Canadian Alliance for Resgional Risk Factor Surveillance (CARRFS)

Research to Support Surveillance and Prevention of the Wider Health Impacts of COVID-19

2021 SYMPOSIUM PROCEEDINGS REPORT

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Dr. Drona Rasali
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Executive Summary

La version française suit l'anglais

The Canadian Alliance for Regional Risk Factor Surveillance (CARRFS) is a network of public health stakeholders across Canada interested in working together to build and strengthen regional/local chronic disease risk factor surveillance. Since it's inception in 2007, CARRFS has strived to be a networking space for public health, academic and policy professionals interested in regional risk factor surveillance.

In 2021, CARRFS hosted a virtual symposium titled Research to Support Surveillance and Prevention of the Wider Health Impacts of COVID-19. The symposium was designed to:

1. Describe the wider health impacts of the COVID-19 pandemic, that can be unintended societal consequences of:
   - Direct response measures to the pandemic, such as impacts of lockdowns, school and business closures, physical distancing requirements, and travel restrictions on mental health, substance abuse, lifestyle, and food security;
   - Indirect responses to the pandemic, such as re-allocation of resources away from prevention and treatment of other health conditions and reluctance of individuals to seek treatment for non-COVID-19 conditions;
   - Exacerbation of socio-economic disparities leading to increased inequalities in health outcomes; and
   - Longer term effects, such as chronic disease sequelae subsequent to the resolution of initial COVID-19 symptoms, also known as "Long COVID-19" or "long haulers," and inequalities arising from long term economic impacts.
2. Explore the opportunities for, and challenges of, research and surveillance at the population level, and discover the possibilities to monitor and assess these impacts and potential responses;
3. Discuss potential opportunities for applied researchers to support surveillance and prevention strategies, while responding to the wider health impacts of public health emergencies.

The Symposium successfully hosted 47 people in learning about the research being conducted across Canada on the wider health impacts of COVID-19. Our five keynote speakers provided in-depth looks at the ways that Canadians' health has been affected over the course of the pandemic as well as the consequences of related public health measures and policy changes. Attendees also heard from seven rapid fire presenters on various related topics of interest to public health researchers nationwide.

Résumé

L'Alliance canadienne pour la surveillance des facteurs de risque régionaux (ACSRFS) est un réseau de professionnels de la santé publique partout au Canada qui souhaitent travailler ensemble pour établir et renforcer la surveillance des facteurs de risque de maladie chronique régionaux et locaux. Depuis sa création en 2007, l'ACSRFS s'est efforcé d'être un espace de réseautage pour les professionnels de la santé publique et de politiques publiques ainsi que les universitaires intéressés par la surveillance des facteurs de risque régionaux.

En 2021, l'ACSRFS était l'hôte d'un symposium virtuel avec le titre 'La recherche pour soutenir la surveillance et la prévention des impacts plus larges de la COVID-19'. Le symposium avait les objectifs suivants :

1. Décrire les impacts plus larges de la pandémie de COVID-19 sur la santé, y inclus des conséquences sociétales non prévues :
    - des mesures d'intervention directe pour contrôler la pandémie, telles que l'impact des confinements, des fermetures d'écoles et d'entreprises, des exigences de distanciation physique et des restrictions de voyage sur la santé mentale, la toxicomanie, le mode de vie et la sécurité alimentaire;
    - les réponses indirectes qui découlent de la pandémie, telles que la réaffectation de ressources au détriment de la prévention et du traitement d'autres problèmes de santé et la réticence des individus à consulter pour des problèmes non liés au COVID-19; et
    - l'exacerbation des disparités socio-économiques conduisant à des inégalités de santé accrues;
    - les effets à plus long terme, tels que les séquelles de maladies chroniques après la phase aigüe de l'infection de COVID-19, également connues sous le nom de « syndrome post-COVID » ou « COVID longue», et les inégalités découlant des impacts économiques à long terme.
2. Explorer les occasions et les défis en matière de recherche et de surveillance à échelle populationnelle, et découvrir les possibilités de surveiller et d'évaluer ces impacts ainsi que les réponses potentielles;
3. Discuter des occasions qui s'offrent aux chercheurs appliqués de soutenir les stratégies de surveillance et de prévention, tout en répondant aux impacts plus larges des urgences de santé publique sur la santé.

Le Symposium a accueilli avec succès 47 personnes qui ont appris davantage sur la recherche menée partout au Canada au sujet des répercussions plus larges de la COVID-19 sur la santé. Nos cinq conférenciers d'honneur ont examiné les façons dont la santé des Canadiens a été affectée au cours de la pandémie ainsi que les conséquences des mesures de santé publique et des changements de politique connexes. Les participants ont également entendu sept présentateurs sur divers sujets d'intérêt pour les chercheurs en santé publique à l'échelle nationale liés à ces enjeux.

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Introduction

The CARRFS Organizing Committee, closely working with the Canadian Public Health Association (CPHA), once again decided to organize its annual symposium as a virtual pre-conference event a day prior to CPHA's Public Health conference.

With the all-round challenges faced during the COVID-19 pandemic continuing, it has become clearly understood that the pandemic has touched almost all aspects of our lives. Public health professionals are now beginning to shift their focus to the surveillance of the wider impacts of the pandemic to inform the mitigation strategies and so it was the obvious choice for this year's theme.

Symposium attendees heard from researchers and public health professionals from across Canada on a wide variety of topics, such as the impact the pandemic has had on health services, chronic disease management, and socio-economic disparities. Atteendees included Epidemiologists, Research Scientists, Policy Analysts, and public health professionals, and represented federal, provincial, and local public health agencies as well as academic and research institutions.

CARRFS is grateful to the presenters and attendees who participated in enriching discussions about ongoing COVID-19 research and surveillance. As in past years, we also want to thank the Centre for Surveillance and Applied Research at the Public Health Agency of Canada and the BC Centre for Disease Control of the Provincial Health Services Authority, for their generous financial support of the 2021 CARRFS Symposium.

About CARRFS

The Canadian Alliance for Regional Risk Factor Surveillance (CARRFS) has its roots in a think tank forum initiated by the Public Health Agency of Canada (PHAC) in 2007 that was attended by over 100 public health professionals. The purpose of the forum was to discuss strategies for risk factor surveillance in recognition that relevant data for public health planning was neither timely nor frequent and was rarely granular enough to be used by local communities.

CARRFS was established as a voluntary network in 2008 to follow up on this work. Since then, the committee has run various programs, including training in public health surveillance skills; research; and an environmental scan to document the current status for laying down the road maps for public health surveillance across the country.

Since 2016, CARRFS has focused on organizing an annual symposium as a pre-conference event of the Public Health conference organized by the Canadian Public Health Association (CPHA) and/or a Collaborator Session as part of the CPHA conference (see slide below).

A slide of historical background depicting major events organized by CARRFS from 2016 to 2021, as presented by Drona Rasali at the 2021 Symposium.

2021 Organizing Committee

Dr. Drona Rasali, Chair (BC)

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Céline Plante (QC)

Dr. Mayilee Canizares (ON)

Dr. Christine Blaser (QC)

Dr. Kavita Singh (ON)

Dr. Bernard Choi (ON)

Dr. Doug Dover (AB)

Event details

This virtual symposium is a pre-conference event of the Canadian Public Health Association (CPHA) Public Health 2021 Conference being held October 6-8, 2021. The CARRFS Symposium will be conducted in English.

Objectives

After attending the CARRFS 2021 Symposium, public health professionals will be able to:

1. Describe the wider health impacts of the COVID-19 pandemic, that can be unintended consequences of:

   - Direct response measures to the pandemic, such as impacts of lockdowns, school and business closures, physical distancing requirements, and travel restrictions on mental health, substance abuse, lifestyle, and food security;

   - Indirect responses to the pandemic, such as re-allocation of resources away from prevention and treatment of other health conditions and reluctance of individuals to seek treatment for non-COVID-19 conditions;

   - Exacerbation of socio-economic disparities leading to increased inequalities in health outcomes; and

   - Longer term effects, such as chronic disease sequelae subsequent to the resolution of initial COVID-19 symptoms, also known as "Long COVID-19" or "long haulers," and inequalities arising from long term economic impacts.

2. Explore the opportunities for, and challenges of, research and surveillance at the population level, and discover the possibilities to monitor and assess these impacts and potential responses;

3. Discuss potential opportunities for applied researchers to support surveillance and prevention strategies, while responding to the wider health impacts of public health emergencies.

Sponsors

We are grateful to the following organizations for generously sponsoring the 2021 CARRFS Symposium:

Session 1 proceedings

Moderated by Dr. Christine Blaser, CARRFS member

Agenda

11:00am   Welcoming remarks (10 minutes)
Dr. Christine Blaser and Dr. Drona Rasali, CARRFS Chair

11:10am   Keynote address (60 minutes): Understanding the wider health impacts of
COVID-19: Evidence from the Public Health Agency of Canada

> **Canada's opioid crisis during the COVID-19 pandemic**
> Dr. Heather Orpana

> **Findings from the Survey on COVID-19 and Mental Health (SCMH)**
> Dr. Murray Weeks

> **Prevalence of long-term effects in individuals diagnosed with COVID-19 – A living systematic review**
> Mrs. Francesca Reyes Domingo

12:10pm   Rapid Fire Presentations (50 minutes)

> **Spatiotemporal transmission dynamics of COVID-19 in Alberta, Canada**
> Ashok Krishnamurthy

> **Backlog in ophthalmic surgeries caused by COVID-19 pandemic in Ontario 2020: a time series modelling analysis**
> Ya-Ping Jin

> **Generalized anxiety in young adults during the summer of 2020, shortly after the first wave of the COVID-19 pandemic in Québec**
> Mai Thanh Tu

> **Assessing the impact of COVID-19 physical distancing measures on the mental health of British Columbians using crowdsourcing data**
> Li Rita Zhang

1:00pm   Q&A about CARRFS (30 minutes)
Moderated by Dr. Christine Blaser and Dr. Drona Rasali (CARRFS members)

Keynote Address

Understanding the wider health impacts of COVID-19: Evidence from the Public Health Agency of Canada

At the federal level, several organizations are conducting or funding surveillance and research work related to the wide health impacts of COVID-19. Symposium registrants had the opportunity to hear about three research projects being conducted at the Public Health Agency of Canada's Centre for Surveillance and Applied Research.

1. **Canada's opioid crisis during the COVID-19 pandemic**
   Dr. Heather Orpana, Centre for Surveillance and Applied Research, Public Health Agency of Canada

This study aims to describe the increase in substance-related harms and deaths that have been observed in surveillance data since the COVID-19 pandemic began.

Looking at the first 12 months of the pandemic compared to the 12 months prior to its start, there was an 88% increase in apparent opioid toxicity deaths, a 27% increase in opioid-related hospitalizations, and a 62% increase in EMS responses to suspected opioid-related overdoses in the 9 provinces and territories for which they have data.

The research team also used a systems dynamic modelling approach to predict opioid use and overdose deaths through to the end of 2021. The model shows that opioid poisoning deaths are likely to remain high or even may increase in Canada during 2021.

Dr. Heather Orpana is a Senior Research Scientist in the Centre for Surveillance and Applied Research at the Public Health Agency of Canada, where she manages the Integrated Data and Enhanced Analytics team in the Substance Related Harms Division. She leads the development of dynamic models of opioid overdose and suicide, as well as research at the intersections of mental health, mental illness, substance use and suicide. Dr. Orpana received her PhD in experimental psychology from the University of Ottawa, and is an Adjunct Professor in the School of Epidemiology and Public Health there.

2. **Findings from the Survey on COVID-19 and Mental Health (SCMH)**
   Dr. Murray Weeks, Centre for Surveillance and Applied Research, Public Health Agency of Canada

The Public Health Agency of Canada (PHAC) partnered with researchers and Statistics Canada to design and implement a cross-sectional survey to assess the impacts of COVID-19 on the mental health and wellbeing of Canadians. Though there have been two cycles of the Survey on COVID-19 and Mental Health (SCMH) – September to December 2020 and February to May 2021 – Dr. Weeks provided results from the first round only.

The survey used symptom-based tools, including the Generalized Anxiety Disorder Scale (GAD-

7), the Patient Health Questionnaire (PHQ-9), and the PCL-5 checklist, to identify respondents with moderate to severe symptoms of general anxiety disorder (GAD), major depressive disorder (MDD), and post-traumatic stress disorder (PTSD), respectively. A positive screening for one of these disorders is not equivalent to being diagnosed by a clinician.

12,344 respondents (age 18+) agreed to share their data with PHAC. The study found that, between September and December 2020:

- 6.3% of Canadians screened positive for PTSD, 13.1% for GAD, and 15.2% for MDD. 20.9% screened positive for at least one of these disorders.

- Groups with higher prevalence of any of these disorders were women (24.3%); younger people between 18 and 34 years (29.3%); people with Indigenous identities (35.5%), frontline workers, such as doctors, nurses, firefighters, and police officers (27.8%); people who drank heavily in the past month (25.5%) or increased alcohol consumption since the beginning of the pandemic (35%); and people who consumed cannabis daily in the past month (42.6%) or increased cannabis consumption since the beginning of the pandemic (54.3%).

- People who screened positive for at least one of these disorders were more likely to report being negatively impacted by COVID-19, including experiencing feelings of loneliness, isolation, and emotional distress, or impacts to physical health, than individuals who did not screen positive.

More information about study methodology can be found on the Statistics Canada and Public Health Agency of Canada websites.
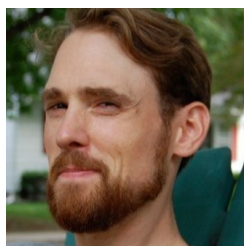
Dr. Murray Weeks is an epidemiologist with the Centre for Surveillance and Applied Research in the Health Promotion and Chronic Disease Prevention Branch of the Public Health Agency of Canada (PHAC). After completing a PhD in Psychology in 2012, he worked as a researcher at the University of Ottawa where he conducted a series of projects examining the development of anxious and depressive symptoms in Canadian children and youth. In 2015, he joined the Department of National Defence as an epidemiologist and conducted research examining the mental health of Canadian Armed Forces personnel using national survey and administrative data. In 2018, he joined the Public Health Agency of Canada as an epidemiologist in the Adult Chronic Diseases and Conditions Division and has been working on addressing gaps in the surveillance of mental illness in Canada. In terms of contributions to the literature, Murray has authored over 30 peer-reviewed articles in academic journals.

3. **Prevalence of long-term effects in individuals diagnosed with COVID-19: A living systematic review**

   Francesca Reyes Domingo, Centre for Surveillance and Applied Research, Public Health Agency of Canada

This living systematic review summarizes the prevalence of symptoms and sequelae reported by people ≥4 weeks after COVID-19 diagnosis. The research team adapted a previous search strategy used by the U.K. NICE and updated it to search for new literature up to April 14, 2021 in Embase, Medline, PsychInfo and Cochrane Central. They screened references for inclusion, extracted data, assessed risk of bias and certainty of the evidence. Prevalence data from laboratory-confirmed populations were meta-analyzed using a random effects model and synthesized separately in the short-term (4-12 weeks) and long-term (>12 weeks) periods after diagnosis.

Of the 4,444 unique citations, 84 observational studies met the inclusion criteria. Over 100 post COVID-19 symptoms and sequelae were reported. Sixty-one percent (95% CI: 44-76%, low certainty) and 53% (95% CI: 41-65%, low certainty) of laboratory-confirmed individuals reported persistence or presence of one or more symptoms in the short- and long-term periods, respectively. The most prevalent symptoms in both periods included: fatigue, general pain or discomfort, shortness of breath, cognitive impairment and mental health symptoms.

A substantial proportion of individuals reported a variety of symptoms ≥4 weeks after COVID-19 diagnosis. Due to gaps in the research base, and the low certainty of the evidence currently available, the research team suggests that further research is needed to determine the true burden of post COVID-19 condition in the general population and in specific subgroups.

Mrs Francesca Reyes Domingo is a Research Scientist with the Evidence Synthesis and Knowledge Translation Unit in the Centre for Surveillance and Applied Research at the Public Health Agency of Canada. She is the lead for a living systematic review on the prevalence of post COVID-19 condition. Prior to this work, she was a Senior Epidemiologist working on national surveillance of various vaccine preventable diseases. Her previous work also involved surveillance of influenza, other novel influenza viruses and emerging respiratory infections as well as systematic reviews which have helped inform guidelines produced by the Canadian Task Force on Preventive Health Care

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Rapid Fire Presentations

* Presenters are underlined

Spatiotemporal transmission dynamics of COVID-19 in Alberta, Canada

Ashok Krishnamurthy, PhD
Department of Mathematics and Computing, Mount Royal University

Introduction: The global coronavirus pandemic (COVID-19) reached Calgary, Alberta on March 5, 2020. Since then, COVID-19 infections have been reported in all health zones of the province. It is essential to understand what future epidemic trends will be, as well as the effectiveness and potential impact of government disease intervention measures. The goal of this research is to provide insight that would support public health officials towards informed, data-driven decision making.

Methods: We present a spatial compartmental models of epidemiology to capture the transmission dynamics of the spread of COVID-19 in Alberta. We use freely available population count data downloaded as a gridded raster map from WorldPop.org to assess the geographical spread COVID-19. Each grid cell has a population count, which is divided into disease compartments. Each grid cell can transmit disease to its neighbors, with probabilities that decline exponentially with the Euclidean distance.

Results: Predicting the transmission dynamics of COVID-19 using mathematical models is challenging and comes with a lot of uncertainty. We present COVIDEpisim, an R Shiny app that integrates mathematical modelling for generating prevalence maps for the spatial spread of COVID-19. Our interactive app can be used to output and visualize how an infectious disease spreads across a large geographical area. The rate of spread of the disease is influenced by changing the model parameters and human mobility patterns. First, we run the spatial simulations under the worst-case scenario, in which there are no major public health interventions. Next, we account for mitigation efforts including strict mask wearing and social distancing mandates, targeted lockdowns, and widespread vaccine rollout.

Conclusions and implications for policy, practice or additional research: Our analyses may shed light more broadly on how COVID-19 spreads in a large geographical area with places where no empirical data is recorded or observed.

Backlog in ophthalmic surgeries caused by COVID-19 pandemic in Ontario 2020: a time series modelling analysis

Ya-Ping Jin, MD, PhD[1-2]; Mayilee Canizares, PhD[3]; Sherif El-Defrawy, MD, PhD[1]; Yvonne M Buys, MD[1]

[1] Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, ON, Canada
[2] Dalla Lana School of Public Health, University of Toronto, Toronto, ON, Canada
[3] Schroeder Arthritis Institute, Krembil Research Institute, Toronto Western Hospital, University Health Network, Toronto, ON, Canada

Introduction: Globally, non-emergent surgeries have been intermittently stopped or ramped down as healthcare systems respond to the coronavirus disease 2019 (COVID-19) pandemic. We assessed the volume of deferred ophthalmic surgeries, the most common adult surgery, from March-December 2020 and suggest strategies and duration required to clear the backlog in Ontario, Canada.

Methods: Population-based Ontario Health Insurance Plan physician billing data from January 2017 to December 2020 was the data source. Time series forecasting models were used to estimate the backlog size. Clearance time under various recovery scenarios was calculated.

Results: From March 16 to December 31, 2020, the estimated ophthalmic surgical backlog in Ontario was 92,150 surgeries (95% prediction interval [PI] (71,288–112,841). In addition, 23,755 (95% PI 14,656–32,497) anti-VEGF (vascular endothelial growth factor) injections performed in ophthalmology clinics were missed. Roughly 90% of the delayed surgeries were cataract surgeries and 4% were retinal detachment surgeries. Nearly half of the provincial backlog (48%, 44,542/92,150) was in the west health region. The estimated provincial clearance time was 248 weeks (95% confidence interval [CI] 235–260) if 10% additional operating hours and 128 weeks (95% CI 121–134) if 20% additional operating hours were added per week based on the weekly ophthalmic surgical volume in 2019.

Conclusions and implications for policy, practice or additional research: The magnitude of the ophthalmic surgical backlog in 2020 alone raises serious concerns for meeting the ophthalmic surgical needs of Ontarians. The pandemic is ongoing and the accrued backlog size is increasing. Before COVID-19, 42%-46% of physicians reported burnout. Adding additional operating hours may worsen burnout of physicians and other health care providers. Planning and actions are needed urgently to balance patients' needs, COVID-19 risk and physicians' and other health care providers' wellness to manage the collateral impacts of the COVID-19 pandemic on the surgical backlog.

Generalized anxiety in young adults during the summer of 2020, shortly after the first wave of the COVID-19 pandemic in Québec

Mai Thanh Tu
Programme d'enquêtes longitudinales, Direction principale des statistiques sociales et de santé (DPSSS), Institut de la statistique du Québec

Introduction: The impacts of the COVID-19 pandemic on mental health and wellbeing are poorly documented, especially in young adults, who are generally more anxious than other age groups. Cross-sectional studies on mental health conducted in the first few weeks of the pandemic lacked information about the pre-pandemic mental health state of the respondents.

This presentation aims at: 1) describing the prevalence of generalized anxiety during summer 2020, shortly after the first wave and, 2) examining its associations with pre-pandemic factors and factors measured during the summer of 2020.

Methods: We used data from the Quebec Longitudinal Study of Child Development (QLSCD), an ongoing

birth cohort with data collected annually or every other year since 1997-1998 (at age 5 months), as well as data from a special round on the COVID-19 pandemic, carried during the summer 2020 (at age 22). Logistic regressions were performed to assess the association between anxiety in 2020 and pre-pandemic factors (e.g. past anxiety, perception of financial situation) and factors measured during the summer of 2020 (e.g. being enrolled in school, working, feeling lonely, worrying about the impact of the pandemic on work opportunities or the value of his or her diploma).

Results: Our analyses revealed the key role of past anxiety for young women and the perception of being poor for young men on their level of generalized anxiety during summer of 2020. As for factors measured during summer of 2020, young adults who felt lonely or were working during the summer as well as young women who worried about the impact of the pandemic on school had a greater probability to experience generalized anxiety during this period.

Conclusions and implications for policy, practice or additional research: Our findings outline the importance of longitudinal data since it allows consideration of the pre-pandemic health state in the interpretation of the impact of the pandemic on mental health and wellbeing.

Assessing the impact of COVID-19 physical distancing measures on the mental health of British Columbians using crowdsourcing data

Li Rita Zhang, MPH[1]; Xibiao Ye, PhD[2]; Drona Rasali, PhD, FACE[1]

[1] BC Centre for Disease Control, Provincial Health Services Authority
[2] Office of the Provincial Health Officer, BC Ministry of Health

Introduction: The introduction of public health measures in March 2020 in response to the COVID-19 pandemic brought about unprecedented changes. We assessed self-reported change in mental health as an impact of physical distancing in British Columbia (BC).

Methods: We used Crowdsourcing PUMF data from the Statistics Canada Survey: Impacts of the COVID-19 on Canadians – Your Mental Health (April 24 - May 11, 2020) collected through a non-probabilistic approach. Applying benchmarking factor, we calculated the percent respondents reporting their mental health as better, worse, or about the same compared to before physical distancing for participating BC residents aged 15+ (n = 6,631). Rates of negative change in mental health were also assessed for subgroups: age (15 - 24, 25 - 34, 35 - 44, 45 - 54, 55 - 64, and 65+), gender (male, female), immigrant status (immigrant, non-immigrant), rural/urban indicator (rural, urban), and community size and metropolitan influence zone (1,500,000+, 500,000 to 1,499,999, 100,000 to 499,999, <100,000, and non-census metropolitan area or census agglomeration).

Results: At the time of the survey, 8.7%, 38.2% and 53.0% BC participants reported better, about the same, and worse mental health after physical distancing, respectively. Compared to demographic group-specific counterparts, a higher rate of negative change in mental health was seen among younger age groups, females, non-immigrants, urban dwellers, and residents of the largest community size (1,500,000+). In particular, age appeared to be the most divisive factor with the younger groups (15 - 24, 25 - 34, 35 – 44 years) reporting

almost twice the rate of worse mental health after physical distancing compared to the oldest group (65+), 62.5%, 63.8%, 64.2%, and 32.4% respectively.

Conclusions and implications for policy, practice or additional research: Physical distancing measures during the COVID-19 pandemic have worsened mental health of more than 50% of survey respondents, in particular younger peoples.

Session 2 proceedings

Moderated by Dr. Kavita Singh, CARRFS Member

Agenda

2:30pm   Welcoming remarks (10 minutes)
Dr. Kavita Singh, CARRFS member

2:40pm   Keynote address (45 minutes)

Learning from the Societal Effects of the COVID-19 Response to "Build Back Better"
Dr. Jason Wong, BC Centre for Disease Control; COVID-19 UNICONS Study Committee, BC

3:25pm   Abstract Oral Presentations (40 minutes)

Socio-economic (SES) Disparities Associated with COVID-19 Incidence in Lower Mainland of British Columbia
Crystal Li

The unintended consequences of the COVID-19 pandemic response on maternal and infant health outcomes, British Columbia, Canada
Sabrina Luke

Examining vaccine coverage inequity across Community Health Service Areas (CHSA) using British Columbia's Index of Multiple Deprivation
Sharon Relova

4:05pm   Keynote address (50 minutes)

COVID Policy Choices: Getting Better Evidence
Dr. Vinay Prasad

4:55pm   Closing remarks (5 minutes)
Dr. Kavita Singh

Keynote Address

Learning from the Societal Effects of the COVID-19 Response to "Build Back Better"

Jason Wong, BC Centre for Disease Control

Multiple public health and other measures were implemented to slow transmission of COVID-19 and preserve hospital capacity and resources. These measures have helped control COVID-19 and minimized serious illness and death due to COVID-19. However, these measures have had broad wide-reaching consequences on society. Understanding the effects of response measures and distribution among population groups can inform decision-making to reduce serious illness and mortality from COVID-19 while minimizing societal disruption. Building on the Chief Public Health Officer of Canada's Report, "From risk to resilience: an equity approach to COVID-19," this presentation highlights the impacts of COVID-19 response measures on the material circumstances, psychosocial factors, and health behaviours of British Columbians. The presentation concludes with several recommendations for investment and collaboration to better understand and address inequities to build a healthier society.

Dr. Jason Wong is a Public Health and Preventive Medicine specialist at the BC Centre for Disease Control. He is the co-chair of a project in BC to understand and monitor the societal impacts of the measures implemented to respond to the COVID-19 pandemic, including on population health and wellness, the health care system, the environment, the economy, and society.

Rapid Fire Presentations

* Presenters are underlined

Socio-economic (SES) Disparities Associated with COVID-19 Incidence in Lower Mainland of British Columbia

Crystal Li, MSc[1], Sunny Mak, MSc [1], Cara McLean, MSc [1], Caren Rose, PhD[1,2], Drona Rasali, PhD, FACE[1,2]

[1] BC Centre for Disease Control, Provincial Health Services Authority
[2] School of Population and Public Health, University of British Columbia

Introduction: Literature published in the early period of the pandemic revealed that socio-economic status (SES) disparities are likely to exacerbate the exposure to COVID-19 cases. Our study aims to evaluate the association of socio-economic disparities in COVID-19 infections during the later part of the ongoing pandemic.

Methods: COVID-19 person-level data (Aug 1, 2020 - April 7, 2021) and Census 2016 neighbourhood level data were linked and analyzed at the Dissemination Area (DA) level. Crude incidence of COVID-19 (per million) were calculated for each of the four SES factors, namely, race/ethnicity, income, education and

occupations, re-grouping them into quintiles (income) or range of percentage of other variables in DAs across which distributions of COVID-19 cases were compared and graphically plotted.

Results: Study results show that COVID-19 incidence was higher with the higher proportions of South-Asian population (74,096 per million for DAs that have ≥33% Population), household income Quintile 3 and 4, and two occupation groups, namely- 1) Trades, transport & equipment operator (55,430 per million for DAs that have ≥25% group population), and 2) Manufacturing & utilities services (54,838 per million for DAs that have ≥7.6% group population). The highest proportions of two highest education level groups, 1) Less than High School (56,452per million for DAs that have ≥26% group population) and 2) High School graduates (42,064 per million for DAs that have ≥38% group population) have positive association with COVID-19 cases resulting in higher incidence rates.

Conclusions and implications for policy, practice or additional research: We have found that the proportions of certain race groups, certain occupation groups and highest education groups and upper middle quintiles of median household income groups are significantly associated with COVID-19 incidence rate. Our study helps identify the characteristics of high COVID-19 incidence groups, which could in turn inform policy intervention and immunization strategy.

The unintended consequences of the COVID-19 pandemic response on maternal and infant health outcomes, British Columbia, Canada

Sabrina Luke, PhD[1,2]; Drona Rasali, PhD, FACE[3,4]; Kenny Der, MBA[1]; Xibiao Ye, PhD[5]; Niloufar Saffari, MSc[1]

[1] Perinatal Services BC, Provincial Health Services Authority, British Columbia
[2] Women's Health Research Institute, Provincial Health Services Authority, British Columbia
[3] BC Centre for Disease Control, Provincial Health Services Authority, British Columbia
[4] School of Population and Public Health, University of British Columbia, British Columbia
[5] Population Health Surveillance & Epidemiology, Office of the Provincial Health Officer, BC Ministry of Health, British Columbia

Introduction: In March 2020, British Columbia adopted a province-wide pandemic response to the novel coronavirus disease (COVID-19) that encouraged social distancing and reduced access to services including health care. It is unknown whether these measures resulted in unintended consequences to maternal and infant health.

Methods: We analyzed births in British Columbia from June 1st, 2019 to December 31st, 2020 using British Columbia's Perinatal Data Registry. Monthly rates of selected outcomes were compared over time. Interrupted time series analysis was conducted to compare trends of cesarean delivery, very preterm and preterm birth, stillbirth, low birth weight, late terminations, exclusive breastfeeding and maternal and neonatal readmissions before and after the pandemic response was implemented.

Results: The rate of cesarean delivery, very preterm and preterm births, late terminations, low birth weight, maternal readmissions, stillbirth and neonatal readmissions all decreased immediately following the

introduction of the pandemic response in March 2020, while exclusive breastfeeding increased during this time. Only neonatal readmissions (p=0.021), very preterm birth (p=0.033) and exclusive breastfeeding (p=0.036) were statistically significant. The change in rate over time increased in the post-pandemic response period for cesarean delivery, exclusive breastfeeding, very preterm and preterm births, and maternal readmissions, while late terminations, low birth weight, stillbirth and neonatal readmissions showed a decrease in the change in rate over time. This change in trend was significant for exclusive breastfeeding (p=0.016), and approaching significance for late terminations (p=0.07).

Conclusions and implications for policy, practice or additional research: The COVID-19 pandemic response had an immediate significant effect on the rate of neonatal readmissions, very preterm birth and exclusive breastfeeding, and a significant prolonged effect on rates of exclusive breastfeeding and late terminations in British Columbia.

Examining vaccine coverage inequity across Community Health Service Areas (CHSA) using British Columbia's Index of Multiple Deprivation

Sharon Relova, MSc[1]; David Roth, PhD[1]; Kate Smolina, DrPH[1,2]; Drona Rasali, PhD, FACE[1,2]; Geoffrey McKee, MD, MPH, FRCPC[1]; Naveed Janjua, MBBS, DrPH[1,2]; Jat Sandhu, PhD, MBA[1,2]

[1] BC Centre for Disease Control, Provincial Health Services Authority
[2] School of Population and Public Health, University of British Columbia

Introduction: COVID-19 has disproportionately affected certain population groups such as people of colour and frontline workers. Vaccines could reduce disparities in infection risk. This study aims to characterize disparities in vaccination coverage, from a health equity lens, at the Community Health Service Area (CHSA) level in British Columbia.

Methods: The British Columbia's Index of Multiple Deprivation (BCIMD) was developed using Statistics Canada's methodology to create quintile scores of deprivation for CHSAs in four dimensions: residential instability, economic dependency, situational vulnerability and ethno-cultural composition (diversity). Vaccine coverage rates were based on receipt of at least one dose as of July 22, 2021. Biplots were created to visualize the relationship between BCIMD quintiles and vaccine coverage. Analyses were done separately for 18-49 and 50+ year olds to account for the province's age-based vaccination plan.

Results: For both 18-49 and 50+, there was no clear pattern of vaccine coverage observed by residential instability. There was a trend towards lower vaccine coverage in CHSAs with higher situational vulnerability and lower ethno-cultural diversity. CHSAs with a greater percentage of ethno-cultural diversity appear to have greater vaccine coverage. There was an association between higher vaccine coverage in CHSAs with lower economic dependency among 18-49, but no association for 50+.

Conclusions and implications for policy, practice or additional research: BCIMD is a useful measure to quantify disparity in COVID-19 vaccine coverage across CHSAs. Healthcare leaders can use this information to develop targeted approaches to vaccination in specific CHSAs, especially those with higher situational

vulnerability and lower ethno-cultural diversity. Patterns seen at the CHSA level may not hold at the individual level (ecological fallacy). Patterns may be confounded by other geographically stratified factors (e.g. population density). Ongoing work to develop statistical models at the individual and/or Dissemination Area level will help us better understand these patterns.

Keynote Address

COVID Policy Choices: Getting Better Evidence
Vinay Prasad, University of California, San Fransisco

Dr. Vinay Prasad shared his perspectives of the interventions implemented to prevent COVID-19 transmission, with a particular focus on the US context.

He suggested that the pandemic will end with very little good evidence on the biggest interventions and that it will take a full decade to gain an understanding of these impacts. Using examples of interventions like lockdowns, school closures and masking, Dr. Prasad suggested that, going forward, we need to:

- Better understand the full impacts of the pandemic as well as its response;
- Gather evidence demonstrating which public health measures minimized risk and which ones ended up being more harmful;
- Understand that worsening mental health leads to destabilized online discourse; and
- Recognize that there have been threats to democracy as a result of the misuse of power in the name of public health, and that this may have accelerated the increased disparities and vulnerabilities felt by some populations.
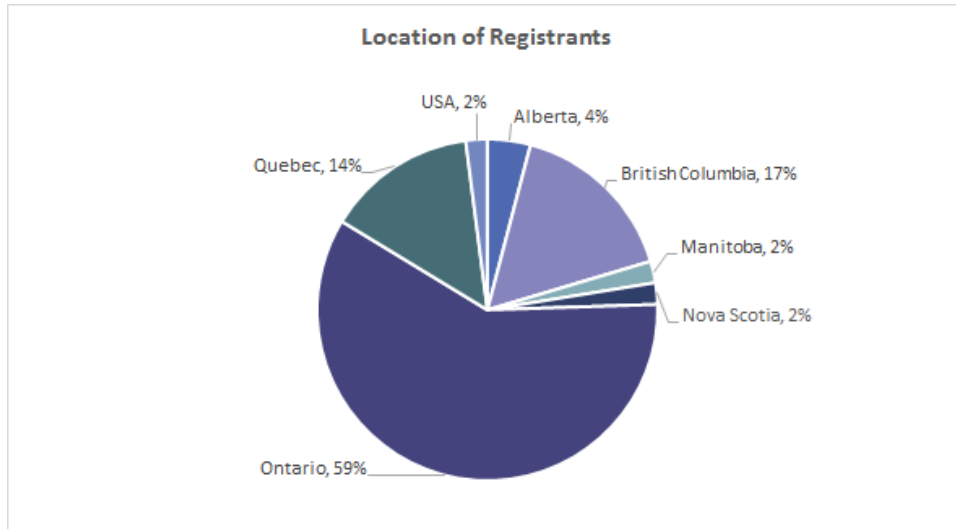
To read more from Dr. Prasad, please visit his website.

Dr. Vinay Prasad, MD MPH is a hematologist-oncologist and Associate Professor in the Department of Epidemiology and Biostatistics at the University of California San Francisco. He runs the VKPrasad lab at UCSF, which studies cancer drugs, health policy, clinical trials and better decision making. He is author of over 300 academic articles, and the books Ending Medical Reversal (2015), and Malignant (2020). He hosts the oncology podcast Plenary Session, and runs a YouTube Channel VinayPrasadMDMPH. He tweets @VPrasadMMPH.
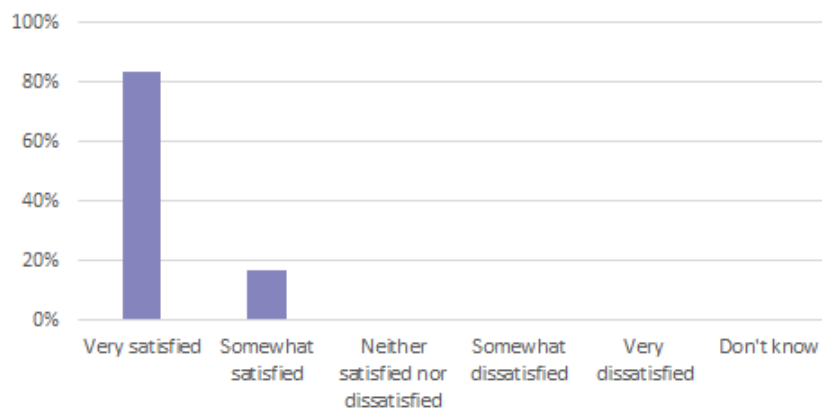
Event Outcomes

47 individuals from across Canada attended the 2021 CARRFS Symposium. They included Epidemiologists, Research Scientists, Policy Analysts, and public health professionals, and represented federal, provincial, and local public health agencies as well as academic and research institutions. The following figure shows the provincial representation of symposium registrants.

Location of Registrants

USA, 2%
Alberta, 4%
Quebec, 14%
British Columbia, 17%
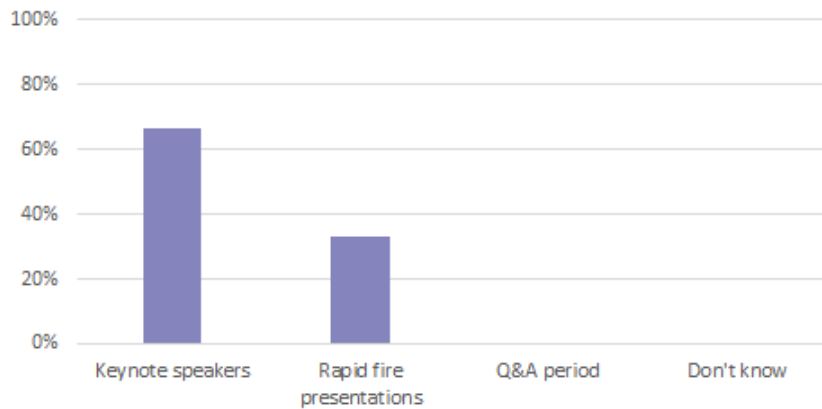Manitoba, 2%
Nova Scotia, 2%
Ontario, 59%

After the symposium, registrants were asked to complete a post-event evaluation survey. 6 individuals completed the survey. Their responses have been included below.

Q1: What is your level of satisfaction with this event?

100%
80%
60%
40%
20%
0%

Very satisfied | Somewhat satisfied | Neither satisfied nor dissatisfied | Somewhat dissatisfied | Very dissatisfied | Don't know

## Q2: What did you enjoy most about today's event?

Q3: Did you come away from the Symposium with any learnings that you can apply to your work/research/studies? Please describe.

- "Comparisons of other people's research findings to compare to our own."
- "I made connections."
- "How people are looking at risk factors across the country."
- "Yes. It was good to know what other projects are ongoing in Canada and how we can build upon them in our team's work."
- "Useful examples of how various indicators were collected and used in BC as well as other Canadian examples."

Q4: Please let us know if there is anything we can do to improve for future CARRFS events.

- " Hard to say as most of the issues were technical. I kept losing my connection. But the presentations that I was able to participate in were great. Thanks."
- "I thought it was great and well done!"
- "Free registration."
- "Hopefully in the future there will be an in-person option."

Q5: Are you likely to participate in CARRFS events in the future?
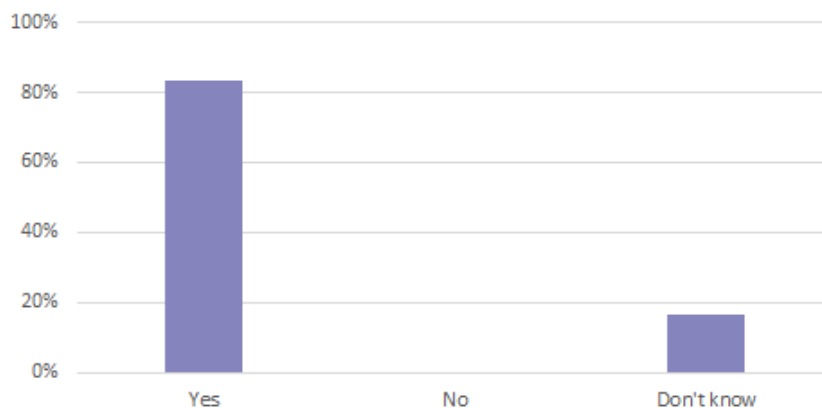
Public Health 2021 Collaborator Session

In addition to the 2021 Symposium, CARRFS presented a Collaborator Session at the CPHA Public Health 2021 Conference on October 6, 2021. The image below provides additional details.

WEDNESDAY 6 OCTOBER | MERCREDI 6 OCTOBRE

12:15 – 13:15 **CONCURRENT SESSIONS**
12 h 15 à 13 h 15 **SÉANCES SIMULTANÉES**

PUBLIC HEALTH 2021 SANTÉ PUBLIQUE
6-8 OCTOBER
DU 6 AU 8 OCTOBRE

SURVEILLANCE OF SOCIOECONOMIC DISPARITIES IN CORONAVIRUS DISEASE-19 (COVID-19): PERSPECTIVES FROM THREE PROVINCES TO INFORM PANDEMIC RESPONSE

Presented by: Canadian Alliance for Regional Risk Factor Surveillance

Health impacts of the COVID-19 pandemic have been worse in vulnerable populations around the world. Using surveillance data across Canada, this session will underscore the disparate toll of the pandemic. We will discuss the importance of mobilizing surveillance data to inform COVID-19 response and deploying population-specific interventions to tackle health inequities. The session will also explore usages of surveillance data to identify at risk sub-populations and to better inform decision-makers to address the socioeconomic inequities of COVID-19.

Learning Objectives

- Characterize socioeconomic disparities in COVID-19 resulting in disproportionate health impacts across populations in Canada.
- Assess the use of surveillance data to identify risk factors and protective levers to inform decision-makers and community leaders deploying population-specific interventions to reduce disparities of COVID-19 in vulnerable populations.
- Discuss opportunities on how surveillance data can continue to support the implementation of mitigation measures to address the inequitable impacts of COVID-19.

Speakers

- Drona Rasali, Director, Population Health Surveillance & Epidemiology, BC Centre for Disease Control, British Columbia Provincial Health Services Authority; Adjunct Professor, School of Population and Public Health, University of British Columbia
- Christine Blaser, Social epidemiologist, Senior scientific advisor, Institut national de santé publique du Québec; Associate Clinical Professor, École de santé publique, Département de médecine sociale et préventive, Université de Montréal
- Sharmistha Mishra, Infectious disease physician, Associate Professor, Department of Medicine, University of Toronto; Clinician Scientist, Division of Infectious Disease, St. Michael's Hospital, Unity Health Toronto; Tier 2 Canada Research Chair in Mathematical Modeling and Program Science

Moderator

- Céline Plante, Scientific advisor, Institut national de santé publique du Québec