism, or necessitated medical consultation.

Results and analysis: Surveys were completed by 5,382 vaccinated individuals with autoimmune diseases (COVID and influenza: 1,802, COVID-alone: 3,704, influenza-alone: 506) and 1,321 unvaccinated individuals with autoimmune diseases. Health event rates within 7 days of vaccination occurred in 9.7% of COVID and flu vaccine recipients, 9.3% of COVID-alone recipients, 6.1% of influenza-alone recipients; 6.1% of controls reported events over 7 days. Compared to unvaccinated controls, the risk of health event following vaccination was higher for both COVID and influenza co-administration [adjusted relative risk (aRR): 1.89, 95% confidence interval (95% CI) 1.42 – 2.52], and COVID vaccine alone {aRR: 1.85, 95% CI, 1.40 – 2.44], but not for influenza vaccine alone (aRR: 1.2, 95% CI, 0.79 – 1.82). No significant change in the risk of emergency department visits or hospitalizations was identified in any vaccine group compared to unvaccinated controls.

Conclusions and implications for policy, practice or additional research: Our findings support the safety of co-administering influenza and COVID-19 vaccines in individuals with autoimmune conditions. While the risk is higher than flu vaccine alone, it is not greater than COVID vaccine alone. These findings may help guide expectations and inform policy for vaccination strategies in this population.

Influenza Vaccine Effectiveness and Number Needed to Vaccinate in the prevention of admission to Assisted Living or Long-Term Care Facilities: A report from the CIRN Serious Outcomes Surveillance Network

Dr. Melissa K. Andrew, Dr. Henrique Pott, Dr. Jason LeBlanc, Dr. May ElSherif, Dr. Todd F. Hatchette, Dr. Shelly A. McNeil, on behalf of the CIRN Serious Outcomes Surveillance (SOS) Network Investigators

Introduction/background: Influenza outcomes are often considered over short-term time horizons; long-term outcomes are less well understood. Older adults are at risk for poor outcomes from influenza, including persistent functional decline and increased care needs. We investigated the impact of influenza vaccination on hospital length of stay (LOS) and incident admissions to Assisted Living or Long-Term Care (AL/LTC).

Methods: Patients hospitalized with acute respiratory illness were enrolled in CIRN SOS Network active surveillance during influenza seasons 2011/2012 through 2018/2019. In this nested case-control study, patients aged 50+ with incident admissions to AL/LTC (cases) were matched 1:10 with controls (matched by age, sex, comorbidity burden score, and level of care needed). Negative binomial regression was used to evaluate the association between exposure to influenza vaccination and LOS. Logistic regression was used to study the association between influenza vaccination and AL/LTC admission.

Results and analysis: We identified 535 cases and 5,350 matched controls. Median age was 81 years [IQR 73-87]. 55.8% had not received seasonal influenza vaccine. Median duration of hospitalization (LOS) was 6 days [IQR 4-11]. Influenza vaccination in the current season was associated with reduced LOS (IRR=0.89, 95%CI:0.84-0.93, p<0.001), and with reduced odds of admission to AL/LTC (OR=0.73, 0.61-0.88, p=0.001); VE against AL/LTC admission was 27% (12-39%). Vaccination only in prior seasons was not associated with LOS (p=0.46) or AL/LTC admission (p=0.063). The number needed to vaccinate to avoid one admission to AL/LTC was 123.

Conclusions and implications for policy, practice or additional research: Older adults hospitalized with influenza are at risk of long-term poor outcomes, including persistent functional decline and admission to AL/LTC. Influenza vaccination in the current season is associated with shorter length of stay, itself a risk factor for institutionalization, and appears to protect against AL/LTC admission. Maintenance of functional independence through preventing influenza severe illness and hospitalization is an important goal of influenza vaccination.

Shingles vaccination coverage among older adults and factors associated with vaccination: An analysis of the Canadian Longitudinal Study on Aging

Professor Nicole Elaine Basta, Angelina Sassi, Christina Wolfson

Introduction/background: Older adults are at increased risk of shingles, a serious disease caused by reactivation of prior varicella-zoster virus infection. Shingles vaccination significantly reduces risk, but uptake varies. Understanding trends in shingles vaccination is critical for identifying those most likely to be unvaccinated and for reducing missed opportunities for vaccination (MOV). The Canadian Longitudinal Study on Aging (CLSA) provides robust data to estimate shingles vaccination coverage among a large sample, identify factors associated with vaccination, and assess MOV.

Methods: The CLSA, launched in 2011, is an ongoing cohort study tracking changes in health among older adults. 18,698 adults aged 50+ surveyed 2018-2021 self-reported their shingles vaccination status and were eligible for this analysis.

Results and analysis: 46.9% (95% CI: 46.0–47.9%) of adults ≥65 years and 25.2% (95% CI: 24.3–26.2%) of adults aged 50-64 reported receiving shingles vaccine in their lifetime. Among adults ≥65, higher income, higher education, having contact with a family doctor or specialist (past year), and receipt of influenza vaccine or pneumococcal vaccine were positively associated with vaccination; while higher age, male sex, non-white race, residing outside Ontario, being in the workforce, and lower self-rated health were negatively associated. Among adults 50-64 years, higher age, higher income, having contact with a family doctor or specialist (past year), and receipt of influenza vaccine or pneumococcal vaccine were positively associated with vaccination; while non-white race, being in the workforce, residing outside Ontario, and lower self-rated health were negatively associated. More than half (56.2% (95% CI: 55.4–56.9%)) experienced a MOV for shingles in the past year.

Conclusions and implications for policy, practice or additional research:
This study provides up-to-date coverage estimates for shingles vaccination among older adults and a comprehensive assessment characterizing factors associated with vaccination. The high prevalence of MOV suggests that shingles vaccination coverage could be improved by offering vaccination alongside influenza vaccine or during health care visits.

Respiratory syncytial virus vaccination among older adults in Canada: number needed to vaccinate and associated costs to prevent severe outcomes

Ms. Lea Separovic, Dr. Anna Funk, Ms. Ayisha Khalid, Dr. Danuta Skowronski

Introduction/background: Respiratory syncytial virus (RSV) disproportionately affects the extremes of age, including older adults. Vaccines have recently been authorized for adults 60+ years in Canada but their prioritized recommendation requires finer age-stratified understanding of relative impact and resource requirements. Using published incidence and vaccine efficacy data we derive the number needed to vaccinate (NNV) to prevent severe RSV-related outcomes among older Canadians 60-69, 70-79 and 80+ years, comparing associated costs of vaccine prevention versus hospitalization.

Methods: Age-stratified severe RSV-related outcome incidences were extracted from a publication based on active surveillance in Canada (ElSherif M et al., Open Forum Infect Dis 2023; doi:10.1093/ofid/ofad315), increasing 1.5x for potential under-ascertainment. One and two season vaccine efficacies against hospitalization, ICU admission and death were approximated from phase 3 trials as: 85%/65%, 90%/70%, and 95%/75%, respectively. Age-stratified NNV was estimated as the inverse of vaccine-attributable absolute risk reduction. We multiplied NNV estimates by projected vaccination cost ($250 CAD per dose) and derived summary ratios comparing to estimated costs per hospitalization ($15000-$20000 CAD) and ICU admission ($50000 CAD) (ElSherif et al.).

Results and analysis: NNV estimates were higher for outcomes of increased severity (hospitalization, ICU admission, or death), but lower by advanced age for 60-69 (1017, 20110, 28390), 70-79 (502, 4890, 6910), versus 80+ (157, 480, 680) year-olds, substantially 6-fold, 42-fold and 42-fold lower, respectively, for the oldest versus youngest categories. Costs of vaccine prevention far exceeded costs of hospitalization or ICU admission (~10-fold or more) among 60-69 (12.7-fold, 100.6-fold) and 70-79 (8.4-fold, 24.5-fold) year-olds, but were more closely aligned among 80+ year-olds (2.6-fold, 2.4-fold). Doubling incidences halve estimates whereas halving efficacies double them but neither sensitivity analysis altered relative order-of-magnitude comparisons.

Conclusions and implications for policy, practice or additional research:
Prioritization of authorized RSV vaccines for older adults should take into account variable risk of severe outcomes with advancing age, warranting more detailed cost-effectiveness evaluation.

Incidence of respiratory syncytial virus (RSV) hospitalization among adults in Ontario, Canada, 2017-2019

Dr. Sarah Buchan, **Ms. Jenna Alessandrini**, Samantha Drover, Melissa Andrew, Susan Bronskill, Kevin Brown, Nick Daneman, Shelley Deeks, Jennie Johnstone, Jeff Kwong, Samantha Lee, Shelly McNeil, Michelle Murti, Sarah Wilson, Allison McGeer

Introduction/background:
Respiratory syncytial virus (RSV) causes significant morbidity and mortality among adults in high-income countries. Recently, there have been several important advancements related to RSV prevention for older adults in Canada. Further data on groups at highest risk of severe outcomes are needed to support vaccine program decision-making.

Methods:
We identified individuals hospitalized with laboratory-confirmed RSV and all International Classification of Diseases-10 (ICD-10) coded RSV-related hospitalizations in adults ≥18 years of age in Ontario, Canada between September 1, 2017 and August 31, 2019. We calculated the incidence of hospitalization per 100,000 people and 95% Confidence Intervals (CIs) using Poisson regression stratified by demographic and clinical risk factors, and sub-stratified by age group. We estimated secondary outcomes including the proportion of individuals with fatal outcomes.

Results and analysis: Over two respiratory virus seasons, we identified 3,928 hospitalizations in patients with RSV. The incidence of hospitalization increased steadily with age from 2.1 (95%CI: 1.9-2.4) per 100,000 in those aged 18-49 years to 43.9 (95%CI: 41.2-46.8) per 100,000 in those aged 70-79 years, with a sharp increase to 131.5 (95%CI: 125.5-137.8) per 100,000 in those aged ≥80 years. The incidence of RSV hospitalization was higher in those with underlying conditions (dementia: 187.5 (95%CI: 174.4-201.5); chronic kidney disease: 161.8 (95%CI: 151.5-172.7); immunocompromise: 98.4 (95%CI: 92.4-104.7)), as well as among those living in low-income neighbourhoods [Incidence: 22.4 (95%CI: 21.1-23.7)] versus high-income neighbourhoods [Incidence: 11.8 (95%CI: 10.8-12.8)]; these results were consistent across age groups. Among those hospitalized, 13.3% died within 30 days of discharge, with 85.7% of deaths occurring in those aged ≥65 years.

Conclusions and implications for policy, practice or additional research: These results highlight the substantial burden of RSV among older adults, particularly among those with pre-existing medical conditions and of lower socioeconomic status. These findings can help inform equitable RSV vaccine recommendations and support vaccine programs to prioritize adults at heightened risk for severe RSV outcomes.

Oral Abstracts Session 2 **Tuesday 26 November** **10:30-12:00** **Room 202**

Simplifying Parental Consent for Immunizations in Nova Scotia with eConsent

Mrs. Kat Macdonald

Introduction/Program Need and Objectives: The current process of gathering parental consent for immunizations, typically managed by public health departments, is labor-intensive, inefficient, and heavily reliant on paper-based forms. This outdated method presents significant barriers to immunization program success, contributing to falling immunization rates and the resurgence of vaccine-preventable diseases. eConsent is a cloud-based solution designed to streamline and modernize the consent gathering process, making it more efficient for public health staff and convenient for parents. This project highlights the success of the Nova Scotia Department of Health in deploying eConsent province-wide.

Program Methods, Activities, and Evaluation: The eConsent solution replaces the paper-based consent process with a fully automated electronic system. Personalized emails with program information and a portal link are sent to parents, who then authenticate and complete the consent form online. The process includes automated reminders for parents who have not yet completed the form. Vaccination records are automatically entered into Panorama via an interoperable connection. The program was evaluated through a pilot in Nova Scotia, assessing participation rates, form completion rates, the speed of returns, and the efficiency of the reminder system.

Program Results or Outcomes: The Nova Scotia pilot demonstrated the effectiveness of eConsent, with a 97% participation rate and a 90% completion rate for online consent forms. Notably, 47% of the forms were returned within one week, and most were returned over four weeks in advance, allowing for better clinic planning. The reminder system proved crucial, with a third of parents needing three or more reminders.

Recommendations and Implications for Practice or Additional Research: The eConsent program offers a scalable and innovative solution to the challenges of traditional consent gathering methods. It significantly reduces administrative burdens and costs associated with paper forms, printing, and mailing. Public health organizations should consider adopting electronic consent systems to enhance immunization programs' efficiency and effectiveness. Further research could explore long-term impacts on immunization rates and potential adaptations for other public health initiatives.

Implementing a Meningococcal B Immunization Program for Nova Scotia Youth At Risk of Invasive Meningococcal Disease

Ms. Stacey Dunphy, Ms. Nancy MacVicar, Dr. Yong Lin, Dr. Molly Trecker, Dr. Shelley Deeks

Introduction/program need and objectives: Invasive meningococcal (IMD) disease is a rare, but serious bacterial infection caused by *Neisseria meningitidis*. Nova Scotia had 50 cases of IMD between 2015 and 2023, the majority of which were serogroup B. During this same time-period, there were high profile deaths among university students and an outbreak in 2022, consisting of two cases at a residence at Dalhousie University.

In June 2023, Nova Scotia's Publicly Funded Vaccine Eligibility for Individuals at High Risk of Acquiring Vaccine Preventable Diseases policy was expanded to include Bexsero meningococcal B vaccine for people under 26 years who are living in a congregate group setting. This includes youth entering post-secondary studies and living in residence for the first time; first time military trainees living in a group setting; and people living in youth congregate settings not otherwise defined, including Nova Scotia Youth Centre, youth community residential settings, or youth shelters. The program reduces financial barriers for eligible youth.

Program methods, and activities: Meningococcal B vaccine was distributed to community pharmacies to promote equitable access. Vaccine was also provided through local public health offices and university health centers. For youth living in a Nova Scotia Youth Centre, vaccine was offered by onsite medical services.

Program results or outcomes: During the first year of the program, the number of youth eligible for Bexsero vaccine was estimated at approximately 5,600. There was a lower overall uptake than anticipated with 36% of the total receiving the first dose, and 25% completing the two-dose series. Bexsero was administered at Pharmacies and University Health Centres.

Recommendations and implications for practice or additional research: Strategies implemented to increase vaccine uptake include sending a reminder email to those receiving one dose, sending letters to grade 12 students informing them of their eligibility, and partnering with universities to send information letters to incoming students.

Keeyoukaywin ahci lii kaansayr kipihtinaant a lii taab - (Visiting with cancer prevention at the kitchen table) - Results from a Métis methodological study on HPV vaccination in Alberta

Mx. KD King, Ms. Tai Grauman, Dr. Shannon E. MacDonald

Introduction/background: Human Papillomavirus (HPV) infections have existed since ancient times, with Elders describing problems of genital warts and gynecological problems in the oral history of the Métis. Today, HPV is the most common sexually transmitted infection in North America. HPV infection is responsible for most cervical and anal cancers as well as many vulvar, vaginal, penile, and oropharyngeal cancers. There are significant disparities in the relative survival of HPV-related cancers for Indigenous People and very limited information about Métis-specific HPV-related cancer prevention. This research explores how the experiences and identity of Métis people in Alberta affect HPV vaccination.

Methods: Using the Métis methodology of *keeyoukaywin* or visiting, authors KD and TG and participants co-authored stories of the lived experiences of Métis families related to HPV and its prevention. In 2023, we met with 13 families from across Alberta. The visits involved sharing meals and visiting around the kitchen table in participants' homes and communities. Stories were written, and participants co-authored and approved the findings.

Results and analysis: Stories shared valuable insights into the impact of social locations; parental concerns for children's safety; navigating the health system; and relationships with cancer, sexual health, land and culture on HPV-related cancer prevention. Métis parents shared their efforts to keep their children safe and requested improved culturally relevant information-sharing related to vaccines and their benefits and risks. Issues related to cultural safety and impacts of colonization, exclusion, and rural/remote living were shared, and the need for increased attention to health and culture was identified.

Conclusions and implications for policy, practice or additional research: Métis parents work hard to keep their children safe, including through vaccination for HPV. Addressing systemic and structural barriers related to Metis-specific HPV education and access to HPV prevention could further improve vaccination coverage. Further research exploring culturally appropriate interventions to improve HPV vaccination is warranted.

A qualitative case study of a privately-funded human papillomavirus (HPV) vaccination program in Ghana: Lessons for a future publicly-funded program - E*mmanuel Marfo*

Introduction/problem definition that demonstrates the need for a policy change: There is no publicly-funded human papillomavirus (HPV) vaccination program in Ghana. From 2013 to 2018, the Global Vaccine Alliance piloted free adolescent HPV vaccination in preparation for a national program. Yet, HPV vaccination in Ghana is still only available through privately-funded programs. The Ghana Health Service recently announced plans to introduce a publicly-funded HPV vaccination program. This study explored an existing privately-funded HPV vaccination program in Ghana to identify challenges and gaps, and to gather insights to inform vaccination practice and the national program.

Research methods: The qualitative case study research design, which explores *how* and *why* a contemporary phenomenon occurs in a real-life context, guided this study. We conducted semi-structured interviews with HPV vaccinators and policy/program leaders at the Greater-Accra Regional Hospital in Ghana from October to November 2023. Our analysis in NVivo focused on experiences, barriers, and challenges in this privately-funded HPV vaccination program.

Results and analysis: Participants (N=16) included HPV vaccinators (n=8) and program/policy leaders (n=8). Our findings revealed many HPV vaccination practice challenges at the hospital. The HPV vaccination program at the hospital operates with no program policy/framework. Vaccinators used HPV screening tests and sexual history in determining eligibility for HPV vaccination. For example, they reported excluding individuals who tested positive for HPV DNA screening from vaccination until after treatment. There are no formal HPV vaccination educational programs for vaccinators, leading to reliance on convenient information sources that may include outdated evidence for vaccination practice.

Recommendations and implications for policy, practice or additional research: This study provides important insights to inform Ghana's forthcoming publicly-funded HPV vaccination program. We recommend the need for a scientifically-informed HPV vaccination policy and guidelines to support the upcoming publicly-funded program. This will enhance an effective and standardized vaccination program that aligns with current evidence and prevent excluding individuals who may benefit from HPV vaccination.

Improving acceptance and uptake of HPV vaccination: Results of pilot interventions in Quebec elementary school

Miss Maude Dionne, **Dre Chantal Sauvageau**, Mme Doriane Etienne, Mme Holly O. Witteman, Mme Eve Dubé

Introduction/Contexte: Human papillomavirus (HPV) vaccines have been offered in Quebec schools to 4th-grade girls since 2008 and boys since 2016. However, the HPV vaccine rate remains below the target of 90 % in several areas of the province. This project aimed to develop and evaluate a multi-component strategy to improve HPV vaccine acceptance and uptake.

Méthode : Sixty-four (64) schools were recruited, of which 32 received the interventions (pilot schools). The strategy included three interventions (face-to-face information by the school nurse, email reminder with an online decision support tool, and telephone reminder by the nurse inspired by motivational interviewing techniques). Parents and school staff completed online surveys. Individual interviews were conducted with school nurses and immunization managers. HPV vaccine coverage was retrieved from the immunization registry.

Résultats et analyse : The strategy was generally well-received by school staff, nurses and parents. Many parents found the three interventions helpful to support their vaccination decision. Most parents (92%) suggested that the face-to-face information session and the decision support tool (82%) be offered to all parents. School nurses considered this intervention more challenging to implement, however. The email reminder was appreciated, but few parents (n=22) used the decision aid tool. A minority of nurses have applied motivational interviewing techniques, as half (51%) of unreturned consent forms were due to forgetfulness by parents. A difference of 6% was observed in HPV vaccine coverage rates between pilot and control schools ($p = < 0.0001$).

Conclusions et répercussions concernant les politiques, la pratique ou les pistes de recherche : Our strategy appears to have positively impacted HPV vaccine acceptance and uptake. It is recognized that education and information strategies are much more effective when integrated into multi-component strategies. As school nurses' workload is high, the accessibility of different tools to promote vaccination to parents could facilitate their work.

Oral Abstracts Session 3 **Tuesday 26 November** **15:30-17:00** **Room 201**

COVID-19 Vaccine Effectiveness Against Severe Omicron-related Outcomes in Children aged 5 to 11 years in Ontario: A Population-based Cohort Study

Dr Pierre-philippe Piche-Renaud, Dr Samantha Drover, Dr. Sarah Buchan, Dr. Sarah Wilson, Dr. Sharifa Nasreen, Dr. Kevin Schwartz, Dr. Mina Tadrous, Dr. Nisha Thampi, Dr. Kumanan Wilson, Dr. Shaun Morris, Dr. Peter Austin, Dr. Astrid Guttmann, Dr. Jeffrey C. Kwong

Introduction/background: Understanding how the efficacy of COVID-19 vaccines translates from clinical trials to real-world settings is critical to inform evolving vaccination policies. The objective of this study was to assess COVID-19 vaccine effectiveness (VE) against severe COVID-19-related outcomes in children aged 5-11 years, including COVID-19-related hospital admissions and multisystem inflammatory syndrome in children (MIS-C).

Methods: We conducted a retrospective, population-based cohort study using linked health administrative data held at ICES, in the first year following the emergence of the Omicron variant (January 2 to December 31, 2022). Baseline differences between subgroups of interest were compared using standardized differences. We used multivariable Cox proportional regression models to estimate VE by time since last dose by treating vaccination as a time-varying exposure, compared to unvaccinated children.

Results and analysis: We included a total of 1,058,740 children, of which 583,867 (55.1%) were vaccinated (≥1 dose) by the end of the study period. In total, there were 185 COVID-19-related hospital admissions and 39 cases of MIS-C. The risk of COVID-19-related admission was much higher in children with an underlying comorbid condition (n=95, 51.4%) compared to children who were previously healthy (adjusted hazard ratio [aHR]=4.77, 95%CI, 3.56-6.38). VE against COVID-19-related admission ranged from 93% (95%CI, 52-99%) 7-29 days after a second dose to 63% (95%CI; 41-77%) ≥120 days after a second dose. No admission occurred after a third dose. There was no statistically significant difference in the risk of MIS-C in vaccinated compared to unvaccinated children (aHR=0.71; 95%CI, 0.38-1.34).

Conclusions and implications for policy, practice or additional research: We found that for children aged 5-11 years, VE against COVID-19-related hospitalization was initially high after a second dose with some signs of waning over time. Children with comorbid conditions were found to be at much higher risk of COVID-19-related severe outcomes and thus may benefit most from targeted interventions to optimize vaccine uptake.

MVA-BN vaccine effectiveness against mpox infection: target trial emulation: a Canadian Immunization Research Network (CIRN) study

Dr Christine Navarro, Ms Cindy Lau, Dr Sarah Buchan, Dr Ann Burchell, Dr Sharifa Nasreen, Ms Lindsay Friedman, Dr Evaezi Okpokoro, Dr Peter Austin, Dr Darrell Tan, Dr Jonathan Gubbay, Dr Jeff Kwong, Dr Sharmistha Mishra

Introduction/background: Modified vaccinia Ankara vaccine (MVA-BN [Bavarian-Nordic], Imvamune®) is a third-generation, live-attenuated, non-replicating smallpox vaccine. In response to the global mpox outbreak in 2022, MVA-BN was deployed in Ontario as post-exposure prophylaxis for high-risk contacts and pre-exposure prophylaxis for gay, bisexual, and other men who have sex with men, and sex workers at high risk of exposure to mpox. We aimed to estimate the real-world effectiveness of MVA-BN against mpox infection.

Methods: We emulated a target trial using linked databases to estimate the effectiveness of one dose of MVA-BN. Our study included males aged =>18 years who: (1) had a history of syphilis testing and a laboratory-confirmed bacterial sexually transmitted infection (STI) in the prior year; or (2) filled a prescription for HIV pre-exposure prophylaxis in the prior year. On each day between June 12, 2022 and October 27, 2022, males who had been vaccinated 15 days prior were matched 1:1 with unvaccinated males by age, geographic region, prior HIV diagnosis, number of bacterial STI diagnoses in the previous three years, and receipt of any non-MVA-BN vaccine in the previous year. We used a Cox proportional hazards model to estimate the hazard ratio comparing the rate of mpox between the two groups, and calculated vaccine effectiveness as (1–HR)x100.

Results and analysis: Each group included 3,204 males. A total of 71 mpox infections were diagnosed over the study period, with 0.09 (95% confidence interval [CI], 0.05–0.13) per 1000 person-days for the vaccinated group and 0.20 (95%CI, 0.15–0.27) per 1000 person-days for the unvaccinated group. Estimated vaccine effectiveness of one dose of MVA-BN against mpox infection was 58% (95%CI, 31–75%).

Conclusions and implications for policy, practice or additional research: In the absence of randomized clinical trials, our findings strengthen the evidence that MVA-BN is moderately effective at preventing mpox infection and should be made accessible and actively recommended to communities at risk.

Uptake and characteristics of individuals who received 2 doses compared to 1 dose of mpox vaccine in Ontario: A CIRN study

Dr. Ramandip Grewal, Dr. Sharmistha Mishra, Ms. Cindy Lau, Dr. Ann Burchell, Ms. Lindsay Friedman, Dr. Christine Navarro, Dr. Evaezi Okpokoro, Dr. Darrell Tan, Dr. Austin Zygmunt, Dr. Jeff Kwong, Dr. Sarah Buchan

Introduction/background: In May 2022, outbreaks of mpox emerged in countries where the virus was not previously endemic, including Canada, and disproportionately affected gay, bisexual, and other men who have sex with men (GBM). In June 2022, Ontario began offering first doses of a 2-dose regimen of Modified Vaccinia Ankara–Bavaria Nordic (MVA-BN) to GBM at high risk of exposure and sex workers. Second doses became widely available in September 2022 for those whose first dose was ≥28 days ago. To help inform programs in accelerating dose 2 uptake, we sought to understand how individuals who received 2 doses of MVA-BN differed from those who received only 1 dose.

Methods: We linked laboratory, vaccination, reportable infections, and health administrative data of individuals who received ≥1 dose of MVA-BN between 06JUN2022-30NOV2022. We compared socio-demographic and clinical characteristics of individuals who received 2 doses to only 1 dose using proportions and standardized differences (≥0.10 programmatically meaningful).

Results and analysis: Among 31,346 individuals with ≥1 dose of MVA-BN, 16.6% (5,208) received 2 doses. Programmatically meaningful differences between those who received dose 2 versus only dose 1 were observed by geography (18.6%, 6.8%, 3.4% versus 9.3%, 11.1%, 7.1% living in Ottawa, Peel/York/Durham/Halton, and Hamilton/Niagara/London/Windsor, respectively); gender (98.0% men versus 92.9% women); older age (median age = 40 versus 38 years); receipt of another vaccine (96.6% versus 91.8%), having ≥1 syphilis test (58.5% versus 45.6%), and more physician office visits (median = 5 versus 4) in the past year; and a syphilis test >3 months after dose 1 (2.5% versus 1.2%).

Conclusions and implications for policy, practice or additional research:
Our preliminary findings suggest that among recipients of dose 1, those who were more engaged in healthcare were also more likely to receive dose 2 of MVA-BN. Next steps include updating our cohort and dose 2 uptake with 2023 data and using regression methods to refine potential statistical associations.

XBB.1.5 vaccine effectiveness against medically-attended COVID-19, including variant-specific: 2023/24 estimates from the community-based Canadian Sentinel Practitioner Surveillance Network

Dr Danuta Skowronski, Ms Yuping Zhan, Ms Samantha Kaweski, Mr Romy Olsha, Dr Sara Carazo, Ms Ayisha Khalid, Dr Richard Mather, Dr Maan Hasso, Dr Hugues Charest, Dr Ines Levade, Dr Agatha Jassem, Ms Suzana Sabaiduc, Ms Lea Separovic, Dr Ruimin Gao, Dr Nathalie Bastien

Introduction/background:
In Canada, Omicron XBB.1.5 monovalent mRNA vaccines became available in October 2023. The Canadian Sentinel Practitioner Surveillance Network (SPSN) estimated XBB.1.5 vaccine effectiveness (VE) against medically-attended COVID-19, including variant-specific, by time since vaccination.

Methods: A test-negative case-control study estimated XBB.1.5 VE against medically-attended, laboratory-confirmed COVID-19 between 29 October 2023 and 6 April 2024 (epi-weeks 44-14) among outpatients ≥12 years presenting with acute respiratory illness to sentinel practitioners in British Columbia, Ontario and Quebec, Canada. Immunization details were extracted from provincial registries. We excluded recipients of non-XBB.1.5 vaccine within 24 weeks before XBB.1.5 campaign

launch and influenza cases from SARS-CoV-2 test-negative controls. Whole genome sequencing was attempted on all contributing case viruses; BA.2.86/JN.1 comprised >80% of sequenced SPSN viruses by epi-week 52 and all unknown clades thenceforth were assumed as such. Age, province, and calendar-time adjusted VE estimates were derived at 2-7, 8-11 and ≥12 weeks between vaccination and specimen collection.

Results and analysis: VE analyses included 460 (14%) SARS-CoV-2 cases and 2,826 test-negative controls. Of 336/460 (73%) sequenced case viruses, 192/336 (52%) were BA.2.86/JN.1, with 60 case viruses additionally assumed as such. At median 10 weeks post-vaccination (interquartile range (IQR)=6-15; range=2-25 weeks), XBB.1.5 VE against COVID-19 overall was 47% (95%CI: 28,61): 59% (95%CI: 36,74) at 2-7 weeks, 56% (95%CI: 22,75) at 8-11 weeks but -1% (95%CI: -71,40) ≥12 weeks (median=16; IQR=14-19 weeks) post-vaccination. The BA.2.86/JN.1-specific VE was 37% (95%CI: 8,56): 54% (95%CI: 12,76) at 2-7 weeks, 51% (95%CI: 8,74) at 8-11 weeks but -3% (95%CI: -77,39) at ≥12 weeks (median=16; IQR=14-19 weeks) post-vaccination.

Conclusions and implications for policy, practice or additional research: XBB.1.5 vaccine reduced the medically-attended COVID-19 risk, including due to BA.2.86/JN.1 variants, by more than half for up to 2 months post-vaccination; however, protection was negligible by 3-6 months post-vaccination. Alongside other considerations (e.g., disease levels), findings have implications for development of vaccines providing more durable protection and/or the timing of additional (e.g., within-season) vaccine doses.

Coadministration of a respiratory syncytial virus vaccine (mRNA-1345) with an influenza or mRNA SARS-CoV-2 vaccine in older adults

Jaya Goswami, Jose Cardona, Alana Simorellis, Denise Hsu, Lauren Wilson, Rakesh Dhar, Xiaowei Wang, Avi Collins, **Dr. Jagjit Ludu**, Honghong Zhou, Sonia K. Stoszek, Christine A. Shaw, Caroline Reuter, Eleanor Wilson, Jacqueline M. Miller, Rituparna Das

Introduction/background: Coadministration of vaccines reduces healthcare visits and potentially increases vaccination rates. We present data evaluating coadministration of mRNA-1345 (50-µg) with licensed quadrivalent seasonal influenza (Afluria Quadrivalent; 60-µg) or mRNA SARS-CoV-2 vaccines (Spikevax Bivalent [ancestral+omicron BA.1]; 50-µg) in older adults.

Methods: In this phase 3, multi-part, double-blind study in older adults ≥50 years, participants in Part A were randomized to receive mRNA-1345+Afluria Quadrivalent, mRNA-1345+placebo, or Afluria Quadrivalent+placebo; in Part B, participants randomly received mRNA-1345+Spikevax Bivalent, mRNA-1345+placebo, or Spikevax Bivalent+placebo (Figure 1). Safety was a primary objective; primary immunogenicity objectives were noninferiority of antibody responses of coadministered mRNA-1345+Afluria Quadrivalent against RSV-A and influenza strains (Part A) and noninferiority of coadministered mRNA-1345+Spikevax Bivalent against RSV-A and SARS-CoV-2 strains (ancestral+omicron; Part B) to comparators at Day 29. Noninferiority of immune responses against RSV-B was a key secondary objective.

Results and analysis: Overall, 3304 participants received vaccines (Part A, n=1623; Part B, n=1681). Coadministration (Figure 1) was generally well-tolerated and had an acceptable reactogenicity profile. In Part A, noninferiority to the comparator was demonstrated against RSV-A based on Day 29 geometric mean titer ratios (GMRs) but not seroresponse rate (SRR) differences; lower-bound 95% CIs of the GMR for all influenza strains (A/H1N1, A/H3N2, B/Yamagata, B/Victoria) and RSV-B were >0.667 (Figure 2). Day 29 SRR difference (95% CI) for RSV-B was -14.3% (-21.5%, -6.9%). In Part B, all 6 co-primary immunogenicity endpoints were met, with noninferiority to the comparator

demonstrated for RSV-A and SARS-CoV-2 (ancestral+omicron strains) based on Day 29 GMRs and SRR differences (Figure 3). Noninferiority against RSV-B in Part B was met based on GMR only.

Conclusions and implications for policy, practice or additional research: mRNA-1345 coadministration with a licensed quadrivalent seasonal influenza or mRNA SARS-CoV-2 vaccine was generally well-tolerated. All GMR noninferiority objectives were met in adults ≥50 years, suggesting that mRNA-1345 can be coadministered with influenza and mRNA SARS-CoV-2 vaccines in this population.

Oral Abstracts Session 4 Tuesday 26 November 15:30-17:00 Room 202

Engaging and Mobilizing Stakeholders to Address Care Gaps: The Federation of Medical Women of Canada Task Force to address the HPV Immunization Crisis during COVID

Vivien Brown, Ms. Sheri Fitzpatrick-Poulain

Introduction/program need and objectives: A major care gap in vaccination is systems and implementation. During COVID the Ontario school-based HPV program faced a crisis. VCRs plummeted to 2.6% in 12 y/o students in 2020-2021. To address the crisis, the Federation of Medical Women of Canada (FMWC) convened a task force of a diverse group of HCPs and allied stakeholders from various sectors.

Program methods, activities and evaluation: A diverse group of Physicians, Pharmacists, Dentists, Public Health Officials, School Board members and Industry were convened and developed eleven short-term and six long-term recommendations addressing six main areas and published them in a white paper as a road map for recovery:

1. Access to HPV vaccines
2. Communication about HPV vaccines
3. Collaboration - HCPs/Public Health/Government
4. Change management
5. Leveraging technology to improve vaccine uptake
6. Investment in public health and research

Program results or outcomes: The Task Force met with Ontario Parliament members, Ministry of Health, and the Ontario Chamber of Commerce. A public relations and education campaign was initiated generating 52,060,242 media impressions in 2022 and 45,574,731 in 2023. Several collaborations were developed for educational events. Synergies with the Cancer Won't Wait program also increased the educational reach. The Ministry of Health implemented changes including an extension for HPV vaccination and a focus on strategies for catch up. VCRs increased from 2.6% to 48% in the latest coverage report. Most impressive were the gains in the catch-up program.

Recommendations and implications for practice or additional research: The Task Force recommendations and actions played a role in the recovery of HPV VCRs. The Task Force process is now being utilized in other therapeutic areas including by the Canadian Public Health Association who are building on the recommendations of the FMWC Task Force with the aim of promoting equity and access of HPV immunization among underserved populations. A major next step is for proper registries in Ontario.

Closing the Gap: Implementing tests of change to address sub-regional HPV immunization inequities in Canada

Dr. Cory Neudorf, Ms. Mika Rathwell, **Ms. Aine Dolin**, Dr. Thilina Bandara, Ms. Jaspreet Saini

Introduction/background: As part of the Action Plan to Eliminate Cervical Cancer, 2040, the Canadian Partnership Against Cancer provided funding to the Urban Public Health Network to conduct a quality improvement project to assess the landscape of HPV immunization coverage across Canada at a subregional level.

Methods: This project engaged 6 public health units across the country to examine HPV immunization data at a sub-regional level, using postal-code data where available and linking coverage rates to socio-demographic indicators where possible to identify pockets of under-immunization. Additionally, qualitative data collection methods such as surveys, focus groups, and interviews were utilized to identify facilitators and barriers that impact specific sub-populations, including Indigenous people, newcomers, and 2SLGBTQIA* people.

Results and analysis: Quantitative insights from six regions, representing approximately 9 million Canadians, indicate that no participating region has reached the 90% coverage goal and that a high level of subregional coverage variability remains. Material and social deprivation emerged as the most salient correlates of under-immunization in these six regions.

Further engagement with parents/guardians and providers suggests several common barriers; however, their weight in influencing HPV immunization uptake varies between and within regions and populations. Common barriers include gaps in knowledge and understanding of HPV and the vaccine, lack of access points outside of school, lost and misplaced consent forms, and mistrust in healthcare systems. Findings indicate four distinct areas to focus intervention efforts: informational, programmatic, relational, and capacity.

Conclusions and implications for policy, practice or additional research: Findings from this work have informed recommendations on increasing youth HPV immunization in under-immunized populations. The second phase of this project is ongoing and focuses on mobilizing these recommendations by implementing strategic and targeted tests of change within each region and helping close gaps in equity in coverage across Canada.

Visiting with administrative and survey data on HPV vaccination coverage in the Métis Nation of Alberta

Mx. KD King, **Ms. Reagan Bartel**, Ms. Ashton James, Dr. Shannon E. MacDonald

Introduction/background: HPV is the most common sexually transmitted infection in North America and is responsible for significant cancer morbidity and mortality. Indigenous Peoples experience higher incidence and mortality from HPV-associated cancers. Safe and effective HPV vaccines have been available in Alberta since 2008, yet no information has been published about Métis-specific HPV vaccination coverage.

Methods: Using the Métis methodology of *keeyoukaywin* (visiting), probability-linked administrative data from the Métis Nation of Alberta citizens registry and the provincial Immunization data repository were used to calculate HPV vaccine coverage and confidence intervals (CIs) for two cohorts of Metis children by ages 13 and 17 in 2018. Self-reported vaccination and Vaccine Confidence Scale (VCS) scores were also measured in a cross-sectional survey with a large convenience sample of parents of Métis children in Alberta in May 2023.

Results and analysis: Using administrative data, HPV vaccination coverage for Métis children (N=2935) by age 13 was 72.19% (95% CI 69.14-74.61%); by age 17, it was 74.58% (95% CI 66.98-79.20%). The cross-sectional survey (N=680) self-reported coverage of eligible Métis children aged 12-17 was 81.22% (95% CI 74.21-88.23%). Population mean VCS scores (range: 1-strongly disagree, to 10-strongly agree) indicated moderately high levels of vaccine confidence both overall (mean 7.09, sd 1.17) and in the areas of Trust (mean 7.71, sd 1.80) and Benefits (mean 7.70, sd 1.92), and lower scores in the perception of Harms (mean 5.25, sd 2.31).

Conclusions and implications for policy, practice or additional research: HPV vaccination coverage in Alberta's Métis population in 2018 was comparable with the general population in Alberta. Self-reported HPV vaccination from 2023 was higher than the administrative data indicated. HPV vaccine confidence was moderate. Further research exploring interventions to improve uptake is warranted to eliminate HPV-related cancer within the Métis Nation.

Moving the Needle Forward: Results from Immunize Canada's Public Health HPV Vaccine Task Force to Improve Vaccination Rates in Ontario

Ms. Antonella Pucci

Introduction/program need and objectives: Human papilloma virus (HPV) is primarily responsible for cervical cancer and linked to other reproductive and oropharyngeal cancers. While HPV-related cancers are highly preventable thanks to HPV vaccines, getting shots into arms remains a challenge. The National Advisory Committee on Immunization (NACI) made a call to action to achieve 90% HPV vaccination coverage in adolescents by 2025. In Ontario, pre-pandemic rates for HPV vaccination maintained around 60% for 12-year-olds in 2018-19. The COVID-19 pandemic had a severe impact on the ability of public health to carry out vaccination programs in school settings, and rates dropped as low as 0.8% in 2021. Immunize Canada launched an HPV Task Force to help achieve NACI's call to action and develop actionable steps for public health to increase HPV vaccination rates in Ontario.

Program methods, activities and evaluation: Public health professionals working in areas of school health or immunization were invited to participate in the HPV Task Force to help increase vaccine uptake in Ontario. An expert advisory board of 6 members was established to provide guidance and expertise on task force activities among the general membership. The task force will hold six virtual workshops to discuss learnings and share knowledge. The task force will be considered successful based on the identification of strategies that the members intend to undertake.

Program results or outcomes: Results from the HPV Task Force will include actionable strategies on how to achieve NACI's call to action, promote equity in vaccine access to underserved populations, and develop initial approaches for public health professionals and units to increase HPV vaccine uptake locally. A communication plan will also be developed to encourage consistent tailored action within the public health sector to improve school-based immunization programs.

Recommendations and implications for practice or additional research: Recommendations from the HPV Task Force will be published in Fall 2024 and presented at the 2024 Canadian Immunization Conference (CIC).

Human papillomavirus (HPV) vaccination coverage among children and adults in Canada

Dr. Marwa Ebrahim, Anna-Maria Frescura, Stephen Cule, Kristina Sabou, Anton Maslov, Jeanette Bourne, Takoua Boukhris, Grace Nichol, Chantal Bacev-Giles

Introduction/background: Canada has not reached its national human papilloma virus (HPV) vaccination coverage goal of 90% among 14-year-olds. This work presents the most-up-to-date information on HPV vaccination coverage as well as factors associated with vaccine uptake in Canada.

Methods: Vaccination coverage among 14-year-olds is presented from the childhood National Immunization Coverage Survey (cNICS), among 9–17-year-olds from the Childhood Immunization Coverage Survey in Key Populations (KPCICS), and among adults 18 years and older from the adult National Immunization Coverage Survey (aNICS). Weighted logistic regression models were built to determine predictors of HPV vaccination from the cNICS 2021 and the aNICS 2023.

Results and analysis: HPV vaccination coverage among 14-year-olds increased from 80.2% in 2019 to 84.0% in 2021. While coverage has not changed for females (2021: 86.4%; 2019: 87.1%), it has increased among males (2021: 81.5%; 2019: 73%). In 2021, HPV non-vaccination was higher among 14-year-olds born outside Canada (aOR: 2.61, CI: 1.20-5.70)) and those with a history of refusal, reluctance, or delay of at least one childhood vaccine (aOR: 3.26 CI: 1.87-5.66).

In 2023, less than one in four 9- to 14-year-olds (21%) and 15- to 17-year-olds (22%) with a recent immigrant parent had not received the HPV vaccine. Among children with a health care worker parent, non-HPV vaccination was higher among 9 to 14-year-olds (60%) compared to 15 to 17-year-olds (28%).

In 2023, 17.7% of adults aged 18 years and older received at least one dose of HPV vaccine; females had higher coverage compared to males (22.5% and 12.0%, respectively). The odds of HPV vaccination among 18-26-year-olds were significantly higher for naturalized citizens; those with household income above $150,000; East/Southeast Asian individuals; and respondents with one or more chronic condition.

Conclusions and implications for policy, practice or additional research: Results could tailor public health interventions in Canada to promote vaccine uptake particularly among groups with suboptimal immunization.

Oral Abstracts Session 5 Wednesday 27 November 10:30-12:00 Room 201

Digital health literacy and factors that influence vaccine acceptance among parents in Ontario: Quantitative findings from a mixed methods study

Dr Sarah Ashfield, Dr Lorie Donelle, Dr. Panagiotta Tryphonopoulos, Dr Ève Dubé Dubé, Dr Maxwell Smith

Intro/Background: Parents make important vaccine decision for their child(ren) and many variables affect parents' decisions. Some parents have an attitude of vaccine hesitancy while others readily accept vaccines. Parents are tasked with locating, understanding, and applying information to inform health decisions, often using online resources; however, there is a gap in understanding the digital health literacy levels of parents making vaccine decisions.

Methods: Quantitative findings from a cross-sectional mixed methods study that examined parental vaccine decision making across the continuum of vaccine hesitant to vaccine accepting are reported.

An online survey of parents of children aged 2-11 years was conducted in Ontario. Digital health literacy was measured, and multiple linear regression assessed predictors of vaccine acceptance.

Results and analysis: 219 parents completed the survey and on average reported high levels of digital health literacy. In regression analysis, digital health literacy, trust, and the vaccine information source healthcare providers predicted vaccine acceptance.

Conclusion and implications: Our study is the first to report on the digital health literacy levels of Canadian parents making vaccine decisions for their child(ren). Our findings demonstrate that trust is an important factor in vaccine acceptance among parents. Trust in immunizations, in healthcare providers, and in vaccine regulation can influence vaccine acceptance. Public health implications include increasing public awareness surrounding the processes of vaccine regulation as well as fostering trust in various organizations, healthcare authorities, public health institutions, and scientists involved in making vaccines. Clinical implications include enhancing access to primary care providers who provide vaccine services across the province. There is opportunity for further research that measures the digital health literacy levels of parents making vaccine decisions.

Routine childhood immunization coverage amongst hospitalized children: A Quality Improvement Initiative

Dr Caitlyn Hui, Ms. Jessica Florio, Ms Aalia Jahurali, Dr Louise Ing, Ms Elahe Karimi-Shahrbabak, Dr Adria Rose, Dr Pierre-Philippe Piche-Renaud, Dr Shaun Morris

Introduction/background: Vaccination is the best preventative measure against infectious diseases. However, the COVID-19 pandemic has led to increased gaps in routine childhood immunization coverage, which are concerning for ongoing circulation of vaccine preventable diseases, including measles. Hospitalizations and clinic visits for other health-related issues are a missed opportunity to identify and address these gaps.

Methods: We implemented a quality improvement initiative on select paediatric wards at The Hospital for Sick Children, Toronto (Ontario, Canada), between December 4, 2023, and February 23, 2024. Demographic information and an enhanced vaccine history, including detailed vaccine records and data on vaccine confidence, were collected by two trained nurses. Participating families received personalized recommendations on vaccination, including: 1) Vaccinating in hospital; 2) Connecting to a primary care provider; 3) Referring to our vaccine consultation service or 4) Referring to our Special Immunization Clinic.

Results and analysis: From 155 families interviewed (of 207 eligible), based on parental report, 106 (68%) were fully vaccinated, 38 (25%) were partially vaccinated, four (3%) were unvaccinated, and seven (5%) were unsure of their vaccination history. Uptake of the measles vaccine, in particular, was suboptimal, with 104/128 (81.3%) of eligible children having received the 12-month dose of the Measles-Mumps-Rubella (MMR) vaccine, and 53/107 (49.5%) of eligible children having received both the recommended MMR and the MMRV doses at 12 months and 4-6 years, respectively.

Conclusions and implications for policy, practice or additional research:
We identified significant gaps in vaccine uptake in hospitalized children that should be urgently addressed in the context of increased global measles circulation. Admission to tertiary care centres is an important opportunity to identify these gaps and implement strategies to improve vaccine uptake.

Vaccines in Pregnancy Canada: A co-designed intervention to support vaccination shared decision-making - *Monica Surti*

Miss Monica Surti, Ms. Medea Myers-Stewart, Ms. Maria Castrellon Pardo, Ms. Marica Bruce, Dr. Andrea Patey, Dr. Maoliosa Donald, Dr. Eliana Castillo

Introduction/background: Improving vaccine communication during pregnancy is essential because vaccination in pregnancy (VIP) protects pregnant persons and newborns and predicts a higher likelihood of childhood vaccination, yet uptake remains low.

Methods: We adapted an existing Australian intervention (SKAI) designed for vaccine communication (Figure 1). Considering the contextual differences between Australia and Canada, as well as the fact that SKAI was developed before COVID-19, we co-designed a new intervention to address current gaps in VIP communication in Canada. This involved collaboration with pregnant persons, their families, healthcare providers (HCPs), and intermediaries. We used person-centered design, EDI principles and an implementation and behavioral sciences-informed approach to:

- Characterize the SKAI intervention using Behaviour Change Theory
- Understand the Canadian context i.e. elicited barriers and enablers to vaccine communication via interviews and conducted a scoping review of VIP resources.
- Map Canadian barriers and enablers to existing SKAI intervention-components.
- Co-design Canadian intervention

Results and Analysis: Pregnant parents want to understand what is best for themselves and their babies' health, balancing clear recommendations with shared decision-making. HCPs want to improve their vaccine communication skills without alienating their clients. However, existing VIP resources focus on knowledge rather than skill-building and self-efficacy. *Vaccines In Pregnancy Canada* supports parents, their families, and providers to engage in shared vaccine decision-making, and trusted relationship-building. The intervention components align with behavioral change techniques, grounded in the theoretical domains framework (Table 1), addressing specific barriers and enablers identified by Canadian parents and providers. HCPs learn the communication approach through both synchronous and asynchronous interactive learning (Figure 2) and earn continuing education credits.

Conclusions and implications for policy, practice, or additional research: Vaccines in Pregnancy Canada offers skill-based training to enhance the self-efficacy of HCPs and parents in vaccine communication. It also provides an open-access digital hub, hosting evidence-based resources for pregnant individuals, their support network, and providers (vaccinesinpregnancy.ca). The next step is a feasibility study in multiple provinces.

Nothing about Me, Without Me: The Value of Co-Design with Patients to Maximize the Relevance and Impact of Vaccination Interventions - Medea Myers-Stewart

Ms. Medea Myers-Stewart, Mrs. Maria Castrellon Pardo, Ms. Monica Surti, Mrs. Marcia Bruce, Ms. Zaileen Jamal, Dr. Andrea Patey, Dr. Maoliosa Donald, Dr. Eliana Castillo

Introduction/background:
Vaccination during pregnancy offers essential protection for pregnant persons and their babies, yet uptake remains low. Enhancing parent-provider communication and improving access to evidence-based resources are crucial in promoting vaccination in pregnancy (VIP). Engaging families is key to developing sustainable and contextually relevant interventions that improve VIP uptake. To develop our parent-facing materials, we employed best practices in person-centred co-design to develop a multi-component intervention featuring a public-facing website with evidence-based vaccine information and resources tailored to the needs of pregnant persons, their families, and providers.

Methods:
We engaged parents, their support networks, and healthcare providers (HCPs) through iterative co-design activities to ensure materials would be relevant and meaningful. Community outreach events with hundreds of pregnant individuals and their families helped us identify common concerns and questions about VIP. Focus groups and semi-structured interviews with parents from diverse backgrounds provided insight into their preferences regarding VIP communication. An online mixed-methods survey including parents across Canada helped us understand the psychological factors influencing VIP decision-making. All website content was co-developed and evaluated with our parent/patient council to ensure materials accurately reflect and represent the needs and preferences of pregnant persons.

Results and analysis:
This iterative co-design process resulted in the development of Vaccines in Pregnancy Canada (VIP Canada), an accessible, evidence-based digital hub and "one-stop-shop" for VIP information that synthesizes research and recommendations into clear, accessible written and visual content **(Figure 1).** By incorporating the voices and experiences of our target population, VIP Canada serves as an inclusive, contextually relevant resource that accurately represents the diverse identities and needs of pregnant persons across Canada.

Conclusions and implications for policy, practice or additional research:
The collaborative process behind VIP Canada demonstrates the value of engaging communities in co-designing vaccine interventions that are relevant and effective for populations with distinct needs. Insights from this approach can be used to develop similar interventions in other settings.

Understanding Parental Preferences Regarding Maternal Respiratory Syncytial Virus (RSV) Vaccination

Ms. Marcia Bruce, Ms. Maria Castrellon Pardo, Ms. Zaileen Jamal, Ms. Medea Myers-Stewart, Ms. Monica Surti, Dr. Maoliosa Donald, Dr. Andrea Patey, Dr. Eliana Castillo

Introduction/background: Respiratory Syncytial Virus (RSV) is a common respiratory virus that causes approximately 80,000 hospitalizations and 100–300 deaths in under 5-year-olds, annually in Canada. Fortunately, preventative measures including a monoclonal antibody for pre-exposure infant prophylaxis and a maternal RSV vaccine are now available. In April 2024, Canada's national advisory committee for immunization recommended an infant prophylaxis program. Given cost, product availability and implementation factors, a sizeable proportion of eligible babies may not receive RSV prophylaxis in upcoming RSV seasons. In this context, understanding parental insights and preferences regarding RSV maternal vaccination as an alternative to infant prophylaxis is important. This study aims to investigate parental preferences regarding maternal RSV vaccination as an alternative to infant prophylaxis for RSV.

Methods: We will use a person-centred, qualitative research methodology. Two patient research partners who are certified in patient and community engagement research (PaCER) will conduct semi-structured focus groups and interviews with up to 30 parents from across Canada. Data will be analyzed using inductive, thematic analysis where patterns identified from the focus group and interview data will shed light on underlying meanings, ideas, and concepts that arise regarding the proposed research questions.

Results and analysis: Focus groups and interviews will be conducted from May – July 2023. Results will be analyzed and ready to be presented at the 2024 CIC Conference.

Conclusions and implications for policy, practice or additional research: The world-wide RSV prevention landscape is currently undergoing a radical change. Despite the approval of new products there are still concerns about availability and cost. Parental preferences will impact uptake. Understanding parental preferences and decision making is important to help empower parents to make informed choices to protect their newborns from this, now preventable, illness.

Oral Abstracts Session 6 Wednesday 27 November 10:30-12:00 Room 202

Improving Vaccine Access for Newcomers and Refugees in Calgary, Alberta: A Navigation Approach

Dr. Ugochukwu Osigwe, Ms. Diedre Lake

Introduction/program need and objectives:
Accessing healthcare in Alberta can be daunting for newcomers and refugees due to various challenges including language barriers, cultural differences, difficulties navigating the booking process, and transportation issues. These obstacles contribute to low vaccine literacy and uptake, posing risks to public health. This project aimed to address these challenges by enhancing vaccine literacy and uptake among newcomer communities through community-based education and outreach, as well as providing navigation support in multiple languages.

Program methods, activities and evaluation: We collaborated with stakeholders and immigrant-serving organizations to identify community needs. We developed culturally appropriate, multilingual vaccine education resources such as flyers, presentations, and videos. Community outreach activities were conducted to engage and build trust within the community. We provided navigation supports which included translation and interpretation, appointment booking, appointment reminders, accompaniment, transportation support. Additionally, we established a booking tool and a dedicated multilingual phone line to provide navigation support in clients' preferred languages.

Program results or outcomes: We developed 19 vaccine flyers in six languages, 10 flyers in a further 4 languages, 10 videos that garnered 35008 views. Organized community vaccine information booths and vaccine education presentations which reached 1980 people. Coordinated four on-site vaccination clinics for refugees and newcomers, contributing to a monthly surge in booking tool usage of over 100%. We received 146 unique requests for navigation supports and served 284 clients.

Recommendations and implications for practice or additional research: The approach leveraged internationally trained physicians to provide targeted culturally responsive vaccine education and provide navigation supports that meets patients where they are. These included barrier reduction supports such as translation and on-site vaccinations. Our multi-pronged strategy proved effective which included community outreach and partnerships with stakeholders, community organizations, immigrant serving agencies and community leaders.

Attitudes towards COVID-19 and influenza vaccines in Yukon First Nation Communities

Champagne and Aishihik First Nations, Selkirk First Nation, Math'ieya Alatini, Dr. Amanda Boyd, Kari Johnston, Dr. Rhiannon Klein, Dr. Michelle Leach, Dr. Eric Merkley, Kristeen McTavish, Eva Newsome, Ruth Nielsen, Alison Perrin, Dr. Liris Smith, Amanda Workman

Introduction/background: Canadian attitudes towards COVID-19 and influenza vaccines vary across the country. While much research investigates attitudes towards vaccines in population centres, very little research focuses on rural, remote, and Indigenous communities. In this community-led study, our collaborative research team used a Yukon First Nations and Western approach to explore attitudes towards COVID-19 and influenza vaccines in Yukon First Nations communities.

Methods: Our collaborative research team includes representatives from Yukon First Nations communities, Council of Yukon First Nations, One Yukon Coalition, Yukon University, University of Toronto, and Washington State University, as well as expert advisors in health and communications. We used a qualitative case study methodology to complete one-on-one interviews, sharing circles, and validation focus groups with Yukon First Nations communities. We had 15-20 participants from each First Nation. Data was collected in rural and urban Yukon communities over Winter and Spring 2024.

Results and analysis: Data was analyzed collaboratively using a combination of deductive and inductive analysis. Deductive analysis was conducted by applying the vaccine hesitancy continuum (the SAGE Working Group on Vaccine Hesitancy, 2015) and 5C model of vaccine hesitancy (Betsch et al., 2018). Inductive analysis was conducted through collaborative working sessions with community-based researchers. In the end, results show that attitudes towards COVID-19 and flu vaccine differ, and that participants' attitudes towards vaccines are impacted by community health experiences, relationships with vaccine providers and communicators, experience and availability of land-based medicines, and individuals' role in the family and community.

Conclusions and implications for policy, practice, or additional research: The results of this project increase understanding of how Yukon First Nation community members make vaccine-related decisions. These results may be used to inform the work of First Nations Governments, Territorial and Federal Governments, organizations, leaders, and communities, to support Yukon First Nations communities today and for future generations. Further, the results of this project will be used to inform future research into Yukon Territory-wide attitudes towards COVID-19 and influenza vaccines.

The essential roles of community-based task forces, networks and organizations in promoting vaccine confidence and uptake during the COVID-19 pandemic in Peel region

Miss Denessia Blake-Hepburn, Dr. Kadidiatou Kadio, Dr. Erica Di Ruggiero, Dr. Shaza Fadel, Dr. Anushka Ataullahjan, Dr. Sara Allin, **Nazia Peer**

Introduction/background: The Ontario government launched the "High Priority Communities Strategy (HPCS)" in December 2020, funding community agencies operating in neighborhoods disproportionately affected by COVID-19 in Durham, Peel, Toronto, York, and Ottawa. Community-led task forces were also formed to increase confidence and uptake for vaccines among minoritized communities. Given the need to capture community perspectives, we analyzed how task forces, networks, and community organizations engaged with faith, racial and ethnic communities to improve vaccine confidence and uptake of COVID-19 vaccines, including perceived facilitators and barriers.

Methods: Between June 2023 and March 2024, we conducted ten online focus groups with three task forces and six HPCS-funded community agencies working in Peel Region. We also conducted four key-informant interviews with representatives from two task forces and one network. We used thematic analysis to explore respondents' perceptions and experiences.

Results and analysis: Respondents reported engagement with a diversity of actors, including public health (e.g., Peel Public Health) and community health centres. They highlighted that tailored strategies proved to be effective (e.g., use of ethnic media and townhalls to address localized religious and language needs, community ambassadors who represent priority communities). Respondents also discussed that building trust among minoritized communities is important to increasing vaccine confidence among these communities. Task forces were mainly formed by

physicians, and volunteer-driven and did not have the capacity to formally evaluate their work. HPCS-funded community agencies had key performance indicators (e.g., number of vaccines provided). Most task forces, which formed during the pandemic, disbanded or ended their COVID-19 work. The community agencies shifted the focus of their work, under the HPCS, to preventative and primary care.

Conclusions and implications for policy, practice or additional research: Ongoing funding should be made available to support community-led efforts (e.g., task forces) to sustain existing vaccine uptake interventions. These findings may help to further strengthen community engagement for future pandemic preparedness and public health emergency responses.

Reducing decisional conflict in COVID-19 vaccination in ethnocultural communities through sensemaking: a participatory action mixed-methods study - Eliana Castillo

Dr Eliana Castillo, Dr. Denise Campbell-Scherer, Yvonne Chiu, Thea Luig, Stephanie Fernandez

Introduction/background: The COVID-19 pandemic revealed profound inequities for people in vulnerable circumstances exposing gaps on pandemic preparedness. We are illuminating the role and function of cultural health brokers as intermediaries between community and formal systems to bridge cultural, linguistic, and knowledge gaps and help people navigate decisional conflict for pandemic measures like vaccinations.

Methods: The Sensemaking Project used participatory action research with twenty-eight intermediaries of immigrant and refugee backgrounds, with deep knowledge of culture, gender, power relations, and the migration experience, from Sept.16 to Dec.16, 2021, in Edmonton, Alberta. They captured real-time reflections, self-interpreting them, as well as their experiences supporting individuals and using the SenseMaker platform, a mixed-method data collection tool. The entire research team engaged in 13 weekly 90-minute audio-recorded and transcribed sessions: seven focused on sensemaking and action planning, and the final five included reflecting on the SenseMaker data and were the focus of the qualitative analysis. Data was managed in NVivo (QSR International Pty Ltd. Version 12, 2018).

Results and analysis: The intermediaries collected and interpreted 277 narratives. There were four entwined components to intermediaries' navigation of the evolving complexity of COVID-19 vaccination: trust, relationships, creation of safe spaces for collective sensemaking and solution finding, and leveraging cultural and social capital to address challenges and barriers to meeting peoples' needs. They worked to reduce decisional conflict and misinformation to support people making informed, values congruent decisions.

Conclusions and implications for policy, practice or additional research
The findings highlight that there are intermediaries with existing relationships, solutions, and infrastructure that can be enriched, leveraged, and amplified to better meet emergency response needs in the community. Understanding how existing intermediaries work in contextually and culturally appropriate ways, leveraging trust with the diverse fields they bridge, and mobilizing action by exaptation from their previous experience in crisis navigation are crucial elements to consider in developing system resilience for future pandemic response planning.

Live virus microneutralization assay reinforces greater cross-reactive SARS-CoV-2 response to emerging variants among previously infected and vaccinated individuals: age-based cross-sectional serosurvey analysis

Ms Samantha Kaweski, Suzana Sabaiduc, Romina Reyes, Julia Dyer, Felicity Clemens, Danuta Skowronski

Introduction/background: In British Columbia (BC), Canada, we conducted serial anonymized residual serosurveys across the COVID-19 pandemic to assess age-related variation in seroprevalence. Commercial immuno-assays detected spike or nucleocapsid (NC) antibody, the latter indicating prior infection, but were not variant-specific and did not yield quantifiable or functional antibody metrics. We therefore undertook live-virus microneutralization assays on age subsets of select serosurveys.

Methods: We separately stratified sera from August and December 2022 serosurveys by anti-NC status, randomly selecting 20 per age group <12, 12-49, 50-69 and ≥70 years. We challenged sera with 100 $TCID_{50}$ units of wildtype, Omicron BA.1 and BA.5 viruses (vaccine strains) as well as Gamma (more frequent in BC than elsewhere) and XBB.1.5 (<5% of locally sequenced viruses by December 2022). We assessed geometric mean titers (GMTs) and proportions meeting or exceeding threshold titers of 16 or 64 by age.

Results and analysis: All variant-specific GMTs were highest among previously infected individuals, further increasing by age, consistent with vaccine coverage. Wildtype and Gamma GMTs were comparable, exceeding all other variant-specific titers in every age group except anti-NC positive children <12 years for whom Omicron BA.1 or BA.5 GMTs were highest and anti-NC positive 12–49-year-olds for whom Omicron BA.5 GMTs were highest in December 2022. In December 2022 among highly vaccinated ≥70-year-olds, XBB.1.5 titers of ≥16 or ≥64 were observed in 80% and 45%, respectively, of previously-infected versus 20% and 10%, respectively, of uninfected individuals. By contrast among relatively under-vaccinated <12-year-olds, the proportions of XBB.1.5 titers meeting or exceeding the same thresholds were lower by at least half among previously infected (40% and 25%) and uninfected (10% and 0%) children.

Conclusions and implications for policy, practice or additional research: Population-based microneutralization assay findings reinforce greater breadth and depth of the immune repertoire among those with hybrid vaccine and infection exposures, including greater cross-reactive titers against emerging novel variants.

Active surveillance for myocarditis and pericarditis in Canadian children 2021-2022: A Canadian Immunization Monitoring Program ACTive study

Dr Karina Top, Dr Julie A Bettinger, Dr Joanne Embree, Dr Taj Jadavji, Dr Rupeena Purewal, Dr Laura Sauve, Dr Jesse Papenburg, Dr Shelley L Deeks, Dr Sarah E Wilson, Dr Kescha Kazmi, Dr Najib Dahdah, Dr Manish Sadarangani, Dr Scott Halperin, Dr Fatima Kakkar, Dr Shaun Morris

Introduction/background: Responding to the emergence of myocarditis/pericarditis as a safety signal following COVID-19 mRNA vaccination, the Canadian Immunization Monitoring Program Active (IMPACT) initiated surveillance at 13 pediatric tertiary centres. This analysis compared characteristics and outcomes of children assessed at an IMPACT centre for myocarditis, myopericarditis, and pericarditis by COVID-19 vaccination status.

Methods: We conducted prospective active surveillance of children ≤16 years of age assessed in the Emergency Department or hospitalized at IMPACT centres (June 1, 2021-December 31, 2022),

monitoring admission lists and diagnostic codes for physician-diagnosed myocarditis, myopericarditis, and pericarditis. We retrieved clinical details and immunization history from medical records. Data were entered on an electronic data capture system. Clinical characteristics were compared between vaccine-proximate cases (COVID-19 vaccination 0-21 days prior to presentation), remotely vaccinated cases (vaccinated January 2021 to >21 days prior to presentation), and unvaccinated cases.

Results and analysis: IMPACT reported 195 cases: 80 (41%) vaccine-proximate cases, 57 (29%) remotely vaccinated, 44 (23%) unvaccinated, and 14 (7%) unknown vaccination status cases. Among vaccine-proximate cases, 87.5% had myocarditis/myopericarditis, 12.5% had pericarditis, 83% were male, and >94% were 12-16 years of age. Of remotely vaccinated cases, 65% had myocarditis/myopericarditis, 35% had pericarditis, 81% were male and 86% were 12-16 years of age. Among unvaccinated cases, 57% had myocarditis/myopericarditis, 43% had pericarditis, 59% were male, and 34% were 12-16 years of age. Unvaccinated cases were more likely to require ICU care (25% versus <6% of vaccine-proximate cases and <9% of remotely vaccinated cases). Nearly all hospitalized cases were fully recovered at discharge (91-98% of 45 vaccine-proximate cases, 36/36 remotely vaccinated cases versus 89-97% of 37 unvaccinated cases).

Conclusions and implications for policy, practice or additional research: IMPACT rapidly initiated surveillance for a new vaccine safety signal. Epidemiology of myocarditis/pericarditis appeared to differ between COVID-19 vaccinated and unvaccinated children. COVID-19 vaccinated children who develop myocarditis/pericarditis may have a less severe initial course than unvaccinated children.

Herd Effects and Serotype Replacement: Quantifying the Population-Wide Impact of Pediatric 13-Valent Pneumococcal Conjugate Vaccination

Ms. Alison Simmons, Dr. Ashleigh Tuite, Dr. Sarah Buchan, Dr. David Fisman

Introduction/background: Streptococcus pneumoniae is a bacterium that causes a wide range of diseases including invasive pneumococcal disease (IPD), community acquired pneumonia, and acute otitis media. The pneumococcal vaccine landscape has changed substantially, with recent recommendations from Canada's National Advisory Committee on Immunization to replace the 13-valent pneumococcal conjugate vaccine (PCV-13) with 15-valent (PCV-15) or 20-valent (PCV-20) vaccines for children, and to use PCV-20 for older adults. We aimed to develop a pan-Canadian pneumococcal transmission model, and to quantify the population-wide impact of using PCV-13 in the pediatric population between 2010 and 2019.

Methods: We developed an age-structured compartmental model that describes pneumococcal transmission dynamics in the Canadian population. We fit our model to age- and serotype-specific IPD incidence between 2010 and 2019, a time when PCV-13 was recommended for routine use in the pediatric population. We compared our fitted model to a counterfactual scenario in which no pediatric pneumococcal conjugate vaccine was used.

Results and analysis: Our fitted model replicates observed IPD trends in Canada by age and serotype group. We estimated that using PCV-13 in pediatric populations averted 1,275 (95% credible interval: 949 - 1,601) IPD cases across the Canadian population between 2010 and 2019. This effect was most pronounced in adults aged 65 years and older, where the use of PCV-13 prevented 6.0 (95% credible interval: 3.6 - 10.5) IPD cases/100,000 population over the 10-year period.

Conclusions and implications for policy, practice or additional research:
Using a model that reflects IPD epidemiology in Canada, we showed that the use of PCV-13 in pediatric populations decreased overall IPD incidence. The benefits of vaccinating children with PCV-13 were accrued predominately via indirect (herd) effects in older Canadians. Our model may be

expanded in the future to project the impact of using recently recommended higher valency vaccines in pediatric and older adult populations.

Pediatric Antibody Responses to SARS-CoV-2 After Infection and Vaccination in Calgary, Alberta

Mrs. Leah Ricketson, Ms. Emily Doucette, Ms. Isabella Alatorre, Tarannum Tarannum, Joslyn Gray, Dr. William Booth, Dr. Graham Tipples, Dr. Carmen Charlton, Dr. Jamil Kanji, Dr. Kevin Fonseca, Dr. James Kellner

Introduction/background: There are few reports of longitudinal serologic responses in children following Sars-CoV-2 infection and vaccination. This study describes longitudinal SARS-CoV-2 antibody responses following infection, vaccination, or both (hybrid immunity) in a cohort of Canadian children. The objectives of our study were to compare antibody levels following SARS-CoV-2 infection, vaccination, and hybrid immunity and to examine antibody decline after final antigen exposure.

Methods: The Alberta Childhood COVID-19 Cohort (AB3C) study was a prospective longitudinal cohort study conducted from July 2020-September 2022 with repeat sampling across 5 visits. Children <18 years of age were enrolled for serial measurement of antibody responses to SARS-CoV-2 virus vaccine and infection in children with and without clinically apparent confirmed or probable COVID-19 infection.

Results and analysis: The final sample size was 919; participants were 50.5% female, 48.2% were >12 years and 88.5% were white ethnicity. The median peak spike IgG level of those with only infection was not different from those with no vaccination or infection (233 AU/mL (IQR: 99-944 AU/mL) vs 3 AU/mL (IQR: 1-5 AU/mL; P=0.1765). Participants with infections after vaccination had higher IgG levels than those where infection preceded vaccination (median: 36,660 (IQR: 22,084-40,000 AU/mL) vs 17,461 AU/mL (IQR: 10,617-33,212 AU/mL); P<0.0001). In a linear mixed methods model, children with infection-only had low levels of antibody that stayed stable over the study duration without further antigen exposures. Those with infection after vaccination had the slowest rate of antibody decline over time at 4% (95%CI: 2%-5%) per week, compared with children where infection preceded vaccine 7% (95%CI: 6%-8%) per week.

Conclusions and implications for policy, practice or additional research: Those with hybrid immunity conferred through vaccination (2+ doses) followed by a SARS-CoV-2 infection had the highest and longest lasting antibody levels, compared to children who had an infection followed by vaccination, vaccination-only, or infection-only. The longer-term clinical importance of these findings, related to prevention of repeated infections and severe outcomes and need for further vaccine doses, is not yet known.

Detection of measles vaccine genotype 4 and 9 months post-MMR vaccine in healthy children during increased measles activity in Ontario, 2024.

Dr. Sarah Wilson, Michelle Science, Tony Mazzulli, Natalie Bocking, Nicola Mercer, Lil Marinko, Anne Marie Holt, Denise Smith, Elizabeth Hulse, Evelyn Lau, Lan Zhang, Romy Olsha, Eleanor Paget, Maan Hasso

Introduction/background: In 2023, Public Health Ontario began testing measles positive PCR specimens with a subsequent PCR test to rapidly identify measles vaccine strain. In 2024, in response to heightened measles activity, clinicians were advised to have a low threshold for measles diagnostic testing for febrile rash illnesses.

Methods: We describe the results of investigations following the detection of measles vaccine genotype from respiratory specimens in two children. Informed consent of parents/caregivers was obtained for both cases.

Results and analysis: Both children were aged 15-23 months, healthy and received their first dose of MMR vaccine 9 (Child A) and 4 months (Child B) prior to rash onset. Both had recent close contact with a recently vaccinated relative. Child A presented with rash only and had measles vaccine virus (CT value 37.7) identified from a nasopharyngeal (NP) specimen the day following rash onset; measles serology was reactive for IgG only. Additional molecular and/or serology testing of the NP and blood for multiplex respiratory virus PCR, HHV6, EBV, CMV, and parvovirus were negative. Child B presented with fever, rash, upper respiratory symptoms and no conjunctivitis. Measles vaccine PCR was detected from NP (CT 37.5) and throat (CT 36.7) specimens and not detected in urine; measles serology was reactive for IgG only. PCR specimens and blood were collected 2-3 days and 13 days post-rash onset, respectively. Additional testing (as outlined above), identified HHV6 by PCR from NP swab and blood.

Conclusions and implications for policy, practice or additional research: A recent Australian review of measles vaccine virus detections 100 days post-vaccination helped support the conclusion that vaccine virus was an incidental finding of prolonged shedding during a period of increased measles testing using highly sensitive PCR methods. An alternate diagnosis for one child was established. The possibility of acquisition from recently vaccinated close contacts was felt to be less likely, but merits further study.

Oral Abstracts Session 8 **Wednesday 27 November** **15:15-16:45** **Room 202**

A multimodal approach to vaccine behaviour change

Mrs Theresa Tang, Dr. Jia Hu, Madison Fullerton, Chelsea D'Silva

Introduction/program need and objectives: There are many factors that influence whether or not a person gets vaccinated. Understanding these reasons are important to tailor a range of strategies to support vaccine confidence and encourage uptake. While many frameworks exist to address vaccine uptake and behaviour change, many of these frameworks focus on increasing vaccine confidence from one angle. Our multimodal approach focuses on using multiple strategies to change vaccination behaviours.

Program methods, activities and evaluation: Our team utilizes a multimodal approach to improve vaccine uptake and confidence, focusing on using actionable insights, community engagement, health communications, advocacy to develop education and impact practice change. We will share examples of how we have worked with community organizations and various partners to conduct focus groups, surveys and other research methods to develop actionable insights to inform the development of evidence-based, tailored vaccine communication and education that meet the needs of priority populations. We will also highlight how collaboration and partnership can be used to form advocacy networks to influence vaccine access and policy recommendations across Canada and influence practice change.

Program results or outcomes: Over the course of the last 3 years, our team has applied this multimodal approach to various vaccine conversions including COVID-19, other respiratory illnesses like influenza, and RSV, and school-based vaccines. Throughout this time we have also developed a coalition of over 500 partners who are invested in supporting our multimodal approach to behaviour change.

Recommendations and implications for practice or additional research: By leveraging this multimodal approach, we can continue to develop evidence-based vaccine behaviour change interventions that are tailored to specific communities, leverage the expertise of healthcare providers, and advocate for greater policy recommendations using the collective voices of a network of champions.

Canadians Value Efficacy and Reduced Side Effect Profiles When Deciding to Receive a COVID-19 Vaccine

Dr. Nancy Waite, Dr. Jeffrey Lazarus, Dr. Paolo Bonanni, Dr. David Salisbury, Dr. Clara Lehmann, Dr. Sumitra Sri Bhashyam, Marie de la Cruz, **Dr. Bruce T. Seet**, Dr. Beth Hahn, Dr. Matthew D. Rousculp

Introduction/background: Despite evidence supporting the efficacy and safety of COVID-19 vaccines, a proportion of the population remains hesitant to receive an immunization. We used a discrete choice experiment (DCE) to understand the vaccine attributes Canadians value most.

Methods: An online survey of 500 adults in Canada was conducted between July and August 2023, which included a DCE within a broader COVID-19 survey. Survey questions covered vaccine preference, COVID-19 experiences, and demographics. The DCE provided two hypothetical vaccine options and an opt-out option in the form of 11 vaccine profiles presented to each participant. Six attributes and levels were presented: vaccine type, protection against COVID-19 infection, protection against severe COVID-19 disease, chance of experiencing common side-effects (i.e., reactogenicity events), chance of experiencing serious side-effects (e.g., myocarditis/pericarditis), and timing of influenza and COVID-19 vaccines. Data were analyzed using a latent class model. Relative attribute importance (RAI) and trade-offs were calculated.

Results and analysis: The mean age of participants was 45 years, 47.0% were female, and 26.0% identified as French-speaking. When asked about COVID-19 vaccination in the broader survey, 56.2% reported that vaccine type was extremely/very important and 32.8% were quite/extremely worried about side-effects. When these attributes were tested in the DCE as part of the vaccine profile, the three highest-ranked attributes were protection against COVID-19 (RAI 33.6%), protection from severe disease (31.0%), and common side-effects (16.7%). Serious side-effects had an RAI of 11.3%, while timing and type of vaccine were lower (5.0% and 2.4%, respectively).

Conclusions and implications for policy, practice or additional research: When Canadians considered a profile for COVID-19 vaccination, efficacy measures ranked first, followed by fewer common side-effects. While the importance of efficacy measures was expected, the relative importance of common side-effects compared to serious side-effects to factor into vaccine decisions was not. Understanding the importance of this attribute can help policymakers and clinicians develop more appropriate implementation and communication strategies to encourage COVID-19 vaccination.

I don't want to talk about that': Difficult patient-provider conversations about COVID-19 vaccination

Dr. S. Michelle Driedger, Mr. Ryan Maier, Dr. Alan Katz, Dr. Alex Singer, Dr. Colleen Metge

Introduction/background: Segments of the public remained conspicuously hesitant towards COVID-19 vaccination once vaccines became available in 2021. During conversations with their patients, whether discussing issues, answering questions, or providing pertinent information, healthcare providers (HCPs) can play a vital role in promoting public health and individual immunization. This study investigates the challenging clinical discussions that HCPs had with patients hesitant about

COVID-19 vaccines and how HCPs navigated those difficult conversations in a time of considerable public controversy.

Methods: During the COVID-19 pandemic (January-May 2022), researchers conducted individual interviews with HCPs (n=10) in the Canadian province of Manitoba. HCP participants included primary care providers, nurse practitioners and specialists from Winnipeg and surrounding communities in the province, including a regional health authority with historically low vaccine uptake.

Results and analysis: The experiences of participating HCPs with patients about vaccination were different with respect to the COVID-19 vaccine compared to prior discussions with patients about long-established and routine vaccines. Issues about vaccine novelty, integrity (e.g., mRNA technology), and related policy (e.g., mandates) now dominated the concerns of hesitant and oppositional patients. HCPs also reported increasing hostility from patients, plus experiences of moral injury and burnout. Most HCPs attempted to integrate ad hoc or recognized discursive strategies (e.g., shared decision-making, motivational interviewing) to facilitate discussion or reception of information. HCPs desired further training in discussion strategies within the context of vaccination. Participants also found mixed success with using decision aids.

Conclusions and implications for policy, practice or additional research: Motivational interviewing and shared decision-making strategies proved to be valuable in allowing HCPs to navigate difficult exchanges with patients, address/acknowledge concerns, and, crucially, preserve relationships. HCPs need to be better supported with training in these strategies and in bearing the moral/emotional/physical consequences of a pandemic in the clinical setting.

Canadian parents' disengagement with childhood COVID-19 vaccination information: A qualitative investigation

Mr. Emmanuel Marfo, Dr. Terra Manca, Janet Sau Wun Lee, Eunah Cha, Dr. S. Michelle Driedger, Dr. Samantha Meyer, Dr. Ève Dubé, Dr. Shannon MacDonald

Introduction/background: COVID-19 remains a public health concern in Canada. Gaining a deeper understanding of parental engagement with childhood vaccination information may be useful in supporting their future decision-making. In this study, we investigated how parents engaged with information to inform decisions about COVID-19 vaccines for their children in the first two years of the pandemic.

Methods: Semi-structured interviews were conducted over Zoom or phone from April to August 2022, building on a large Canadian survey study of vaccine decision-making and interactions with COVID-19 information. Parents/guardians (having at least one child 11-18 years old) with diverse social identities and locations (i.e., race, ethnicity, language, and education) were purposefully recruited if their survey response indicated vaccine hesitancy. Thematic analysis was employed to descriptively analyze the data.

Results: Forty-eight interviews (out of 142 invitees) were completed (38 in English, 10 in French). Most parents engaged with multiple vaccine information sources (e.g., newspapers, academic journals, and health agency websites) early in the pandemic to make decisions about their own vaccination, such as verifying the trustworthiness of materials. However, many parents had already disengaged from vaccine information sources, including new messaging, before childhood COVID-19 vaccines were approved. In making decisions for their child(ren)'s vaccination, most parents relied on personal experiences and the same information used for their own vaccination decisions. Disengagement with vaccine information resulted from information satiation, avoidance of social conflicts with individuals with dissimilar opinions, and the use of disengagement to prevent dwelling on negative emotions.

Conclusions and implications for policy, practice or additional research: Credible messaging about vaccination may not be enough for parents already disengaged from vaccination information or experiencing information/vaccination fatigue. Eventual disengagement from information reaffirms the need for early and timely communication, and engagement with parents/guardians. Public health professionals need to develop strategies for ongoing engagement with parents between crises to stave off disengagement during a pandemic.

COVID-19 vaccine hesitancy and adverse events following immunization: Findings of a cross-sectional study

Miss Maude Dionne, **Dre Chantal Sauvageau**, M Jérémie Sylvain-Morneau, Mme Fatima Gauna, M Radhouene Doggui, M Jeremy K. Ward, Mme Eve Dubé

Introduction/background: In Quebec, COVID-19 vaccine uptake among adults was initially high for the first two doses, but it decreased for the subsequent booster doses. We also observed vaccine hesitancy. This study assesses the relationship between attitudes towards vaccination and the experience and perceived severity of self-reported adverse events following immunization (AEFI).

Methods: A web survey of 8,419 Quebec adults who received at least one dose of COVID-19 vaccine answered questions about vaccine hesitancy before vaccination (main exposure) and self-reported AEFIs (outcome) after last dose administered. Data were collected from September 17th to 23th, 2023. Two coders performed a qualitative content analysis on the reported AEFIs (N=3 808). Self-reported severity of the AEFIs was grouped into four categories: none, light, moderate, and severe. Descriptive and multivariate logistic regression analysis were performed with SAS.

Results and analysis: The main AEFIs reported were fatigue or malaise (20.7%), injection site disorder (17.3%), musculoskeletal pain (11.2%), headache (11.0%), and fever (10.6%). Higher proportions of respondents who were very hesitant before COVID-19 vaccine reported having a severe AEFI compared to those not hesitant (25.0% vs 3.4% =, $p < 0.0001$). Younger age (as a continuous variable OR=0.979), higher education level (University OR=1.557 vs high school or less), being a female (OR=1.306), and being vaccine-hesitant (OR=1.688 vs non or less hesitant) were positively associated ($p < 0.0001$) with self-reported AEFIs. Having experienced AEFIs that prevented the performance of daily activities (OR=3.564 vs those who have not experienced that) and having COVID-19 vaccine doubts (OR=3.564 vs no doubt) were significantly associated with reduced intention to receive other vaccines in the future according to multivariate analysis.

Conclusions and implications for policy, practice or additional research: Our study highlighted that vaccine hesitancy could influence self-reported AEFIs and their perceived severity. Transparent and tailored communication explaining potential adverse events after immunization while emphasizing strategies to mitigate these effects could be useful.

Oral Abstracts Session 9 Thursday 28 November 10:30-12:00 Room 201

Immunization Uptake for Immigrant and Non-Immigrant Children in Manitoba

Dr. Cindy Jardine

Introduction/background: Immunization of children is one of the most efficacious and cost-effective public health interventions to prevent infectious diseases. While immigrant children in Canada are generally suspected to have lower rates of immunization than non-immigrant children, there is little empirical evidence on actual uptake in this population.

Methods: Information from the Manitoba Immunization Monitoring System (MIMS), Manitoba Population Registry and Immigration Refugee and Citizenship Canada databases were linked for the period January 1, 2006 to December 21, 2015. Three cohorts of children up to 5 years of age were compared: foreign-born children who immigrated to Canada (Cohort A), children born in Canada to

immigrant mothers (Cohort B) and children born in Canada to non-immigrant mothers (Cohort C). Uptake (on-time, delayed, partial, none) of the DTaP-IPV-Hib, PCV, MMR and Rotavirus vaccines was determined.

Results and analysis: For DTaP-IPV-Hib, 32% of children in Cohort A were unvaccinated (compared to 0.3% and 0.6% in Cohorts B and C). For PCV, 45% of children in Cohort A were unvaccinated (compared to 2.2% and 1.3% in Cohorts B and C). For Rotavirus (which was not available until April 2014), 85.6% of children in Cohort A were unvaccinated (compared to 6.8% and 12.5% for Cohorts B and C). However, for MMR, only 7.1% of children in Cohort A were unvaccinated (compared to 19.1% and 11.0% in Cohorts A and B).

Conclusions and implications for policy, practice or additional research: In Manitoba, children who immigrated to Canada were significantly more likely to be unvaccinated for DTaP-IPV-Hib, PCV and rotavirus than children born in Canada. However, this was not found for the MMR vaccine. Increasing immunization of this at-risk population requires policy and/or practice changes to provide better access to health care providers, production of appropriate immunization information in multiple languages, and better access to immunization services (e.g. through schools or cultural venues).

Developing and implementing an evidence-informed behaviour change campaign to raise awareness about missed MMR vaccines

Ms. Chelsea D'Silva, Noah Ivers, Jia Hu, Daniel Warshafsky, Cora Constantinescu, Emi Linds, Theresa Tang, Madison Fullerton

Introduction/background: The measles vaccination was integral to Canada receiving measles elimination status; however in 2024, measles cases are rising. During the COVID-19 pandemic, many children missed the second dose of the measles, mumps and rubella (MMR) vaccine, which is usually administered at 1 year of age and a second dose before entering school. To raise awareness about missed MMR vaccines in Toronto and Peel Region, Ontario, we developed an evidence informed behaviour change campaign.

Methods: We administered a survey based on the COM-B Model for Behaviour Change to parents of children aged 4-10 in Ontario to understand their perspectives of MMR vaccines. These data were used to develop and tailor creative concepts which were then user-tested through focus groups with parents. For the media buy (Instagram, Facebook, Google), our objective focused on reach and frequency to engage our target audience aged 25-64 in Mississauga, Brampton, Caledon, and Toronto. The campaign was scheduled from February 1 to March 31 to prompt parents to consider updating their children's vaccinations.

Results and analysis: 1,061 parents completed the survey. We found that 65% of parents were concerned about measles, mumps and rubella but 30% of parents were unaware of how to access an MMR vaccine. Focus group participants preferred messaging that highlighted the protective power of the vaccine without shaming parents or making overstated promises. Accordingly, we launched the "Power Up!" campaign, promoting school as a fun adventure, and stressing the importance of full vaccination for readiness. The campaign achieved a reach of 3,439,844, with 4,201 individuals seeking further information online.

Conclusions and implications for policy, practice or additional research: We highly encourage other jurisdictions to leverage the social media assets from this evidence-informed campaign to generate greater awareness about missed MMR vaccines. This approach could be used to raise awareness about other public health concerns.

Evidence-Informed Strategies to Increase Routine Childhood Vaccination Awareness and Engagement Amongst Newcomers to Canada: A Qualitative Study

Miss Caitlin Ford, Madison Fullerton, Ginamaria Vetro, Theresa Tang, Dr. Jia Hu, Emily Doucette, Dr. Siobhan Wong King Yuen

Introduction/background: Newcomers (i.e., immigrants, refugees, foreign workers) to Canada experience unique challenges (i.e., language barriers, lack of transportation, etc.) in navigating the healthcare system, which can lead to gaps in care and missing important health services – like routine childhood vaccination (RCV). Given the importance of RCV in preventing severe illness, our research objective was to understand the specific needs, preferences and concerns that newcomer parents face when accessing RCVs in Canada.

Methods: Through focus groups (n=11) with newcomer parents – conducted as part of two separate studies – we explored newcomer parent attitudes towards 1) general RCVs and 2) school-based vaccine programs. Focus group discussion guides were informed by the COM-B model, and designed to understand newcomer parents' capability, opportunity, and motivation to participate in vaccination. These discussions were also used to gather feedback on school-based vaccine resources. Transcripts were analyzed using an inductive thematic analysis approach; and subsequent themes informed the development, testing, tailoring and dissemination of vaccine resources to meet the needs of this population.

Results and analysis: Across both studies, a total of 80 newcomer parents representing 13 countries of origin were engaged. The following themes were identified: 1) lack of reputable RCV information, 2) language barriers, 3) limited access to primary care, 4) lack of accessible transportation, 5) limited vaccine appointments, 6) concerns of vaccine safety and side effects, 7) desire for information from trusted sources, and 8) preference for visually presented information.

Conclusions and implications for policy, practice or additional research: These findings have informed the design and implementation of resources and programs for newcomer parents RCVs. Underpinning the success of these initiatives has been the community-driven and evidence-informed approach. Furthermore, in partnership with several trusted newcomer-serving organizations, and disseminated through pre-existing information channels.

Confidence and Barriers: An Analysis of Factors Associated with Timely Routine Childhood Vaccination in Canada during the COVID-19 Pandemic

Dr. Harry Mackay, **Dr. Jeremy Gretton**, Dr. Sandra Chyderiotis, Stephanie Elliott, Dr. Anastassia Howarth, Catherine Guo, Dr. Angela Mastroianni, Dr. Christine Kormos, Dr. Jessica Leifer, Dr. Lauryn Conway, Dr. Mark Morrissey

Introduction/background: Routine childhood vaccination is a crucial component of public health in Canada and worldwide. To facilitate catch-up from the global decline in routine vaccination caused by the COVID-19 pandemic, and towards the ongoing pursuit of coverage goals, vaccination programs must understand barriers to vaccine access imposed or exacerbated by the pandemic. This study aimed to understand pandemic-related barriers to routine immunization among Canadian parents.

Methods: We conducted a regionally representative online survey in January 2023 including 2,036 Canadian parents with children under the age of 18. We used the COM-B model of behaviour to examine factors influencing vaccination timeliness during the pandemic. We assessed Capability with measures of vaccine understanding and decision difficulty, and Motivation with a measure of vaccine confidence. Opportunity was assessed through parents' self-reported experience with barriers to vaccination (e.g., clinic closures) as well as social opportunity (estimates of peer vaccination rates).

Results and analysis: 24% of surveyed parents reported having missed or delayed one of their children's scheduled routine vaccinations since the beginning of the pandemic, though most parents reported either having caught up or intending to catch up soon. In the absence of opportunity barriers, motivation was associated with timely vaccination for children aged 0-4 years (aOR=1.81, 95% CI: 1.14-2.84). However, experience with one or more opportunity barriers eliminated this relationship.

Conclusions and implications for policy, practice or additional research: The association between barriers and timely vaccination suggests that perennial and new pandemic-associated barriers are a critical challenge to vaccine coverage goals in Canada. Our study builds upon existing work both by using Canadian data, and by examining a synergistic interaction between motivation and ease of access – not just isolated effects. This underscores the importance of developing strategies to improve vaccine confidence and overcome common barriers to vaccination.

"It was a joint decision:" An analysis of parental accounts of COVID-19 vaccination decision-making with and for children

Dr. Terra Manca, Ms. Janet Lee, Dr. Shannon MacDonald

Introduction/background: Families in Canada were tasked with an incredible challenge when COVID-19 vaccinations were approved for children amid rapidly changing information, pandemic-related risks, and individualized responsibilities to protect their children. This study aimed to explore the diverse ways that vaccine hesitant parents described making COVID-19 vaccination decisions for children, often with the active involvement of other caregivers and older children.
Methods: We conducted semi-structured interviews with parents of children over 11-years-old in the Spring and Summer of 2022. We invited interview participants from respondents to a national survey via email invitations. We purposefully selected participants to include those who demonstrated some hesitancy towards COVID-19 vaccines and to ensure diversity across demographic characteristics (ethnicity, education, region, etc.). Five researchers closely read and coded transcripts using a feminist discourse analysis approach in NVivo.

Results and analysis: Interview participants (N=48) reported caring for a total of 82 children who were eligible for vaccination (over 5-years-old). At the time of interview, many participants appeared vaccine accepting. Most children had received two or three COVID-19 vaccine doses, with five children receiving one dose and 13 receiving none. However, many who accepted vaccination felt ambivalent, delayed vaccination, or intended to refuse future doses. Although some parents made decisions for their children (especially for younger children), others explained "it was a joint decision" they made as a family and often with children. When children were involved in decision-making, parents described talking with children about how to find information and make health decisions.

Conclusions and implications for policy, practice or additional research: Findings suggest that diversity in how families protect and socialize their children also shape how vaccine decisions are made with or for children. Consideration for family diversity, multiple caregivers, and children's involvement in vaccine decision-making could help in the development of public health messaging to better support families' efforts to find credible information and make informed decisions.

Burden of paediatric RSV infections in children with and without comorbidity in British Columbia to inform updated immunoprophylaxis recommendations

Dr. Marina Viñeta Páramo, Dr. Allison Watts, Dr. Alfonso Solimano, Dr. Hind Sbihi, Dr. Danuta M. Skowronski, Dr. Pascal M. Lavoie

Background: Respiratory Syncytial Virus (RSV) is the main cause of lower respiratory infection in young children. Until recently, RSV immunoprophylaxis targeted ~1% of <2-year-olds. In 2023, new immunization strategies, including longer-lasting monoclonal antibodies, were approved by Health Canada allowing broader population coverage. We compared burden of RSV-related hospitalizations in children with and without chronic medical conditions (CMC, ≥12 months) in British Columbia (BC) to inform prioritization and implementation guidelines.

Methods: Retrospective population-based pediatric cohort from BC born April 2013-March 2023 (N=432,012; with CMC=26,284). RSV hospitalizations (ICD-10 codes: J12.1, J20.5, J21.0, B97.4) in <2-year-olds were extracted from a hospital discharge database. RSV hospitalization rates were calculated overall and by age groups, stratified by CMC status. Lengths of stay, ICU admission, inter-hospital transport and number-needed-to-immunize (NNI) to prevent one RSV hospitalization during the first year were compared, the latter assuming monoclonal antibody efficacy of 77% (Simões, 2023).

Results and analysis: Overall, 4,416 RSV hospitalizations were recorded among <2-year-olds (1%; 5.3 per 1,000-person-years), peaking at age one month and consistently higher in children with CMC (Fig. 1), notably select CMC subgroups (Fig. 2). Children with versus without CMC experienced longer stays [average 5.1 days (SD: 6.1) vs. 3.3 (SD: 2.6), p<.001], proportionately more ICU admissions [134/564 (24%) vs. 574/3,824 (15%), p<.001] and inter-hospital transports [147/564 (26%) vs. 812/3,824 (21%), p=.010]. Among <1-year-olds with versus without CMC, 1.55% vs. 0.78% were hospitalized with corresponding NNI estimates of 167 and 84 to prevent hospitalization.

Conclusions and implications for policy, practice, or additional research: While most RSV hospitalizations occur in healthy children, they accrue within the window of protection otherwise achievable with pregnancy vaccination. Considering limited supplies, high costs and higher efficiency by NNI, children with CMC may be preferentially prioritized for extended protection through longer-lasting monoclonal antibodies. These findings could inform RSV immunoprophylaxis program decisions.

A Health Economic Evaluation for Implementing an Extended Half-life Monoclonal Antibody for All Infants vs. Standard Care for RSV Prophylaxis in Canada

Mr Thomas Shin, Mr Jason Lee**,** Ms Alexia Kieffer, Dr Michael Greenberg, Dr Jianhong Wu

Introduction/background: Respiratory syncytial virus (RSV) is a highly infectious virus, and infants and young children are particularly vulnerable to its progression to severe lower respiratory tract illness (LRTI). Nirsevimab, an extended half-life monoclonal antibody, was recently approved in Canada as a passive immunization intervention for the prevention of RSV LRTI.

Methods: A static decision tree model was utilized to determine the cost-effectiveness of nirsevimab in Canadian infants compared to current standard of care (palivizumab for infants born preterm, and with specific chronic conditions) and generate an optimal price per dose (PPD) at accepted willingness-to-pay (WTP) thresholds. Various health outcomes (including hospitalization, ICU, and mechanical ventilation) and healthcare costs were calculated over one RSV season, with any necessary follow-up prophylaxis in the second season for three infant categories (palivizumab-eligible, preterm, and term). All health-related parameters and costs were tailored to the Canadian environment.

Results and analysis: Compared to scenarios where only at-risk segments of the infant population received nirsevimab, the base case (administering nirsevimab to all infants in their first RSV season) was the most cost-effective versus standard care: the PPD was $692 at a $40,000/QALY WTP threshold, using average costing data assumptions across all scenarios. Compared to standard care, the base case scenario could avoid 18,249 RSV-related health outcomes (reduction of 9.96%). Variations in discount rate, distribution of monthly RSV infections, nirsevimab coverage rate for infants born at term, and palivizumab cost had the most significant model impact.

Conclusions and implications for policy, practice or additional research: Passive immunization of all infants with nirsevimab can significantly reduce RSV-related health and economic burden across Canada.

Cost-effectiveness of 15-valent and 20-valent pneumococcal conjugate vaccines in pediatric populations: A systematic literature review

Dr. Catharine Chambers, Sarah Wilson, Elizabeth Brown, Sarah Buchan, Reed Morrison, Christine Navarro, Janice Sarmiento, Jeffrey Pernica, Jessica Hopkins, on behalf of the Ontario Immunization Advisory Committee

Introduction/problem definition that demonstrates the need for a policy change: Health Canada recently authorized 15-valent and 20-valent pneumococcal conjugate vaccines (PCV15 and PCV20) for children, with the National Advisory Committee on Immunization (NACI) recommending that either PCV15 or PCV20 should be used for routine pediatric immunization programs. Our objective was to update NACI's systematic review of PCV15/PCV20 cost-effectiveness studies (which included studies published up to March 7, 2023) to inform provincial program decisions in Ontario.

Research methods: We conducted a systematic review of PCV15/PCV20 cost-effectiveness studies for routine immunization of children aged <18 years published in English from January 1, 2018, to December 31, 2023. We searched PubMed using a combination of terms (e.g., pneumococcal, vaccine, pediatric, cost-effectiveness) or their synonyms and screened titles and abstracts for eligibility. Only peer-reviewed studies that reported costs per quality-adjusted life year (i.e., cost-utility analyses) were included.

Results and analysis: Of the 285 identified studies, six met our eligibility criteria (2/6 included in NACI's review, 4/6 published after NACI's review). Three studies compared PCV15 to PCV13 (i.e., the current standard of care in most Canadian provinces/territories) using a 3+1 schedule and three compared PCV20 to PCV15 or PCV13 using a 2+1 or 3+1 schedule; 5/6 were industry-sponsored. All assumed approximate price parity between PCV15 and PCV13, with PCV20 priced at 10-12% higher. All included indirect effects of immunization on pneumococcal disease incidence in unvaccinated populations. In the three PCV15 studies, PCV15 was dominant over PCV13 (i.e., intervention was cost-saving and more effective). In the three PCV20 studies, PCV20 was dominant over its comparator (either PCV13 or PCV15).

Recommendations and implications for policy, practice or additional research: Published cost-effectiveness studies of PCV15/PCV20 in pediatric populations favoured the new, higher-valent vaccines, with PCV20 dominating over PCV15 in direct comparison. Together with other scientific and programmatic considerations, the Ontario Immunization Advisory Committee used this economic evidence to inform its recent decision to recommend PCV20 for Ontario's routine pediatric immunization program.

Use of 20-valent, 15-valent, and 13-valent pneumococcal conjugate vaccines in the pediatric Canadian population: an economic evaluation

Ms. Alison Simmons, Dr. Gebremedhin Gebretekle, Dr. Robert Pless, Dr. Aleksandra Wierzbowski, Dr. Matthew Tunis, Dr. Ashleigh Tuite

Introduction/problem definition that demonstrates the need for a policy change:
Two pneumococcal conjugate vaccines, covering 15 and 20 Streptococcus pneumoniae serotypes (PCV-15 and PCV-20, respectively), were recently approved for use in the Canadian pediatric population. We evaluated the cost-effectiveness of PCV-20, PCV-15, and PCV-13 (the currently used 13-valent pneumococcal conjugate vaccine) in unvaccinated infants initiating routine pneumococcal vaccination.

Research methods: We used a static cohort model to estimate sequential incremental cost-effectiveness ratios (ICERs) of PCV-20, PCV-15, and PCV-13 in the pediatric population beginning their primary series. ICERs were presented as costs (in 2022 Canadian dollars) per quality adjusted life year (QALY). Costs and outcomes were calculated over a 10-year time horizon at the program level and a lifetime time horizon at the individual level, and were discounted at a rate of 1.5% per year. We explored the impact of uncertainties in model parameters and assumptions in sensitivity analyses.

Results and analysis: Routine use of PCV-20 and, to a lesser extent, PCV-15 is projected to reduce pneumococcal disease burden, compared to PCV-13. Based on product cost assumptions, sequential ICERs for PCV-15 and PCV-20 were $58,800 and $135,200 per QALY gained compared to PCV-13 and PCV-15 respectively, from the health system perspective, excluding indirect (herd) effects. A reduction in serotype-attributable pneumococcal disease due to indirect vaccine effects decreased sequential ICERs for PCV-15 and PCV-20, with the preferred strategy determined by the time to reach a given reduction in pneumococcal disease.

Recommendations and implications for policy, practice or additional research: Both PCV-15 and PCV-20 are expected to reduce pneumococcal disease burden and increase QALYs in Canadian children compared to the continued use of PCV-13. The inclusion of PCV-15 or PCV-20 in the routine pediatric pneumococcal vaccination schedule may be cost-effective.

Cost-effectiveness of RSVpreF vaccine and nirsevimab for the prevention of respiratory syncytial virus disease in Canadian infants

Dr Gebremedhin Gebretekle, Man Wah Yeung, Dr. Raphael Ximenes, Alexandra Cernat, Alison E. Simmons, Dr April Killikelly, Dr Winnie Siu, Dr Ellen Rafferty, Dr Nicholas Brousseau, Dr Matthew Tunis, Dr Ashleigh R. Tuite

Background: Respiratory syncytial virus (RSV) infection poses a substantial health and economic burden for infants worldwide. In 2023, Health Canada approved RSVpreF vaccine (ABRYSVO™) in pregnant women and pregnant people (PWPP), and nirsevimab (BEYFORTUS™) in infants to protect infants against RSV infections. Our study evaluated the cost-effectiveness of these interventions (alone or in combination) for Canadian infants during their first RSV season, compared to current standard of care (a palivizumab [SYNAGIS™] program).

Methods: We developed a static model of monthly birth cohorts to compare the impact of nine potential strategies implemented over a one-year period. We computed sequential incremental cost-effectiveness ratios (ICERs) in 2023 Canadian dollars per quality-adjusted life year (QALY) from the health system and societal perspectives. Model inputs were largely derived from literature. Sensitivity and scenario analyses were performed to explore the impact of alternate assumptions.

Results and analysis: Nirsevimab programs for all infants averted more medically-attended RSV disease than RSVpreF programs for all PWPP, with the most RSV cases averted in seasonal nirsevimab programs with catch-up. However, none of the all-infants nirsevimab and/or year-round RSVpreF programs were cost-effective at commonly used cost-effectiveness thresholds. Seasonal nirsevimab programs with catch-up were cost-effective if focused on infants at moderate/high-risk (ICER <$28,000/QALY) or infants residing in areas with higher RSV burden and medical costs, such as (ICER of $5,700/QALY). Using a $50,000/QALY threshold, an all-infants nirsevimab program could be optimal if per dose price of nirsevimab is below $110-190. A combined program of year-round RSVpreF for all PWPP plus nirsevimab for infants at high-risk was optimal if nirsevimab is priced above $110-190 and RSVpreF is priced below $60-125. Our results were robust across various assumptions.

Conclusions and implications for policy, practice or additional research: New prophylactic interventions can substantially reduce RSV disease burden on infants, and targeted nirsevimab programs are the most cost-effective option at current product prices.