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CHIEF PUBLIC HEALTH OFFICER (CPHO) ANNUAL REPORT CATALYST GRANTS – 2021 & 2022 COHORTS: EVIDENCE BRIEF BOOKLET

SUBVENTIONS CATALYSEUR LIÉES AUX RAPPORTS ANNUELS DE L'ADMINISTRATRICE EN CHEF DE LA SANTÉ PUBLIQUE (ACSP) – COHORTES DE 2021 ET DE 2022 : LIVRET DE SYNTHÈSE

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Les subventions Catalyseur liées aux rapports annuels de l'administratrice en chef de la santé publique ont vu le jour grâce à la participation et à la contribution conjointe des partenaires financiers suivants : Institut de la santé publique (ACSP) et des populations des IRSC, Institut de la santé des femmes et des hommes des IRSC, Institut de la santé des Autochtones des IRSC, Institut des maladies infectieuses et immunitaires des IRSC, Centre pour la recherche sur la préparation en cas de pandémie et d'urgence sanitaire et Agence de la santé publique du Canada.

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EXECUTIVE SUMMARY

CPHO Annual Report Catalyst Grant Program

Thanks to the commitment of six program funders, three Chief Public Health Officer (CPHO) Annual Report Catalyst Grant competitions were launched in 2021, 2022 and 2023. The overarching goal of these grants was to catalyze research aligned with the opportunities and evidence gaps identified in the research opportunities of the CPHO Annual Reports:

- A Vision to Transform Canada's Public Health System (2021)
- Mobilizing Public Health Action on Climate Change in Canada (2022)
- Conditions for Resilient Communities: A Public Health Approach to Emergencies (2023)

The three-pronged objectives of the catalyst grants were to 1) foster links between researchers, decision-makers and knowledge users; 2) facilitate responsive and evidence-informed decision-making; and 3) strengthen capacity to generate and apply context-specific knowledge in order to build more effective and equitable public health systems.

A total of 43 projects were funded through the three grant competitions, each grant valued at between $100,000 and $125,000, representing a total investment of $4.85M.

Competition	Funding Results
Catalyst Grant: 2021 CPHO Report	17 funded projects
Catalyst Grant: 2022 CPHO Report	15 funded projects
Catalyst Grant: 2023 CPHO Report	11 funded projects

Evidence Briefs as Knowledge Mobilization Products

To maximize knowledge mobilization, teams were asked to participate in a CIHR-hosted workshop in September 2024 and to submit an optional two-page Evidence Brief. This Booklet thus contains the Evidence Briefs submitted by 27 teams from the 2021 and 2022 cohorts, which had reached the end of their funding period. The briefs aim to share key findings, impacts and next steps with partners and knowledge users, and highlight implications for policy and/or practice. By publishing and disseminating this Booklet, CIHR-IPPH and partners seek to advance the evidence-to-policy/action gap on key public health priorities, and advance the understanding and application of knowledge mobilization.

Contact Us

For more information about the CPHO Report Catalyst Grants, please contact the CIHR-IPPH team: Bahar Kasaai, Assistant Director (bahar.kasaai@cihr-irsc.gc.ca) or Danielle Schirmer, Lead, Strategic Initiatives (danielle.schirmer@cihr-irsc.gc.ca).

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RÉSUMÉ

Subventions Catalyseur liées aux rapports annuels de l'administratrice en chef de la santé publique

Grâce à leur contribution, six bailleurs de fonds ont permis de lancer trois concours de subventions Catalyseur, soit en 2021, en 2022 et en 2023. Ces subventions visaient essentiellement à catalyser la recherche correspondant aux possibilités de recherche et aux lacunes dans les données probantes cernées dans les rapports annuels de l'administratrice en chef de la santé publique (ACSP), à savoir les suivants :

- Une vision pour transformer le système de santé publique du Canada (2021);
- Mobiliser la santé publique contre les changements climatiques au Canada (2022);
- Créer les conditions favorables à la résilience des communautés : une approche de santé publique en matière d'urgences (2023).

Les concours de subventions Catalyseur liées à ces rapports poursuivaient trois objectifs précis, soit de faciliter l'établissement : 1) de liens entre chercheurs, décisionnaires et utilisateurs des connaissances; 2) de processus décisionnels adaptés et fondés sur des données probantes; 3) d'initiatives de renforcement des capacités afin de générer et d'appliquer des connaissances adaptées au contexte et, ainsi, de favoriser l'efficacité et l'équité au sein des systèmes de santé publique.

Au total, 43 projets ont été financés. Les montants accordés variaient entre 100 000 $ et 125 000 $ par subvention et représentaient un investissement total de 4,85 millions de dollars.

Concours	Résultats
Subvention Catalyseur : Rapport de l'ACSP (2021)	17 projets financés
Subvention Catalyseur : Rapport de l'ACSP (2022)	15 projets financés
Subvention Catalyseur : Rapport de l'ACSP (2023)	11 projets financés

Exposés de données probantes : des produits de mobilisation des connaissances

Pour optimiser la mobilisation des connaissances, on a demandé aux équipes financées de participer à un atelier tenu par les IRSC en septembre 2024 et de soumettre un exposé de données probantes (facultatif) de deux pages (si le financement de leur projet prenait fin). Le présent livret de synthèse regroupe les exposés de données probantes préparés par les 27 équipes faisant partie des cohortes de 2021 et de 2022 qui avaient atteint la fin de leur cycle de financement. Les exposés font état des principales conclusions et retombées des travaux, des prochaines étapes avec les partenaires et les utilisateurs des connaissances ainsi que des répercussions sur les politiques ou les pratiques.

En publiant et en diffusant ce livret, l'IRSC-ISPP et ses partenaires cherchent à combler l'écart entre les données probantes et les politiques/actions sur les principales priorités en matière de santé publique, et à faire progresser la compréhension et l'application de la mobilisation des connaissances.

Demande de renseignements

Pour obtenir de plus amples renseignements sur les subventions Catalyseur liées aux rapports de l'ACSP, communiquez avec les représentantes suivantes de l'Institut de la santé publique et des populations des IRSC : Bahar Kasaai, directrice adjointe (bahar.kasaai@cihr-irsc.gc.ca) ou Danielle Schirmer, responsable des initiatives stratégiques (danielle.schirmer@cihr-irsc.gc.ca).

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PROJECT DETAILS

Title: Digital Health and Artificial Intelligence based Platform for Early Chronic Disease Risk Assessment and Prediction to Improve Population Health
Nominated Principal Investigator : Samina Abidi
Affiliation : Dalhousie University
Keywords: knowledge mobilization, health research data, chronic disease risk assessment and mitigation strategies

RESEARCH PRIORITIES

The overall goal of this project is to develop an AI and digital-health based system to implement and test a public-facing chronic disease risk assessment framework called Personalized Risk Investigation, Stratification and Mitigation (PRISM) platform. As a catalyst project, we are investigating and implementing a proof-of concept PRISM platform to perform cancer risk assessment for five most common types of cancer in Atlantic Canada. We are pursuing cancer risk assessment at two levels: (a) public-facing cancer risk assessment using validated risk assessment tools; and (b) assessment of an individual's future risk of onset of cancer by using cancer prediction models developed using population health data that correlate health determinants with incidence of cancer outcomes. Ultimately, this work has the potential to empower individuals to self-assess their potential risk for cancer, and to motivate them through personalized health promotion educational content to modify their behavioral risk factors to mitigate the onset of cancer.

RESEARCH APPROACH

This is an ongoing pilot project, whereby our approach to develop PRISM involves four components:
1.Develop Machine Learning (ML) based models to predict an individual's future risk of five common cancers in Atlantic Canada. We are developing we are developing cancer risk prediction models by analyzing population health data from the Atlantic Partnership for Tomorrow's Health (Atlantic PATH). Our cancer risk assessment analyzes risk factors pertaining to social determinants of health, health status, family history, environmental exposures and incidence of other chronic diseases. We are employing cascading classifiers to predict both the potential cancer occurrence, as well as the type of cancer.
2.Computerization of evidence-based cancer risk assessment tools. We are extending our previously developed semantic web-based knowledge model to computerize these paper-based cancer risk assessment tools in terms of a Knowledge Graph that associates biological, mechanistic and clinical cancer risk factors to discover future cancer risk in an individual.
3.Employing digital health and visual analytics methods to develop an interactive web-based cancer risk assessment dashboard for individuals to monitor their health status and cancer risk factors.
4.Perform a pilot study to evaluate the usability and functionality of PRISM for cancer risk self-assessment and monitoring.

KEY RESEARCH FINDINGS

The project is in progress, and the final research finding will be made available at the project's completion in a year's time. However, at this stage, the preliminary research findings are as follows:
1.The PRISM dashboard, illustrating the risk for multiple cancer types based on the computerization of the validated risk assessment tools, is almost complete and individuals by responding to a series of data collection questions are able to view their level of cancer risks and the risk factors contributing to the risk.

2.The population health data, covering Atlantic Canada, shows a 1:5 ratio of cancer incidence.
3.The ML based prediction models are capable of predicting the onset of cancer and cancer type with an approximate accuracy of 65-70%. This is a promising finding as it shows that the data possesses information to predict cancer. However, the accuracy is low at this point and we are currently working on improving the prediction accuracy by using more advance ML methods.
4.Population health data, specifically collected through surveys, has a lot of missingness and noise which requires a significant data cleaning and processing to make it usable by ML methods
5.Clustering of data is showing interesting groupings of individuals with a common outcome. These clusters of similar individuals are to be investigated further to generate phenotypes of individuals which can be subsequently used to stratify individuals in terms of cancer risk and cancer type.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

According to Canadian Cancer Statistics 2022 special report released by the Canadian Cancer Society, Statistics Canada and the Public Health Agency of Canada, cancer rates were highest in Atlantic Canada between 1994 and 2018. Economic burden of cancer is estimated to be $26.2 billion in Canada in 2021, whereby 30% of costs were borne by patients and their families. The significance of this project it that it is offering a strategic opportunity to disrupt the current trend of high prevalence of cancer in Atlantic Canada by empowering citizens to take personalized measures to prevent the onset of cancer. The AI-based Cancer Risk Assessment Model being developed is based on population health data from Atlantic PATH and validated cancer risk assessment tools. Atlantic PATH, a regional cohort of CanPATH, is a multi-centered prospective cohort study that include data from more than 35000 participants (30-74 years) from four Atlantic provinces. The database also includes longitudinal data from more than 21000 participants to track changes over time. Our risk assessment model is grounded in data collected from Atlantic Canadians and will provide a holistic solution to avoiding lifestyle-related cancer risk through self-assessment, self-monitoring of risk factors and adhering to risk mitigation strategies. Our KT plan has two goals: (a) Inform the general public about the risk factors leading to chronic disease onset through the use of the PRISM; and (b) Inform public health researchers about digital health-based strategies for assessment of multi-morbid risk. Our partnership with NS Dept. of Health and Wellness through Young-Shand (co-applicant and knowledge user) will support dissemination of our project's outcome (i.e. PRISM) to public health organizations.

KEY MESSAGES

- Our novel PRISM platform will enable early assessment and stratification of individual cancer risks and timely communication of this risk to individuals, thus enabling them to proactively seek assistance/interventions to mitigate the onset of cancer.
- PRISM will provide targeted behavioral interventions and education to individuals to mitigate modifiable risk factors to help prevent the onset of cancer.
- Our person-centered PRISM platform uses easy-to-understand visual analytics to visualize health status and multiple cancer risk based on the integrated outcome of the machine learning (ML) models and risk assessment tools.
- The risk assessment ML model is trained on Atlantic PATH data, longitudinal data collected from Atlantic Canadians.

OUTPUTS, PRODUCTS & IMPACT

The end product is a digital health-based public-facing Personalized Risk Investigation, Stratification and Mitigation (PRISM) platform, that will help individuals to:
1.AI-driven tools to predict potential cancer onset based on population health data for Atlantic Canada

2.Self-assess, monitor and self-manage their cancer risks
3.Learn about their (modifiable) risk factors contributing to potential onset of cancers in Atlantic Canada

PRISM dashboard uses visual analytics to visualize health status and cancer risk based on the integrated outcome of the risk prediction models and risk assessment tools with the following features:
(i) Cancer risk snapshot, whereby cancer-specific risk assessments for multiple (5) cancers are predicted as color-coded risk levels (relative and absolute risks) presented as low, moderate and high risk
(ii) Individual overall cancer risk by aggregating risk for specific type of cancer in an individual
(iii) Interactive H-diagram to illustrate the progression of of cancer risk factors over time
(iv) Node-diagrams to show risk factor influence on cancer risk
(v) Chord diagrams showing predicted cancer risk in terms of both direct and intermediate risk factors

PROJECT DETAILS

Title: Assessing COVID-19 Vaccination Uptake in People with Diabetes
Nominated Principal Investigator : Sonia Butalia
Affiliation : University of Calgary
Team Members: Baiju R. Shah, Ronald J. Sigal, Jamie L. Benham, Brandy Wicklow, Catherine H. Yu, Kaberi Dasgupta, Shazhan Amed, Cora Constantinescu, Luan M. Chu, Padma Kaul
Keywords: diabetes, vaccine, COVID-19, public health, population health
Contact: Sonia Butalia, sbutalia@ucalgary.ca

RESEARCH PRIORITIES

Although Canadians have a publicly funded health system, crises like the COVID-19 pandemic can widen health inequities. Some groups of people, such as people with diabetes, are at risk of health inequities, and this may have occurred with COVID-19 vaccination. We assessed COVID-19 vaccination uptake among people with diabetes, a research priority from the 2021 CPHO's Annual Report (i.e., the effectiveness of a public health measure (i.e., vaccination) implemented during the COVID-19 pandemic). Understanding rates of, and factors associated with vaccine uptake is important because diabetes is a common chronic condition in Canada, and people with diabetes experience significant adverse effects of COVID-19, have had high rates of vaccine hesitancy with other serious infections, and are susceptible to health inequities. There are no large population level studies that have assessed vaccine uptake among people with diabetes in Canada or elsewhere.

RESEARCH APPROACH

We conducted a retrospective, population-based cohort study of adults living in Alberta, Canada. We linked several large clinical, and administrative population level databases, within Alberta to assess the rates of COVID-19 vaccination among people with and without diabetes. Then, we assessed the characteristics of people with and without diabetes, who received COVID-19 vaccination. Importantly, we assessed a number of important clinical and sociodemographic factors. Our team includes a pan-national multidisciplinary expert team of diabetes care experts, infectious disease specialists, vaccine hesitancy experts, and epidemiologists.

KEY RESEARCH FINDINGS

We identified over 3.7 million adults (~ 50% female, average age of 47 years old), with ~10% living with diabetes. We established COVID-19 vaccination uptake in people with and without diabetes, including the proportions of people who were fully vaccinated, partially vaccinated, and unvaccinated. We assessed vaccination uptake between December 14, 2020, and March 31, 2022. We also established factors associated with lower and higher uptake among people with and without diabetes.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

In a large Canadian population cohort, we established COVID-19 vaccination uptake among adults with and without diabetes. We also established important characteristics of people who have lower or higher COVID-19 vaccination uptake in those with and without diabetes. Further work is needed to better understand the system and individual based facilitators of, and barriers to vaccine uptake. Understanding these factors may support ensuring equitable access, inform future public health vaccine-based interventions, as well as strategies to maintain and sustain vaccine uptake. This research is important for public health because it advances health knowledge by providing real-world evidence on vaccination in people with diabetes. We have established rates of COVID-19 vaccination among people with diabetes, a group that is highly vulnerable to health inequities and the effects of COVID-19 infection. This study is important for the public, people with diabetes, their families, clinicians, researchers, advocacy groups, and policy makers. Our research team is working to disseminate our study findings.

KEY MESSAGES

- Public health measures, especially vaccination, are important for COVID-19 risk reduction. Population level vaccine uptake in people with diabetes is understudied. We assessed COVID-19 vaccine uptake among adults with and without diabetes, and the factors associated with vaccination.
- In a large Canadian population cohort, we established COVID-19 vaccination uptake among adults with and without diabetes. We also established important characteristics of people who have lower or higher COVID-19 vaccination uptake in those with and without diabetes.
- Further work is needed to better understand the system and individual based facilitators of, and barriers to vaccine uptake. Understanding these factors may support ensuring equitable access, inform future public health vaccine-based interventions, as well as strategies to maintain and sustain vaccine uptake.

PROJECT DETAILS

Title: Advancing public health surveillance in Ontario – Improving flexibility and performance of the Acute Care Enhanced Surveillance (ACES) System
Nominated Principal Investigator : Megan Ann Carter
Affiliation : Queen's University, KFL&A Public Health
Team Members: Amber Simpson (Queen's University), Megan Bailey (St Lawrence College), Nancy Slipp (KFL&A Public Health, Queen's University)
Keywords: syndromic surveillance, public health, outbreak detection, disease surveillance, machine learning
Contact: Nancy Slipp, nancy.slipp@kflaph.ca

RESEARCH PRIORITIES

The project's primary research focus is to enhance the Acute Care Enhanced Surveillance (ACES) system to more effectively detect and monitor emerging public health threats. By upgrading to advanced machine learning techniques and incorporating multiple statistical models, the system can better process raw emergency department data and stay ahead of potential public health challenges. Our research priorities are as follows:

- Enhancing ML and NLP Capabilities: Developing advanced techniques to improve accuracy in syndrome classification and threat detection.
- Hybrid Detection Approaches: Combining rule-based and ML methods to address the limitations of each approach.

The project aligns with the CPHO 2021 Report priorities by improving Data and Infrastructure, Health Equity, and Preparedness and Response. It aims to enhance public health data processing, address health disparities, and boost readiness for emerging threats. The COVID-19 pandemic highlighted potential weaknesses in current processes and highlighted the need for more robust and adaptable surveillance tools. The scope and severity of public health threats have increased, affecting public health professionals, healthcare providers, and vulnerable populations who rely on accurate data for timely interventions. This research aims to address these issues by improving and modernizing an existing surveillance system.

RESEARCH APPROACH

We have enhanced the ACES system by developing automated data orchestration tools for efficient extraction, loading, and transformation of high-volume emergency department data. KFL&A now utilizes a dedicated NLP testbed and a modern data lakehouse for improved data aggregation and harmonization. In machine learning, we've explored various approaches:

- Vector Categorization: We use FastText with Floret embeddings to convert chief complaints into numerical vectors, enabling effective comparison and classification of incoming data based on similarity to labeled examples from the MIMIC ED dataset. This method improves handling of rare and misspelled terms but faces some challenges due to semantic differences in real-time data from Ontario EDs.
- Rule-based and ML Classifiers: We developed classifiers combining rule-based methods and convolutional neural networks to identify ED visits related to opioid toxidrome.
- Anomaly Detection: Using matrix profile analysis, we identify anomalies in time series data by measuring distances between subsequences. Anomalies are detected based on statistical thresholds and positive trend analysis, with results visualized in HTML reports and PowerBI. This method efficiently highlights aberrant events for further investigation.

KEY RESEARCH FINDINGS

A pilot dashboard was built to test data visualization of the data for future sharing with ACES epidemiologists. The dashboard aimed to both provide data for prospective use, to identify potential opioid overdoses events in near real-time, and to compare the new techniques against traditional ACES techniques as well as gold standard NACRS data to develop user trust in the new methodology. The primary prospective component displayed the normalized visit counts for each identified symptom, grouped into categories (e.g., cardiovascular and non-specific neuropsychological signs/symptoms) in heat maps. The heat maps are then overlaid with anomaly windows (between 3-30 days). The intent was that periods with overlapping increase in normalized visit counts/anomalies across multiple symptoms could indicate a potential event. The retrospective component compared daily counts for chosen groupings of the new opioid overdose symptoms, with ACES counts for related syndromes and the various APHEO (Association of Public Health Epidemiologists in Ontario) definitions for opioid-related ED visits. Word clouds of common terms associated with individual symptoms were also provided to provide context into the terms.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

The symptom-based approach piloted with opioid overdoses has directly informed ACES data products over the past 18 months. The idea of using a range of less-specific symptoms to provide real-time insight into emerging public health concerns has proven to have widespread value. Starting with the unprecedented wildfire smoke in Ontario during the summer of 2023, the ACES team developed wildfire smoke and heat related-illness custom syndromes and built these into a daily report generated for each public health unit.

Subsequently, this process has been adapted for measles, RSV, and alcohol (to monitor impacts of the LCBO strike). Like the overdose symptom techniques, these use rule-based methods using a combination of specific terms, pre-existing ACES syndromes and sometimes additional fields (e.g., age). Often, multiple definitions with different levels of specificity are used. These reports have improved the situational awareness of local public health units, Public Health Ontario and the Ministry of Health. It has proven to provide such critical value that it is being incorporated into a redesign of the ACES user interface. Furthermore, the new interface is being designed with flexibility as base principle to allow for future custom syndrome development either through rule-based methods or other machine learning techniques.

KEY MESSAGES

- Purpose built machine learning infrastructure enables rapid exploration of new ideas and decreases the time to live response during emerging public health events/emergencies. Hybrid modeling and label propagation with vector similarity search are promising techniques for bolstering surveillance activities when ground truth data for supervised learning is scarce.
- A pilot dashboard exploring data visualization techniques to share opioid overdose-related symptoms was built. It used normalized ED visit count heat maps overlapped with anomaly windows to provide insight into periods where there may be overdose events. To lend credence to the new techniques, retrospective data compared to traditional ACES methods and gold standard NACRS data was also provided.
- The concept of using multiple definitions of varying specificity of associated symptoms within ACES data, informed by this project, has been applied to multiple emerging public health issues including wildfire smoke, heat, and measles. Daily reports are generated and shared with local public health epidemiologists, as well as experts from Public Health Ontario and the Ministry of Health. They have and will continue to inform real-time situational awareness.

PROJECT DETAILS

Title: Lessons from Northern Ontario: Rural-proofing emergency management in Canada
Nominated Principal Investigator: Leith Deacon
Affiliation: University of Guelph
Team Members: Amanda Mongeon, Kate Mulligan, Hilary Gordon, Renee St Onge
Keywords: Emergency, Rural, COVID-19, Resilience, Municipal

RESEARCH PRIORITIES

What is the issue?
Rural-proofing emergency management, in line with the CPHO 2021 research priorities "Impactful and lasting public health policies and programs" and "Effective governance across jurisdictions and sectors" as well as the Centre for Research on Pandemic Preparedness and Health Emergencies' priorities of "Coordinated evidence base and capacity" and "Knowledge mobilization."

Why is it important?
Systemic inequities lead to rural health disparities, and in rural areas, overlapping emergencies strain resources and physical and mental health. The conditions that support health manifest at the local level, where people live their lives. Therefore, exploring ways to prevent and minimize the local impact of emergencies is an important part of promoting health.

This research aimed to explore the experiences of rural municipalities during the COVID-19 pandemic as an entry point to identifying opportunities to support them in reducing the impact of future disruption.

RESEARCH APPROACH

What research method(s) and approach(es) did you use?

- Case study design over two years, using a document review, 22 key informant interviews, and an in-person participatory workshop with 13 participants.

Who were the key people, communities and organizations involved? Why, and how?

- 7 municipalities with populations <10,000 in Northern Ontario, Canada provided insight into their experiences during COVID-10
- 6 Northern Ontario local public health agencies, Canadian Red Cross, an Indigenous Community Health Centre, and a municipal association shared their experiences supporting rural communities during the pandemic
- All participants were invited to take part in the participatory workshop to identify recommendations for action
- An advisory committee provided advice at each phase of the project

How was the concept of health equity integrated into the proposed research? How were biological/sociocultural factors taken into consideration?

- Equity was included in the conceptual framework that guiding the research
- Questions related to Indigenous well-being and work related to equity-seeking groups were included in interviews

KEY RESEARCH FINDINGS

What were your main findings?

1. Rural communities have unique governance realities, social and ecological conditions, and experiences with hazards, necessitating rural-specific approaches for effective emergency management.
2. Decisions and engagement in emergency management are often influenced by the knowledge and beliefs of individuals involved. These individual factors need to be considered in the context of high stress and rapid decision-making.
3. Even in rural Northern Ontario, information, ecological, and economic systems are influenced globally, and by national and provincial government decisions.
4. There is a gap between research literature, federal and global governance priorities in emergency management, and local implementation.
5. There is inconsistent understanding of the emergency management cycle and uneven participation across its phases, with a focus on preparedness and response over prevention, mitigation, and recovery.
6. There is a mismatch between the tools used in emergency management and the actual needs of the prolonged emergency response.
7. Findings validated existing evidence.

What were the findings in relation to health equity?

1. There are varied perspectives related to when and how to, and roles in addressing equity-related dimensions of emergencies
2. There are opportunities to enhance decolonization of emergency management work within treaty territories

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

What are the key implications of this research and for whom?

- Findings identify opportunities to shape future experiences of rural communities in a context of ongoing disruption. They are relevant to multiple levels of government, the public health sector, and communities.

How will the evidence impact public health policy, systems and/or practice?

- 4 recommendations are made for policy, systems and practice change: Clarify emergency management; Increase system capacity for emergency management; Foster understanding of rurality; Modernize approach to emergency management.

How does it contribute to improving population health outcomes and equity?

- Recommendations include embedding equity factors into emergency response and focusing on addressing health inequities as part of prevention phase of emergency management cycle.

What are the next steps to mobilize, implement, and/or scale the evidence generated?
Public report (early Sept), public policy brief (early Sept), submission to Ontario Emergency Management legislation review (late Aug), Webinar (fall 2024), 3 papers for publication (fall/winter 2024)

What are the research needs, gaps, or opportunities for the future?

- Explore alternatives to and adaptations of the Incident Management System and related tools
- Intervention research on prevention, risk mitigation, and communications in rural areas*
- Investigate rural service delivery models

KEY MESSAGES

- This study learned from rural experiences of COVID-19 to identify opportunities to minimize the impact of future disruption. It addressed the CPHO 2021 research priorities "Impactful and lasting public health policies and programs" and "Effective governance across jurisdictions and sectors" and the Centre for Research on Pandemic Preparedness and Health Emergencies' priorities of "Coordinated evidence base and capacity" and "Knowledge mobilization."
- Key findings are: rural communities are distinct and require place-based approaches; decisions and engagement in emergency management are often influenced by the knowledge and beliefs of individuals involved; local rural systems are part of larger governance systems; emergency management is inconsistently understood and implemented; there is a mismatch between the tools used in emergency management and the needs of prolonged emergency response. Also, findings revealed a gap between literature, federal and global governance priorities in emergency management, and local implementation.
- The findings suggest areas for action to which multiple levels of government and sectors can contribute. Four Recommendations with associated sub-recommendations are offered: Clarify emergency management; Increase system capacity for emergency management; Foster understanding of rurality; Modernize approach to emergency management.

OUTPUTS, PRODUCTS & IMPACT

Output 1: Public report. Public facing report summarizing findings and recommendations. Available in September 2024 at https://sustainablecommunityplanning.com/EnablingStructures

Output 2: Policy brief. Research summary and recommendations for policy-makers. Available in September 2024 at https://sustainablecommunityplanning.com/EnablingStructures

Output 3: Webinar. Webinar hosted by National Collaborating Centre for Environmental Health. To be available in Fall 2024 at https://ncceh.ca/resources/webinar-recordings?f%5B0%5D=webinar_series%3Ahbe_forum

PROJECT DETAILS

Title: Fostering workforce capacity to maximize opportunities for the digital transformation of public health in Canada
Nominated Principal Investigator: Mark Gilbert
Affiliation: University of British Columbia, BC Centre for Disease Control
Team Members: Brown, Adalsteinn D; Davies, Hugh W; Worthington, Catherine A; Ibanez-Carrasco, Francisco; Iyamu, Ihoghosa O; Kushniruk, André W; McKee, Geoffrey W
Contact: Ihoghosa (Muyi) Iyamu, ihoghosa.iyamu@bccdc.ca

RESEARCH PRIORITIES

- In her 2021 annual report, Canada's Chief Public Health Officer of Canada (CPHO) highlighted the need to prepare the Canadian public health workforce to maximize the potential benefits of digital technologies. Since the COVID-19 pandemic, shortcomings in the public health workforce's capacity to leverage digital technologies for public health while operationalizing fundamental public health principles of ethical propriety, social justice and health equity have been demonstrated.
- The CPHO's vision for transforming Canada's public health system relies on ensuring workforce expertise and human resource capacity (Building block 4) and leveraging medical and digital health technologies (Building block 3) for public health. Therefore, it was important to understand what digital competencies might be recommended in Canada and training models that can effectively address these competencies.
- Further, a specific focus on the public health workforce and digital competencies required to drive the CPHO's vision was needed considering current digital health strategies in Canada do not adequately address previously outlined fundamental public health principles. Rather, their focus is on the patient-provider interface and the systems required to support this interface. They also do not also recognize the increasing role of digital technologies as a determinant of health and its role in widening health disparities.

RESEARCH APPROACH

Partnering with academic leads at UBC, UVic and UofT, we implemented the first two steps of Thomas' 6-step approach for curriculum development through multi-phase research.

- Step 1 – problem identification and general needs assessment – First, we conducted a rapid literature review and consolidated competency recommendations specifically relevant for digital public health and training approaches proposed to address competencies. Second, we conducted an environmental scan of digital public health training programs available globally. These programs had to be delivered as degree awarding programs or could be courses offered as part of degree awarding programs. We cataloged common curricular content of the identified programs, their training methods and academic disciplines involved in designing and delivering program content.
- Step 2 – targeted needs assessment – We conducted focus groups with a diverse group of public health practitioners drawn from regional and provincial health authorities across Canada. We also conducted a focus group with practitioners from federal public health agencies serving historically marginalized communities. Participating practitioners had to have experience working with digital technologies in their current role. We reviewed identified digital competency recommendations from previous phases with practitioners and explored their practical experiences to inform adaptations to competency recommendations and training approaches.

KEY RESEARCH FINDINGS

- Despite apparently limited literature, digital competency recommendations cut across all competency categories of PHAC's core competencies for public health framework. New competencies recommendations explored ethically and efficiently using digital data streams and managing and governing digital infrastructure and systems required to leverage new digital data streams.
- Among 58 programs and courses identified globally, 5 were from Canada. Program offerings focus on three main areas – public health data science (50%), public health informatics (28%) and a mix of offerings exploring various digital competencies (22%). This mix addresses competencies relevant in designing, implementing and evaluating digital technologies applied across public health functions and understanding threats and opportunities of widespread adoption of digital technologies, especially the digital determinants of health.
- Practitioners acknowledge a mismatch between their digital competencies and public expectations of public health services especially since the pandemic. Practitioners suggest Canada needs to simultaneously bolster digital capabilities of its public health systems alongside workforce digital competency. Preferred approaches include integrating considerations for digital technologies within existing curricula, providing opportunities for basic digital literacy especially given the age diversity of the workforce, and tiering competencies with opportunities for specialized digital competencies (e.g., big data analytics), all within applied transdisciplinary training contexts.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

- Given PHAC's current update of the core competencies for public health in Canada, we must consider digital competencies across competency categories, alongside competencies for governance, administration and use of diverse digital data streams for public health. The framework should also consider how competencies can position practitioners to better understand and address digital determinants of health, tiering competencies based on practitioners' expected engagement with technologies.
- Schools of public health must re-examine their curricula and integrate considerations for digital technologies across existing programs and courses. While specialized digital public health programs and programs are needed for more advanced digital competency roles, an overview of digital technologies from a public health lens is needed in formal graduate and undergraduate programs and through continuing education.
- To offer updated curricular offerings that address needed digital competencies, new transdisciplinary partnerships with computer sciences, information sciences, media studies and other relevant disciplines is required. It is not clear how these partnerships can be implemented to facilitate cohesive delivery of updated curricular and continuing education programs.
- Given already packed public health curricula, it is also important to explore how these new competencies may be integrated without overburdening trainees, especially those not in specialized roles requiring digital technologies

KEY MESSAGES

- We explored digital competencies required to bolster the public health workforce's capacity to effectively leverage digital technologies for the transformation of public health systems in Canada in line with the CPHO's vision. We also explored training approaches required to address identified digital competencies.

- Recommendations for digital competencies cut across existing PHAC core competencies for public health categories and include new categories related to the ethical use, governance and administration of digital data streams. While curricula offerings in Canada do not address identified competencies effectively, many programs are emerging globally. However, practitioners need an integrated approach that considers digital technologies from a public health lens across existing curricula while providing additional opportunities for basic digital literacy and specialized digital competencies within the workforce. They also suggest digital competencies must be accompanied by updates to the digital capabilities of the public health systems.

- Given work to update Canada's core competency framework, it is important to consider integrating digital competencies while encouraging schools of public health to review their curricula and identify opportunities to integrate considerations for digital technologies into existing programs. However, we must consider how transdisciplinary partnerships might inform curricular and training updates.

OUTPUTS, PRODUCTS & IMPACT

- Public Health Association of BC Presentation – the digital transformation of public health requires new competencies and training models - https://dishiresearch.ca/resource/the-digital-transformation-of-public-health-requires-new-competencies-training-models-and-multidisciplinary-partnerships/
- Digital competencies and training approaches to enhance the capacity of practitioners to support the digital transformation of public health - https://publichealth.jmir.org/2024/1/e52798
  https://dishiresearch.ca/resource/digital-public-health-seminar-series/
- This project has informed a proposal to the UBC strategic investment fund to develop proposed curriculum changes for DPH at the School of Population and Public Health at UBC and other similar planned proposals at UVic.

PROJECT DETAILS

Title: Preparation for Transforming Oral Health Prevention throughout Canada
Nominated Principal Investigator: Juliet Guichon
Affiliation: University of Calgary
Team Members: Aaron Clift
Keywords : oral health; community water fluoridation
Contact: Juliet Guichon, guichon@ucalgary.ca

RESEARCH PRIORITIES

Dental decay is the most common chronic disease of childhood and affects almost 96% of adults in Canada. In addition to the pain, suffering and misery that dental decay causes, it also takes time from productive endeavours. In 2007, 2.26 million school days and 4.15 million workdays were reportedly lost every year to dental visits and dental sick days. In 2023, the Canadian Government allocated $13 billion over five years to pay for dental treatment for certain Canadians. This allocation of public funds recognizes the seriousness of the need for dental treatment.

This project analyses how more Canadians might enjoy the benefits of a public health measure that has over 75 years of evidence that it is effective, safe, cost-effective and equitable. Community water fluoridation reduces the incidence of dental decay by approximately 25%. New technology makes this public health measure available in a cost effective and practical way to communities of as few as 50 residents. Yet, according to the Office of the Chief Dental Health Officer and the Public Health Agency of Canada in 2022 only 14.4 million Canadians (38.8%) benefit from community water fluoridation. Promoting community water fluoridation can prevent suffering, particularly for low-income and historically marginalized communities who have traditionally had less access to dental care.

RESEARCH APPROACH

This research project sought to understand how municipalities gain, lose and/or regain community water fluoridation. Two historical studies use qualitative methods and institutional theory to describe how major Canadian cities lost fluoridation (Kingston 1966, Quebec City 2008, Calgary 2011, Windsor 2013) and then how three Canadian cities recently gained fluoridation (Windsor 2018, Regina 2021 and Calgary 2021). Information sources include news media articles, public social media communications and fluoridation-related correspondence to elected officials from residents and others. Variables of interest include officials' understanding and knowledge about fluoridation, and the prime sources of their information about efficacy, safety, and electorate's support for the health measure. The focus is on by whom, how, when, and why fluoridation was ceased or (re)implemented.

Much helpful information has also come from interviews with key stakeholders (e.g., current and retired public health officers, current and former elected officials). Purposive sampling targeted people who played a significant role in either advocating to decision-makers or deciding. Semi-structured qualitative interviews were conducted in person or by using a secure, virtual platform, e.g., Zoom, with informed consent. All interviews used open-ended questions to explore the topic further. Recruitment will continue until theme saturation occurs. All interviews will be audio-recorded and transcribed verbatim. A thematic framework analysis (Sandelowski, 2000) was undertaken for each research focus (removal, implementation, and reimplementation of fluoride).

KEY RESEARCH FINDINGS

The historical studies have found the following factors are conducive to the adoption of fluoridation in Canadian municipalities:

- availability of local data on dental caries
- endorsement by local public health authorities, and their participation in pro-fluoridation campaigns
- participation of local medical and dental communities in campaigns, communicating scientific consensus
- availability of campaign material that is comprehensible to non-experts
- personal relationships between fluoridation advocates and elected officials
- advocacy for fluoridation by local leaders – e.g. mayors, city councilors, community leaders
- opinion polling which demonstrates majority public support for fluoridation
- data on the financial savings associated with community water fluoridation
- favourable coverage in mainstream media
- favourable attention on social media
- historical experience with fluoridation: public opinion polls show that people who grew up in jurisdictions with fluoridation favour it at higher rates than those who grew up in communities without
- demographic composition of the population: university graduates are more supportive of community water fluoridation than those without. There is some evidence of associations with income (higher incomes more favourable) and age (younger people more favourable), but those findings are less consistent
- character of the opposition: opponents of fluoridation are more effective when their spokespeople include individuals with scientific or medical backgrounds
- early detection of anti-fluoridation activities and commencement of transmission of reliable information by credible sources

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

This publication of this research and other information will be posted on the research team's website tin English and French, The Canadian Fluoridation Society La société canadienne pour la fluoration". The Network would aim to work, over a period of years, to engage people in the 12 cities (and other municipalities) to enhance or to commence their own local initiatives to improve oral health in their communities with water fluoridation. The Network would offer support, knowledge, advice and encouragement.

The research team is comprised of academics from British Columbia to Nova Scotia who are trained in law, ethics, history, dentistry, epidemiology, psychology, pediatrics, family medicine, critical care medicine and water engineering. The team is advised by a dental hygienist who leads care of First Nations members in the Calgary area, the former Chief Water Engineer of Calgary, general dentists in Calgary and Vancouver and three people knowledgeable in politics and communication. Many members of the research team have worked to bring fluoridation to either Calgary or Regina, and can address the medical and scientific dimensions of the question, as well as their experience of public policy campaigning for fluoridation.

KEY MESSAGES

- Dental decay causes pain, suffering and misery, as well as negatively impacting the national economy. Community water fluoridation reduces the incidence of dental decay by approximately 25%. However, only 38.7% of the Canadian population enjoy access to fluoridation.

- Promoting community water fluoridation can prevent a significant amount of suffering, particularly for low-income and historically marginalized communities who have traditionally had less access to dental care.
- Two historical studies used qualitative methods and institutional theory to describe how major Canadian cities lost and/or regained fluoridation. These studies are based on review of scholarly and non-scholarly written documentation as well as oral history interviews with key stakeholders. This research has identified a number of factors that facilitate the adoption of community water fluoridation in Canadian municipalities.
- The publication of this research and other information will be posted on the research team's website in English and French, "The Canadian Fluoridation Society/Société canadienne de fluoruration. The not-for-profit, federally incorporated Society engages in knowledge translation. It will work, over a period of years, to engage people in the 12 cities (and other municipalities) to enhance or to commence their own local initiatives to improve oral health in their communities with water fluoridation. The Society would offer support, knowledge, advice and encouragement.

OUTPUTS, PRODUCTS & IMPACT

- Aaron Clift, "Health Professionals and the Politicization of Medical Issues: The Case Study of Community Water Fluoridation in Canada", Medicine & Society, CMAJ (under review)
- Aaron Clift, “The Politics of Preventative Oral Healthcare”, presented at the 32nd History of Medicine Days Conference, 17-18 March 2023, University of Calgary, Alberta, Canada. (Second Prize, Best Overall Presentation).
- Canadian Fluoridation Society/Société canadienne de fluoration, website: https://canadianfluoridationsociety.ca

PROJECT DETAILS

Title: Trends in Vaccine Hesitancy in Canada: results from the iCARE Study
Nominated Principal Investigator: Kim Lavoie
Affiliation: University of Quebec at Montreal (UQAM)
Team Members: Simon Bacon, Frederique Deslauriers, Camiller Leger, Vincent Gosselin-Boucher, Samir Gupta, Keven Joyal-Desmarais, Justin Presseau, Michael Vallis, Kim Corace et al.
Keywords: Vaccine hesitancy, Public health, Infection control
Contact: Alix Wong, alix.wong-min.cnmtl@ssss.gouv.qc.ca

RESEARCH PRIORITIES

Key to reducing infectious disease morbidity and mortality and reducing the need for invasive prevention measures (e.g., lockdowns) is widespread acceptance of vaccines. Despite widespread availability of COVID-19 vaccines across Canada, uptake has been sub-optimal. Key to optimizing vaccination rates is understanding patterns and correlates of hesitancy over time. This will allow us to improve vaccine policy planning, develop targeted interventions, and enhance tailoring of vaccine messaging to vulnerable groups. To this end, we examined rates of vaccine hesitancy and their correlates among Canadians by analyzing data from five cross-sectional age, sex and province-weighted population-based samples who completed online surveys between April 2020 and March 2021. In order to explore the factors associated with vaccine hesitancy over time, data across all surveys were examined as a function of key sociodemographics, clinical characteristics, and psychological factors known to be important for vaccine behaviour.

RESEARCH APPROACH

This study analyzed data from the International COVID-19 Awareness and Responses Evaluation (iCARE) Study (www.icarestudy.com), which is an ongoing, international, multi-wave, cross-sectional observational survey study of public awareness, attitudes, and responses to COVID-19 public health policies and their impacts. For this study, we report data from five sequential cross-sectional age, sex and province-weighted population-based samples (n=15,0919) of Canadian adults who completed online surveys (via Leger Opinion). Data were collected between April 2020 (Survey 1), and March 2021 (Survey 5).

Vaccine hesitancy was assessed with the question: “If a vaccine for COVID-19 were available today, what is the likelihood that you would get vaccinated?” Response options were dichotomized into ‘very unlikely, unlikely, somewhat likely’ (hesitancy) vs. ‘very likely’ (no hesitancy). Rates of vaccine hesitancy across the five surveys were reported, and data across all surveys were examined as a function of key sociodemographics, clinical characteristics, and psychological factors known to be important for vaccine behaviour in order to explore the factors associated with vaccine hesitancy over time.

KEY RESEARCH FINDINGS

- A total of 42.2% of respondents reported some degree of vaccine hesitancy, which was lowest during surveys 1 (April 2020) and 5 (March 2021) and highest during survey 3 (November 2020).
- Fully adjusted multivariate logistic regression analyses revealed that women, those aged 50 and younger, non-Whites, those with high school education or less, and those with annual household incomes below the poverty line in Canada were significantly more likely to report vaccine hesitancy, as were essential and healthcare workers, parents of children under the age of 18, and those who do not get regular flu vaccines.

- Endorsing prevention behaviours as important for reducing virus transmission and having high COVID-19 health concerns were associated with 77% and 54% reduction in vaccine hesitancy, respectively. However, having high personal financial concerns was associated with 1.33 times increased odds of vaccine hesitancy.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Results highlight the importance of targeting vaccine efforts to specific groups, particularly those may have lower risk perceptions (younger people), greater concerns about vaccine side effects (women, healthcare workers), and marginalized groups (lower SES, visible minorities) who may have less trust in vaccines and health authorities. Strategies including local education (paying attention to health literacy) and community/mobile vaccine clinics may help address awareness, confidence, and access gaps.

Vaccine campaigns should emphasize both the collective and individual benefits of vaccination (rather than focus on the risks of not getting vaccinated), including the financial benefits of a fully vaccinated society, and should use strategies that incentivise (rather than coerce) people to get vaccinated.

Future research should monitor changes in vaccine intentions and behaviour over time, as pandemic trends shift, to better understand underlying social and behavioural determinants.

KEY MESSAGES

- Addressing vaccine hesitancy represents a major challenge for infectious disease prevention, and may have been exacerbated by the pandemic.
- Despite the 'promise' of vaccines, rates of vaccine hesitancy were high (40%) between April 2020 and March 2021 - lowest during pandemic waves 1 and 3 and highest during wave 2. Perceived importance and health concerns were associated lower hesitancy, high financial concerns were associated with higher hesitancy.
- Results highlight the importance of targeting vaccine efforts to specific groups (younger people, women, healthcare workers, marginalized groups), and should emphasize the importance and health and financial benefits (both individual and collective) of getting vaccinated.

OUTPUTS, PRODUCTS & IMPACT

- Lavoie, KL, Gosselin Boucher, V, Stojanovic, J., Gupta, S. Gagné, M., Joyal-Desmarais, K., et al. (2022). Understanding national trends in COVID-19 vaccine hesitancy in Canada – Results from five sequential cross-sectional representative surveys spanning April 2020 to March 2021. BMJ Open. https://bmjopen.bmj.com/content/bmjopen/12/4/e059411.full.pdf
- Stojanovic, J., Boucher, V. G., Gagné, M., Gupta, S., Joyal-Desmarais, K., Paduano, S., Aburub, A., Sheinfeld Gorin, S. N., Kassianos, A. P., Ribeiro, P. A. B., Bacon, S. L., & Lavoie, K. L. (2021) Global Trends and Correlates of COVID-19 Vaccination Hesitancy: Findings from the iCARE Study. Vaccines, 2021, 661, 1-13. https://www.mdpi.com/2076-393X/9/6/661
- Vallis M, Bacon S, Corace K, Joyal-Desmarais K, Sheinfeld Gorin S, Paduano S, Presseau J, Rash J, Mengistu Yohannes A, Lavoie KL. (2021) Ending the Pandemic: How Behavioural Science Can Help Optimize Global COVID-19 Vaccine Uptake. Vaccines (Basel). 2021 Dec 22;10(1):7. doi: 10.3390/vaccines10010007. PMID: 35062668; PMCID: PMC8777721. https://pubmed.ncbi.nlm.nih.gov/35062668/
- Cafe Scientifque (event): https://icare.mbmc-cmcm.ca/events-media-coverage/cafe-scientifique/
- Sample infographic: https://icare.mbmc-cmcm.ca/wp-content/uploads/2022/05/VaccineMotivators_updateSept3_EN.jpg

PROJECT DETAILS

Title: Communication Competencies for Public Health
Nominated Principal Investigator: Jennifer McWhirter
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Team Members: Melissa MacKay, Devon McAlpine, Lauren Grant, Andrew Papadopoulos, Iknoor Sidhu
Keywords: communication, public health, competencies, training, education
Contact: Jennifer McWhirter, j.mcwhirter@uoguelph.ca

RESEARCH PRIORITIES

Communication cross-cuts everything we do in public health. It is vital we attend to its practice carefully to ensure a healthier, safer, more equitable post-pandemic future, enhance trust, and address health mis- and dis-information. This requires an investment in the training and education of the current and future public health workforce in communication. To help guide both education and practice, current opportunities need to be characterized and gaps noted, and a competency framework must be developed to inform future opportunities that will, in turn, strengthen workforce capacity and enhance effective public health communication.

RESEARCH APPROACH

Methods and approaches used: environmental scans and content analyses of education and training opportunities related to communication; scoping reviews of the literature; survey of the Canadian public health workforce; draft competency development by the research team; and a consensus-building process (key informant interviews, two surveys, and virtual consensus meeting with public health communication experts from practice and research). Health equity was given careful attention when developing the competency statements.

KEY RESEARCH FINDINGS

Demand for communication training and education is high among the Canadian public health workforce; however, current training and education opportunities do not align with this demand.
Draft communication competency statements received high agreement when rated by the public health workforce and public health communication experts.
The consensus-process resulted in 18 competency statements.
No differences based on gender were observed in our research findings.
A workforce with robust communication competence will be able to more effectively support and contribute to health equity.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Our research provides new, evidence-based modern communication competencies for public health to help transform public health practice. If we are to transform public health in Canada, increase trust in public health, promote health equity, and successfully address mis- and dis-information, we must understand and ensure our public health workforce's robust competence in communication. The Communication Competency Framework for Public Health, and the evidence generated for its development will be useful for: design and mapping of curricula for education and training; assessing capacity, capability, and training requirements among the workforce; ensuring appropriate communication skills within teams at public health organizations; advocating for sustainable investment to support public health workforce development; and informing the revision of the PHAC Core Competencies. The capacity of the workforce will be strengthened in their ability to effectively

communicate in a strategic, evidence-based, equitable, and audience-centred way. Our next step is to publicly launch the Communication Competency Framework for Public Health via a webinar and make it available download by the public health community.

KEY MESSAGES

- Demand for communication training and education is high among the Canadian public health workforce; however, current training and education opportunities do not align with this demand
- Extensive research culminating in a consensus-building process resulted in 18 communication competency statements
- The Communication Competency Framework for Public Health can help guide training, education, and practice to positively contribute to the Canadian public health workforce's robust competence in communication

OUTPUTS, PRODUCTS & IMPACT

Primary Output: Communication Competency Framework for Public Health in Canada (forthcoming)

https://healthbydesignlab.com/projects/public-health-communication-competencies/

The background research conducted to inform and develop the Competency Framework resulted in nine peer-reviewed publications (five published, two under review, and two forthcoming). Example publications include:

- McAlpine D, MacKay M, Grant LE, Papadopoulos A, McWhirter JE. (2023) Modernizing Public Health Communication Competencies in Canada: A Survey of the Canadian Public Health Workforce. Canadian Journal of Public Health
- MacKay M, Ford C, Grant LE, Papadopoulos A, McWhirter JE. (2024) Developing Public Health Competency Statements and Frameworks: A Scoping Review and Thematic Analysis of Approaches. BMC Public Health.

Other forthcoming outputs include a webinar to launch the competencies, and knowledge synthesis documents summarizing the evidence generated.

PROJECT DETAILS

Title: Addressing Youth Mental Health Literacy: Evidence-Based Consensus Statements for the Youth MindTrack and Beyond
Nominated Principal Investigator: Jeanna Parsons Leigh
Affiliation: Dalhousie University
Team Members: Stephana J Moss, Sonia Siddiqui, Cristina Zuniga Chacon, Cynthia Sriskandarajah, Maia Stelfox, Ben Gaunce, Micaela Harley, Stacie Smith, Sofia B Ahmed, Kathryn A Birnie, Donna Halperin, Scott Halperin, Christine Hampson, Jia Hu, Laura Leppan, Angie Nickel, Kristine Russell, Andrea Soo, May Solis, Henry T Stelfox, Sharon Straus, Perri R Tutelman, Kirsten M Fiest, Nicole Racine.
Keywords: Youth; Digital Tool; Mental Health Literacy; Delphi Consensus Process; Focus Groups
Contact: Jennifer Parsons Leigh, J.ParsonsLeigh@dal.ca

RESEARCH PRIORITIES

Substantial evidence has reported that adult-type mental health disorders frequently emerge in youth-hood and typically demonstrate a course characterized by chronicity and numerous periods of relapse. It is also well established that this course can be modified through early intervention as youth often reveal a need for mental health care prior to reaching the threshold for a traditional psychiatric diagnosis. Recent years have witnessed transformative advances in the sophistication and accessibility of information communication technologies that have set the stage for the delivery of high-quality mental health care to youth through telemedicine (i.e., practitioner-driven distribution of medical services via electronic information and telecommunication technologies). However, youth must first obtain adequate knowledge of how and when mental health disorders develop to appraise their need for help and to engage in help-seeking behaviours. As one step toward addressing the mental health crisis in Canada, we aimed to co-design a digital tool targeted to improve mental health literacy among youth aged 11-18 years. We also aimed to produce evidence-based consensus statements to aid the conceptualization, development, and evaluation of future digital tools by other research groups to support youth mental health literacy.

RESEARCH APPROACH

We conducted an interconnected, three-phase process following established guidelines for co-design studies, wherein we partnered with youth and parents at the conception of this project to facilitate active engagement throughout all phases of work. In Phase I we developed our strategic priorities by convening a diverse scientific team including youth research partners and adhering to guidelines for deliberative dialogue and priority setting activities. In Phase II we determined evidence-based consensus statements to aid the conceptualization, development, and evaluation of ours and future digital tools to support and enhance youth mental health literacy by conducting a modified Delphi consensus process with youth, researchers, and decision makers, according to expert recommendations for using the Delphi method in mental health research. In Phase III we led serial focus groups to co-design a youth digital mental health literacy tool with youth, researchers, and decision makers. To further infuse youth voices throughout Phase III, we partnered with the Young Canadian Roundtable on Health (a national youth engagement to connect youth with policymakers to address gaps in youth health) and The Sandbox Project (helping organizations come together, share resources, and leverage partnerships to address specific health challenges faced by youth in Canada); partnership meetings were held after the production of each iterative tool prototype.

KEY RESEARCH FINDINGS

The scientific team in Phase I identified three strategic priorities that included to: 1) improve youth mental health literacy through education on mental health signs and symptoms; 2) enhance cultural humility by engaging youth from diverse backgrounds as partners to directly inform tool development; and to 3) promote support accessibility by empowering youth to be informed stewards of their own mental health. From Phase II we created 21 evidence-based consensus statements on conceptualizing, developing, and evaluating digital tools to support youth mental health literacy that included: four statements on understanding mental health, six on exercising mental health, three on evaluating mental health, and seven on engaging one's mental health. From Phase III, we co-designed our digital tool to support youth mental health literacy—The Youth MindTrack. The resulting design of the Youth MindTrack included four main sections: 1) Understanding My Mental Health; Building My Mental Strength; Seeking Support; and Tracking My Mental Progress. Navigation within the tool consisted of a top bar, as well as a side bar menu, and a simple "home" button to allow users to return to the home page at any point throughout the tool.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

The Youth MindTrack is novel in that it was designed to be applicable to youth who have been diagnosed with a clinical mental health disorder as well as youth who may be experiencing subclinical symptoms of a mental health disorder. We accomplished this in three main ways. First, we included a sub-section specific to how and why we feel emotions, including evidence-based strategies for emotion regulation, which is an essential, yet conventionally underemphasized, feature of mental health. Earlier work has highlighted the role of emotion regulation in both clinical and subclinical symptoms of mental disorders in youth. Second, the section on seeking support that included information on the benefits of, and how to seek support, was developed for youth to consider at any point within their mental health journey. The Nationwide Resources page in this section also incorporated a comprehensive list of helplines and community-based services, as well as specialized or referral-based clinical services, among other wellness supports. Third, we created two interactive trackers for youth to track their habits and mood to monitor personal progress, identify potential triggers, and increase self-awareness. These trackers were developed with the intention for youth to proactively manage mental health symptoms and to serve as a data-driven resource for youth to access and reference when prompting a conversation on their mental health. Ultimately, the potential use of the Youth MindTrack among all youth is arguably a major advance over disorder-specific digital mental health literacy tools, as it obviates the need to develop discrete mental health literacy tools for each clinical condition that impacts mental health.

KEY MESSAGES

- Using extensive key informant engagement and a user-centered co-design process we successfully developed the Youth MindTrack: a digital tool to support youth in strengthening their mental health literacy by recognizing, managing, and preventing mental health disorders.
- Our rigorous methodological approaches driven by established and relevant guidelines and frameworks provide robust evidence that an iterative and participatory research-based process with youth can help adapt health technology to their unique mental health needs.
- The results reported from the present work lend credence to co-designed and comprehensive digital mental health literacy tools as potentially scalable interventions that may translate to real-world mental health benefits in bolstering youth mental health functioning.

OUTPUTS, PRODUCTS & IMPACT

Output 1: The Youth MindTrack; A co-designed and user-centered digital tool to support youth mental health literacy; [in user-testing].

Output 2: Evidence-based Consensus Statements; 21 statements to facilitate the conceptualization, development, and evaluation of future digital tools to support youth mental health literacy by other research groups; [in peer-review].

Output 3: National Youth Partnerships; Partnering with Children's Healthcare Canada, Young Canadian's Roundtable on Health, and The Sandbox Project to facilitate future research inquiries to improve child and youth health in Canada.

Image 1: Strategic Priorities

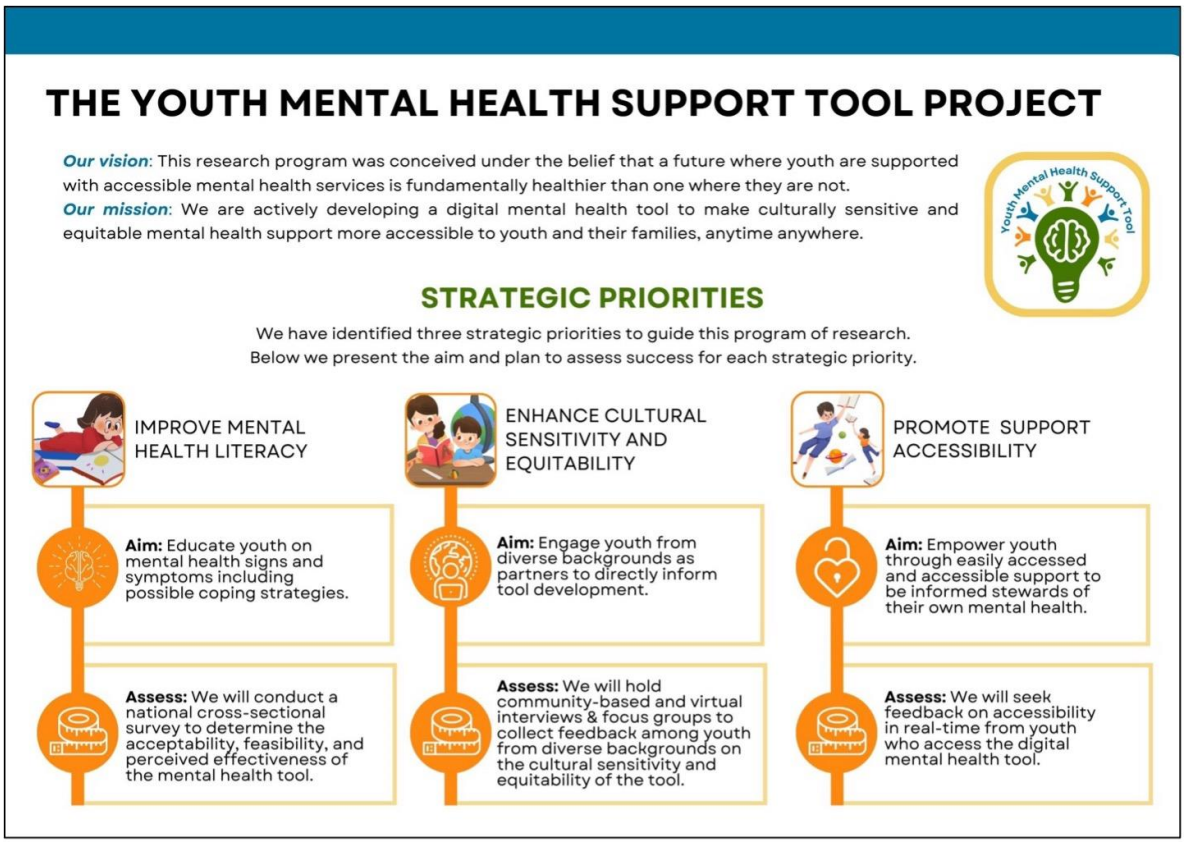
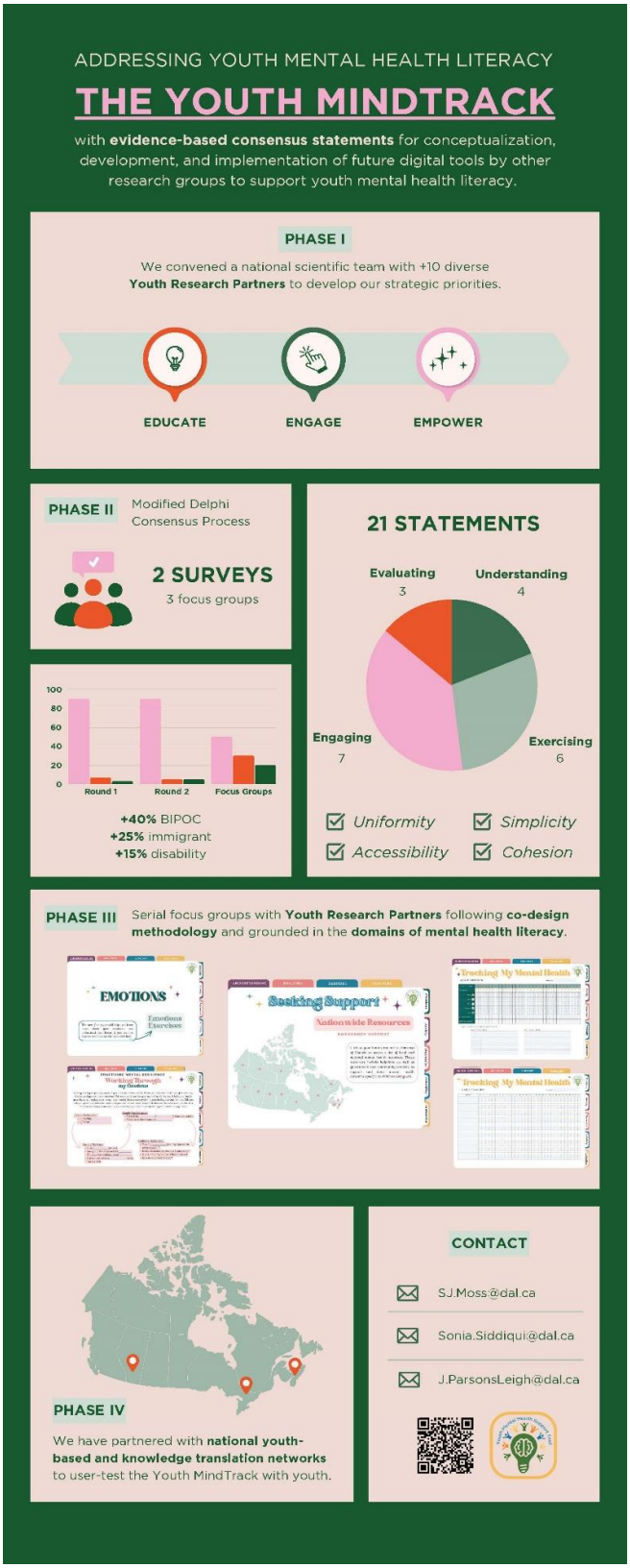


Image 2: Study Infographic



PROJECT DETAILS

Title: Application of the population-scale global positioning system data to communicable disease surveillance: Bayesian disease mapping of COVID-19 risks integrating the spatial interaction matrix.
Nominated Principal Investigator: Sahar Saeed
Affiliation: Queen's University
Team Members: Chi Zhang, Hiroshi Mamiya
Keywords: Disease Mapping, Origin-destination data, Global positioning system, COVID-19, Public health geographic surveillance

RESEARCH PRIORITIES

Small area estimation of communicable disease risk is a critical public health task to identify high-risk diseases for timely intervention and locally tailored preventive programs. Geographic surveillance typically requires information coding "nearness" of each administrative area (e.g., census tracts) to account for the dependency of case counts rooted in the diffusion of diseases. In traditional disease mapping, such information has not been available, and thus, the nearness (contiguity) information was derived from distance-based geospatial measurements, ignoring the movement of residents.

Modern data, including privacy-protected population-scale origin-destination mobility data collected by Global Positioning Systems, allow capturing spatial interactions across areas due to mobilities. Thus, such data enables realistic (more accurate) modelling of disease risk estimation, which has not been done to date. The advancement of disease mapping will lead to a better understanding of the local heterogeneity of communicable disease risks. The objective of this study is to develop and evaluate the analytical procedures and software codes that incorporate the geospatial mobility data using Montreal and a case study, which will be scalable to all Canadian cities. These data are aggregated (area-level) data, and thus, the risk for the bleach of privacy (the re-identification) has been removed, as it is not possible to identify any individual-level information.

RESEARCH APPROACH

Study Design: Ecological, cross-sectional study using Montreal borough (n=24 areas) as the unit of analysis, using the reported cases of COVID-19 in October 2022.

Collaborators: McGill Clinical and Health Informatics (Prof Hiroshi Mamiya and Chi Zhang) as an expert in analyzing large spatially dependent data.

Equity: Intensity of mobility was visualized in relation to the area-level census-derived social determinants of health, namely the proportion of low-income cutoff residents, visible minorities, and those with low educational attainment. Given the areal (spatial) nature of data in our study, intersectional analysis was not performed.

KEY RESEARCH FINDINGS

- We have developed an analytical pipeline to process geospatial mobility data at the level of census tracts and dissemination areas in Canada using temporally varying origin-destination matrix format using a geospatial database and Python programming language. The codes are available publicly from our repository.

- Using these data and publicly available datasets from the city of Montreal, we developed Bayesian disease mapping models incorporating mobility data as a spatial structure to model the disease risk functions for Montreal boroughs. The codes are available for public use.
- We evaluate the predictive validity of the mapping model with and without the spatial interaction matrix encoding the mobilities of residents. However, the publicly available COVID data, at the level of Montreal borough, are too easy to predict disease risk due to the high disease counts to appreciate the improvement of disease risk prediction using the mobility data. Thus, we are currently applying the developed software codes and models to small-area disease counts in the city of Toronto.
- Additionally, our models identified that areas with a high proportion of low-income individuals and visible minorities have a disproportionately higher frequency of mobilities within and across boroughs, suggesting their vulnerability to exposure to communicable diseases.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Next steps: Apply our analytical pipeline and disease risk estimation model to other census metropolitan areas in Canada, starting with the city of Toronto data, which has smaller geographic regressions and is thus more useful for creating timely predictions of disease risks as a function of population mobility. Their small disease counts (small area – small disease count) also allow realistic testing of the model where case counts are unstable at the early phase of epidemics, relative to our test data in Montreal.

Our analytical approach will allow better identification of geography regions at risk for communicable diseases, thereby advancing the surveillance methods by publication health agencies. Such surveillance programs will facilitate targeted and timely action to prevent or mitigate the local burden of diseases, in particular, areas with low socioeconomic status that

KEY MESSAGES

Research priorities studied:

- Develop and test methods for disease risk estimation of small geographic areas using mobility data capturing weekly travels among Canadians.

Key research findings:

- Mobilities are more frequent among areas with lower socio-economic status. We have developed publicly accessible codes and social statistical models applicable to the population mobility data in Canada.

Key implications for policy and practice:

- Advancement of geographic public health surveillance of communicable diseases.

OUTPUTS, PRODUCTS & IMPACT

The weblink for out public repository showing all software codes and images will be emailed in a week or two, once all the proprietary information (e.g., password to server access) have been removed from the codes and our internal documents.

PROJECT DETAILS

Title: Advancing Equity-Based Pandemic Preparedness Through Intersectional Analysis
Nominated Principal Investigator: Julia Smith
Affiliation: Simon Fraser University
Team Members: Muhammad Haaris Tiwana, Alice Murage, Dawn Hoogeveen, Ahalya Mahendra, Miga Chultem, Megan Kirby
Keywords: Equity, Policy, Covid-19, Priority populations, Intersectionality
Contact: Muhammad Haaris Tiwana, mhtiwana@sfu.ca

RESEARCH PRIORITIES

The COVID-19 pandemic, like previous pandemics, has disproportionately affected various populations despite efforts by government and public health officials to address health inequities. The federal government's pandemic response, described as feminist and informed by GBA+ assessments, reveals a disconnect between policy intentions and outcomes. This discrepancy is partly due to an insufficient focus on social inequities and historical contexts. The research aims to understand public health policy challenges and opportunities for mitigating health crisis disparities in Canada and develop tools for integrating intersectional analysis into pandemic preparedness. The research priorities addressed from the CPHO 2021 Report include: engaging communities in culturally safe and meaningful ways in public health solutions; measuring the indirect impacts of COVID-19 public health measures on health equity, mental health, and well-being; and identifying intervention frameworks that promote coordinated inter-sectoral action on public health challenges. Addressing these priorities is crucial as they highlight the need for inclusive public health strategies that consider diverse social determinants of health, ensuring that future health crises do not exacerbate existing inequities and that affected populations receive the support they need.

RESEARCH APPROACH

We conducted two scoping reviews: one on the direct and indirect effects of COVID-19 on priority populations in Canada, and another on assessments of Canada's pandemic response incorporating intersectional and equity-focused approaches. We performed a policy document analysis to understand whether, where, and how GBA+ and related equity considerations were included. This documentation was sourced through systematic searches of federal institutions' websites and targeted Google searches. When gaps or missing details were identified, we reached out directly to the appropriate authorities using our extensive networks. To gain a deeper understanding of the opportunities and barriers to policy implementation, we conducted key informant interviews with federal policy actors and civil society organizations. Key informants were purposively sampled, followed by snowball sampling. The research focused on intersectional inequities, specifically in the context of pandemic preparedness. Key organizations involved included representatives from Women and Gender Equality Canada and the Public Health Agency of Canada. These collaborators were engaged at all phases of the research project, providing key contacts for interviews and acting as knowledge users. Health equity was integrated into the research by examining multifaceted policy impacts correlating to sociocultural factors, ensuring a comprehensive analysis of the inequities faced by various populations.

KEY RESEARCH FINDINGS

Our analysis of COVID-19 pandemic policies reveals that while efforts were made to address equity, many policies exacerbated existing inequalities or created new ones, particularly affecting migrants, women, children, and those of lower socioeconomic status. Notable gaps were identified in addressing the needs of 2SLGBTQ+ individuals, older adults, those with disabilities,

and Indigenous Peoples, highlighting the uneven implementation of equity considerations like GBA+. Issues included inadequate focus on culturally sensitive and dialect-specific information for non-English speakers and reliance on Civil Society Organizations with limited funding to implement equity-focused policies. Despite some successes, such as centralized GBA+ leadership, the pandemic response also faced challenges related to urgent implementation and limited evidence integration. Our study underscored the importance of establishing robust, equity-based policy frameworks and preexisting relationships to enhance pandemic preparedness and response.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Our research underscores the need for equity-focused frameworks in public health policy and practice, revealing how pandemic policies can either deepen or mitigate existing health inequities. The key implication is that integrating approaches like GBA+ into pandemic preparedness and response is crucial for addressing the unique needs of vulnerable groups and ensuring equitable access to health resources. Evidence shows that improving policy design and implementation requires a nuanced understanding of intersectional factors affecting priority populations, which can enhance public health outcomes and equity. The next steps involve mobilizing this evidence to refine and implement adaptable, inclusive policy frameworks. Collaboration among government agencies, civil society organizations, and community stakeholders is essential for scaling these practices effectively. Future research should focus on identifying and addressing policy implementation gaps and evaluating the impact of equity-based approaches to inform ongoing and future public health strategies. This will help bridge existing research gaps and improve the effectiveness of equity-oriented responses in health crises.

KEY MESSAGES

Research Priorities Studied:

- Community Engagement and Impact Measurement: Engaging communities in culturally safe ways and measuring the indirect impacts of COVID-19 on health equity, mental health, and well-being.
- Intervention Frameworks: Identifying priorities that promote coordinated inter-sectoral action on public health challenges.

Key Research Findings:

- Exacerbation of Inequities: Many pandemic policies worsened existing inequalities or created new ones, particularly for migrants, women, children, and those of lower socioeconomic status.
- Strength of GBA+: having a pre-existing framing work to guide equity-based pandemic response, as well as established relationships across government sectors and with civil society, provided a solid basis of Canada's response to COVID-19
- Gaps in Policy Implementation: Significant gaps were found in addressing the needs of 2SLGBTQ+ individuals, older adults, those with disabilities, and Indigenous Peoples, highlighting uneven application of GBA+ and lack of culturally sensitive information.
- Challenges in Policy Execution: The pandemic response faced issues related to rushed implementation and inadequate evidence integration despite some successes, such as centralized GBA+ leadership.

Key Implications for Policy and Practice:

- Need for Equity-Focused Frameworks: Integrating GBA+ and similar approaches into pandemic preparedness and response is essential to addressing the needs of vulnerable groups and ensuring equitable health resource access.
- Future Research and Collaboration: Effective scaling of equity-based practices requires

- collaboration among government agencies, civil society organizations, and community stakeholders. Future research should address policy implementation gaps and evaluate the impact of equity-based approaches.

OUTPUTS, PRODUCTS & IMPACT

Output 1: Op-ed on Intersectional Pandemic Responses, published in Policy Options," Read here: https://policyoptions.irpp.org/magazines/august-2023/intersectional-pandemic-response/

Output 2: Accompanying Brief, Applying intersectional approaches to pandemic preparedness and response. Available Here," Access here: https://pipps.cdn.prismic.io/pipps/dcf401eb-70dd-4500-b99a-1ad10a982f99_Intersectionality+Brief+Aug+2023.pdf

Output 3: Scoping Review, "Equity Lens on Canada's COVID-19 Response," published in the International Journal of Health Policy and Management. (DOI: https://doi.org/10.34172/ijhpm.2024.8132)

Output 4: Policy Paper, collating findings from the Key informant interviews & policy document is under review at the International Journal for Equity in Health.

Output 5: Pandemic Preparedness Playbook: Ensuring Equity-Based Response During Crisis, "Drafted for Fall Dissemination," Coming Soon.

PROJECT DETAILS

Title: Evaluation of Virtual Family Visits in Long-Term Care Homes (VFV Study)
Nominated Principal Investigator: Janice Sorensen
Affiliation: Long-Term Care & Assisted Living, Fraser Health Authority
Team Members: Valorie Crooks, Tyler Cole, John Pickering, Sherin Jamal, Catherine Youngren, Lillian Hung, Maria Montenegro, Jeremy Snyder, Akber Mithani, Fraser Health Long-Term Care and Assisted Living Research Partners Group
Keywords: long-term care, virtual visits, family, equity, COVID-19 pandemic
Contact: Janice Sorensen, janice.sorensen@fraserhealth.ca

RESEARCH PRIORITIES

This evaluation addresses the state-of-the-art medical and digital health technology research priority area to: "evaluate effectiveness and efficiency of digital health initiatives implemented in response to the COVID-19 pandemic to identify lessons learned and opportunities for equitable and inclusive scaling". Aligned with this research priority area, we evaluated the effectiveness and efficiency of virtual family visits (VFVs) that were rapidly adopted in long-term care (LTC) homes to support psychosocial health in response to the COVID-19 pandemic-related visitation restrictions in Fraser Health in British Columbia (BC). Exploring lessons learned by engaging residents, family, care staff and decision maker knowledge users in the evaluation process aimed to inform equity-oriented, inclusive, and impactful LTC home VFV policies and practices. A focus on utilization emphasizes the importance of adaptable and sustainable solutions for scalability across different LTC home contexts and enhancing the overall equity-oriented resilience in future health emergencies to support psychosocial health and wellbeing in LTC homes.

RESEARCH APPROACH

A utilization-focused evaluation approach was employed to explore preferences for and experiences with virtual visits versus in-person visits during the COVID-19 pandemic in Fraser Health, British Columbia. Reflections were provided on lessons learned, innovative practices, and barriers and facilitators. These findings aimed to inform equitable policies, practices, and infrastructure to enable VFVs that are person-centred, coordinated, and value-based to meet the psychosocial needs of residents and their families. Interviews and focus groups were conducted with residents, family members, and care staff and analysed through constant comparative analysis. Inclusive engagement of socioculturally diverse research participants and knowledge users in LTC homes enabled an equity-oriented research approach. This was key for integrated knowledge mobilization to develop actionable tools and resources aimed at different knowledge user groups on best-practices and policy for VFVs in LTC homes.

KEY RESEARCH FINDINGS

Themes emerging from this study include:

1. inconsistent / often inadequate infrastructure to support equitable VFVs in LTC homes,
2. resident and family-centred needs for equitable visitation,
3. VFVs to overcome geographical barriers to visitation, and
4. negative impact on care staff well-being, workload, and moral injury due to inadequate infrastructure for VFVs in LTC homes.

These findings hold valuable lessons to improve VFVs for equity-denied and rights-holder groups. For example, residents, their family members, and care staff that lacked adequate supports, training, access, and/or resources to enable VFVs in LTC homes. VFVs overcame geographical barriers to

Using these data and publicly available datasets from the city of Montreal, we developed Bayesian disease mapping models incorporating mobility data as a spatial structure to model the disease risk functions for Montreal boroughs. The codes are available for public use.

to visitation and were highly valued to maintain social connection for some residents and their family. However, not everyone benefited equitably from VFVs due to inadequacies in infrastructure to support person-centred visitation needs in LTC homes. Witnessing the social isolation of residents whilst struggling with a lack of physical and workforce infrastructure for VFVs in LTC homes to meet the demand for family connection during the COVID-19 pandemic negatively impacted care staff tasked with coordinating and supporting VFVs.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Our findings emphasize the need for policies and practices to support equity-oriented VFVs across LTC homes. Policies for VFVs made by decision makers at provincial, regional, and LTC home-levels, should address inadequacies in physical infrastructure, e.g., access to connected devices and private spaces, and workforce infrastructure, e.g., staffing levels and training to coordinate and support VFVs. They should also aim to support resident- and family-centred VFV practices to address sociocultural and economic factors; and personalized needs related to, e.g., mobility, sensory, language, and cognitive abilities; and improve the wellbeing, psychosocial health, and quality of life of residents, their family and care staff in LTC homes.

KEY MESSAGES

- From a utilization-focused perspective of residents, their family and care staff, we evaluated VFVs that were rapidly adopted across LTC homes during the COVID-19 pandemic in Fraser Health, BC. We aimed to identify lessons learned to inform equity oriented LTC VFV policies and develop actionable tools and resources for scale and spread of VFV best practices across LTC homes.
- Although VFVs overcame geographical barriers to visitation in LTC homes during the COVID-19 pandemic, inadequate physical and workforce infrastructure to support VFVs had a negative impact on the wellbeing and workload of staff who struggled to meet resident- and family-centred needs for equitable visitation.
- Equity-oriented policies and practices for VFVs should address inadequacies in physical and workforce infrastructure across LTC homes and enable resident- and family-centred approaches that consider personal factors, preferences, and needs.

PROJECT DETAILS

Title: Technological Implications of Vaccine Certificates and their Public Health Impact
Nominated Principal Investigator: Kumanan Wilson
Affiliation: Ottawa Hospital Research Institute

RESEARCH PRIORITIES

During the COVID-19 pandemic, many jurisdictions implemented mandates for proof of vaccination using digital vaccine certificates to gate access to certain activities. However, the use of these digital certificates has been controversial and have been criticized for infringing on individual rights and freedoms and having scientific and technological limitations. We sought to gather evidence from the implementation of these certificates to guide potential future uses.

Identify existing examples of digital vaccine certificate solutions in provinces and territories in Canada and in OECD countries. Evaluate the solutions based on (1) equity/ethical/legal, (2) technological, and (3) public health considerations using the United Kingdom Royal Society criteria for vaccine certificate development. Provide recommendations on future use of vaccine certificates.

RESEARCH APPROACH

We employed a comprehensive scoping review strategy to identify digital vaccine certificate solutions across Canada and OECD countries. Our approach involved a systematic search of grey literature and academic sources focusing on existing digital solutions and emerging technologies. Key considerations included equity, ethical, legal, technological, and public health aspects, guided by the UK Royal Society criteria for vaccine certificate development. Data collection combined literature review, grey literature analysis, and thematic categorization of digital solutions based on operational, privacy, and accessibility factors. We synthesized findings to provide recommendations for the future use of vaccine certificates.

KEY RESEARCH FINDINGS

- Operational challenges: technical issues, such as QR code implementation, underscored the need for a robust, user-friendly digital infrastructure.
- Privacy and surveillance: balancing public health safety with privacy rights was critical, highlighting ethical concerns about the use of surveillance tools.
- Equity and accessibility: digital vaccine certificates raised concerns about accessibility, particularly for marginalized communities and those without digital access.
- Ethical considerations: vaccine certificates prompted debates over privacy, freedom, and potential discrimination between vaccinated and unvaccinated individuals.
- Public health impact: certificates contributed to increased vaccination rates and reduced healthcare strain, supporting economic recovery, particularly in travel and tourism.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

- Develop robust digital infrastructure to support secure and effective vaccine certificate systems.
- Ensure equitable access to technology and address privacy concerns to prevent exclusion.
- Establish clear guidelines and regulations to balance security and public trust.
- Efforts should focus on fostering collaboration between different levels of government and further developing existing systems to standardize and strengthen solutions.

KEY MESSAGES

It is not improbable that proof of vaccination certificates will be required in the future. Addressing challenges that were experienced during COVID-19 in advance of an emergency may help smooth their use in the future. A sliding scale approach can be considered where the use of the passports can be guided by the science and the potential threat.

PROJECT DETAILS

Title: Public health systems governance for intersectoral action on climate change
Nominated Principal Investigator: Sara Allin
Affiliation: University of Toronto
Team Members: Stephanie Simpson; Mélanie Seabrook; Erica Di Ruggiero; Fiona Miller; Barry Pakes; Marianne Jacques; Liane Fernandes; David Kaiser; Juan Solorzano; Lara Gautier; Jasmine Pawa; Andrew Pinto; Veena Sriram; Edward Xie; Jane Zhao
Keywords: Extreme Heat; Public Health Systems; Intersectoral Action; Collaborative Governance; Climate Change
Contact: Sara Allin, sara.allin@utoronto.ca

RESEARCH PRIORITIES

Climate change is one of the most urgent crises facing public health systems in Canada. While core public health functions such as surveillance and health protection are critical to addressing its impacts, the inherently "wicked" nature of climate change requires intersectoral collaboration within and beyond health systems. Little is known, however, about how and to what extent governance mechanisms condition the setting, pursuit, and measurement of progress toward common goals throughout intersectoral collaboration. Identified as a critical knowledge gap within the 2022 CPHO Annual Report, our research aims to improve this understanding and inform effective governance mechanisms to guide collaborative climate action in a complex and increasingly fraught context. To do so, our work focuses on local collaborative efforts to address extreme heat as the greatest contributor to weather-related mortality in Canada. Our research priorities include to:

1. Describe the collaborative governance mechanisms for climate action by public health and other stakeholders at provincial, regional, and local levels;
2. Assess the perceived effectiveness of existing governance mechanisms through local case studies set in British Columbia, Ontario, and Québec; and
3. Identify and communicate actions to strengthen government arrangements.

RESEARCH APPROACH

The following research activities have been informed by an integrated knowledge translation approach, with support of an Advisory Group comprised of the research team, and representatives from municipal governments, public health departments, and community organizations.

Research Priority 1: we conducted a rapid scoping review of extreme heat response strategies in British Columbia, Ontario, and Québec between 2005-2023. A total of 14 academic articles and 328 grey literature sources informed our development of preliminary case descriptions, with the heat response plans in Vancouver, Toronto, and Montreal selected as local cases for further exploration of existing governance mechanisms.

Research Priority 2: we conducted 26 semi-structured interviews with key informants involved with local heat response across a range of sectors, including public health, emergency management, fire and emergency medical response, and community organizations. Drawing on the results of the rapid scoping review, we sought to understand informants' roles and responsibilities, as well as perceptions of the strengths and weaknesses of the collaborative governance arrangements supporting their heat response efforts. We also inquired about how health equity is incorporated into planning, including strategies to support populations most vulnerable to heat impacts. Thematic analysis informed characterizations of governance arrangements, including similarities and differences across cases.

KEY RESEARCH FINDINGS

Each province mandates local public health authorities or local government departments to develop heat response strategies. Montreal and Toronto have public facing frameworks articulating response protocols and intersectoral roles and responsibilities, whereas these details are not publicly reported by Vancouver. Predominant approaches to heat response across each city include public alerting systems, the provision of information on heat health impacts, and interventions targeting vulnerable populations (e.g., cooling stations & street outreach).

Emergency management departments function as the central coordinating authority in each city. While the regional public health authority plays a coordinating role in Montreal, public health is more peripherally involved Toronto and Vancouver.

Key informants from each case reported a lack of formal evaluation and collective accountability mechanisms related to their response strategies. Instead, they typically self-monitor their activities and hold themselves accountable in fulfilling strategic goals and objectives. In the absence of formal evaluations of effectiveness, most key informants perceived plans to be well coordinated and implemented.

While Montreal's cross-sectoral coordination table enables an integrated response, sectors in Vancouver and Toronto operate in a more siloed manner. Community organizations generally contribute to local heat response, however such efforts are not always connected to the formal plans of each City.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

This research sought to identify mechanisms for effective governance of intersectoral collaboration addressing extreme heat at the local level. Key findings pertaining to the strengths and weaknesses of existing approaches may therefore inform future iterations of Vancouver, Toronto, and Montreal's annual heat response strategies. For example, as each city has yet to develop and systematically implement formal evaluations of their respective response plans, efforts to identify, define, and monitor metrics of effectiveness may be prioritized. Our findings may also inform the development of heat response plans in other localities. For example, considerations of the collaborative facilitators consistently identified across our cases, including clearly defined roles and responsibilities, a central coordinating body, inclusion of a diversity of sectors, trust, consensus, and adaptability, may be proactively factored in response planning and accounted for throughout implementation. As knowledge mobilization is critical to these endeavors, our team will, in the coming months, organize deliberative dialogues to co-develop actionable, pragmatic recommendations to strengthen governance arrangements for collaborative climate action. Moving forward, local officials and climate researchers are advised to meaningfully engage with community organizations and people with lived experience in all aspects of local heat response, including plan development, implementation, and evaluation.

KEY MESSAGES

Our research directly addresses the 2022 CPHO Annual Report research priority calling for "intersectoral action on climate change and the determinants of health". Key findings from this work include:

1. Extreme heat is of growing concern at local and provincial levels, and its disproportionate health impacts are key considerations within corresponding response plans. However, efforts to monitor and evaluate strategies to reach groups most vulnerable to heat impacts, including the provision of information resources and geographically dispersed cooling stations, are needed to ensure that such interventions are indeed producing their intended positive health impacts.

2. Several facilitators of collaborative heat response efforts were identified across cases, including clearly articulated roles and responsibilities, a central coordinating body, inclusion of a diversity of sectors in planning, high levels of trust among actors, goal consensus, and the ability to adapt. Financial and human resources are also critical to successfully implementing and maximizing the positive health impacts of local heat response plans.

3. Although extreme heat has clear health implications, public health authorities' role in local response ranges from leadership to support. Integrated response plans like Montreal's can ensure that all relevant actors remain engaged in and attuned to the various intersectoral components of comprehensive response strategies.

OUTPUTS, PRODUCTS & IMPACT

Seabrook, M., & Simpson, S. (October 2024). Public health systems governance for intersectoral action on extreme heat in three Canadian provinces. Inaugural Health & Sustainable Care Symposium, Toronto, Ontario, Canada. [Oral Presentation] (accepted).

Simpson, S., Seabrook, M., Umar, I., Ayala, P., & Allin, S. (May 2024). Findings from a Rapid Scoping Review of Public Health Systems Governance for Intersectoral Action to Address Extreme Heat in Canada. [Oral Presentation]. CAHSPR Conference, Ottawa, Ontario, Canada.

PROJECT DETAILS

Title: Catalyzing Intersectoral Conversations on Climate Displacement and Health in BC
Nominated Principal Investigator: Heather Castleden
Affiliation: University of Victoria
Team Members: Nicole Bates-Eamer, Maya Gislason, Dawn Hoogeveen, Simi Kang, Angel Kennedy, Jeff Masuda, Kathryn Stone, Sarah Wiebe,
Keywords: climate, displacement, evacuation, wildfire, health
Contact: Nicole Bates-Eamer, nbeamer@uvic.ca

RESEARCH PRIORITIES

Climate-related displacements exacerbate pre-existing health conditions and inequities, disrupting homes, livelihoods, education, community cohesion and access to care. Populations that have been historically and systematically discriminated against are more at risk of displacement and have fewer resources to recover from these significant disruptions. For example, there is evidence that increases in domestic violence occur during floods and wildfires. Notably, Indigenous Peoples, who have been using their knowledge systems to prepare for, cope with, and survive disasters since time immemorial, experience one-third of climate-related long-term displacements in Canada.

The CPHO 2022 Report and Castleden's accompanying "What We Heard: Perspectives on Climate Change and Public Health" further recognized the link between climate displacements and its impacts on mental health, stress, and anxiety. The public health and health services costs are enormous. Despite these recognitions little empirical work has examined the specific public health impacts of displacement on individuals, families, communities, and healthcare services. Considering the major displacements from recent floods and wildfires in BC, our team catalyzed cross-sectoral conversations to better understand how communities, service organizations, governments, and researchers are currently preparing for and responding to extreme weather events and to identify priorities for future preparedness and response as our changing climate intensifies.

RESEARCH APPROACH

Health equity was central to our research approach in how we established the composition of our research team and how we carried out our project. We were also guided by the four tenets of the Native Women's Association of Canada's (NWAC) culturally relevant gender-based analysis framework: intersectionality, gender diversity, distinctions based, and Indigenous knowledge.

We began our project with an invitational gathering in Victoria, BC. The province's five Regional Health Authorities (RHAs) were key participants. Also invited were the First Nations Health Authority, BC Wildfire Service, First Nations Emergency Services Society, the Ministry of Emergency Management and Climate Readiness, the National Collaborating Centre for Indigenous Health and NWAC; this group formed our Advisory Circle, and we met several times throughout the project.

From there, we held interviews with key stakeholders to better understand the extent of climate displacement in their jurisdictions and their efforts to address the public health impacts. The RHAs requested the team conduct desktop research to address climate displacement questions specific to their region's communities. We concluded our project with a final gathering to share our findings, stimulate additional insights, and identify key outputs from the project.

KEY RESEARCH FINDINGS

One of our key findings was about how responding to and preparing for climate impacts negatively impacts people's well-being who work in this space: there are major mental health tolls on those workers, not just on evacuees. We also heard about how climate displacement impacts health authorities even when their authority is not directly impacted by evacuations, because other authorities relocate patients from directly affected areas. There is deep knowledge and expertise in communities that have first-hand experience with displacements, including excellent examples of culturally-safe, decolonial practices for supporting Indigenous patients who need to be moved in an evacuation and many known good practices for culturally-safe, Indigenous-led evacuations. In contrast, there is concern with reception centres being able to provide wrap-around care for those with complex needs and role of public health in ensuring those needs are met. Many policies and programs focus on downstream responses versus upstream preparation. Finally, there is a lack of clarity about roles and responsibilities of different agencies and organizations in terms of preparing and responding to events – there is a desire for more collaboration, clarity, and events that bring actors together.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Key actors working in at the intersection of climate displacement and health in BC were able to gather twice to discuss their interests, actions, and priorities for this work in the future. This brought awareness to the impacts of climate displacement on the public health sector and revealed a need for proactive well-being policies for those working in public health. Our research provides evidence of the need for greater investments in upstream factors to ensure climate readiness.

KEY MESSAGES

Research priorities studied:

- Climate displacement and public health: how communities and individuals prepare for and respond to the public health dimensions of evacuations from floods and wildfires in BC; the role of and impact on public health in these preparations and responses

Key findings:

- Responding to and preparing for climate impacts negatively impacts people's well-being who work in this space (major mental health toll not just on evacuees)
- Climate displacement impacts health authorities beyond the area being displaced as they receive patients from directly affected areas
- Deep knowledge and expertise in communities that have first-hand experience with displacements
- Policy implications
- Need to shift to upstream factors for public health promotion and climate preparation (away from downstream responses)
- Need for a community of practice working across sectors connected to climate and health
- Need policies to support public health and emergency management workers to prevent burnout, attrition and detrimental mental health impacts

OUTPUTS, PRODUCTS & IMPACT

Project illustration by MITACS Global-link Intern, Anna West

https://heclab.com/catalyzing-intersectoral-collaborations-on-the-intersectional-public-health-impacts-of-climate-displacement-insights-from-british-columbia/

PROJECT DETAILS

Title: Exploring the role of public health champions initiating transformational change on climate-related food insecurity
Nominated Principal Investigator: : Sarah Funnell
Affiliation: Queen's University
Team Members: Krystal Kehoe Macleod, Mwali Muray, Tanya Horsley, Michael Robidoux, Kelly Skinner, Charles Dabone, Elizabeth Kristjansson, Hannah Neufeld, Sonia Wesche, Isabelle Giroux, Tiff-Annie Kenny, Janet Juil, Michael Fitzgerald, Peter Tanuseputro, Lauren Konikoff, Kruti Patel, Katelyn Wang, Marie-Josee Massicotte, Karen Ferguson,Ben Smith, Randy Mayes, lan Bowmer, Husein Moloo, Kimberley Trotter, Rob Chief, Jo-Anne Henderson-White.
Keywords: food insecurity, climate change, lndigenous communities, champions, public policy
Contact: Krystal Kehoe Macleod, kmacleod@bruyere.org

RESEARCH PRIORITIES

This project addresses three of the opportunities identified in the Generating Knowledge to lnform Public Health Action on Climate Change in Canada report (e.g ., prioritizing equity and community in climate actions; intersectoral action on climate change and the determinants of health; and public health system leadership for climate action). The study gathered evidence on lndigenous and public health leadership on climate action related to food insecurity in the North by exploring and analyzing the role of "change champions" in Northern lndigenous communities. A comparative content analysis identified change champions in federal and provincial/territorial policy documents and compared these to who lndigenous communities viewed as their influential actors mobilizing intersecterai action on climate-related food insecurity and health. We brought together an lndigenous Advisory Circle of change champions in three Northern communities and engaged with community leadership (e.g., Chiefs, Councils, Boards) to understand their needs and priorities in this space. This project clearly addressed opportunities for public health and climate change interventions through supporting co-design of strategies with change champions from lndigenous communities that will ensure lndigenous-led solutions and knowledge translation focused on improving education and programming at regional governance and local community corporation levels in the North. ln the context of climate change and health, an lndigenous locus is essential to understanding the threat of food insecurity, which allows this project to address structural and social determinants of health.

RESEARCH APPROACH

Using an action research approach, this study used three phases: look, think, and act. We completed a comparative content analysis of recent and relevant public policies on climate-related food insecurity to identify and describe who decision makers see as change champions working in the Canadian North. We built partnerships with three lndigenous change champions connected to three Northern lndigenous communities and initiated conversations with leadership in these places to explore the needs and priorities of their communities in relation to food insecurity and lndigenous food sovereignty. This laid the groundwork for future phases of this project building on the relationships and partnerships that were established.

Advisory Circle members: Sara Ayaruak-Thomson,ill1uk from Rankin lnlet, Nunavut; ArleneJung from Wawakapewin First Nation north of Sioux Lockout, Ontario; Celina Wolki from Paulatuk in the lnuvik Region, Northwest Territories Our team has strong representation of lndigenous researchers and collaborators in recognition that lndigenous Peoples' rights and ways of knowing must be respected, protected, and prioritized in climate change policy and research. Co-production and taking lime to build meaningful and reciprocal relationships is crucial to ensure that knowledge is collected and used in a culturally sale way.

KEY RESEARCH FINDINGS

This study has reinforced that climate change is having a significant impact on food production and security in Northern Indigenous communities. Food insecurity is defined as poor or unreliable access to adequate food caused by lack of money or other resources and is linked adverse health outcomes, high health and social services utilization rates/costs, and premature mortality. We found that although there is increasing interest by political decision-makers and Indigenous leaders in tackling climate-related food insecurity (CRFI), many policymakers do not know much about how Indigenous "change champions" (CC) are working in their communities to address the health and social impacts of CRFI through Indigenous-led projects and these change champions are often invisible in the food security policy documents that are meant to be guiding work in this area. We heard that food insecurity is of key importance to the leaders of Indigenous Northern communities and that more consistent resourcing of Indigenous-led programs/initiatives is a priority for them and their communities. Research and action to address CRFI in the North must take a rights-based approach and be focused on supporting Indigenous-led solutions.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Indigenous change champions see food system-related problems as being interconnected to climate change. Research and action to address climate-related food insecurity (CRFI) in the North must take a rights-based approach and be focused on Indigenous-led solutions, yet it remains unclear if/how policymakers working on CRFI portfolios communicate and support Indigenous change champions (CC) to mobilize action to address the health and social impacts of CRFI in their Northern communities. We will be seeking funding for the next phase of this project to understand how CC working in Northern communities can connect with policymakers and funders in a meaningful, culturally relevant, and sustainable way to improve knowledge of, and support for, the mobilization of Indigenous-led action to address CRFI and its health impacts in the North. This evidence will contribute to the creation of opportunities for intersecteral and cross-jurisdiction collaboration where CC working in the North are engaged in co-designing strategies to better communicate with and leverage policymakers to improve knowledge of, and support for, the mobilization of Indigenous-led action to address climate-related food insecurity and health in the North.

KEY MESSAGES

- Research and action ta address climate-related food insecurity in the North must take a rights-based approach and be focused on Indigenous-led solutions.
- Change champions doing work in Indigenous Northern communities are often invisibilized in public policy which can contribute ta Indigenous-led solutions being under-funded and inconsistently supported.
- We need better strategies and infrastructure for change champions working in Northern communities to connect with policymakers and funders in meaningful, culturally relevant, and sustainable ways to improve knowledge of, and support for, the mobilization of Indigenous-led action ta address climate-related food insecurity and its health impacts in the North.

OUTPUTS, PRODUCTS & IMPACT

These are in the process of being prepared.

PROJECT DETAILS

Title: Air Pollution and Asthma in Canada
Nominated Principal Investigator: Kate Johnson
Affiliation: University of British Columbia
Team Members: Amin Adibi, Spencer Lee, Stephanie Harvard, Tony Lanier, Sian-Hoe Cheong, Zainab Zeyan, Rachel Carter
Keywords: lung disease, wildfires, asthma development
Contact: Kate Johnson, kate.johnson@ubc.ca

RESEARCH PRIORITIES

Air pollution is a daily threat to the health of Canadians and remains persistently high due to increasing wildfires related to climate change. The 3.8 million Canadians with asthma are particularly susceptible, as air pollution can cause asthma to develop, worsen asthma symptoms, and lead to asthma 'attacks'. Air cleaners fitted with high efficiency particulate air (HEPA) filters reduce air pollution in homes and can decrease the risk of developing asthma and its burden among people who already have asthma, which could make them a key climate adaptation measure.

Our research priority was to assess the value-for-money of a government distribution program of at-home portable air cleaners in British Columbia (BC) in terms of its impact on overall health systems costs and the life expectancy and quality of life of British Columbians.

RESEARCH APPROACH

We evaluated the cost-effectiveness ('value-for-money') of distributing air cleaners to the general population of British Columbia (BC). We used a simulation modeling approach to determine whether the health benefits of air cleaners outweighed their costs. We considered the costs of purchasing air cleaners, and their impact on reducing exposure to air pollution, which causes asthma to develop and increases the risk of asthma attacks and death. We included the costs to the healthcare system of treating asthma, and the impact of air pollution on patient quality of life and life expectancy (combined in a single measure called quality adjusted life-years [QALY]).

Our model development was informed by a team of 4 patients with asthma or their caregivers, and one medical health official. They assisted the research team in decisions on how to model asthma, its costs and health effects.

KEY RESEARCH FINDINGS

Under a fully subsidized air cleaner distribution program, the incremental cost-effectiveness ratio (ICER) varied from $35,668/QALY to $130,892/QALY across the 16 Health Service Delivery Areas (HSDA) in BC, and averaged $68,780/QALY across the entire province. Using the commonly accepted willingness to pay threshold of $50,000 for one quality adjusted life-year (where a QALY of 1 is equivalent to one year in perfect health), a government distribution program of air cleaners represented good value for money in three HSDAs (Kootenay Boundary, East Kootenay, and Okanagan), all of which are located in the interior of the province.

Implementing an air cleaner distribution program in BC would prevent 9,760 new cases of asthma from developing over a 10-year time horizon from 2012 to 2022. For people who already have asthma, an air cleaner distribution program would prevent a total of 9,318 asthma attacks over 10-years, 1,689 of which would require and emergency room visit or hospitalization.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

- Key implications: In the interior of BC, government distribution of air cleaners can be a key measure to reduce the burden of asthma, which is increasing as a result of wildfire smoke.
- Enhancing Canada's public health system: Government distribution of tools for reducing exposure to climate change-related hazards can be a valuable investment of healthcare resources.
- Future opportunities and next steps: Conducting similar analyses for the rest of Canada and further engaging with government decision makers on air cleaner distribution strategies.

KEY MESSAGES

- A fully subsidized air cleaner distribution program would prevent new cases of asthma and reduce severe complications for people who have asthma. In the interior of BC, where exposure to wildfire smoke is consistently high, it represents a high value investment of government resources.
- Our findings underscore the program’s potential to enhance health equity, particularly in marginalized communities with higher asthma burdens and heightened susceptibility to air pollution exposures.

PROJECT DETAILS

Title: Facing Climate Change in Poverty
Nominated Principal Investigator: Sean Kidd
Affiliation: Centre for Addiction and Mental Health
Team Members: Mariya Bezgrebelna, Leanne Lacap, Mariam Farooq, Jolly Noor, Yaa Amoah
Keywords: Climate change, health, poverty
Contact: Leanne Lacap, Leanne.Lacap@camh.ca

RESEARCH PRIORITIES

Current climate change mitigation and adaptation plans are typically limited in considering the needs of people experiencing poverty and there is a limited evidence base in this area. This program of research is primarily focused on co-creating knowledge with a specific aim of prioritizing equity and community, particularly individuals and communities living in poverty, in climate action initiatives. Our research recognizes that poverty is a key factor in individual and community vulnerability to environmental risks - with a focus on health and wellbeing. These risks are compounded by several intersections, such as age, gender, and access to shelter. We aim to articulate the health and wellbeing risks posed by the climate crisis for individuals and communities in Canada experiencing poverty, delving deeper into the perspectives of lived experience experts and professionals working in the intersection of these areas. This work has taken an intersectional approach and prioritizes Indigenous engagement amongst other systemically marginalized communities. Our research is important as it extends and builds out from the existing evidence base, drawing on multiple forms of expertise and sources of evidence. It contributes to other organized efforts that seek to address health equity gaps related to the climate crisis.

RESEARCH APPROACH

In our research methods, we utilize academic and grey literature reviews, employ expert think tanks, and conduct semi-structured interviews with diverse lived experience experts, public health unit leaders, policy makers, health system leaders, and direct service professionals across Canada. We are also mapping datasets relevant to climate change and health equity. Key populations of focus include women, older adults, children and youth, people lacking housing, and intersections with Indigenous communities, communities experiencing environmental racism, and disability communities.

Key advisors and collaborators on this project include experts at the climate-health-poverty nexus from across Canada - who represent many different disciplines, roles, and focus areas. We have policy-oriented and scientific advisories (national and international) and Indigenous collaborators including an Elder and the National Collaborating Centre for Indigenous Health. We have a diverse lived expert advisory and further engaging lived experts through participatory action projects. These perspectives have been instrumental to engaging the many sources of information, people and groups that we are seeking out - from which to gain access to the best available evidence and opinion.

Health equity is fundamental to this work - from the topic and objectives through to the various points of engagement, governance, and knowledge mobilization pathways currently in progress.

KEY RESEARCH FINDINGS

The interview phase is still in its early stages, so we haven't obtained solid findings just yet. However, we can discuss some emerging themes. Our initial findings validate existing research showing that poverty exacerbates pre-existing inequalities and has a significant impact on the ability to adapt to and mitigate climate-related health risks for equity-deserving groups.

Some of the emerging themes focus on a targeted approach or support for various groups, and emphasize the importance of engaging lived experience experts in policy discussions related to mitigation and adaptation. One of the lived experience experts we interviewed highlighted that the available resources are often inaccessible, particularly because they are typically located in downtown areas of cities, making it difficult for those living outside the city to access them. Ultimately, it is imperative to thoroughly examine the circumstances of those most vulnerable and involve them in developing solutions tailored to their specific needs. Furthermore, it is essential to leverage our understanding of the escalating climate-related health risks to prioritize prevention, access to adequate housing, support services, and a basic income. A systemic response is necessary to effectively support communities living in poverty in adapting to and mitigating climate-related health risks.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

This research seeks to strengthen Canada's public health systems' capacity to adapt and respond to climate change by prioritizing lived experiences, attending to health equity, and considering intersectionality.

Addressing the climate crisis for those in poverty and lacking adequate shelter requires a comprehensive, coordinated systems approach. This includes aligning organizations and professionals, fostering international collaborations, and prioritizing Indigenous leadership. Legal avenues such as implementing maximum indoor temperature by-laws, recognizing housing as a human right, and promoting inclusive disaster risk reduction are crucial. The real solution necessitates systemic change, including universal basic income models and addressing disparities in resource allocation and health impacts. We require an informed and engaged public and governments prepared to make significant changes immediately.

There is a scarcity of research on how environmental risks affect marginalized populations living in poverty in Canada. Specifically, there is a lack of evidence on the impact of climate change on their health and well-being. Additionally, there is a notable absence of trials and case studies of interventions at various levels, including individual and systemic levels. Furthermore, future research should consider social factors such as gender-based violence and women’s economic inequality in relation to climate hazards.

KEY MESSAGES

Our research focuses on prioritizing equity and community in climate action initiatives, particularly for individuals and communities living in poverty in Canada. We aim to understand the specific risks posed by the climate crisis for these vulnerable groups. Our research emphasizes an intersectional approach, including the involvement of Indigenous communities and other marginalized groups, to address health inequalities related to the climate crisis.

As the interview phase is still in its early stages, we have not yet obtained solid findings. However, our initial findings validate existing research on the impact of poverty on climate-related health risks for marginalized groups. Some emerging themes emphasize the importance of involving people with lived experiences in policy discussions. It is crucial to examine the circumstances of the most vulnerable and involve them in developing tailored solutions. Additionally, we need to prioritize prevention, access to adequate housing, support services, and a basic income to mitigate climate-related health risks for communities living in poverty.

Addressing the climate crisis for those in poverty and lacking adequate shelter requires a systems approach, international collaborations, and prioritizing Indigenous leadership. Universal basic income models, and addressing disparities in resource allocation are crucial.

OUTPUTS, PRODUCTS & IMPACT

Output 1: Commentary on Addressing Poverty and Homelessness is Central to an Equity-Focused Response to Climate Change: Considering Canada as an Example

Access link pending

Output 2: Scoping review on Climate Change, Poverty and Health

Access link pending

Output 3: Canadian Poverty, Health Equity, and Climate Change Initiative Website

Has reports and information tailored to broad audience

Access link pending

PROJECT DETAILS

Title: Climate change and adolescent health and wellbeing: understanding impacts to support long-term monitoring
Nominated Principal Investigator: Gina Martin
Affiliation: Athabasca University
Team Members: Jayden Chang, Jack McIlraith, Wendy Craig, William Pickett, Scott Leatherdale, Michael McIsaac, Jason Gilliland, Gordon McBean, James Voogt
Keywords: Climate change; extreme weather; adolescents; GIS
Contact: Gina Martin, gmartin@athabascau.ca

RESEARCH PRIORITIES

Climate change is projected to increase the severity, frequency, and duration of extreme weather/weather-related events. Globally, it is estimated that children born in this decade will face up to seven times as many extreme weather/weather-related events in their lives compared to their grandparents' generation.

There is a dearth of knowledge regarding how the experience of such events impacts adolescents.

RESEARCH APPROACH

Data merging of environmental data on heat, wildfire, flood, and hurricanes to repeated cross-sectional adolescent health survey data (the Health Behaviours in School-aged Children Study (HBSC)).
Adolescents (grades 6-10) across Canada from survey data in the years 2013/14 and 2017/18. Data were collected at schools. Data merging was based on the date of survey administration to ensure extreme weather exposure occurred before the survey date. Environmental data sources were from multiple data products.

Our research team includes GIS analysts, climatologists, and adolescent health experts.

KEY RESEARCH FINDINGS

A protocol for data merging based on various data products was developed and tested. Originally we were going to use a single data source but found at the data triangulation phase that the single source missing key events; however, separate sources for individual events meant more updated data, although it required more data wrangling.

Within the HBSC sample >25% of participants experienced some form of climate change related event in the 12 months prior to the survey. Next steps include examining the impacts of these events on health outcomes.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

A protocol for data merging based on various data products was developed and tested. Originally we were going to use a single data source but found at the data triangulation phase that the single source missing key events; however, separate sources for individual events meant more updated data, although it required more data wrangling.

Within the HBSC sample >25% of participants experienced some form of climate change related event in the 12 months prior to the survey. Next steps include examining the impacts of these events on health outcomes.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Developing the data merging protocol allowed us to identify strength and weaknesses in existing environmental data sets in terms of merging with health data. Once finalized our protocol and code can be utilized by other researchers. Identifying health impacts to adolescents will allow for more targeted and evidenced-based supports for those who experience climate change related extreme events. Evidence on adolescent health impacts can be shared with policy-makers and practitioners to best support adolescents' health.

As the HBSC survey data is repeated-cross-sectional we hope to utilize the protocol and build from this project to include the most recent survey cycle (2023) and look at repeat exposures and mitigating variables.

Sharing the lessons learned and processes developed in this project will allow for utilization of existing data sources to monitor and study the impacts of climate change on health.

What are the research needs, gaps, or opportunities for the future? Sharing of lessons learned and resources; capacity building for researchers who are experts on climate change and health who can work with both environmental and health data; collaboration with physical scientists is important for rigor.

KEY MESSAGES

- Canadian adolescents are exposed to increased duration, frequency, and severity of climate change related extreme events compared to previous generations.
- Using existing health and environmental data sources offers an opportunity to monitor and understand the impacts of climate change on adolescent health.
- The processes developed can be extended to future years of HBSC survey data and could be implemented with other populations.

PROJECT DETAILS

Title: First Nations Built Environment Climate Action
Nominated Principal Investigator: Wanda Martin
Affiliation: University of Saskatchewan
Team Members: Lori Bradford, Shelley Kirychuk, Kerry McPhedran, Penelope Sanz, Charlene Thompson
Keywords: energy-efficient housing, documentary, energy poverty

RESEARCH PRIORITIES

Housing on reserve in Saskatchewan places First Nations people at significant risk of poor health outcomes. Many houses are in considerable need of repair, overcrowded, and poorly ventilated, leading to mould issues, poor air quality and poor health outcomes. Such houses are difficult to cool in the summer and to heat in the winter, resulting in significant energy costs. Buildings are a major contributor to greenhouse gas emissions through lifetime energy use. Several reserves in Saskatchewan are embracing climate actions through building energy-efficient housing and training members in energy audits. High energy costs on reserve contribute to the growing energy poverty in Canada. As individuals or bands are putting money into the energy costs, they have less to contribute to repairs or new housing that could reduce overcrowding. This research addresses several priorities on public health action on climate change, highlighting climate change interventions and prioritizing equity and community in climate actions. It is vital to take an asset-based approach to climate action on reserve to demonstrate what can be achieved and better understand the barriers to improved housing and health on reserve.

RESEARCH APPROACH

This participatory research began with a provincial housing symposium in Saskatchewan to understand the First Nation's community actions for healthy housing. It was followed by multiple case studies to document energy-efficient projects and desires for climate action on reserve. We have conducted site visits, documenting the successes and challenges of energy-efficient projects on reserve. We spoke with housing managers, community members, builders, and architect designers to better understand the costs and implications for energy-efficient buildings on reserve. Health equity has been a strong foundation for this study as we look at the differences between urban and rural housing on and off-reserve housing, as well as the different housing funding models on reserve. Participants were both men and women, from youth to elders, First Nations and non-First Nations, and across the income and education spectrum.

KEY RESEARCH FINDINGS

The symposium, with representation from 15 First Nation communities, three government organizations, 13 industry partners, students, academic researchers, and organization partners, resulted in a framework on what makes a house a home and action steps to improve housing quality on reserve. The case studies document the strong willingness and abilities for energy-efficient housing on reserve. Industry partners are trusted allies in improving reserve housing quality and are interested in establishing respectful long-term relationships. Funding mechanisms for improved housing quality concern many participants, and funding for alternative energy sources remains a barrier. There is confusion on the charges for energy on reserve, with a suggestion that reserve rates are higher than necessary. Youth are engaged in climate action, demonstrating passion for the land, and working toward a sustainable future. Older participants also expressed enthusiasm for alternative energy approaches and hope for the future, recognizing the challenges with funding mechanisms and competing demands for health and safety on reserve.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Building infrastructure is a significant cost, and overcrowding is an ever-present concern on reserve. The balance between a higher-energy-standard house versus more houses concerns decision-makers. There are immediate solutions to improve energy efficiency in existing houses, but there is a knowledge deficit and a need to access funds for retrofitting. Clean energy in Saskatchewan remains a challenge, so reducing energy consumption remains a priority for many. Recordings of the symposium and the cases will tell the story of the values, knowledge and aspirations for healthy housing on reserve. They will be essential for relating to Canadian provincial and federal governments. Public health professionals can support healthy housing on reserve, recognizing the need to advocate for necessary resources to transition to clean energy and energy-efficient housing models. There is a need for greater capacity and skill building on energy-efficient homes. The next steps are to work with First Nations communities to develop skill-building programs to improve housing literacy and existing housing stock while raising the housing standard for improved health outcomes on reserve.

KEY MESSAGES

- Energy-efficient housing can significantly improve health outcomes and reduce greenhouse gas emissions. Lower energy costs not only support a healthy environment but also play a crucial role in promoting health equity.
- There is a strong demand for healthy housing on reserve and an interest in energy-efficient housing and producing renewable energy. Many First Nations communities have competing demands for health and safety on reserve, but some communities are addressing energy challenges through improved housing and education.
- Funding mechanisms for reserve housing make it difficult to transition to clean energy. Policy and decision-makers can harness the desire for clean energy to develop new mechanisms for healthy, energy-efficient homes.

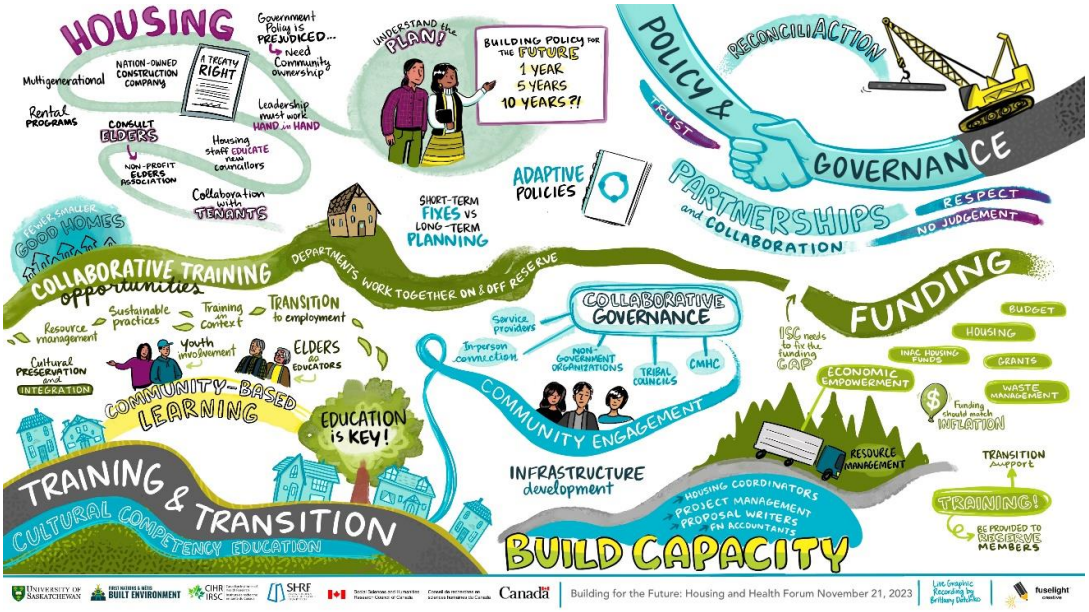
OUTPUTS, PRODUCTS & IMPACT

Output 1: Interdisciplinary research team development https://research-groups.usask.ca/fn-built-environment/

Output 2: Symposium report and graphic recordings https://research-groups.usask.ca/fn-built-environment/events1/building-for-the-future-the-built-environment-in-saskatchewan-first-nation-and-metis-communities.php

Image 1: Builds and Procurement & Asset Management

Image 2: Policy and Governance & Training and Transition



PROJECT DETAILS

Title: Shade for Health and Climate Adaptation and Resilience
Nominated Principal Investigator: Jennifer McWhirter
Affiliation: University of Guelph
Team Members: Melissa MacKay, Karen Landman, Nadia Amoroso, Brendan Stewart, Janani Sivarajah, Lauren Grant, Andrew Papadopoulos, Reed Ciarloni
Keywords: shade, climate change, public health, environmental design, built environment
Contact: Jennifer McWhirter; j.mcwhirter@uoguelph.ca

RESEARCH PRIORITIES

Shade increases the safety, health benefits, and thermal comfort of outdoor public places by mitigating extreme heat. Shade is scarce, inequitably distributed, and has design and implementation challenges. This evidence synthesis and knowledge mobilization project aims to improve our cities' shadescapes. Research priorities addressed: public health and climate change interventions; prioritizing equity and community in climate action; building knowledge on climate-health connections; intersectoral action on climate change and determinants of health; and public health system leadership for climate action.

RESEARCH APPROACH

Methods and approaches being used: scoping review of the peer-reviewed and grey literature to provide a birds eye view of the literature and sub-reviews on shade equity issues, shade policy, shade design and implementation best practices, and more; interviews and focus groups with public health and built environment professionals; generate evidence-informed visuals of shade via professional renderings, generative AI tools, and a national shade design competition. Health equity is being given careful consideration by having one of the sub-reviews focused solely on equity, asking meaningful questions about equity in the interviews/focus groups, and prioritizing EDI in participant recruitment.

KEY RESEARCH FINDINGS

- 919 articles were met the inclusion criteria and included in the main scoping review
- Articles on shade, shade and equity, and shade and social characteristics increased over time
- Setting of focus was mostly urban centres/cities followed by parks; schools and childcare facilities were less common settings
- Most articles came from the discipline of environmental sciences (300); articles from public health (126) were more often focused on UV protection relative to heat mitigation
- Most articles were quantitative (only 23 qualitative studies)
- Age and gender were the most frequent social characteristics the articles considered
- Thematic analysis for sub-reviews on shade policy, shade and mental health, and shade and equity are underway

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Our research will provide evidence to mobilize public health action on climate change by bringing together multiple disciplines to synthesize and disseminate evidence for immediate uptake into practice. The Shade Design Framework, and the supporting evidence synthesized for its development, will: facilitate and enhance effective interdisciplinary collaboration between public health, landscape architecture, and planning; inspire creative shade design solutions as an example of public health action on climate change; provide an evidence base for shade provision advocacy and policy creation; and encourage evidence-based and health-centric decision-making for designing the built environment.

Future research will include community co-design of shade solutions and empirical measurement of their impact.

KEY MESSAGES

In the context of a warming climate, increasing urbanization, and growing demand for outdoor public places, shade provision needs to be addressed.

Shade confers many benefits and co-benefits, including heat mitigation, thermal comfort, physical activity, UV protection, biodiversity, and air quality; However, it is inequitably distributed.

Syntheses of the available evidence on shade design, policy, and equity and enhanced collaborations between public health and built environment professionals will help to improve our cities' shadescapes and promote cool equity.

OUTPUTS, PRODUCTS & IMPACT

Outputs are still being generated, but will include: five peer-reviewed published scoping reviews; one commentary article; knowledge synthesis documents; a Shade Design Framework, and a national Shade Design Competition.

Conference presentations have so far included: 2024 What Works Climate Solutions Summit (Berlin); Canadian Society of Landscape Architects 2024 Congress (Winnipeg)

Our research will provide evidence to mobilize public health action on climate change by bringing together multiple disciplines to synthesize and disseminate evidence for immediate uptake into practice.

PROJECT DETAILS

Title: Extreme weather events caused by climate change: Estimating the prevalence of at-risk workers
Nominated Principal Investigator: Cheryl Peters
Affiliation: University of British Columbia

RESEARCH PRIORITIES

Extreme weather events related to climate change (floods and storms, droughts, wildfire, and extreme heat) can cause significant health impacts among workers. For example, construction and utility workers responsible for clean-up after these events can be exposed to biological hazards, injury, and carcinogens that can result in disease. However, workers are an understudied population in climate change health research. In this project, we aim to identify the occupations and industries impacted by climate change-related extreme weather events and estimate the number of workers at risk in Canadian provinces.

The specific objectives of the project are to:

1. Identify industries and occupations impacted by climate change-related extreme weather events across Canada (floods and storms, droughts, wildfires, and extreme weather events);
2. Estimate the prevalence and level of risk of adverse health outcomes to workers, by province, age, sex, and other socioeconomic variables;
3. Strengthen the connection between researchers and occupational health organizations and governments.

RESEARCH APPROACH

We will employ CAREX Canada methods to estimate the proportion of workers in the industries and occupations exposed to each identified extreme weather event. First, we will review relevant data sources regarding both the health impacts of extreme weather events and occupations/industries of interest (this step mostly complete). Following the literature review, we will interview expert key informants to gain further insight into the populations and outcomes that may be of interest (presently underway). These interviews will help to determine the proportion of workers in the occupations and industries that may be exposed to the weather event and, therefore, at risk of adverse health outcomes, and have already provided in-depth insights. Based on these sources, we will next use 2021 census data to determine the number of workers in each occupation and industry at risk and will apply proportions to those numbers. The data infrastructure to complete this phase has recently been constructed. Throughout this process, we will continue to consult with key informants to confirm whether our proportions are accurate and come to a consensus on the population at risk of exposure. For the second objective, we will apply principles of EDI to identify more vulnerable sociodemographic populations, including sex, gender, ethnicity, age, and income level, depending on the available data. Finally, we will develop knowledge translation materials to facilitate policy bodies in developing strategies to protect workers.

KEY RESEARCH FINDINGS

The research project is ongoing so the following results are preliminary. Based on historical records, we have identified that the priority extreme weather events vary by province. For instance, wildfire exposure is a greater priority in Alberta and British Columbia while extreme heat will be a greater priority in Ontario and Quebec. These results will help to guide policy or regulation in the future. Based on a previous scoping review, key informant interviews, and review of the Canada Career Handbook, we have identified the following industries of interest for all extreme weather events:

Agriculture, Construction, Healthcare, and Public Administration. The occupations of interest are those based primarily outdoors but we also considered occupations with inadequate ventilation and air conditioning. The key informant interviews we have conducted to date have focused on wildfire and extreme heat exposure, and these interviews indicated that all identified workers will be at risk of negative health outcomes due to extreme weather events with additional vulnerabilities by age, sex, and socioeconomic status. This has major implications for occupational health and safety planning in Canada, as we expect hundreds of thousands if not millions of workers to be at risk of negative health outcomes.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

We are unable to provide implications for policy and practice at this point but we hope that the results from this study will help define future protections for workers during extreme weather events. By identifying the worker groups that are at most risk of extreme weather exposure, we hope to further inform targeted intervention practices/policies. Previous CAREX analyses focused on cancer prevention have been cited in policy documents outlining how to protect workers from carcinogens in the workplace. For example, WorkSafeBC developed an enforcement program for sun safety based on work conducted by CAREX on solar UV radiation exposure. Additionally, the Government of Canada used CAREX estimates in policy documents regarding the banning of asbestos. Similar steps can be taken using these results. In addition, by highlighting the connection between these extreme weather events and climate change, we hope to make it clear that these events will happen more frequently and with greater severity in the future so it is important to make changes quickly.

KEY MESSAGES

Workers in certain industries and occupations may be at greater risk of the health impacts caused by climate change-related extreme weather events than others and the direct and indirect impacts may be more far-reaching than it seems. Individuals in outdoor occupations and those in occupations with limited or insufficient protection from weather events may be a priority for policy recommendations, but these recommendations may vary based on the health outcome, extreme weather event, and province in question.

PROJECT DETAILS

Title: Estimating Sex and Gender Differences in Heat Vulnerability in Montreal
Nominated Principal Investigator: Louise Pilote
Affiliation: McGill University
Team Members: Majid Ezzati, Colleen M. Norris, Yusheng Zhou
Keywords: Heat vulnerability, sex differences, gender factors, urban health, climate change
Contact: Louise Pilote, louise.pilote@mcgill.ca

RESEARCH PRIORITIES

This study addresses the critical issue of heat-related cardiovascular disease (CVD) mortality in an urban context, focusing on sex and gender differences in heat vulnerability. It aligns with the CPHO 2022 Report's emphasis on climate change adaptation and health equity. Focusing on estimating sex and gender differences in heat vulnerability, this project aligns closely with this priority of "Conduct intersectional analyses to better understand differential health-related risks, existing and compounding vulnerabilities and the impacts of climate change experienced by priority populations". As climate change rapidly intensifies, heat waves are becoming more frequent and severe, potentially increasing CVD-related deaths. Evidence suggests that women may experience different rates of heat-related CVD mortality due to physiological, social, and environmental factors. However, current heat vulnerability assessments often overlook sex and gender considerations in CVD outcomes. This research aims to fill this gap by developing a sex- and gender-sensitive Heat Vulnerability Index (HVI) for Montreal, assessing its effect modification on heat-CVD mortality associations, and exploring the relative importance of gender-related indicators in heat-CVD risk.

RESEARCH APPROACH

This study employs a two-stage approach:

1. Heat Vulnerability Index (HVI) Construction: The HVI will incorporate factors related to exposure, sensitivity, and adaptive capacity.
2. Heat-CVD Mortality Analysis: We will use a time series analysis with a case-crossover design to assess the association between heat and CVD mortality, and the effect modification by HVI. Specifically, we will employ a quasi-Poisson generalized linear model with a distributed lag non-linear model (DLNM) component to account for the non-linear and delayed effects of temperature on CVD mortality. Interaction term will be assessed to test for effect modification by heat vulnerability.

Data sources for this project include satellite imagery, census data, hospital admission data and health surveys. The study period focuses on summer time ranging May 1st to September 30th, in 2018-2022, which years effected by significant heat waves in Montreal.

The research team comprises experts in epidemiology, biostatistics, and health geography, ensuring a comprehensive approach to the complex issue of heat-CVD vulnerability. Health equity is integrated by considering various gender related factors, including social and demographic factors. The study applies an intersectionality lens by examining how sex and gender interact with other social determinants of health in the context of heat-CVD vulnerability.

KEY RESEARCH FINDINGS

The study is expected to reveal significant sex and gender differences in heat-related CVD mortality risk across Montreal. Anticipated findings include:

1. Identification of spatial patterns in heat vulnerability, highlighting areas where people may be at higher risk.
2. Quantification of the effect modification of the HVI on the association between heat and CVD-related mortality, potentially revealing differential associations for males and females.
3. Identification of specific gender-related factors that contribute to increased heat-CVD vulnerability.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

These findings will provide new insights into the sex- and gender-specific aspects of heat-CVD vulnerability, potentially challenging or validating existing evidence on sex differences in heat-related health risks.

This research has significant implications for urban planning, public health policy, and cardiovascular health management in Montreal and beyond. Key implications include:

1. Informing the development of targeted, sex and gender-sensitive heat mitigation strategies specifically aimed at reducing CVD mortality.
2. Guiding the allocation of resources for heat-wave preparedness, focusing on areas and populations at highest risk of heat-related CVD events.
3. Providing a methodology for integrating sex and gender considerations into climate change adaptation planning, particularly in relation to cardiovascular health.

Next steps involve disseminating findings to key stakeholders, including policymakers, public health practitioners, and cardiovascular health specialists. The sex- and gender-sensitive HVI methodology can be adapted and implemented in other urban areas facing similar climate-related cardiovascular health challenges. Future research opportunities include longitudinal studies to assess the effectiveness of gender-sensitive interventions in reducing heat-related CVD mortality.

KEY MESSAGES

- This study addresses gaps in understanding sex and gender differences in urban heat-related CVD mortality risk in an urban context.
- The research will assess the effect modification of a novel Heat Vulnerability Index on heat-CVD mortality associations in Montreal, with a focus of sex and gender perspective.
- Findings will inform targeted, equity-focused climate change adaptation strategies to reduce heat-related CVD mortality in urban settings.

PROJECT DETAILS

Title: Citizen Science Approaches in Mosquito Surveillance: Strengthening Capacity of Public Health and Climate Change Adaptation
Nominated Principal Investigator: Atanu Sarkar
Affiliation: Memorial University of Newfoundland
Team Members: Wendy Pons, Alaa Badawi, Antionette Ludwig, Lydia Ma
Keywords: Citizen science, mosquito, climate change, adaptation
Contact: Atanu Sarkar, asarkar@mun.ca

RESEARCH PRIORITIES

What is the issue? Citizen science helps to increase capacity for scientific research in areas where little capacity existed before while also increasing public knowledge on the health risks of mosquito vectors. But, there has yet to be an evaluation of the validity or sustainability of different citizen science approaches to mosquito surveillance, or of the efficacy of these approaches in communicating mosquito-borne disease risks to the public.

Research opportunities from CPHO report 2022 - Intersectoral action on climate change and the determinants of health AND Building knowledge on climate-health connections

Why is it important? Citizen science approach can improve mosquito surveillance in under-served areas.

RESEARCH APPROACH

Methods:

1. Knowledge Synthesis by systematic review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.
2. Creating a toolkit with contributions from an Expert Advisory Group.

Key people involved: project team members, research assistants, external experts

KEY RESEARCH FINDINGS

For objective 1: 918 abstracts were screened, from which 133 full-text articles were reviewed for inclusion. From those 65 articles were included for review.

Expert advisory group meeting in progress

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

In progress

KEY MESSAGES

In progress

OUTPUTS, PRODUCTS & IMPACT

In progress

PROJECT DETAILS

Title: 'Build it so they will come.' Understanding lived experience to catalyze active transportation as a climate change intervention
Nominated Principal Investigator: Kate Storey
Affiliation: University of Alberta,
Team Members: Karen Lee (Co-I), Candace Nykiforuk (Co-I), Robert Summers (Co-I), Collaborators: Kayla Atkey, Michael Janz, Andrew Knack, Tim Konoval, Robert Lipka, Genevieve Montemurro, Pablo Orozco, Stephen Raitz, Ashley Salvador, Nathan Smith, Madeleine Stout, Laura Thue, Rhonda Toohey, Brian Torrance
Keywords: Active transportation, climate change, healthy cities, qualitative methods, implementation science
Contact: Kate Storey, kate.storey@ualberta or Genevieve Montemurro, grs@ualberta.ca

RESEARCH PRIORITIES

Active transportation (AT) is an equitable and inclusive population health intervention which promotes health while also mitigating climate change. Canada's National AT Strategy states that increasing the modal share for AT is at the heart of Canada's climate plan. Working at the 'settings' level of a city ensures all individuals are reached, including those most vulnerable. AT promotes physical and mental health, while also providing social, economic, and environmental benefits. In 2022, Edmonton City Council approved an investment of $100M (2023-26) towards the Active Transportation Plan (AT Plan) – one of the most significant population health and climate change interventions in the City's history. To empirically support the implementation of this AT and climate change intervention in Edmonton, our research is using novel implementation science research which can also inform other Canadian AT interventions. Our objectives align directly with 'research and knowledge generation opportunities' in the CPHO 2022 companion document under 'public health and climate change interventions.' Our research explores Edmonton 'culture' as well as upstream factors that impact AT use. We seek to understand Edmontonians' lived experiences and support and inform design aspects of the AT Plan to promote successful implementation. This research fills an important implementation science gap and informs population health interventions to mitigate climate change.

RESEARCH APPROACH

Our research built on our team's longstanding partnerships and previous CIHR-funded Healthy Cities project (ICS: 429954) and was co-developed with partners and collaborators to ensure findings act as levers to innovate, improve and inform the AT Plan implementation and adaptation. Our diverse team includes city councilors and staff, researchers, and collaborators in health, government and education. Project partners were engaged throughout the research process from initial conceptualization to data generation and interpretation. We applied a primarily qualitative approach, relying on implementation science and the principles of community engaged research. We focused on two objectives: 1) to explore upstream factors that affect adaptation and implementation of the AT Plan; 2) to innovate and support design aspects of the physical and built environment by informing the AT Plan implementation through an equity lens (i.e., what gets built, where, and for whom). Our study design prioritized youth voice (e.g., through Photovoice and draw-and-tell interviews) centering lived experiences across the lifespan and across diverse city wards (e.g., through Go-Along interviews). Through document and media analysis, we assessed Edmonton AT-related public discourse/ 'culture' to understand key levers for adaptation, education, and encouragement (i.e., 'how to build it to ensure they will come').

KEY RESEARCH FINDINGS

A key finding to date has been the importance of relationship building and allowing sufficient time to conduct healthy cities research. Our core team of collaborators has been critical in ensuring that our research remains relevant and aligns with implementation timelines and needs. Prioritizing knowledge mobilization and the ongoing and collaborative nature of this work has been instrumental in generating relevant evidence and nurturing partnerships. This project prioritized youth voice which our partners valued because historically this perspective has been difficult to capture through traditional public engagement sessions. Data generation with youth emphasized the importance of 1) AT-friendly infrastructure, 2) social connectedness & exploration, and 3) safety for self and belongings. Dimensions of connectedness fostered by AT journeys included connection to self (e.g., mastery/independence), to others, and the natural environment (e.g., "I like the fresh air, fresh grass and there's a big hill here where I can go sledding when it snows" P37, Age 12). Our findings also reinforced/confirmed priorities that were being set within the early implementation of the AT network (i.e., availability and reliability of AT infrastructure, safety from traffic, secure bike parking at schools and other locations).

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

Edmonton's greenhouse gas emissions are amongst the highest (per capita) in the world, with transportation accounting for 31% of emissions. This research provides necessary qualitative evidence to support and inform the $100M AT Plan investment to promote successful implementation of this climate change and public health intervention. This research has implications locally, provincially, and nationally for partners working to better improve and expand AT networks in urban municipalities, prioritizing safe, active, liveable and more sustainable cities. Through our media and document analysis, we have identified important 'levers' to promote AT education and uptake. Through qualitative data generation with citizens, we are generating empirical knowledge about AT use that incorporates lived experience, local context, and equity considerations (i.e., what gets built, where, and for whom?) This includes the identification of needs, gaps, and opportunities for AT from the perspectives of youth and adults across the city. Edmonton is one of many Canadian cities that is experiencing significant population growth alongside increased densification and an urgent need to reduce emissions. Ongoing knowledge mobilization activities developed with project partners (government, health, education) is applying the evidence generated, to inform and support AT network implementation in Edmonton and in other Canadian urban municipalities.

KEY MESSAGES

- Active transportation (AT) is an equitable and inclusive population health intervention which promotes health while also mitigating climate change. This research explores Edmonton AT 'culture' as well as upstream factors that impact AT use. This research mobilizes knowledge about AT use that incorporates lived experience, local context, and equity considerations (i.e., what gets built, where, and for whom?).
- Through qualitative data generation with Edmontonians, including youth, and examination of AT 'culture' and discourse, we have identified needs, gaps, and opportunities relating to AT network implementation (e.g., existing and planned expansion) and key levers to support education and encouragement for AT modes, and increased modal shift.
- The partnership model applied in this study blends best practices in urban transportation planning and sustainable mobility, with novel implementation science research. City partners (e.g., councilors, engineers, planners, communications and other city staff) have clear knowledge and expertise in the planning and design of AT infrastructure and facilities, and city-led community engagement has been critical in informing the initial AT Plan. Locally informed, context-specific qualitative research contributes to successful implementation.

Specifically, collaborative knowledge mobilization between research and city partners ensures the relevance and applicability of research findings, filling gaps that may otherwise remain unanswered.

OUTPUTS, PRODUCTS & IMPACT

Output 1: Storey, K.E., Bouchard, D., Nazeem, M. Healthy Cities Panel, Public Health 2024, Canadian Public Health Association. April 23, 2024.

Healthy cities and implementation science.

Output 2: Montemurro, G., MacNeil, M., Solanki, S., Klassen, D., Storey, K.E. (2024). Draw me a picture of your journey: Understanding active school travel experiences among students in Edmonton, Alberta. Shaping the Future 2024. Jasper, Alberta, Canada.

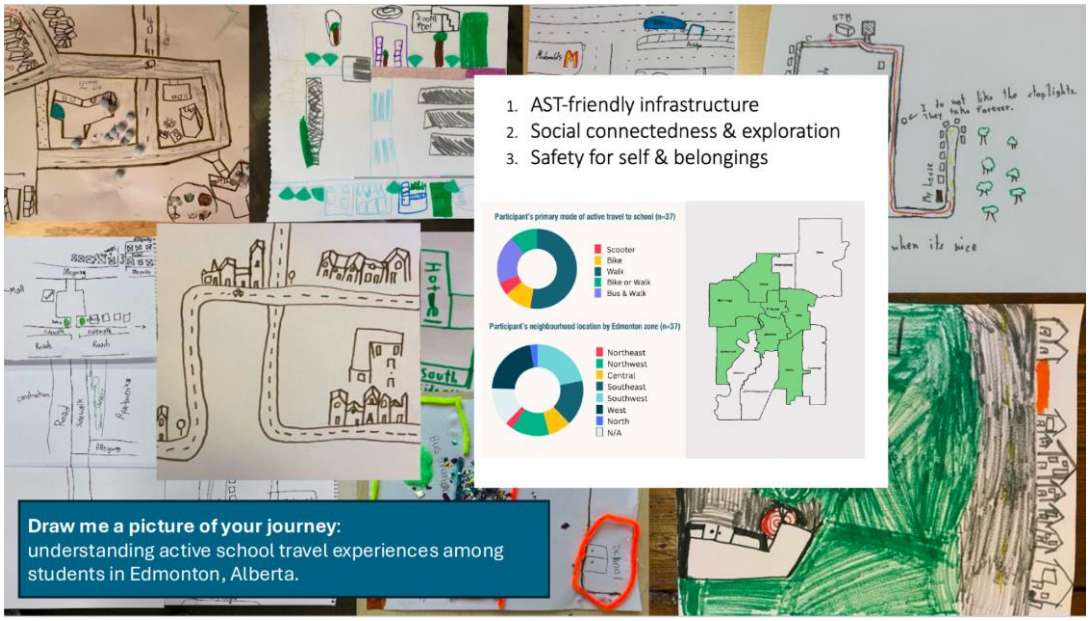
Active travel and school partnerships.

Output 3: Storey, K.E., Montemurro, G., (2024). 'Build it so they will come.' Understanding lived experience to support Edmonton's bike plan implementation. Winter Cycling Congress 2024. Edmonton, Alberta, Canada.

Active transportation and municipal partnerships.

Image 1: Building relationships and sharing knowledge to promote healthy, safe, active, liveable and more sustainable cities.

Image 2: Draw me a picture of your journey: understanding active school travel experiences among students in Edmonton, Alberta.



PROJECT DETAILS

Title: LGBTQIA+ Communities and Climate Change: An Exploratory Study
Nominated Principal Investigator: Shelby Yamamoto
Affiliation: University of Alberta
Team Members: Lowe, S.L., Denier, N., Pabayo, R., Wu, H., St. Dennis, F.
Keywords: climate change, LGBTQIA+, health, weather, resilience
Contact: Shelby Yamamoto, shelby.yamamoto@ualberta.ca or Sammy Lowe, salowe@ualberta.ca

RESEARCH PRIORITIES

We have already experienced the effects of climate change, which have been linked heart and lung conditions, poorer mental health, infections, and injuries. However, the effects of climate change do not affect everyone equally. Social, economic, and other factors can compound these health risks. Among those facing compounded climate change risks are people who identify as LGBTQIA+. LGBTQIA+ people face challenges such as exclusion, bias, and stigma that can worsen climate change health risks.

Unfortunately, very little research so far has included LGBTQIA+ communities. The climate change and health risks, needs, experience, and resilience of LGBTQIA+ communities is largely unknown, which is an important knowledge gap. As such, this study aimed to expand on ongoing work with people self-identifying as members of the LGBTQIA+ community to explore: (1) climate change and health experiences and resilience, (2) health outcomes tied to weather events and disasters, and (3) potential pathways that affect the relationships between weather, disasters, and health in British Columbia. Our goals were to report on climate change and health risks, highlight gaps in our knowledge, identify areas of resilience, promote research in this area, and share the stories of people from the LGBTQIA+ community in British Columbia.

RESEARCH APPROACH

A mixed method approach was used to address these objectives. For objective 1, we conducted a series of focus group discussions and interviews to explore LGBTQIA+ community climate change experiences and resilience. Data is being analyzed using reflexive thematic and content approaches. To investigate weather- and disaster-related pathways and health risks in LGBTQIA+ communities, we are using weather data from the Canadian Urban Environmental Health Research Consortium, and sociodemographic, health, and other data from the 2021 Canadian Census, and the Sex Now and Our Health surveys. Multilevel modelling and spatial and mediation analyses are planned. Representatives from the LGBTQIA+ community, the BC Ministry of Health, and the Queer and Trans Health Collective are helping to guide this work.

Sex and gender are critical components of this work and is incorporated at all stages of this research, including proposal development, study design, data collection, analysis plans, interpretation, dissemination, and other knowledge translation activities. The project and findings will be designed, guided, informed, interpreted, and disseminated collectively in partnership with the team, knowledge users, and LGBTQIA+ advisory group. Intersectionality is a key part of this work, which has been guided by the findings to emerge from the focus group discussions and interviews.

KEY RESEARCH FINDINGS

Main health impacts experienced across LGBTQIA+ communities in British Columbia include: adverse mental health, including more immediate impacts (e.g., stress linked to high heat, displacement, and

wildfires; anxiety from consuming disheartening climate-related media) as well as indirect and longer-terms impacts (e.g., existential fear and hopelessness; concerns of downstream impacts from food and water source disruptions); reduced opportunity for physical and outdoor activity; worsening of respiratory conditions; and restricted mobility and isolation during extreme weather events. In addition, trans and non-binary participants discussed unique health impacts related to the gender-affirming practices of chest binding and hormone replacement therapy, as these activities increase their susceptibility to overheating and respiratory difficulties. As one participant mentioned, periods of high heat and poor air quality have forced them to choose between having their gender affirmed and avoiding respiratory distress and heat stroke.

Participants also stressed that 'formal' networks, including the healthcare system and government organizations, did not provide them with adequate preventative or mitigative information or resources to respond to the unique climate and environmental health impacts that they face. Rather, their strategies and resources to adapt to these impacts come almost solely from informal community networks of other LGBTQIA+ individuals with shared lived experiences.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

The lack of climate change and health research considering LGBTQIA+ identifying populations is important gap in the 2022 Intergovernmental Panel on Climate Change and Chief Public Health Officer of Canada's reports. Key goals of this work were to promote climate change and health research inclusive of LGBTQIA+ people; investigate intersectional LGBTQIA+ climate change and health risks; identify critical research needs; and share the overlooked experiences of people in the LGBTQIA+ community with the aim of informing the development of more inclusive and equitable strategies. Findings indicate that LGBTQIA+ needs are not being considered in this space, which is increasing climate change health risks and hindering the building of resilience.

This is an emerging, understudied area of research. Population-based strategies need to be aware of and include the needs of LGBTQIA+ populations. Community outreach and partnerships will be key to engaging, involving, and reaching people to reduce risks. Future work in this area should include the scaling up of this research to other areas of Canada, the capturing of data around perceptions of climate change and health, the development of policies that consider the needs and scaffold onto existing strengths of LGBTQIA+ populations, and the exploration of community-focused knowledge translation approaches.

KEY MESSAGES

- This work addresses the dearth of information on the climate change and health risks, needs, experiences, and resilience of LGBTQIA+ communities. These communities have historically been understudied and underserved, facing unique systemic barriers like exclusion, bias, and stigma that can exacerbate climate-related health risks. By exploring the climate-health links within and across LGBTQIA+ communities in British Columbia, we aim to identify areas for targeted research and policy, as well as existing resiliency that can be leveraged to promote health and climate equity.
- Climate change and environmental exposures are linked to various health impacts in LGBTQIA+ communities, including mental health challenges, restricted physical activity, isolation, and poor respiratory outcomes. Trans and non-binary individuals face unique respiratory and temperature-related vulnerabilities due to gender-affirming practices like chest binding and hormone therapy. Currently, LGBTQIA+ individuals rely on informal community networks for climate-health information and resources, due to a lack of culturally competent resources from healthcare providers.

- Findings suggest that while LGBTQIA+ communities are experiencing unique climate-related health impacts, their needs are not fully considered in climate and health spaces. Future work should meaningfully include and center LGBTQIA+ voices in research, policy, and interventions, addressing the historic and ongoing systemic barriers they face.

OUTPUTS, PRODUCTS & IMPACT

In addition to forthcoming research manuscripts, reports, and presentations, we are developing community-focused outputs include: a 'tip sheet' of prevention and impact mitigation strategies shared by members of the community; a climate change and health themed drag show to invite community in to discuss the findings from our work in an engaging and accessible way; and, a collection of climate hope and resilience stories to share back to community to highlight existing strengths and work being done by LGBTQIA+ communities in the climate change and health spaces.

Impact: While this work is ongoing, many participants have expressed that being involved in this research process has provided them with an opportunity to engage meaningfully in discussion and action in the climate health space in a way that centers their voices and experiences in a non-extractive way.

PROJECT DETAILS

Title: An Intersectoral and Community-based Participatory Research Approach to Transforming Protection for Priority Populations from Extreme Temperatures (short: 'Extreme Temperature Services Study')
Nominated Principal Investigator: Liv Yoon
Affiliation: University of British Columbia
Team Members: Abby Zhou, Ashley Wan, Nicole Chin, Lam Liu, Michelle Yeung, Erika Siao, Shruti Chakravarty, Aneesha Sran, Chaimae Chouiekh, Eduardo Rosales, Thanh Le; Knowledge User Partners: BC Ministry of Health (Jonathan Carroll); BC Centre for Disease Control (Sarah Henderson, Alexis Crabtree), Fraser Health Authority (Emily Newhouse), Vancouver Coastal Health (Michael Schwandt)
Keywords: cooling centres, warming centres, seniors, housing, right to cool
Contact: Liv Yoon, liv.yoon@ubc.ca

RESEARCH PRIORITIES

With extreme temperatures becoming more intense and frequent due to climate change, their disproportionate impacts on people with prominent vulnerability – such as our target population of people who are unhoused, or live in low-quality subsidized housing (e.g., single room occupancy units), including seniors – warrant urgent attention. While there are extreme temperature shelters and services available, they are underutilized in metro Vancouver. With this background, this trans-sectoral community-based participatory research project aims to:

1. improve access to and uptake of existing services and resources, and;
2. seek creative and transformative alternatives that can protect people facing highest risk from extreme temperatures.

RESEARCH APPROACH

We are taking a community-based participatory research (CBPR) approach, recognized for its centring of community to address issues of health inequities resulting from socioeconomic and other structural disadvantage and discrimination – which aligns well with the need to 'prioritize equity and community in climate actions' as outlined in the Chief Public Health Officer (CPHO) report. With recruitment facilitation from our community partners, we will conduct in-depth, semi-structured interviews with two different groups: 1) target populations (those impacted by poor housing security and quality, including seniors) who have, or have not, used extreme temperature shelters; and 2) service providers of extreme temperature shelters. Confirmed and expected support from a range of community organizations will allow us to integrate diverse types of knowledge and expertise to understand intersectional experiences, and ultimately lead to contextually and culturally appropriate actions. By amplifying their experiences and knowledge, and enhancing their access to decision makers, we are leveraging a public health intervention as a means to prioritize equity and community empowerment. Interview data will be analyzed using thematic analysis, together with community partners.

KEY RESEARCH FINDINGS

Our research identified key barriers and experiences of both service users and providers regarding cooling centres. Service users reported significant concerns about safety, stigma, hygiene, and the perceived necessity of these centres. Issues like discomfort with unfamiliar environments, language barriers, and a sense of unnecessary government intervention were prevalent. Hygiene concerns were particularly acute for those with underlying health conditions. Service providers echoed some user concerns about comfort and accessibility but highlighted their efforts in communication and adapting

services, despite operational challenges such as insufficient staffing and unpredictability of extreme heat events. Operational barriers, including insufficient information, lack of activities, and restrictive hours, were significant deterrents for users. Infrastructural issues, like inadequate transportation and geographic disparities in cooling centre locations, further compounded access challenges. Both groups recognized the need for improved communication, better facilities, and more inclusive planning to address these barriers effectively.

NEXT STEPS: IMPLICATIONS FOR POLICY & PRACTICE

To effectively address the barriers identified in our study, policy and practice should focus on leveraging existing, familiar public spaces and enhancing community-based interventions. Rather than constructing new, standalone cooling centres, efforts should be redirected towards improving and utilizing spaces that people already frequent, such as malls, parks, and grocery stores. These locations can be adapted to offer cooling relief more effectively, particularly for those who might otherwise avoid formal cooling centres due to stigma or misinformation. Additionally, community organizations should play a key role in disseminating information and ensuring accessibility, especially for marginalized groups who may face barriers to traditional cooling centres. This includes enhancing outreach programs and ensuring transportation options are available to those in need. It is also crucial to address the diverse needs within cooling centres by designing spaces that cater to different groups, thus avoiding potential stigma and promoting inclusivity. Strengthening tenant protections to improve housing quality and expanding subsidized cooling options for residences will also be essential in mitigating heat risks at the home level. By focusing on these strategies, we can create a more resilient and responsive network to protect individuals during extreme heat events.

KEY MESSAGES

- Integrate Cooling Solutions in Familiar Spaces: Enhance accessibility and comfort by using existing public spaces like malls and parks for cooling, rather than relying solely on standalone cooling centres.
- Address Perceived vs. Actual Availability: Bridge the gap between what people perceive as available and what is actually provided, focusing on overcoming barriers such as safety concerns, hygiene, and operational limitations.
- Enhance Comminges-Based Interventions: Utilize existing social networks and community programs to spread information about cooling resources and support, particularly for marginalized and isolated individuals.
- Design Inclusive Cooling Centres: Create specialized areas within cooling centres to cater to diverse needs, including providing separate spaces for different priority groups to address stigma and ensure inclusivity.
- Improve Housing Quality and Tenant Protections: Strengthen residential cooling options and tenant rights to ensure that individuals can stay cool at home, addressing issues such as inadequate indoor cooling and landlord-related challenges.
- Ensure Consistency and Clear Communication: Standardize operations across cooling centres, improve communication about services and hours, and provide reliable transportation options to reduce confusion and increase accessibility.
- Support Community Capacity Building: Invest in programs that bolster local community resilience and enhance social capital to better respond to extreme heat events.

OUTPUTS, PRODUCTS & IMPACT

NCCEH Webinar on May 30, 2024: 'Community-based participatory research approach to transforming protection for priority populations from extreme temperatures' - https://ncceh.ca/events/upcoming-webinars/community-based-participatory-research-approach-transforming-protection

'Right to Cool'; Knowledge Exchange on May 31, 2024 - https://climatejustice.ubc.ca/news/recap-extreme-temperature-services-%E2%80%8B-right-to-cool-knowledge-exchange/#:~:text=By%20addressing%20these%20challenges%2C%20the,to%20adequate%20cooling%20and%20protection. Image 2: Study Infographic

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