

# Environments and Health Research Summit

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## SUMMARY

The **Environments and Health Research Summit**, held in **Ottawa, ON, on April 17 and 18, 2023** served as the capstone **knowledge translation event** of the **Environments and Health Signature Initiative (EHSI)** spearheaded by the Canadian Institutes of Health Research (CIHR). This two-day event was an important opportunity to reflect on the initiative's highlights, to take stock of the state of environments and health research in Canada and to explore a path forward considering current Canadian issues, challenges and potential strengths. The Summit largely signified the completion of the EHSI, which was an important strategic investment in the interdisciplinary nature of environments and health research.

The Summit was a fully hybrid event including multiple advance webinars hosted by the Canadian Urban Environmental Health Research Consortium (CANUE) and the National Collaborating Centre for Environmental Health (NCCEH). Readers of this report who want to learn more about the EHSI work and the Summit are directed to publicly available [video recordings](#).

The 18 projects funded by CIHR's EHSI were diverse in their team make-up and partnerships as well as in their research scope. In coming together in the context of the Summit, each team was able to expand upon their key results and emphasize that the team-based science with a five year funding horizon were strengths of the EHSI. Relative to other CIHR funding opportunities, the longer time of the EHSI projects enabled teams and partnerships to more fully evolve and achieve their goals. CIHR's *a priori* recognition of the complexity of the issues and the nature of the research to be done, which led to cross-cutting research themes and an emphasis on building intersectoral partnerships, were also EHSI strengths appreciated by the research teams and the Summit participants.

Several of the research teams were able to explore mechanisms for successful intersectoral partnerships, crucially setting the stage for moving science to action. While partnerships differ for multiple reasons, they require an investment in time and effort to bring multiple stakeholders together across government, industry, non-profit, media, and others to form meaningful connections. Co-development of research questions and co-production of evidence tailored to local contexts helps build such connections ultimately helping to facilitate the uptake of results and commitment to follow-up/evaluation. Additionally, it is important to integrate different perspectives, particularly Indigenous knowledge, in future environments and health research, again through partnerships that establish lasting connections.

Looking forward, development of similar research programs, which are urgently needed, should further consider what in the EHSI worked well and why. This implies that additional follow-up on the experience would be valuable in guiding future strategies to advance environments and health research. In light of the above observations, options for moving the field forward were discussed at the Summit and five recommendations were made:

1. Hold future Environments and Health Summits
2. Launch an effort to scale what was learned in the EHSI in terms of novel measurement methods and community engagement processes.

3. Improve coordination to document and direct interdisciplinary environments and health research.
4. Develop flexible funding mechanisms.
5. Create a high-profile position for a children's health advocate.

With the completion of the EHSI, there is concern for what comes next. Summit participants and sponsors came together in Ottawa understanding that there is no follow-up initiative. This situation must be addressed with an even bigger effort given awareness among scientists and the public of the central role our environment plays in health and the risks posed by climate change and biodiversity loss. Acting on the five recommendations above would be a good start.

CIHR has led the way through its EHSI but should not be solely responsible for advancing a future Canadian initiative. Research leading to solutions spanning the whole of government and the whole of society is necessary and this spans well beyond CIHR and requires political will. Conditions are ripe today for moving quickly on a fully funded Canadian Environments and Health research strategy with recent developments such as the ascension of Bill S5 recognizing Canadian's right to a healthy environment and the major environmental challenges upon us such as 2023's wildfire season.

One-off initiatives will fall short of what is needed to address the challenges of today and those ahead. In reality, **a future Canadian institute on environments, health and well-being would be best-positioned** to effectively fund the work needed to support Bill S5's amendments to the Canadian Environmental Protection Act, including new approaches to chemicals management through a public health lens, to improve healthcare to prevent disease and reduce its environmental footprint and, broadly to understand the effects of large-scale environmental change and how to best address the challenges given the complexity of the causes and solutions and the value of Indigenous ways of knowing.

Within CIHR, funding mechanisms could be established that **ensure that environmental factors are integrated into a larger portion of its ongoing health research portfolio**. This strategy would potentially challenge a more diverse range of researchers to recognize and evaluate how environments bridge their traditional areas of health research. With the present funding landscape several key elements were identified at the Summit for future programs:

1. Create funding criteria that ensure *environment* becomes a theme that all CIHR institutes address holistically and substantively as part of their interests and priorities.
2. Offer a range of grant types (small, medium and large) to provide opportunities for early- and mid-career researchers, as well as for established researchers with large networks.
3. Establish two-stage funding applications and/or extend the funding period to allow time for interdisciplinary research teams to solidify and establish and capitalize on partnerships that lead to sustained, action-oriented connections.
4. Foster a data platform that can host and make available data collected through research projects but that is not dependent on time-limited research-funded grants.

Attendees at the Summit recognized the need for regular opportunities for cross-disciplinary dialogue pertaining to environments and health issues, since no platform for such knowledge sharing exists in Canada. Despite Canada's considerable strengths in this area, this has led

to a fragmented landscape. To this end, a much broader accounting of recent activities and investments in environments and health research in Canada would help identify critical gaps while contributing to a more-integrated network of researchers and stakeholders.

## RÉSUMÉ

Le **Sommet de la recherche sur la santé et l'environnement**, qui s'est tenu à **Ottawa (Ontario) les 17 et 18 avril 2023**, a constitué l'événement phare en matière d'**application des connaissances de l'Initiative phare Environnements et santé (IPES)**, dirigée par les Instituts de recherche en santé du Canada (IRSC). Cet événement de deux jours fut une occasion importante de se pencher sur les faits saillants de l'IPES, de faire le point sur l'état de la recherche sur les environnements et la santé au Canada et de réfléchir à la voie à suivre en fonction des enjeux, des défis et des atouts potentiels du Canada. Le sommet marquait en grande partie l'achèvement de l'IPES, qui constituait un investissement stratégique important dans le domaine de la recherche interdisciplinaire sur les environnements et la santé.

Le sommet était un événement entièrement hybride comprenant plusieurs webinaires préalables organisés par le Consortium canadien de recherche en santé environnementale urbaine (CANUE) et le Centre de collaboration nationale en santé environnementale (CCNSE). Les lecteurs de ce rapport qui souhaitent en savoir plus sur les travaux de l'IPES ainsi que sur le sommet sont invités à consulter les [enregistrements vidéo](#) accessibles au public.

Les 18 projets financés par l'IPES des IRSC étaient très variés, tant sur le plan de la composition des équipes et des partenariats que sur celui de la portée de la recherche. En se réunissant dans le cadres du Sommet, chaque équipe a pu présenter ses principaux résultats. Les équipes ont souligné que la recherche en équipe interdisciplinaire et l'horizon de financement de cinq ans constituaient des points forts de l'IPES. Par rapport à d'autres possibilités de financement des IRSC, la durée plus longue des projets IPES a favorisé l'évolution des équipes et des partenariats et leur a permis de mieux réaliser leurs objectifs. La reconnaissance *a priori* par les IRSC de la complexité des enjeux et de la nature de la recherche à effectuer, qui a mené à des thèmes de recherche transversaux et à une attention particulière sur l'établissement de partenariats intersectoriels, a également été une force de l'IPES reconnue par les équipes de recherche et les participants au Sommet.

Plusieurs équipes de recherche sont parvenues à explorer les processus permettant d'établir des partenariats intersectoriels fructueux, préparant ainsi le terrain pour passer de la science à l'action. Bien que les partenariats diffèrent pour de multiples raisons, ils nécessitent néanmoins un investissement en temps et en ressources pour réunir de multiples parties prenantes au sein des gouvernements, de l'industrie, des organisations à but non lucratif, des médias et autres, en vue d'établir des liens significatifs. L'élaboration conjointe de questions de recherche et la coproduction de données probantes adaptées aux contextes locaux contribuent à l'établissement de ces liens. En fin de compte, cela facilite la diffusion et la mise en application des résultats, ainsi qu'un engagement en matière de suivi et d'évaluation. En outre, il est important d'intégrer différentes perspectives, en particulier les connaissances

autochtones, dans les travaux de recherche futurs sur l'environnement et la santé. Une fois encore, cela passe par des partenariats qui permettent d'établir des liens durables.

Considérant l'avenir, l'élaboration de programmes de recherche similaires, dont le besoin est urgent, devrait davantage tenir compte des éléments de l'IPES qui ont bien fonctionnés et des raisons de leurs succès. Cela implique qu'un suivi supplémentaire de cette initiative serait très utile pour orienter les stratégies futures visant à faire progresser la recherche sur les environnements et la santé. Sur la base des observations ci-dessus, des pistes pour faire progresser le domaine ont été discutées lors du sommet et cinq recommandations ont été formulées:

1. Organiser de futurs sommets sur l'environnement et la santé
2. Lancer un effort pour étendre les acquis de l'IPES en termes de nouvelles approches de mesure et de processus d'engagement communautaire.
3. Améliorer la coordination pour documenter et diriger la recherche interdisciplinaire sur les environnements et la santé
4. Développer des mécanismes de financement flexibles
5. Créer un poste de haut niveau pour un porte-parole de la santé des enfants

La fin de l'IPES suscite des inquiétudes quant à la suite des choses. Les participants au sommet et les commanditaires se sont réunis à Ottawa en sachant qu'il n'y aurait pas de suite à cette initiative. Cette situation doit être abordée avec un effort encore plus important, étant donné que les scientifiques et le public sont conscients du rôle central que joue notre environnement dans la santé et des risques posés par le changement climatique et la perte de biodiversité. Agir sur les cinq recommandations ci-dessus serait un bon début.

L'IRSC a ouvert la voie avec son IPES, mais ne devrait pas être le seul organisme responsable de l'avancement d'une éventuelle initiative canadienne. Des solutions couvrant l'ensemble du gouvernement et de la société sont nécessaires, ce qui va bien au-delà des IRSC et exige une volonté politique. Les conditions sont aujourd'hui réunies pour avancer rapidement sur la voie d'une stratégie de recherche canadienne sur la santé et l'environnement dotée d'un financement intégral compte tenu des développements récents, tels que l'adoption du projet de loi S-5 reconnaissant le droit des Canadiens à un environnement sain, et les grands défis environnementaux qui nous attendent, tels que la saison des incendies de forêt de 2023.

Les initiatives ponctuelles ne suffiront pas à relever les défis d'aujourd'hui et de demain. Dans les faits, un futur **Institut canadien de l'environnement, de la santé et du bien-être serait le mieux placé** pour financer efficacement les travaux nécessaires pour soutenir les amendements du projet de loi S-5 à la Loi canadienne sur la protection de l'environnement, y compris les nouvelles approches de la gestion des produits chimiques dans une optique de santé publique. Un tel institut permettrait également d'améliorer le système de santé afin de prévenir les maladies et de réduire son empreinte environnementale et, plus généralement, de comprendre les effets des changements environnementaux à grande échelle et les meilleurs moyens de relever ces défis, compte tenu de la complexité des causes et des solutions et de la valeur des modes autochtones d'acquisition du savoir.

Au sein des IRSC, des mécanismes de financement pourraient être mis en place pour **veiller à ce que les facteurs environnementaux soient intégrés dans une plus grande partie de leurs programmes de recherche en santé actuels**. Cette stratégie pourrait inciter un éventail plus diversifié de chercheurs à reconnaître et à évaluer la façon dont l'environnement rejoint leurs champs de recherche traditionnels en matière de santé. Compte tenu du contexte actuel de financement, plusieurs éléments clés ont été identifiés lors du sommet pour les programmes futurs:

1. Créer des critères de financement qui garantissent que l'environnement devienne un thème que tous les instituts des IRSC abordent de manière holistique et substantielle dans le cadre de leurs activités et de leurs priorités.
2. Offrir une gamme de types de subventions (petites, moyennes et grandes) afin d'offrir des possibilités aux chercheurs en début et en milieu de carrière, ainsi qu'aux chercheurs établis disposant de vastes réseaux.
3. Établir des demandes de financement en deux étapes et/ou prolonger la période de financement afin de laisser le temps aux équipes de recherche interdisciplinaires de se consolider et d'établir et d'exploiter des partenariats qui aboutissent à des partenariats durables et orientés vers l'action.
4. Favoriser la mise en place d'une plateforme de données capable d'héberger et de mettre à disposition les données collectées dans le cadre de projets de recherche, mais qui ne dépende pas de subventions de recherche à durée limitée.

Les participants au sommet ont reconnu la nécessité de fournir régulièrement des occasions de dialogue interdisciplinaire sur les questions d'environnement et de santé, étant donné qu'il n'existe au Canada aucune plateforme permettant un tel partage des connaissances. Malgré les atouts considérables du Canada dans ce domaine, le paysage est fragmenté. À cette fin, un bilan beaucoup plus large des activités et des investissements récents dans la recherche sur les environnements et la santé au Canada contribuerait à identifier les lacunes importantes tout en favorisant la mise en place d'un réseau plus intégré de chercheurs et de parties prenantes.

## BACKGROUND

The importance of both nature and nurture on individual and population health is a well known principle. Nurture is broadly anything related to the environment implying that health and well-being are intimately linked to our environment. Clearly, awareness of the critical role the environment plays in the health of Canadians is not new to CIHR, yet there has never been a mechanism within the CIHR mandate and structure to advance, on an ongoing basis, Canadian science on environmental health. This is despite there being considerable Canadian expertise on the subject, ongoing interest in the research community and a high value Canadians place on a clean environment, at least partially because of nearly unanimous recognition that our health is affected by our environment.

The Canadian health science community has long looked south of the border to the U.S. National Institutes of Health (NIH) and its specific support, since 1966, for the National Institutes of Environmental Health Sciences (NIEHS) and asked why there is no Canadian parallel. In 2022, the NIEHS had a grant funding stream of USD \$931.1 million ([Buse et al., 2023](#)). Since 2000, European Union members have funded €2.4 billion on research focused on environmental drivers of health and well-being ([Buse et al., 2023](#)). Climate change, which is one of several pressing environmental issues, is perhaps the most concerning environmental issue of today, further establishing the importance of understanding and addressing its current and future impact on health. Since 1993, the prestigious journal, *The Lancet*, has worked to reveal climate change to be the [biggest global health threat of the 21st century](#), and also a tremendous opportunity to tackle the social and environmental determinants of health.

Clearly, there has and continues to be considerable Canadian research on environmental health. However, this work is spread among many projects supported by different CIHR Institutes, across the Tri-Council, within various federal and provincial ministries, such as Health Canada and the Public Health Agency of Canada, and embedded in untold numbers of other research efforts pertaining to the environment throughout Canada. This work has supported the development of many essential public health and environmental policies and enabled Canada to contribute on the world stage. However, this highly dispersed nature of the environment and health efforts in Canada, which is not unique to Canada, makes it difficult to appreciate the level of investment being made. More-critically, it makes it difficult to effectively translate the knowledge being created towards solutions or policies, to think strategically about whether the most-pressing needs are being met, what gaps exist in knowledge and to have the foresight needed to prepare for future challenges.

To its credit, CIHR launched its Signature Initiative on Environments and Health in 2016, clearly signalling that a more-focused program of research was needed. This initiative, the EHSI, terminated in 2023 with no planned follow-up. In April 2023, key contributors to the EHSI research projects, other experts in environment and health along with multiple stakeholders gathered at an Environments and Health Summit in Ottawa to look back on the EHSI accomplishments but also forward to potentially inform future Canadian initiatives.

The purpose of this report is to document how the Environments and Health Research Summit was organized and what was learned in bringing participants together, including



representatives from the 18 research teams, public health organisations, community and advocacy organisations, and key government agencies.

## The EHSI Initiative

### Developing the EHSI

The EHSI was co-led by the CIHR Institutes of Population and Public Health and Infection and Immunity in partnership with the Institutes of Circulatory and Respiratory Health; Human Development, Child and Youth Health; Nutrition, Metabolism and Diabetes. Collaborating institutes included the Institutes of Gender and Health; Aging; and Indigenous Peoples Health.

In spring 2013, the Canadian Institutes of Health Research organised **the Environments and Health National Forum** for academic and government-based researchers and government agencies to identify opportunities for interdisciplinary environments and health research. In response to feedback received at this forum, as well as feedback from **the Measuring Environmental Exposures Workshop** in November 2011 and **the Environments, Genes, and Chronic Disease Workshop** in February 2012, CIHR opted to take a nexus approach. The purpose for this approach was to signal the importance of the interconnections between human health and environmental exposures, and to examine the complexity of these interconnections and interactions in both etiological and prevention studies. Additionally, a nexus approach highlights the interdependence of actions taken by multiple sectors and the necessity of cross-sector collaboration in tackling environmental problems. The approach can lead to "improved overall resource use efficiency, sustainable resource management, and equitable benefit sharing" (Stockholm Institute, 2011).

The nexus areas in the EHSI were:



**Agri-food:** Food production, for domestic use and export, is an important pillar of the Canadian economy. Many emerging public health issues arise at the animal-human- ecosystem interface and are related to the intensification and integration of food production. This nexus area also includes a focus on food security, food safety, nutrition and the microbiome (the ecological community of microorganisms that share our body space, soil and water).



**Resource development:** Resource production influences the social, physical (built and natural) and economic environments, thereby impacting on health in both direct and indirect ways. While development of natural resources is an important part of building a healthy economy, the balance of influences is often distributed unevenly and/or inequitably across social classes and geographic regions.



**Urban form:** In Canada, the proportion of Canadians living in urban areas has grown steadily over time. Citizens' perceptions are affected by the design of communities which in turn affects healthy behaviours – for example, walkability of neighbourhoods with high traffic exposure. Research can contribute to the development of evidence-based policies and by-laws that promote increased levels of land-use mix, street connectivity and residential density. These policy and regulatory interventions can have lasting

public health and health equity effects for population sub-groups of all ages.

Eighteen interdisciplinary national teams were ultimately supported by CIHR starting in 2016 to undertake applied public health research projects in the areas of:

- environments, genes and chronic disease
- intersectoral prevention research
- analysis-ready environmental exposure data and methods platform

When relevant, the nexus areas were integrated into each project's scope

The aim was to “build upon Canadian research strengths and expertise and strengthen Canada's position as an international leader in interdisciplinary environments and health research” (CIHR, 2019).

**“The EHSI represented a \$35 million investment in environments and health research sustained over 5 years”**

- Brian Rowe, Scientific Director of the CIHR Institute of Circulatory and Respiratory Health

## The EHSI Science

The planning and investment made by CIHR resulted in 18 funded projects. Descriptions of the projects can be found in the Appendix to this report. The range of science undertaken was highly diverse. Each project was able to tackle their research questions with considerable depth, capitalizing on their team's expertise and existing resources (e.g., cohorts, animal models, strong relationships) while engaging many relevant partners with complementary expertise and from multiple sectors. However, the diversity across the projects and the relatively small number of them meant that there was limited rationale for cross-fertilization to potentially realize greater advances in science. A mid-term workshop hosted by CIHR in Ottawa in November of 2018 made significant gains in bringing the teams together across some themes (e.g., big data). However, there remained much more opportunity for the teams to collaborate to build upon their progress, something the Summit helped bring to the forefront.

**“The Summit helped all EHSI investigators learn about the other projects to better see commonalities and opportunities for collaboration towards significant advances in the science around environments and health in the future.”**

- Jeff Brook, Summit Chair and CANUE Scientific Director

Reflecting on the EHSI priorities of CIHR, the funded projects fell into the two distinct themes of intersectoral prevention (IP) and environment-gene interactions (GxE) in chronic disease. Both these areas clearly warranted research effort, but scientifically were difficult to tie together. The data and methods platform developed by the **Canadian Urban Environmental Health Research Consortium (CANUE)**, which was also funded under the EHSI, spanned across the scope of the projects. For example, some project teams in the IP theme collaborated on CANUE initiatives related to urban form and equity while some projects in GxE accessed CANUE data for their research.

### Intersectoral Prevention Research

Broadly, eight projects made considerable headway in building partnerships across sectors or stakeholders, domestically and internationally. Through these partnerships, the research teams were able to deeply explore underlying relationships and systems and power structures enabling more-impactful and more-equitable environments and health research that better reflects the interests of multiple stakeholders. An overarching question most sought to answer or explore was, ***What are the processes that enable more-equitable and more-effective engagement among stakeholders?***

Three of the eight IP projects involved **significant partnerships with Indigenous people**. Among these, important and challenging issues were explored, very broadly ranging from: **food security** and food systems and threats associated with **climate change** in multiple cultures; environmental impact assessments that more-meaningfully and equally reflect perspectives of Indigenous women and integrate both environmental and social impacts of resource development, and; the sharing of **Indigenous ways of knowing** in the context of energy transition and independence towards more-balanced communication of knowledge, establishment of governance models and progress on reconciliation.

Three of the eight IP projects were motivated by the potential for **urban environmental interventions to improve public health**. Increasing physical activity and decreasing accidents are two important measures that were explored. Two projects were able to build or enhance strong intersectoral working relationships spanning levels of government to better define and implement research directions, which ultimately helps insure uptake and impact, as well as effective evaluation. A third project in this realm helped advance understanding how the population perceives and accepts urban interventions, particularly those aiming to address deeply rooted inequities.

**Water resources** and how to deal with impending shortages in southern Alberta was another research topic supported under the EHSI that took a deep dive into the involvement of multiple sectors including development of new insight into the public's acceptance of water recycling for drinking purposes. Improving wastewater quality for reuse is potentially

inevitable in many regions and public acceptance cannot be taken for granted nor can the potential for unintended consequences of practices to assure water safety.

Interestingly, **youth mental health** was also a topic where the EHSI enabled substantive research to be conducted. There are many communities that have been built on **fossil fuel** extraction and processing. The environmental impacts, from local to global, of this industry are well-recognized by youth in these communities. The need and demand for transition away from what has been a long-term source of livelihood for these communities is also inherently apparent to many of these youth. This conflict invariably questions long-standing identities and can be a source of intergenerational tension, both issues that affect or will affect youth mental health. To help address this challenge, EHSI researchers engaged communities in Canada and in South Africa to better understand how to deal with upcoming **energy transitions**.

### Environment, Genes and Chronic Disease Research

The most common element among these research projects was interest in the microbiome with six studies advancing understanding of the potential involvement of the **microbiome**. Interaction between host, genes and microbiome were shown in relation to **colorectal cancer, inflammatory bowel disease, pediatric obesity and asthma, adipose tissue, diabetes mellitus and auto-immune diseases**. Study approaches differed from combined human and animal studies to cohort studies, including targeted populations of first- and second-generation Asian immigrants. These all showed that there is significant potential in improving disease outcomes via better understanding of the microbiome. The environmental factor explored most-often was diet, including how maternal diet may affect subsequent risk of obesity in children. **Dietary factors** such as fibre, processed foods, agricultural practices and possibly the dietary changes associated with geography/culture were explored. Identification of early biomarkers that could inform treatment and early intervention were also a common objective contributing to progress related to both **personalized medicine** and understanding of the **exposome**.

The CHILD cohort and CanPATH (CARTaGENE cohort in Quebec) were the **major cohort platforms** engaged in the EHSI. CHILD enabled new evidence of the impact of early life antibiotic use on the microbiome and asthma to be uncovered. Both CHILD and CanPATH undertook research on the effects of air pollution showing that these exposures impact **DNA methylation** and **gene expression**, respectively.

A key environmental factor of concern given the need for the development of regulations is **chemical exposure**. Only one project entirely focused on those risks, generating new information on the endocrine-disrupting effects of new chemicals introduced as replacements for restricted substances such as **BPA**. Research using the CHILD cohort also led to new evidence of risks from exposure to chemicals in the indoor environment. This work revealed that certain **phthalate and flame-retardant compounds** found to be highly prevalent in house dust significantly increased the risk of early life wheeze and asthma diagnosis at age 5.

# Planning the Environments and Health Research Summit

## **Rationale for the Summit**

The two-day Environments and Health Research Summit was organized in response to CIHR's call to hold a capstone EHSI knowledge mobilization event. The Summit aimed to bring together the 18 EHSI research teams, which were diverse in their expertise and came from across Canada, to highlight progress and to consider lessons learned and possible future directions.

## **Target Audience**

The target audience for the current report is Health Canada and the Canadian Institutes of Health Research, who requested and supported the Summit. However, the Canadian research community and all stakeholders concerned with advancing and exchanging knowledge pertaining to environments and health also represent targets for this report. Specifically, environments and health scientists at Health Canada will benefit from learning about the findings of 18 research projects. As well, Scientific Directors and Assistant Directors at the Canadian Institutes of Health Research will benefit from a compilation of EHSI findings and from learning what a diverse group of researchers and organisations valued about the EHSI and what could advance Canadian research in this critical area.

## **Organizing the Summit**

In the summer of 2022, the Canadian Urban Environmental Health Research Consortium (CANUE) was granted a planning and dissemination grant from CIHR to host an end-of-grant meeting for CIHR's Environments and Health Signature Initiative.

The steering committee for this Summit consisted of a multidisciplinary group of researchers who were engaged in the EHSI. The committee was formed after a call for participation from EHSI Principal Investigators. From that initial invitation, nine researchers joined to provide advice, guidance, and direction to planning the event:

**Jeff Brook (Chair)**, Scientific Director, Canadian Urban Environmental Health Research Consortium; Associate Professor, University of Toronto

**Heather Castleden**, Professor, University of Victoria

**Margot Parkes**, Professor, University of Northern British Columbia

**Brent Hagel**, Professor, University of Calgary

**Alberto Martin**, Professor, University of Toronto

**Padmaja Subbarao**, Professor, University of Toronto

**Lise Gauvin**, Professor, Université de Montréal

**Daniel Fuller**, Associate Professor, University of Saskatchewan

**Nazeem Muhajarine**, Professor, University of Saskatchewan

Additionally, the committee invited Health Canada, represented by Dr. Dave Stieb, and the National Collaborating Centre for Environmental Health (NCCEH), represented by Lydia Ma, to join the planning of the Summit. As a leader in knowledge translation and a hub of environmental public health professionals in Canada, the NCCEH provided key input and magnified the Summit by co-hosting the pre-Summit webinars, as well as contributing additional cash resources. The early engagement and connection with Health Canada helped

shape the program and facilitated acquisition of additional resources to ensure that the event was hosted at a premier venue and attracted top-tier national and international speakers to participate.

From early in the planning, the committee recognized that it was important for the Summit to host a hybrid meeting, enabling a flexible format of participation and effective engagement of on-site and online participants and presenters. Thanks to additional funds provided by Health Canada, the committee was able to enhance the Summit by hiring a professional facilitator and upgrading the A/V package to provide the best possible experience for online attendees.

Meeting regularly on a weekly or bi-weekly basis, the committee crafted their vision and established the goals and identified speakers and attendees, and an event promotional plan for the Summit. From an initial impetus to host a two day, by invitation hybrid workshop, the committee refined the agenda, format, and mix of speakers. Decisions were driven by the committee and implemented by the Canadian Urban Environmental Health Research Consortium (CANUE), as the lead organiser for the Summit. In particular, leveraging the committee members' networks was key to ensuring a diversity of perspectives were represented, especially Indigenous perspectives. In person attendance targeted approx. 80 participants with a cap of 100 and additional capacity via formal virtual participation (also by invitation). Furthermore, all interested stakeholders (unlimited numbers) were able to register to observe the livestreaming portions of the Summit.

### **Summit Vision**

**With the end goal of promoting healthier, sustainable environments for all, the objectives of the Environments and Health Research Summit are to take stock of and communicate the knowledge produced through the CIHR-funded *Environments and Health Signature Initiative (EHSI)* and establish a strategy that (i) fosters the growth of interwoven environments and health research in Canada through dedicated funding, and (ii) helps accelerate the uptake of research into policy, programs and practice.**

To maximise the productivity over the two days of the Summit, the committee decided to forgo traditional research result presentations, and instead requested that the 18 research teams share their findings and reflections on their projects over six webinars held prior to the Summit. The basis for each webinar was a series of questions and each webinar featured three research teams grouped by common themes. These provided the leaders of each project the opportunity to share findings with an audience of other scientists, environmental public health practitioners, policy makers, advocates, and students, while also engaging in discussions designed to help them see connections between their project and work being done by other EHSI teams. The format of the webinars also had the benefit of orienting researchers to each other's projects prior to them attending the Summit.

## Final Summit Objectives and Agenda

The steering committee set the main objectives of the Summit and advance webinars as:

1. Take stock of and communicate the knowledge produced through the CIHR-funded *Environments and Health Signature Initiative* (EHSI).
2. Establish a strategy that (i) fosters the growth of interwoven environments and health research in Canada through dedicated funding, and (ii) helps accelerate the uptake of research into policy, programs and practice.

The structure that the steering committee came up with for the Summit was for the first day to be dedicated to exploring and refining key messages from each of the EHSI projects in the context of the interests of different knowledge users. The second day was then to be focused on looking forward in the context of the EHSI ending with no follow-up initiative despite an increased need for new knowledge and innovation regarding the connections between environments and health in order to address a multitude of environmental concerns impacting Canada and the planet. Opening speakers were invited to set the background for each day and these talks were followed by panel discussions and extensive discussion with the in person and online participants. The Summit agenda is provided in the Appendix.

## OVERVIEW OF THE PRE-SUMMIT WEBINARS

Prior to the Summit, six webinars, each featuring three research projects, were held. These provided an opportunity for Summit attendees, and all interested individuals, to learn about the EHSI research through a more-candid conversation with the researchers (see questions in text box). The 18 projects were organised around six common research themes: **Urban Form, Resource Development, Obesity and Environment, Child Health, Microbiome, and Agri-Food.**

To augment visibility and to enhance uptake, the NCCEH co-promoted these pre-Summit webinars with CANUE. Over 700 people registered for the six webinars, and they have been viewed 358 times since being posted on YouTube, and the CANUE and NCCEH websites (as of October 6).

[Video recordings of the webinars](#), which are each 1.5 hours in length, and provide a **legacy of the EHSI key results and lessons learned**, are hosted indefinitely on the free YouTube platform via the NCCEH:

1. [Urban Form and Health](#)
2. [Resource Development](#)
3. [Obesity and Environment](#)
4. [Microbiome](#)
5. [Child Health](#)
6. [Agri-Food, the Food-Water Nexus and Health](#)

In the webinars, each team was asked to reflect upon and respond to the following questions:

1. What critical scientific questions motivated the research directions your team pursued under the EHSI?
  - a. How important was EHSI in you being able to pursue this work; would it have happened if not for the EHSI opportunity? (5 mins per team)
2. Did new insights emerge during the course of the project that were relevant to your or other researcher's thinking and/or you considered would be important to policy makers, advocacy groups, new directions for research, commercial opportunities and/or forming new community partnerships?
  - a. Did these insights influence how the project evolved?
3. How has your own thinking changed from when you started your EHSI project and now? (5 mins per team)
  - a. What surprised you in your project? Were there unexpected challenges that you overcame?
  - b. What's the most common question that your friends or family ask you about your research?
4. What are the key messages about your final research results that you would like today's audience to take away from today's discussion? (5 mins per team)
5. Is there anything that we didn't ask about, that you would like to mention? (2-3 mins per team)

Across all six webinars some overarching themes emerged.

### 1. Relationships

In all the webinars, teams identified the importance of taking time to establish relationships with stakeholders as being vital to successfully carrying out environments and health research. Especially in areas of Indigenous health, it is vitally important to take time to build trust and reciprocity in relationships. Effectively building these partnerships in effect increases the capacity for environments and health research to be conducted. However, it takes time and is not likely to be done well in a short (e.g., 1-2 yrs) grant unless working relationships already exist.



**Case Study: A SHARED Future: Achieving Strength, Health, and Autonomy through Renewable Energy Developments for the Future**

As the only EHSI project funded under the Indigenous Ways of Knowing funding stream, **A Shared Future** worked to ensure that 50% of decision-making roles were Indigenous, and 50% were women-identifying to ensure that gender was at the forefront of the research agenda. They also sought partnerships with the Native Women's Association of Canada to amplify Indigenous women's voices. This partnership and approach resulted in finding there was a need to amplify Indigenous women's voices in renewable energy development. Investigation of the sector revealed 20% of the renewable energy industry is women, but in Indigenous contexts, 50% of roles are performed by Indigenous women. This signifies a link between Indigenous women's leadership and moves away from extractive colonial models of energy development. The EHSI funding enabled the project to develop partnerships with Indigenous Elders and organisations so that decisions about the project were made by and with Indigenous people.

## 2. Granting period

Many teams expressed that having a five-year period to conduct their research allowed them the opportunity to pursue more advanced research questions and projects that came up during their research, and to think broadly about the issues they wanted to address and what questions they would ask.

**Case Study: Environments and Health INTERACT: INTERventions, Research, and Action in Cities Team**

The EHSI project grant enabled established researchers such as Yan Kesten (Université de Montréal) and Meghan Winters (Simon Fraser University) to work together for the first time and forge a successful collaboration within the **INTERACT initiative**. The EHSI enabled many such new connections. The context of having dedicated funding for five years meant that they could attract partners who knew that they would be engaging with a project over several years. These partnerships helped them to co-develop further research questions, especially around equity issues, which are now the focus of the second phase of the project, funded for another five years. The EHSI enabled the team to develop partnerships that challenged and deepened the research questions that the project was able to follow-up on.

## 3. Team Science

Another theme that came through in the webinars was the importance that the grant was awarded to a team of researchers working across disciplines who brought different perspectives and expertise to the research questions. Many found the grant was instrumental in bringing together an interdisciplinary team able to advance scientific questions and think about research questions from multiple perspectives at once.

**Case Study: Elucidating the Gene-Environment Interactions that drive Autoimmune Disease among South Asian Canadians - The GEMINI Program**

The EHSI enabled the **GEMINI** program to assemble an interdisciplinary team with expertise in clinical epidemiology, microbiome, health geography, immunology, genetics, nutrition science, and inflammation in the gut. Having an interdisciplinary team was instrumental in moving research questions forward, and it would not have been possible to assemble such a team without the EHSI funding.

## OVERVIEW OF THE SUMMIT

**“Nexus areas of the EHSI were a way to focus research around key areas while maintaining complexity inherent in environments and health”**

- Brian Rowe, Scientific Director of the CIHR Institute of Circulatory and Respiratory Health

The Summit brought together over 150 participants - 90 attendees in person and 66 online participants - representing key stakeholders including Health Canada, Prevent Cancer Now, the National Collaborating Centre for Environmental Health, the National Collaborating Centre for Determinants of Health, the National Collaborating Centre for Methods and Tools, Environment and Climate Change Canada, the Canadian Public Health Association, Public Health Ontario, Native Women’s Association of Canada and universities across Canada.



*Pictured: Brian Rowe, Scientific Director, CIHR Institute of Circulatory and Respiratory Health*

Prior to each day’s opening speakers and panel discussions, representatives from the CIHR helped set the context of the EHSI and CIHR’s perspectives.

On April 17, **Brian Rowe**, Scientific Director of the CIHR Institute of Circulatory and Respiratory Health discussed the origins and structure of the EHSI, as well as CIHR’s ongoing investments in environments and health research. A recording of his remarks can be [found online](#).

On April 18, **Nancy Edwards**, former Scientific Director of the CIHR Institute for Population and Public Health and key architect of the EHSI offered her reflections on what it took to bring such a unique program to fruition and her reflections on what the research teams had achieved based upon her observations of the pre-summit webinars and the first day of the summit. A recording of her remarks can be [found online](#).

### Key messages:

- CIHR has identified Indigenous health and equity, diversity and inclusion (EDI) as cross-cutting themes for future research funding.
- EHSI teams successfully embraced the complexity of environments and health research, but there needs to be an effort to broaden the relevance of what was learned through a mapping all the partners engaged; the levels of government, the NGOs, and advocacy groups, and to orient within relevant policy windows in order to identify gaps and help plan and target knowledge translation from the EHSI.

**“There needs to be an effort to scale-up and scale-out what was learned in terms of novel measurement methods and community engagement processes.”**

- Nancy Edwards, former Scientific Director of the CIHR Institute for Population and Public Health and key architect of the EHSI

## SUMMIT PROCEEDINGS

### Day 1– April 17, 2023

The overall goal of Day 1 was to highlight the work of the EHSI and the 18 projects, building upon the pre-Summit webinars. Through invited speakers, a panel discussion and a break-out workshop the research teams were tasked with reflecting on their main findings and determining ways to best communicate them. The day was structured to allow a closer look at **strategies for effective knowledge translation** based upon the viewpoints of different experts and typical audiences of scientific research.

#### Framing Remarks from Senator Greenwood

**“This is not a time for business as usual.”**

- Senator Margo Greenwood

Senator Greenwood provided framing remarks for the Summit, which emphasised the urgency of environments and health research. A recording of her remarks can be [found online](#). She convincingly set the tone for the day, broadly centering environments and health research within the context of Indigenous perspectives and the necessity of doing so in order to make true progress.



*Pictured: Senator Margo Greenwood*

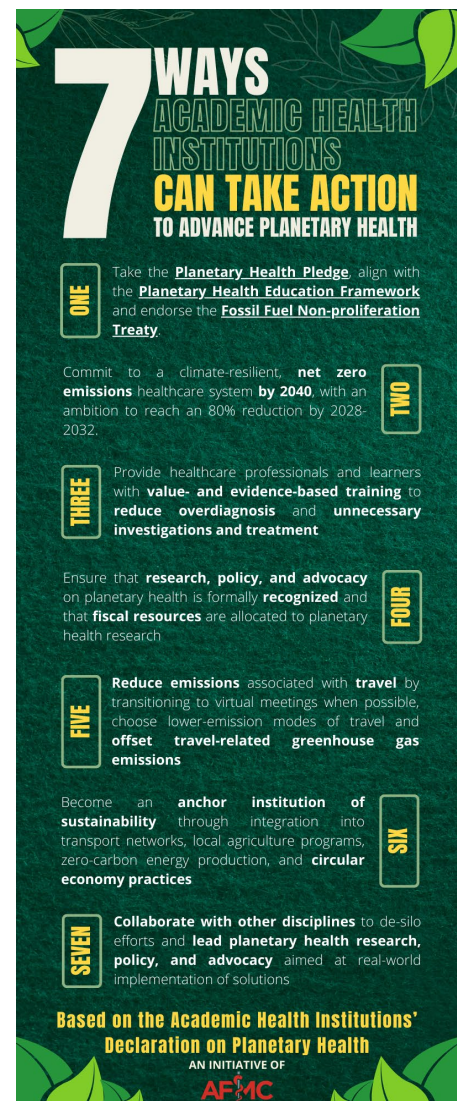
#### Key Message

- Need everyone contributing to develop solutions to environments and health challenges.
  - offer opportunities for creativity and innovation.
  - create a platform for multiple contributors (academic, government, NGOs) to address environments and health at individual, systemic and structural levels.

Several important points were raised in the Senator’s presentation:

- Need to include all ways of thinking to tackle environments and health.
- To address inequities, we need diverse approaches anchored in justice.
- Whatever people do to the land, people do to themselves.
  - Humans need to see themselves as part of environment.
- Indigenous philosophies can inform interventions that benefit everyone.
- Colonialism is a source of inequities in health.

- Poverty, substandard housing, overrepresentation of Indigenous people in correctional facilities, lack of potable water all have detrimental effects of people and communities
- Climate change is urgent and presents unique challenges for Indigenous communities
  - Compromises access to traditional foods, exacerbates food insecurity.
  - Unpredictability of environmental change threatens Indigenous traditional ways of knowing which is based on relationship with the land.
  - Environments and health goes much further than climate change alone to embrace Planetary Health.
- The Declaration on Planetary Health is a more-encompassing perspective.
  - Environmental, social and structural determinants of health need to be treated collectively.
  - Underscores work of EHSI
  - Almost in parallel with the summit, the Association of Faculties of Medicine put forward their own Declaration on Planetary Health (AFMC, 2023) - see image to right.
- To their credit, CIHR and the EHSI teams have already been considering the broad implications of planetary health, which can help appreciate the complex thinking needed for effective policy responses
  - Need more knowledge on the complex social and physical connections impacting planetary health through research

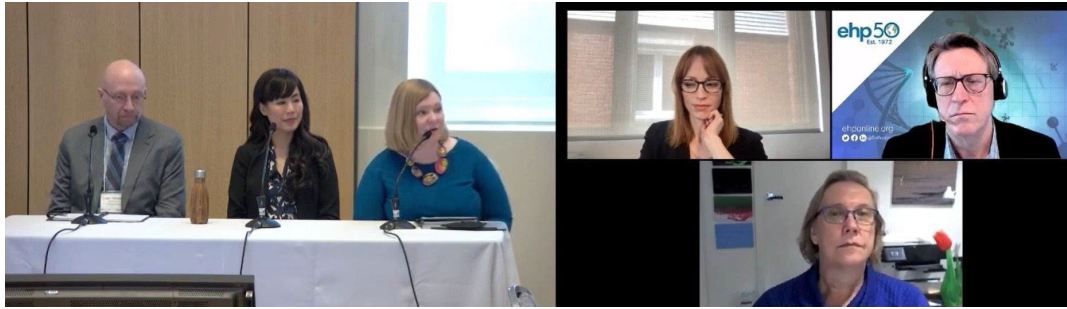


***“Our being depends on human health, flourishing natural systems and stewardship of the land.”***

- Senator Margo Greenwood

## Morning Plenary: Maximizing Impacts from Environments and Health Research

The morning plenary session was a moderated panel discussion between public health professionals, policy makers, journalists and advocates. The goal of this session was for panelists to share their views on how they use scientific results to achieve their goals, how to communicate them effectively for impact, including identifying the most-relevant messages, and recognizing when and how results may influence policy/practice/guidelines and be of interest to all Canadians and the media. A recording of the session can be [found online](#).



Panelists: In person from left to right: Cory Neudorf, President of the Urban Public Health Network; Melissa Lem, President of the Canadian Association of Physicians for the Environment; Sarah Viehbeck, Chief Science Officer at the Public Health Agency of Canada. Virtually: Carolyn Jarvis, Chief Investigative Correspondent at Global News; Joel Kaufman, editor-in-chief of Environmental Health Perspectives; and bottom, Evelyne de Leeuw, Professor at the University of New South Wales.

Key insights around how to effectively communicate research findings to influence policy makers, public health practitioners and media included:

- The framing of environmental health information is critical for uptake.
  - Who delivers the message can be as important as the message itself.
  - Academics are looked upon as highly credible providers of information and viewpoints and in regards to environments and health they increasingly face the need to speak out on issues despite how it could threaten relationships.
  - Academics need to be aware of the broader socio-political context in which science is being communicated in order to better frame their messages.
  - Policymakers need to know how the results of a study fit into the broader state of the science.
  - Couching evidence within a story-driven narrative that explains what is new about the research and how it is applicable to everyday people can be more impactful for creating messages of interest to the media.
  
- Connections between scientists and stakeholders can be challenging.
  - Need to establish partnerships with local actors to translate knowledge effectively.
  - Partnerships are always contested because entering into partnerships means giving up control of how science is used.
  - Partnerships also needed to advocate for change.
  - Scientists need to be strategic in choosing who they work with and consider what partners make the most sense given where their research is within the policy cycle.
  - Connecting different players in a given sector is what sets the stage for change to happen.

***“For change to happen we don’t need more partnerships we need more connections.”***

- Evelyne de Leeuw, Professor, University of New South Wales

## Lightning Round

Given the pre-summit webinars, each of the 18 research teams were asked to present a very brief overview of their project at the summit. The main purpose was to encourage a further distilling of the most-important information to convey and to give other summit participants some information to guide their choices for which projects to visit during the World Cafe session.

A recording of the lightning round presentations can be [found online](#). Each presentation includes:

1. A brief statement about what their project was about.
2. The 2-3 main accomplishments so far.
3. Some reflection on approaches to communicating 'excitement around' the project.

Some of the insights that emerged during the presentations include:

- There can be high value in **going beyond conventional channels of knowledge translation**.
  - Although all teams had published many research papers over the course of their projects, many pursued knowledge translation through other avenues including videos, podcasts, documentaries, and partnerships with Indigenous communities to ensure knowledge is of use for communities.
    - Sherilee Harper shared how her team worked with Indigenous communities in Canada, Peru and Uganda, who placed a high value on other research outputs and approaches to knowledge translation. These included a book detailing the nutritional content and climate impacts on different traditional foods for the Shawi in Peru; photo documenting the Indigenous food system of the Batwa in Uganda and how it is being impacted by climate change; and creating a documentary film with Inuit in Labrador about how the declining caribou population is impacting their food system, mental health and well-being.
    - Jeff Brook, talked about CANUE and its new knowledge mobilization tool, HealthyDesign.City, through a talk given at the 2022 U of T TEDx and posted on YouTube by TEDx.
- The EHSI's structure allowed research teams to **embrace the complex nature of environments and health research** setting the stage for greater gains in understanding of the issues and challenges and for increased confidence to tackle the complexity inherent in environments and health research as opposed to over-simplifying messages to stakeholders.
  - Many teams expressed the complex nature of environments and health research, and how they discovered the extent of complexity through their projects as well as how to work-through the complexity.
    - Michael Ungar's project on youth resilience is looking at the impact on family dynamics and youth mental health in fossil fuel producing communities from a multi-systemic frame of resilience. This means considering identity formation, the macroeconomics of the global price of oil, and how that impacts family dynamics, depression, and other psychological impacts. As these communities will need to undergo a dramatic transformation soon away from oil and gas production, understanding these complex dynamics can help begin conversations with these communities.

## World Café

The World Café allowed researchers from each team, grouped according to the pre-summit webinar groupings, to engage with summit attendees not directly involved in any of the research. The primary objective of this session was for researchers to be challenged to clarify or refine the messages about what was most important about their work and what they learned and to consider the knowledge translation approaches to best connect with different audiences. Another goal of this session was for Summit participants to learn more



about EHSI projects of their interest while individual research teams developed more appreciation for the interests of different types of stakeholders. Ultimately this was to help researchers generate additional, more-impactful, clear messages and afterwards in plenary, the researchers from each project shared an “aha” moment. A recording of the reflections from the researchers can be [found online](#).

*Pictured: Padmaja Subbarao, Professor at the University of Toronto, and Raissa Marks (facilitator)*

### Insights from the World Café

The exercise helped research teams think more about how to clarify or refine their messages. Borrowing from the morning panel discussion, many of the participants came to the realization that **stories need to lead the data in order to convince policymakers**. The exchange of information that the world café facilitated also led to the conclusion that **more communication between Health Canada, CIHR and other funding agencies is needed to better coordinate environments and health research and ultimately to gain more benefit from the research investments**.

New Idea (“Aha” Moment)	Context from the World Café
More research into power and power dynamics in intersectoral partnerships could provide insights into how to structure and govern partnerships effectively	Lise Gauvin’s project investigates how to develop intersectoral partnerships to implement urban interventions. These partnerships may or may not have the capacity to enact the changes that are required to improve population health and reduce inequities.

More work needs to be done into how to pull together all strands of environments and health research of the EHSI into a cohesive message	Norman Neumann's research into how to reuse wastewater in order to adapt to droughts caused by climate change is just one example of environments and health research, but the connections with the other projects have not been explored
Needs to be a child health advocate in Canada to make a big impact on future health	Vern Dolinsky's research into the processes that lead to childhood diabetes means he has an appreciation for the significant impact health interventions in childhood can have on a person's healthy lifespan, and a child health advocate could help to put those issues on a national health agenda
A better way to talk about environments and health issues is needed so that action is taken	Meghan Winters and the INTERACT Team work with municipalities to evaluate and understand urban interventions, but talking about equity issues can sometimes be polarising, so researchers should communicate much more strategically with the goal of having cities take action
Cross-ministerial approach needed to advance environments and health	Brent Hagel's research into active transportation safety for children informed his view that there should be a health in all policies approach taken by governments that bring together ministries around common goals
More drums, more female leaders, more connection for more opportunities for more resilience	Chris Buse reflected the words of Simon Brascoupe, an Indigenous Elder and advisor to the A Shared Future EHSI project, about what is needed to advance environments and health research
Better science communication around the microbiome is needed	Jennifer Gommerman sees that hype around the microbiome can lead people in the community to spend more money on foodstuffs that may not be beneficial for their disease, so better communication around the microbiome is needed to enhance its understanding among the general public
Need to embrace two-eyed seeing: viewing from both Indigenous and Western perspectives	The ECHO project works to build intersectoral capacity to understand and respond to the health impacts of resource development, drawing on and integrating a wide variety of perspectives



Needs to be somewhere for students to go who are interested in careers in environments and health research or action	Currently post-docs are not able to clearly see where opportunities to focus on environments and health exist within government, industry and academia (i.e., who is doing what?)
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## Day One Workshop

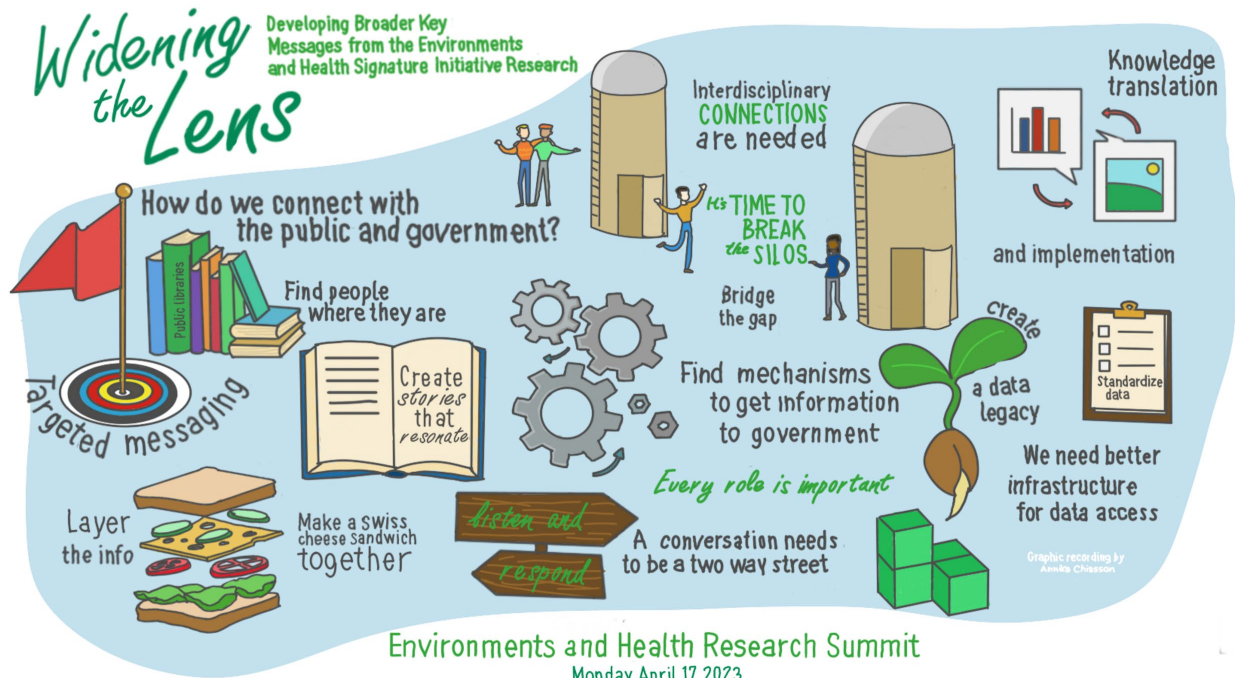
In the workshop, attendees worked in small roundtable groups to consider key collective messages around the environments and health research programs that could be shared more broadly. Thus, the goal was for research teams and summit participants to **think across themes** to generate these messages based upon connections among the research results and then to generate broader communication messages and outreach strategies. Fortuitously (or coincidentally), two ideas from the World Cafe were consistent with this predetermined workshop goal. Specifically,

1. More work needs to be done into how to pull together all strands of environments and health research of the EHSI into a cohesive message.
2. A better way to talk about environments and health issues is needed so that action is taken.

A secondary goal of the workshop was to further explore the connections across themes to identify future directions for environments and health research in preparation for day two of the Summit.

The day's theme of effective knowledge translation (KT) continued to resonate with participants during the workshop as highlights from the round table discussions tended to focus on this issue, producing more ideas on how to better get their messages out to both the public and decision makers in government.

The central ideas coming from these round table discussions are highlighted in the pictorial overview (below) of the session: **"Widening the Lens"**. *Bringing the messages from the EHSI to the public and government (policymakers) is not "a one size fits all" endeavour; messages or "stories" need to be targeted to the intended audience and ideally are created with these knowledge users leading to ongoing two-way conversations. In this process there are several roles to be played necessitating that a range of the expertise involved in the research contributes to knowledge translation, ideally highlighting the multidisciplinary aspects of the research and solutions.*



Health Canada

Santé Canada



National Collaborating Centre for Environmental Health  
Centre de collaboration nationale en santé environnementale

**The inherent interdisciplinary nature of environments and health research, which often serves to inspire researchers, could also be leveraged to make KT messages more compelling.**

*Idea:* The Urban Form NEXUS area of the EHSI bridges several disciplines, from public health to architecture to urban planning and more. KT messages could be created around a narrative about the breadth of disciplines or expertise involved to promote how 'environmental design dramatically influences human health' and what current knowledge indicates could be done to improve public health.

- target decision-makers, funders, and the public with this message in sharing the latest research results.
- perfect the balance between details and the overall message
- researchers consider partnering with experts trained in science communication to create the most compelling stories.
- get into the community, such as public libraries and other 'hubs', to disseminate important public health information.
- establish a community of practice around sharing the information and stay committed to building relationships over time to keep them alive.

**Community-based research could be leveraged further to help create and prime the public audience for uptake of the results.**

- Work with and within communities was a common, and many cases a necessary element of the IP projects.
  - Working at local/municipal level is key to impacting health around environment.

- There is risk, from the researcher perspective, in enabling communities to advance the research and projects independently (i.e., researchers lose control of the narrative).
- In the future, ongoing dialogue involving researchers and community representatives (e.g., activists) could lead to more uptake of the research findings.
  - Extending the dialogue beyond the funding period or the completion of the publications requires highly dedicated researchers.

**There should be more formal data sharing between researchers and the government.**

- There is a need for an integrated database of exposure, time, etc., data and continued maintenance of current infrastructure for data collection/data mining (e.g., CANUE or an environments and health institute serving academic and government scientists).
- Could more academic-government researcher partnerships facilitate reach of the results to parliamentary committees/senators?
  - First consider: Why should they care? (public? budget? other).

**There is a need for a national “heatmap” of exposure and outcome data from a variety of sources.**

- This requires a greater level of collaboration/networking to establish the infrastructure so that this data repository can be created and made available to researchers working in the “environmental health” space.
- This is incumbent on sufficient funding.
- Such an effort could extend to the translation of generated knowledge to enact change, but better governance would be needed to support this direction (e.g., to generate consistent messages).

# SUMMIT PROCEEDINGS

## Day 2 – April 18, 2023

### Framing Remarks from Senator Kutcher

**“Bill S5 will provide a right to a healthy environment for everyone in Canada.”**

- Senator Stan Kutcher

Senator Kutcher discussed the updates to the Canadian Environmental Protection Act included in Bill S5 (*“Strengthening Environmental Protection for a Healthier Canada Act”*) and the role scientists can play in informing government actions to ensure equitable access to healthy environments. A video recording of Senator Kutcher’s remarks can be [found online](#).



*Pictured: Senator Stan Kutcher*

#### Key Message

- Bill S5 policy goals will require government investment in scientific research capacity given current underfunding.
  - Government will need data to determine what constitutes a healthy environment.
  - Will require community engagement with populations that are especially vulnerable to environmental health risks.

Several important points were raised in the Senator’s presentation:

- Further federal investments are needed to support current scientific policy directions set out in Bill S5, an amendment to the Canadian Environmental Protection Act
- Areas where the federal government should be investing now to enable scientific work supporting Bill S5 include:
  - Biobanks; in order to determine the impact of chemicals on human health, we need robust biobank capacity in Canada.
  - Enhanced laboratory capacity to support exposure biomarker research.
  - Improvements in toxicogenomic research capacity, requiring investment in both bureaucracy and academia.
  - Investments in large-scale longitudinal studies to understand the impacts of environmental exposures across the entire lifespan, supported by cohorts and data infrastructures like CanPath, CANUE, and CHILD.
  - Participation in international research initiatives to benefit environmental health in Canada and globally.

- Conceptually, an exposome approach that considers the totality of environmental exposures across the lifecourse and their contribution to disease and adverse outcomes may be where the science will need to head.
- May require modified or new organisational or institutional structures to support policy directions of Bill S5.
- Scientists and scientific organisations need to deal with misinformation and disinformation if progress is to be made on environments and health.

***“Disinformation has negative health and environmental impacts.”***

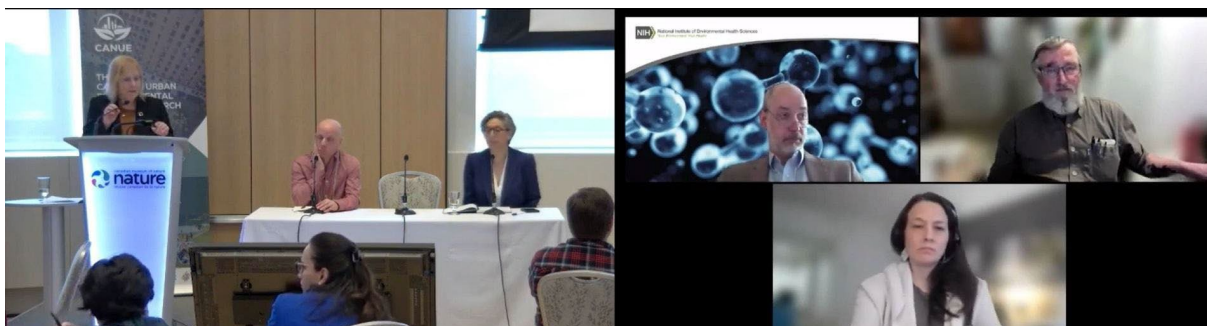
- Senator Stan Kuthcer

## Morning Plenary I: Enhancing Canada’s Environments and Health Research Profile

The morning plenary session was a moderated panel discussion about overarching research directions recognizing unique Canadian priorities, capacities and strengths.

### Key Question for the Panel:

*What would a research program look like that bridges One Health, Planetary Health, Indigenous Knowledge, Equity, and Exposome and that serves the needs of research, government and Canadians, in light of today’s global challenges?*



Panelists: In person left to right: Michael Brauer, Professor at University of British Columbia; Samira Mubareka, Professor at University of Toronto; Virtually: David Balshaw, Director of Extramural Research and Training at the U.S. National Institute of Environmental Health Sciences; Trevor Hancock, Public Health Physician; and Nicole Redvers, Associate Professor at Western University.

A video recording of the session can be [viewed online](#).

***“Addressing issues of the anthropocene requires every faculty from health and medicine to social science, arts, business and law.”***

- Trevor Hancock, Public Health Physician

## Key Points from the Panel Discussion

Several highlights from points raised by the panel and audience are summarized in the following:

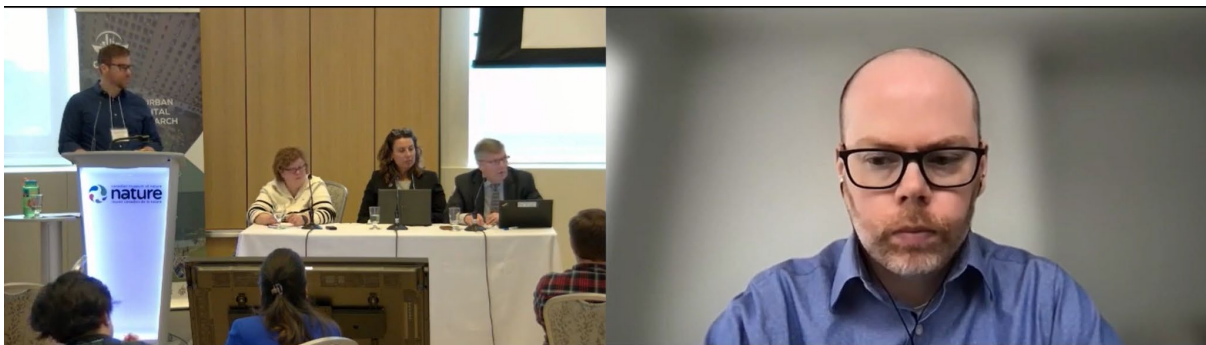
- For lasting, far-reaching success viewpoints need to change from our traditional human centred perspective (ego-centric v. eco-centric)
- Need to embrace landscape immunity and incorporate land-use planning in health and biodiversity risk assessments.
- A global effort is needed around how to apply and increase the cost-effectiveness of the available technologies to measure multiple environmental exposures at once.
  - We have the technologies to measure multiple exposures but they can't be deployed easily or consistently.
  - Methodologies and metadata need to be standardized and harmonized to enable comparisons between labs, between institutions and between countries.
- The environment needs to be considered in all aspects of current health research.
  - Air pollution is a good example of an environmental exposure that is now taken seriously by the global health community, but it took a sustained effort to rise to its current level of prominence.
- Opportunities for community-driven environmental research within present funding structures must be increased.
- Future academic research in Canada needs to be coordinated at the tri-council level because of its deep interdisciplinary nature.
  - A future Canadian institute on environments, health and well-being would be best positioned effectively fund work aimed at understanding the effects of large-scale environmental change and how to best address the challenges given the complexity of the causes and solutions.
  - There is currently no equivalent to US National Institutes of Environmental Sciences in Canada, meaning there is no single entity coordinating research activities.
  - For future success, sustained, long-term funding, rather than one-off initiatives, is essential.

## Morning Plenary II: Enhancing Canada’s Environments and Health Research Capacity

The second morning plenary session was a moderated panel conversation between representatives of federal funding bodies and summit participants.

### Key Questions for the Panel:

*Do you see tangible opportunities (emerging) for multiple funding agencies to work together to advance support for multidisciplinary environments and health research? From your perspective what are the largest gaps in knowledge needed to understand and avoid future risks? Which gaps do you see that are particularly policy-relevant requiring the most immediate attention for Canada?*



Panelists: In person left to right: Sylvie Lamoureux, Professor, University of Ottawa; VP Research, Social Sciences and Humanities Research Council; Marisa Creatore, Executive Director, Centre for Research on Pandemic Preparedness and Health Emergencies; Brian Rowe, Professor, University of Alberta and Scientific Director, CIHR Institute for Respiratory and Circulatory Health.

Virtually: Tim Singer, Director General, Environmental and Radiation Health Sciences, Health Canada.

The panel members each recognized the importance to Canada of multidisciplinary environments and health research. From this recognition emerged an overarching theme of the need to approach the challenge of increasing Canada’s environments and health research capacity from the ‘systems level’ by looking across the social, behavioral and environmental determinants of health but also the necessity of ensuring knowledge on human experience and on societies is considered to generate insights that can have impactful responses to today’s global challenges.

Ultimately, solutions that work will require a whole of government and whole of society approach and, to achieve this, interdisciplinary teams need to work over long-term horizons. Investing in such teams - or broadly capacity in Canada - is essential to be prepared to effectively respond to health emergencies as they arise. Examples of such emergencies are the COVID-19 pandemic and the Fort McMurray wildfire. Clearly, this also brings up the urgency of climate change and the need for research that informs how Canada prepares to mitigate the impacts of past and future emergencies. Given the scope of such an effort and

Canada's size and as a result limited resources, the approach going forward must think strategically and build strong collaborations extending beyond national borders.

While there is not yet a concerted effort in government to shape a research program that reflects the scope of the challenges we face, based upon the information the panelists were able to share, they did offer perspectives on how the programs they represent have contributed to work in this direction and some of the key mechanisms for continuing to advance environments and health research.

A recording of the discussion can be [viewed online](#) and the key points raised by each panelist are summarized below.



Health  
Canada Santé  
Canada

**Tim Singer**

**Director General, Environmental and Radiation Health  
Sciences, Health Canada**

**Context:**

- Health Canada not primarily research funder, regulatory body
  - Responsive to changing needs of Canadian society.
- An active internal research program, 420 research papers over last 5 years.
- Health Canada has established a new office of environmental health.

**Research needs:**

- Interventions to mitigate impacts of climate change.
- Characterize and address health inequities.
- Explore merits of public health lens to chemicals management.
  - Previously taken inventory approach.
  - Public health: look at which chemicals/exposures are linked to which adverse outcomes.
- How to implement an overall shift to a system approach - behavioural, social, environmental determinants of health.
  - Can't address individual factors without addressing broader factors in parallel.

**Future directions:**

- Need to continue data integration and make fundamental data infrastructure sustainable.
- Canada has limited means, which requires collaboration and strategy.
- Need to get better at bringing economics into research, and costing impact of interventions.
  - Focusing on upstream factors will bring huge economic dividends in avoided costs.
  - This can be a selling point for governments to support this research into the future.



**Context:**

- Social sciences and humanities have key role to play in environments and health research ecosystems.
- SSHRC plays an important role to fund research across disciplinary and geographic boundaries on global challenges.

**Research needs:**

- Generate knowledge on human experience and societies to generate insights to inform responses to global challenges.
- Identify global challenges that could impact Canada and facilitate KT initiatives to share knowledge among disciplines, and non-profit, government and business sectors.
  - Building from SSHRC's *Imagining Canada's Future* initiatives

**Future directions:**

- Only when health sciences, social sciences, natural sciences and humanities work together can solutions that drive societal change be developed.
  - NFRF is a great example of interdisciplinary research and must include expertise in social sciences.

**Context:**

- Environments and Health was an area that was underinvested in and CIHR launched the EHSI across multiple institutes to increase interdisciplinary research funding in that area.
  - Another example is the Fort McMurray wildfire research funding developed with Alberta Health Services, Red Cross, Alberta Innovates Health Solutions, and CIHR that was launched within six months of the fire.

**Research Needs:**

- They are best identified within the context of each existing institute's agenda.
  - There are current avenues to get research funding for the health effects of the environment by researching it within particular health domains that are of interest to different institutes.

**Future Directions:**

- Encourage more cross-cutting research initiatives on environments and health.

- In the short term, working within the existing institutes will be more promising than pushing for a new institute focusing on environments and health, which will require more long-term planning.
- Institute Advisory Boards have influence over what the Institutes do and focus on, and researchers who volunteer to sit on those committees can contribute to what funding areas get prioritized.



**Marisa Creatore**  
**Executive Director, Centre for Research on**  
**Pandemic Preparedness and Health Emergencies**

**Context:**

- The Centre for Pandemic Preparedness and Health Emergencies which was established in January 2022.
  - Mandate to ensure Canada has emergency-ready health research system in place to prepare, respond and recover from health emergencies.

**Research Needs:**

- Intervention-focused research and implementation science approaches.
- Research anchored in justice and equity.
  - Can work with researchers on shared priorities.
  - Equip Interdisciplinary teams to work together over long term horizons.

**Future Directions:**

- Increase capacity.
  - look beyond three- or five-year funding commitments to more long-term, sustainable funding.
  - requires political will and clear leadership.
  - Encourage more cross-cutting research initiatives on environments and health.
  - Training interdisciplinary teams, for example with tri-council training opportunities.
- Research that supports whole of government and whole of society solutions
  - requires political buy-in.

***“Whatever you’re doing, look at the effect of the environment on your domain and publicize it.”***

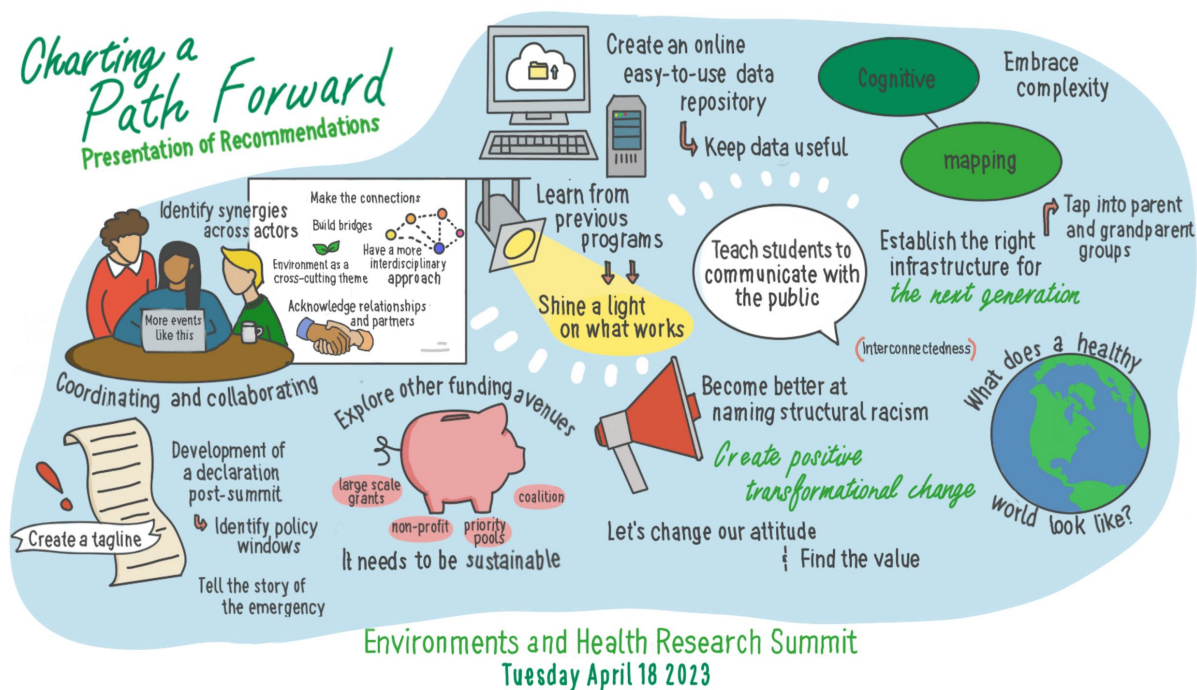
- Brian Rowe, Scientific Director, CIHR Institute of Circulatory and Respiratory Health

## Workshop: Charting a Path Forward

Following-up on the morning Plenary and presentations from representatives of several funding agencies, the Summit participants were tasked with considering what is needed to advance environments and health research in Canada. This was undertaken in small break-out groups, which were organized to mix-up research teams and different stakeholder sectors. Virtual participants were also organized into similar groups to hold on-line discussions.

Each group was asked to come up with **one big idea that will move the environments and health agenda forward**. The groups and additionally were charged with co-developing recommendations for government, academia, advocacy, and funding agencies for advancing environments and health research going forward.

As the pictorial overview (below): **Charting a Path Forward**, portrays, the workshop and plenary were met with enthusiasm and active sharing of ideas. *Overall, it was recognized that there is a need for coordination of the research, current and future, in order to effectively build upon past successes, to make connections across disciplines and to identify key knowledge gaps. This is best led by government bodies who would also help connect results (i.e., new knowledge) with stakeholders, align the work with policy windows, create other funding avenues with more stakeholders and ensure capacity (i.e., expertise) is sustained in the long term.*



## Plenary Discussion

The path forward outlined in the plenary cut across several themes: Interdisciplinary research; An institute of environments, health and well-being; Research infrastructure and; Advocacy. The key ideas within these themes are outlined below.

### Interdisciplinary research

- Specific calls for interdisciplinary research with strict criteria
- Consider 2-stage proposal mechanisms.
  - allows time and initial resources for connections in new teams to mature, including face-to-face meetings.
- Funding for team grants that have a criteria for interdisciplinarity.
- Create structures and mechanisms that support interdisciplinarity within universities.
  - Vital for planetary health but need to create sufficient institutional inertia.
  - Interdisciplinary teams foster cultures that are overt about how partners see knowledge and power.
  - Share motivations of each for working on this research.
  - Invest time in identifying shared values and vision and define common language.
  - Define and co-develop clear high-level goals.
  - Create spaces for collaboration.
  - Foster “Creative professional activities” like networking events.
- Better recognize and acknowledge interdisciplinary collaborations.
  - Expand “academic currency” for such work.
- Encourage interdisciplinary training early in research career development.
  - Training on successful partnerships.
  - Student intensive courses/programs.
- Build collaborations with Europe and USA.

### An Institute on Environments, Health and Well-being

- Enhance Funding mechanisms.
  - New funding to keep big projects going.
  - Ensure data governance oversight are part of the process.
- Increase environments and health priority calls within larger calls across all 3 agencies.
- To avoid: With funding agencies giving out larger amounts for much larger initiatives there could be the tendency to generate some inequity in the health funding landscape because it favours established researchers with large networks.
- Simplify New Frontiers in Research Fund-like calls.
- Re-thinking the funding model.
  - taking into consideration time commitment of project management, etc.
- To avoid: only small grants and large multi-million-dollar grants (i.e., need the medium grants).
- Recognize that participatory research (i.e., community-based) takes a long time and funding mechanisms are not optimal.

### Research infrastructure

- Need a “centralised” resource that doesn’t rely on researcher-driven funding.

- Federally managed data platform.
  - Virtual platform to connect people and projects.
  - just to know what's "out there".
- Attempt to much more-broadly and inclusively document research on environments and health.
  - support expertise to integrate this research to identify common themes and knowledge gaps and areas of strength.

## Advocacy

- Researchers must engage actively with advocacy allies.
  - More allies are needed such as the Canadian Centre for Policy Alternatives, Canadian Association of Physicians for the Environment and from other professional organisations, nurses, doctors and universities.
  - Need an active network in order to be prepared with the skills and knowledge to get action.
  - Train students on how to communicate research to different audiences.
- Build public awareness across the lifecourse to promote healthy choices.
  - From parents and children to adults.
  - Action often starts with public outcry, but relationships with advocacy groups should come earlier.
- Direct advocacy towards known policy windows (see recording of Senator Kutcher's presentation).
- Funding needed to move from knowledge to action that supports community activism.
- Use the process of learning systems to achieve policy/policy systems for environments and health.
- Connection with different workforces to implement and amplify messages.
- Engage with politicians who are passionate about environments and health and can help make things happen.
- Develop a post-summit declaration that pushes for interdisciplinary environments and health research to create positive/transformational change.

## Key Messages from the Environments and Health Summit

The two-day *Environments and Health Summit* brought together representatives from all 18 of the EHSI projects along with a diversity of other participants. Collectively, their goal was to reflect upon the EHSI research in the context of how the results have been and can be translated for different audiences (e.g., knowledge users) and to consider future directions in Canada towards a sustained (i.e., funded) environments and health research agenda. Given higher level goals, the Summit's focus was not on a detailed series of presentations demonstrating what each project achieved. Research highlights were discussed through six separate webinars (available [online](#)) in the weeks prior to the Summit. These webinars were followed at the Summit with brief presentations on each study's key findings (see [Lightning Round](#)) to facilitate discussion during the World Café. These roundtable discussions were structured so that the researchers were queried by Summit attendees to spark reflection on their key messages, their knowledge translation (KT) audiences and common themes across the different project's findings which could potentially be communicated in a more-integrated manner to a wider audience.

## Strategies for enhancing the uptake & impact of KT Efforts

With the goal of the first day being geared towards identifying strategies for enhancing the uptake and impact of KT efforts, several key messages emerged:

- 'Academics' (i.e., university-based researchers engaging in environments and health research) are viewed by most audiences (i.e., recipients of new knowledge) as being highly credible and possessing valuable information and viewpoints. As such, there is an increased need for 'academics' to be heard and to be vocal, speaking out on issues where they have expertise even if the messages may be unpopular to some stakeholders, including partners engaged in their own research.
- Research findings and their implications, such as evidence supporting societal change, are more-effectively shared with audiences if presented within a story-driven narrative that explains what is new about the research and how it is applicable to everyday people.
- In addition to being briefed on the new evidence arising from research, policymakers need to gain an appreciation of how the results of a study fit into a broader state of the science.
- Establishing partnerships with local actors (e.g., such as in healthy cities research) is essential to translating knowledge effectively although it is important to be mindful of power and power dynamics in intersectoral partnerships, particularly in attempts to build consensus.
- Communities of practice can be extremely valuable for sharing information and building relationships but require long term engagement/commitment to keep them moving the agenda forward.
- Connecting different key players in each sector (i.e., those not normally interacting with one another) and equipping them with evidence from recent research is what sets the stage for change to happen (i.e., the 'same old' partnerships are not enough).

- A high profile, empowered child health advocate in Canada is needed to make a big impact on future health.
- Integration of all strands of the environments and health research conducted in the EHSI into a cohesive message is needed to better realize the KT opportunities.
- Need to include all ways of thinking in the research and KT strategy to successfully tackle issues related to environments and health.

## Future environments and health research directions in Canada

The second day of the Summit was dedicated to reflection of what was learned through the EHSI, including from the previous day, and then the focus shifted to discussion on future environments and health research directions in Canada, and how they can be sustained (i.e., funded).

CIHR's thoughtful planning of its EHSI resulted in scientific progress on several fronts, often tackling several deep-seated issues that hinder progress on environments and health, such as how to build intersectoral partnerships that work. Looking forward, there are countless, specific research studies to be done to inform future initiatives for improving Canada's environmental record to ensure health, equity, and a sustainable future. These needs are clearly beyond what one funding initiative can support. However, despite valuable experience being gained through the 6+ years of EHSI research, the Summit and its lead-up webinars revealed an essential next step: **There needs to be an effort to synthesize and scale what was learned in terms of novel measurement methods and community engagement processes.**

## Sustaining Future Environments and Health Research in Canada

Without a future EHSI to focus research and support multidisciplinary teams working substantively with stakeholder partners, health-oriented, environmental research will likely revert to being under-funded and fragmented. Unquestionably, there will be some excellent research, given the interests and expertise within the Canadian scientific community both in government and academia. While large research gaps will exist everywhere, the lack of leadership in the environments and health area will mean that the research that is occurring will lack coordination and synthesis and that in Canada we won't be able to effectively identify where the most serious knowledge gaps exist, what directions best build upon Canada's talent and current, promising results and thus would be most fruitful. Furthermore, foresight will suffer with an inability to uncover "unknown unknowns".

At the Summit, Bill S5, which represents an update to the Canadian Environmental Protection Act (CEPA) was profiled on the morning of Day Two. A centerpiece of Bill S5 is the formal recognition of the **right to a healthy environment** for all Canadians. The implications of this right could be far-reaching. Bill S5 potentially represents a significant policy driver that will require greater investment in scientific research informing issues related to environments and health. The question of how an effective research program could unfold was addressed via a panel discussion and a workshop during the Summit's

second day. Perspectives related to One Health, Planetary Health, the Global Burden of Disease, Indigenous Health and the Exposome were represented. Several key messages emerged:

- A tri-council Institute on environments, health and well-being is needed.
  - Only this level would be able to support truly holistic, multidisciplinary research.
  - Only a dedicated institute can efficiently coordinate research and subsequent knowledge translation efforts.
    - These directions will require sustained, long-term funding, rather than one-off initiatives.
- New research needs to capitalize on the emerging technologies for measuring multiple exposures at once and also ensure they are deployed easily or consistently.
  - Canada could lead or join a global effort dedicated to doing this effectively.
    - Methodologies and metadata need to be standardised and harmonised to enable compatibility among data platforms and labs across multiple countries.
- Short of a dedicated institute across the tri-councils, CIHR could advance the environments and health agenda by requiring investigators, regardless of institute, to substantively consider all relevant environmental aspects within their research foci.
- Team grants implemented over two stages are necessary to allow time for recipients to connect across disciplines and to develop novel research questions and solutions.
- Specific criteria for evaluating interdisciplinarity in team grants are needed.
- Universities should play a role in creating structures and training that support interdisciplinary work.
- CIHR and other funding bodies should consider options for renewing successful projects to keep larger efforts going, such as those requiring significant initial effort to create multi-stakeholder/intersectoral partnerships.
- Initiatives that provide larger funding amounts to support larger programs are necessary given the complexity of environments and health research, but this can lead to inequity in the health funding landscape because it caters to established researchers with large networks.
  - Availability of funds for smaller projects can allow newer investigators to establish their programs.



## RECOMMENDATIONS - NEXT STEPS

The conditions are ripe today for moving quickly on a fully funded Canadian Environments and Health research strategy.

Nearly concurrent with the Summit the **Association of Faculties of Medicine of Canada released their [Declaration on Planetary Health](#)** declaring that “the health of the planet a Code Red emergency and call for immediate implementation of planetary health education and research, and the transition to climate-resilient and low-carbon health systems in order to build a healthy, sustainable, and just future for all.”

**“As healthcare professionals, we have a responsibility to lead the charge towards a healthier, sustainable, and just future for all. This is not just an opportunity, but a moral imperative that cannot be ignored.”**

- [AFMC September 2023](#)

Shortly after the Summit on June 13, 2023, **Bill S5 received [royal assent](#)**, becoming law in Canada, officially adopting the right to a healthy environment.

Then came our **unprecedented summer of fires** and recognition that coast to coast no Canadians are immune from the impacts of climate change.

Now on Oct. 25. 2023, “**over 200 health journals** called on the UN, political leaders, and health professionals to recognise that climate change and biodiversity loss are one indivisible crisis and must be tackled together to preserve health and avoid catastrophe”.

**“This overall environmental crisis is now so severe as to be a global health emergency.”**

- 200 health journals writing in [The Lancet](#)

Following on from the Summit the Canadian Journal of Public Health published an editorial entitled: “[Canada needs an institute to fund research into environments, health and societal well-being](#)”. This editorial, authored by several of the Summit participants and organizers, calls for readers of the journal and the research community at large to help advocate for the funding and support structures needed. In making the plea, the editorial outlines the rather dire state of research funding in Canada and the risks of allowing this situation to continue. What is needed to adequately address the environmental determinants of health is “a coherent approach that mixes, integrates and converges know-how from many fields to generate solution-oriented research”, recognizing the Geneva Charter for Well-being from the World Health Organization. The need for an institute was further articulated in an editorial in the Hill Times written by some of the authors in the Canadian Journal of Public Health. This can be accessed [here](#).

Collectively, these statements are unambiguous and make it clear that **a comprehensive strategy is urgently needed and that the scope of research guiding Canada and the world towards solutions must be broad**. This might best be captured within the context of planetary health. Interestingly, although only 18 projects were undertaken in the EHSI, their

scope was broad and laid a strong foundation for impactful environments and health research going forward. However, this work must continue and, given the developments outlined above and as Canadians witness nearly daily, the imperative for a dramatic increase in effort is clear. The deliberations at the Environments and Health Summit may thus offer some guidance for next steps.

**1. Hold future Environments and Health Summits.**

- The theme should vary and typically would take stock of some aspects of current knowledge and ways to advance environments and health research in Canada.
- At present, there is no encompassing body in Canada taking a lead on this critical issue, yet many organizations continually point towards the importance of health within the enormous environmental challenges the world is experiencing.
- These Summits should include broad representation from Federal, Provincial, Research, Advocacy, and other organizations working in Environments and Health.

**2. Launch an effort to scale what was learned in the EHSI in terms of novel measurement methods and community engagement processes.**

- This would be an appropriate topic for a follow-up Summit.
- The EHSI research teams represent a unique cohort of grant recipients who have learned distinctive lessons pertaining to how interdisciplinary research can be done. This is particularly valuable because interdisciplinary research is where many scientific advances will come from in the future.
- Future efforts should be made to document, spread and scale these insights to ensure interdisciplinary research architecture is maintained and strengthened in Canada.
- There was much learned over the course of the EHSI that other research teams could learn from. Efforts should be made to document those methods and processes and to scale them to the broader scientific research community in Canada. This would help build capacity among researchers to conduct community-engaged scientific research.
- Should such an effort be launched there will be a need for a platform or portal where lessons learned are documented, data, methods and best practices are shared and connections can be made so that future efforts move ahead and avoid 'reinventing the wheel'. Such a platform should not be dependent on project-based research-driven funding to ensure it is sustained, well-used and promoted.

**3. Improve coordination to document and direct interdisciplinary research.**

- Despite significant progress, funding bodies should make further contributions towards supporting an interdisciplinary environments and health research community, including Indigenous knowledge and ways of knowing.
- More health research than is appreciated has environmental relevance but is not adequately documented in this context. As a result, policymakers, research managers and researchers do not know the full extent of the work being done and by whom.
- A federally led platform to connect people and projects could take key steps towards advancing collaboration and progress in the field. Such a platform would be difficult for CIHR or another of the Tri-Council funding bodies to champion and sustain. A logical home for this platform, which could be a valuable Canadian resource, would be Health Canada.

- The actual (full scope of the) Canadian landscape is unknown, partly because many research efforts have a link to environmental health issues but are not solely categorized as environments and health research (e.g., large Canadian cohort platforms such as CLSA and CanPATH). As a result, the landscape is highly fragmented and the different ‘homes’ of knowledge and expertise are not optimally coordinated.
- Appreciation is thus lacking regarding what connections are most ripe for addressing new questions, what role Indigenous knowledge can play and what potential exists for real discovery and progress.
- A platform designed to connect people and projects that could be working together would make it easier for researchers to find out who is doing complementary research so that higher impact work can be undertaken in the future.

#### **4. Develop flexible funding mechanisms.**

- Although essential to building capacity for intersectoral research, developing productive participatory research partnerships with community organisations, municipalities, Indigenous knowledge holders and other relevant stakeholders is time-consuming.
- Recognizing these time-consuming processes in the funding structure could help facilitate this critical area of research across a range of disciplines.
- Increasing funding for team grants that have a specific requirement for interdisciplinarity would do more to increase capacity in Canada’s for more complex scientific research to be undertaken.

#### **5. Create a high-profile position for a children’s health advocate**

- Pregnancy, infancy and throughout childhood are critical time windows when environmental exposures can have an outsized impact on physical and mental health which can last throughout life.
- Opportunities for effective interventions are potentially great as is the interest of parents to protect their children.
- Raising the profile of these opportunities through an advocate could serve to raise awareness of environments and health issues and the value of scientific research.

## **CONCLUDING REMARKS**

The environments we live in have a profound effect on our overall well-being and more broadly who we are. The ways that this comes about are complex, operating on all scales inside and outside our body, and are bi-directional whereby the environment continually shapes us and we continually shape the environment. The impacts are felt individually and also accumulate over populations such that well-being requires knowledge and action in consideration of both of these perspectives.

While subtle, the use of the phrase *environments and health*, which CIHR used for the EHSI, vs. *environmental health* is important. The former helps ground us less towards anthropocentric thinking and more towards an understanding that above all, environments

(and ecosystems) must be healthy for humans and humanity to realize long-term well-being; humans are (one) part of the whole.

The research undertaken across the EHSI covered this *whole environments and health* spectrum admirably. Each in their own way, the projects embraced the inherent complexity of the systems they were studying thereby significantly advancing knowledge.

Looking ahead and beyond the five recommendations above, we know what we need to do. While the EHSI made significant progress on some critical hurdles, there is much work to be done to build on that progress:

- implementing and evaluating currently known or newly discovered healthy city solutions in a complex social environment
- extending the mission of personalized medicine towards personalized environmental health
- embracing both Indigenous and western knowledge towards minimizing impacts and preparing for the implications of environmental/societal change, such as water scarcity, wildfires, extreme weather and energy and economic transitions.



Photo: Summit attendees at the Canadian Museum of Nature.

## APPENDIX

### Project Descriptions, Key Findings and Selected Outputs

Project Name	Principal Investigator	Description	Key Findings	Publications
<b>URBAN FORM</b>				
Multisectoral Urban Systems for health and Equity in Canadian cities	Lise Gauvin, Université de Montréal	At the beginning of the 21st century, to counter threats to population health, Public Health Departments have forged new alliances with major Canadian cities. This research program studies partnerships aimed at transforming built environments to increase the availability of fruit and vegetables, promote public transport and physical activity, and improve availability of affordable housing and to understand population perspectives on these transformations.	<ul style="list-style-type: none"> <li>• Intersectoral partnerships aimed at healthy eating and active living come in different shapes and forms; all preoccupied by health equity yet the pursuit of equity systematically poses conceptual and operational challenges</li> <li>• Many analyses show that women and individuals identifying as being Indigenous tend to show greater</li> </ul>	<p><a href="#">Improving health through multisectoral collaboration: enablers and barriers   SpringerLink</a></p> <p><a href="#">Employing the equity lens to understand multisectoral partnerships: lessons learned from a mixed-method study in Canada   International Journal for Equity in Health   Full Text   biomedcentral.c</a></p>

			<p>acceptance of many of the urban form transformations that could lead to healthy eating and active living</p> <ul style="list-style-type: none"> <li>• Understanding how to integrate equity and population acceptance into the interventions led by intersectoral partnerships is a critical gap that could be addressed in future research</li> <li>•</li> </ul>	<p><a href="#">om)</a>  <a href="#">Hosford, K, Winters, M., Saint-Onge, K., Muhajarine, N., &amp; Gauvin, L. Acceptability of built environment interventions to support active travel in 17 Canadian Metropolitan Areas: Findings from the THEPA study. World Conference on Transportation Research, July 2023. BOOKLET WCT R2023.pdf</a></p>
<p>The Built Environment and Active Transportation Safety in Children and Youth</p>	<p>Brent Hagel, University of Calgary</p>	<p>This research program studies how features of the built environment affect whether kids walk or bike to school and whether or not certain built environment features increase or decrease their likelihood of getting hurt. The program partners with injury prevention professionals, provincial governments, environmental organisations and traffic safety professionals who are in a position to help us better understand what features of traffic environments are dangerous or safe.</p>	<p>Prioritise social equity in planning road safety interventions including:</p> <ul style="list-style-type: none"> <li>• Reducing speeds</li> <li>• Deploying traffic calming</li> <li>• Separating children from traffic (bike lanes, better walking</li> </ul>	<p><a href="https://cumming.ucalgary.ca/research/child-active-transportation-safety-environment/resources/publications">https://cumming.ucalgary.ca/research/child-active-transportation-safety-environment/resources/publications</a></p>

			infrastructure)	
<p>Environments and Health INTERACT: INTERventions, Research, and Action in Cities Team</p>	<p>Yan Kestens, Université de Montréal</p>	<p>This research project measures how designing healthy cities can influence physical activity and how much people participate in social activities. It evaluates four infrastructure designs in four different Canadian cities (Vancouver, Victoria, Saskatoon and Montreal). It also develops and refines smartphone apps to measure how people move through cities. These tools include apps to measure physical activity and apps for interactive mapping of where people move in a city.</p> <p>The INTerventions, Equity, Research, and Action in Cities Team (INTERACT ) is a pan-Canadian collaboration of scientists, urban planners, public health practitioners, community partners, and members of the public, uncovering how the design of our cities is shaping the health and well-being of all Canadians.</p>	<p>Created research infrastructure, such as cohorts, tools and methods to evaluate urban transformation, gather data, and develop evidence to support policymakers</p> <p>Developed strong partnerships with over 50 stakeholders and local partners to define research agenda and questions, which has led to local evidence as well as additional funding</p>	<p><a href="https://link.springer.com/article/10.1186/s12889-018-6339-z">https://link.springer.com/article/10.1186/s12889-018-6339-z</a></p> <p><a href="https://teaminteract.ca/findings/">https://teaminteract.ca/findings/</a></p>

## RESOURCE DEVELOPMENT

<p>A SHARED Future: Achieving Strength, Health, and Autonomy through Renewable Energy Developments for the Future</p>	<p>Heather Castleden, University of Victoria</p> <p>Diana Lewis, University of Guelph</p>	<p>This research program, the only EHSI program that leads with Indigenous Ways of Knowing, focuses on bringing forward stories of reconciliation and healing in the context of intersectoral partnerships in renewable energy projects. The program’s research goal is to bring to light new and restored understandings of energy and integrative health. We examine how these partnerships may offer opportunities for a new era of nation-to-nation collaborations between Indigenous Peoples, organisations, and governments, with proponents, consultants, utilities, and state governments. Our program examines how Indigenous knowledge systems have the potential to lead us towards reconciling, healing, and decolonizing our relations with each other as well as the land, air, and water around us.</p>	<p>Developed governance model with 50% Indigenous representation and 50% representation of people identified as women</p> <p>Partnered with community leads to ensure knowledge sharing is relevant to Indigenous communities</p>	
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<p>The ECHO Network (Environment, Community, Health Observatory): Strengthening intersectoral capacity to understand and respond to health impacts of resource development</p>	<p>Margot Parkes, University of Northern British Columbia</p>	<p>The ECHO Network is focused on working together across sectors to take notice of - and respond to - the influence of resource extraction on health and well-being, with specific emphasis on rural, remote and Indigenous communities and environments. ECHO brings together researchers and knowledge-holders across health, environment and community sectors who have identified the need to better understand and address the cumulative health, equity and ecological challenges of resource extraction and climate change. The ECHO Network is anchored in knowledge exchange partnerships in New Brunswick, Alberta, and British Columbia, with connections across Canada and Oceania. ECHO has developed a platform of integrative tools and processes to strengthen intersectoral capacity, and to connect people to information, practices and shared perspectives across generations and contexts. By focusing on integrative and collaborative responses to cumulative impacts of resource extraction and climate change, the ECHO Network has also identified new pathways of connection and co-benefits for health, including collective efforts that prioritise Indigenous leadership, champion equity and eco-social approaches to public health.</p>	<p>Embodiment of environment, health and community interdisciplinarity</p> <p>Led successive pilots integrating health, social and environmental impact assessments</p> <p>Worked with knowledge users to co-develop impact assessment tools that bring together perspectives on ecosystems, environment, equity and health</p>	<p><a href="https://www.echonetwork-reseaecho.ca/resources">https://www.echonetwork-reseaecho.ca/resources</a></p>
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<p>Patterns of Resilience Among Youth in Contexts of Petrochemical Production and Consumption in the Global North and Global South</p>	<p>Michael Ungar, Dalhousie University</p>	<p>This project assesses how young people adapt across the carbon cycle and use what we learn about their patterns of resilience to improve the lives of all youth. Both oil and gas production and the process of consumption (as it relates to climate change) have large impacts, both positive and negative, on social, economic and environmental systems that affect young people's mental health and overall wellbeing. To better understand these complex relationships at both ends of the carbon cycle, a multidisciplinary and multisectoral team of researchers and community and industry partners in two communities in Canada (Drayton Valley in Alberta, Cambridge Bay in Nunavut) and two communities in South Africa (Dunoon in the Western Cape, Secunda in Mpumalanga) studied the resilience of young people and the systems with which they interact.</p>	<p>Global price of oil has dramatic impact on family dynamics and rates of depression in children</p> <p>Better understand how to successfully transition from carbon producing community</p>	
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## OBESITY AND ENVIRONMENT

<p>Determining the genetic and environmental factors associated with metabolic phenotypes across Canada</p>	<p>Philip Awadalla, University of Toronto</p>	<p>The program capitalises on existing data and resources to address highly relevant questions for public health authorities, researchers, and health practitioners. The focus is on metabolic syndrome (MetS), a cluster of medical conditions that are common in ageing adults, including: obesity, hypertension, high cholesterol, high blood sugar, and insulin resistance. The activities of this program are: (1) To quantify the effect of air pollution and built environment on MetS; (2) to study the effect of air pollution on molecular changes in DNA that regulate gene activity, and to determine if these changes are associated with MetS; (3) to map differences in the DNA code that regulate the expression of genes, and see if their effect are modified by environmental factors.</p>	<p>Gene expression profiles reflect region of living rather than ancestry</p> <p>Gene expression is associated with air pollution and higher prevalence of CVD and respiratory traits</p> <p>Also discovered gene x environment interactions (air composition) at specific loci using eQTL mapping</p>	
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<p>Gene Environment Team on Brown/beige Adipose Tissue (GET_BAT)</p>	<p>Gregory Steinberg, McMaster University</p>	<p>More than 5 million Canadians have the chronic interrelated diseases of obesity, non-alcoholic fatty liver disease (NAFLD) and type 2 diabetes (T2D) and their incidence in the population are rapidly increasing. Obesity is an important risk factor for developing NAFLD and T2D which contribute to the development of liver cancer and heart disease. Therefore, designing new ways to treat or prevent T2D and NAFLD are important. In this proposal we will conduct studies in cells, mice and humans to examine how agricultural and food processing practices may regulate BAT metabolic activity directly or indirectly by altering the billions of bacteria that reside within our gastrointestinal tract. These studies will help us develop new strategies to enhance BAT activity that may be effective for treating and preventing obesity, NAFLD and T2D.</p>		
<p>CANadian Urban Environmental (CANUE) Health Research Consortium</p>	<p>Jeff Brook, University of Toronto</p>	<p>The consortium plays a pivotal role in supporting the research needed to address these issues. It links standardised environmental exposure data about air quality, green spaces, walkability, noise and other aspects of the urban/suburban environment to existing human health data platforms. This enables studies looking at how these factors affect health, from birth to old age. We also map where and how conditions are changing, and how that increases or decreases the risk of health impacts.</p>	<p>443 data requests, 135+ peer-reviewed publications, 20+ MSc and PhD theses</p> <p>Significant need to enable public health and urban planners to use environmental data</p>	<p><a href="https://canue.ca/publications/">https://canue.ca/publications/</a></p> <p><a href="#">Healthier Cities – One Neighbourhood at a Time   Jeffrey Brook   TEDxUofT</a></p>

## MICROBIOME

<p>The impact of the gut microbiome and environment on the development of colorectal cancer</p>	<p>Alberto Martin, University of Toronto</p>	<p>This team of international recognized researchers investigates the role of bacteria that reside in the gut in the development of colorectal cancer. The previous and proposed research from this team show that gut bacteria is at the root of colorectal cancer; its manipulation of dietary nutrients such as complex carbohydrates and the subsequent impact on metabolic processes within the gut promotes the development of colorectal cancer in mice and humans that are genetically predisposed to develop this disease. The research has the capacity to develop diagnostics if a specific bacterial species is identified as the causative agent in colorectal cancer. In addition, the research will lead to the development of preventative protocols for colorectal cancer using alterations in diet or specific antibiotics that displace or out-compete "pathogenic" strains.</p>	<p>A diet rich in fibres will protect you from colon cancer caused by this common E. Coli bacteria</p>	<p><a href="https://albertomartinlab.ca/publications/">https://albertomartinlab.ca/publications/</a></p>
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<p>Programmatic research to understand how modifiable environmental factors interact with the genome in the development of asthma.</p>	<p>Stuart Turvey, University of British Columbia</p>	<p>It isn't clear why some people get asthma and others don't, but it's probably due to a combination of environmental and genetic (inherited) factors. The goal of this research program is to understand these environmental and genetic factors that cause asthma. This new understanding is expected to give us better tools to predict who will get asthma and to develop ways to prevent asthma developing in the first place.</p>	<p>Antimicrobial stewardship efforts in British Columbia have reduced early-life antimicrobial exposure over the last two decades through reduced prescribing in antibiotics, with a similar trend in asthma incidence</p> <p>Children in CHILD cohort who were prescribed antibiotics in first year of life had double the risk of being diagnosed with asthma at school age</p>	<p><a href="https://www.bcchr.ca/turveylab/selected-publications">https://www.bcchr.ca/turveylab/selected-publications</a></p>
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<p>Elucidating the Gene-Environment Interactions that drive Autoimmune Disease among South Asian Canadians - The GEMINI Program.</p>	<p>Jennifer Gommerman, University of Toronto</p>	<p>The GEMINI project (Generational differences in Environmental exposures caused by Migration: Impact on Incidence of inflammatory disease) studies a growing concern in South Asian Canadian communities – these communities are experiencing an increase in incidences of chronic inflammatory disease upon exposure to the North American environment.</p>	<p>2nd generation South Asians in Ontario lack microbes from 1st generation, but need to understand to what degree changes in microbiome are driving increased risk of chronic disease</p>	
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## CHILD HEALTH

<p>The Developmental Origins of Pediatric Obesity and Obesity-Related Complications.</p>	<p>Vernon Dolinsky, University of Manitoba</p>	<p>This translational project studies clinical populations of pregnant mothers, their children and parallel rodent model systems in order to determine how early life environmental exposures (e.g.- maternal diets, high blood sugars etc.) affect the genes of the children to influence their risk for obesity. We will also determine whether altering the early life environment (e.g.- through diet etc.) modifies disease risk factors in children most susceptible for obesity. The identification of new early life biomarkers of disease could prevent the extensive health and financial burden of obesity.</p>	<p>Series of biomarkers for diabetes and obesity can inform future interventions to disrupt intergenerational diabetes trajectory</p>	
<p>Gene and environment effects on lung health and risk for chronic respiratory disease, asthma &amp; COPD</p>	<p>Padmaja Subbarao, Hospital for Sick Children</p>	<p>This project studies a group of babies that have been followed since birth, whose families have filled out lots of questions about what they eat, breathe and how often they get sick. These kids and their families have also done breathing tests that measure how well their lungs are doing. From studying all of this information, we believe we can discover what things each person can do to improve their lungs and prevent them from getting chronic breathing problems, making Canada the healthiest place to live.</p>	<p>Only 12% of asthma explained by genetics in children, while 30% explained by environmental factors</p>	



<p>The diet-microbiota-gut axis in pediatric IBD</p>	<p>Alain Stintzi, University of Ottawa</p>	<p>This research program investigates the complex interactions among diet, the gut microbiota, and the host. It provides information that may be essential for personalised dietary and microbiota changes required to keep people with inflammatory bowel disease (IBD) in remission. It is well accepted that the gut microbiota plays a crucial role in the digestion of food, particularly plant-derived starches, and the production metabolites essential for human health. The primary objective of the proposed research is to investigate the complex tripartite interactions between the diet, the gut microbiota, and the host. Additionally, this study aims to characterise the role of microbial food-derived metabolites in paediatric IBD. This study will generate the information necessary for developing methods to improve bacterial activities in our intestine as treatment for IBD patients. This research will have important implications for the quality of life of people with IBD everywhere.</p>	<p>Discovered new insights into the diet-host-microbiome interactions which reveals changes in the composition and function of IBD microbiome, which suggests that it may be possible to manipulate the gut microbiome to improve treatment response for IBD</p> <p>Also discovered biomarkers that could identify risk of IBD and severity of inflammation which could help optimise treatment</p>	
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## AGRI-FOOD, THE FOOD-WATER NEXUS AND HEALTH

<p>Climate Change and Indigenous Food System, Food Security, and Food Safety (Climate Change IFS3)</p>	<p>Sherilee Harper, University of Alberta</p>	<p>The Climate Change and Indigenous Food System, Food Security, &amp; Food Safety (Climate Change IFS3) has created a multinational intersectoral team to characterise the vulnerability and resilience of Indigenous food systems to climate change to inform, enhance, and expand climate change adaptation interventions and adaptation planning.</p>	<p>Indigenous knowledge systems important in understanding how climate change affects food systems</p> <p>Indigenous self-determination in research critical</p> <p>Climate food health solutions available in this context</p>	<p><a href="https://www.climatechan geandglobalhealth.com/publications">https://www.climatechan geandglobalhealth.com/publications</a></p>
<p>Developing a Framework for Wastewater Reuse in Canada: Using Quantitative Microbial Risk Assessment, Risk Communication , and Community Engagement for Evaluating</p>	<p>Norman Neumann, University of Alberta</p>	<p>Drinking water treatment and sanitary waste management are considered the most important environmental public health achievements for infectious disease prevention. This project develops a participatory water reuse framework to engender trust in government and utilities to provide safe reuse water that communities seek to have in an equitable way to address Canada's \$90 billion water service infrastructure deficit.</p>	<p>Southern Alberta running out of water, so need to figure out how to reuse wastewater</p> <p>Some microbes resistant to wastewater treatment, and are antimicrobial resistant - could we be creating the ultimate superbug?</p>	

Water Fit-For-Purpose Reuse				
Endocrine Disrupting Chemicals: Towards Responsible Replacements	Barbara Hales, McGill University	<p>This research focuses on determining the extent to which our food, drinking water and breast milk contain the chemicals that have emerged as replacements for polybrominated diphenyl ether flame retardants, phthalates and bisphenol A. It then determines if these new alternatives are safer than the substances that they have replaced. International regulations/regulatory processes related to the assessment of alternatives/replacements, with a focus on Canada, US, Europe and South Africa, were analysed with the goal to transform the knowledge that is acquired during this team grant into international policy objectives and legal standards.</p>	Bisphenol A - cooking does not reduce exposure, thermal labels source of bisphenol S	

## Summit Agenda

### Vision Statement

**With the end goal of promoting healthier, sustainable environments for all, the objectives of the Environments and Health Research Summit are to take stock of and communicate the knowledge produced through the CIHR-funded *Environments and Health Signature Initiative* (EHSI) and establish a strategy that (i) fosters the growth of interwoven environments and health research in Canada through dedicated funding, and (ii) helps accelerate the uptake of research into policy, programs and practice.**

The CIHR Environments and Health Signature Initiative Research Summit is a two-day event that will take stock of knowledge that has been produced and shared through CIHR's *Environments and Health Signature Initiative*, and will provide research teams with hands-on coaching to improve the communication, translation and exchange of that knowledge. It will also facilitate a dialogue between researchers, policy makers, and knowledge users with the goal of outlining pathways for environments and health research to move in the future to strengthen Canada's position as an international leader in interdisciplinary environments and health research.

### Day 1: Improving Knowledge Translation for Environments and Health Research

The first day of the summit will focus on the EHSI teams' accomplishments and their varied approaches to knowledge translation. Prior to the Summit the teams will participate in a webinar to discuss their research accomplishments and at the meeting will give a 2-minute summary of their key activities and outcomes. These will be revisited during the day after hearing perspectives from knowledge users, which will be shared through a panel discussion. The panelists, representing different audiences, will discuss best practices and new approaches to knowledge translation for scientific research. This panel will feature topics such as: how to translate research to policy; strategies to craft effective messages for various audiences (e.g., policy-makers, advocacy groups); and approaches to evaluating the effectiveness of knowledge translation (i.e., uptake).

With these concepts in mind, after delivering their 2-minute research summary, the EHSI grant teams, grouped together along similar themes, will share their research with the invited knowledge users in a world cafe to better appreciate interests of different types of stakeholders and which concepts from their work are more-difficult to explain, ultimately to generate additional, more-impactful, clear messages. This will be followed by a workshop for research teams and Summit participants to think across themes, with discussions that cross-fertilize ideas on connections among the research results, subsequently leading to bigger picture communication messages, outreach strategies and future directions for their research. The goal will be to create a clear narrative of the successes of the EHSI research and how it has changed our understanding of the various issues explored. "What do we know now that we did not before? Why is it important?" It is hoped that by the end of the day a high-level vision of the significance of the research and its potential impact will emerge and then be presented in report back discussions along with identification of the critical issues for future work that will then motivate Day Two of the Summit.

## DAY 1 - ENHANCING KNOWLEDGE TRANSLATION FOR ENVIRONMENTS AND HEALTH RESEARCH

(V indicates in-person with virtual option: <https://utoronto.zoom.us/j/87314040870>)  
(L indicates Livestream on YouTube)

<b>9:00 am</b>	Breakfast/registration
<b>9:30 am</b>	<p>(V) (L) <b>Indigenous Opening Ceremony</b>  <b>Simon Brascoupé</b>, Anishinabeg/Haudenosaunee – Bear Clan is a member of Kitigan Zibi Anishinabeg First Nation, Maniwaki, Quebec; Adjunct Research Professor, Carleton University &amp; Former Chair of the CIHR Institute of Aboriginal Peoples Health Advisory Board</p>
<b>9:45 am</b>	<p>(V) (L) <b>Remarks from the Canadian Institutes of Health Research</b>  <b>Dr. Brian Rowe</b>, Professor, University of Alberta; Scientific Director, CIHR Institute of Circulatory and Respiratory Health (ICRH)</p>
<b>10:00 am</b>	<p>(V) (L) <b>Framing the Summit</b>  <b>Senator Margo Greenwood</b>, Independent Senator (British Columbia); Indigenous Scholar of Cree Ancestry</p>
<b>10:30 am</b>	<p>(V) (L) <b>Objectives for the day and overview of the Environments and Health Signature Initiative (EHSI)</b>  <b>Jeff Brook</b>, Associate Professor, University of Toronto; Scientific Director, Canadian Urban Environmental Health Research Consortium (CANUE)</p>
<b>10:45 am</b>	<p>(V) (L) <b>Panel Discussion</b>  <b>Maximising Impacts from Environments and Health Research: Perspectives from knowledge users</b></p> <p>The goal of this session is for panelists representing stakeholders from government, academia and advocacy to discuss how they use scientific results to achieve their goals, share how to communicate them effectively, including identifying the most-relevant messages, and recognizing when and how results may influence policy/practice/guidelines and be of interest to all Canadians and the media.</p> <p><b>Moderator:</b>  <b>Jeff Brook</b>, Associate Professor, University of Toronto; Scientific Director, Canadian Urban Environmental Health Research Consortium (CANUE)</p> <p><b>Panelists:</b>  <b>Sarah Viehbeck</b>, Chief Science Advisor, Public Health Agency of Canada  <b>Cory Neudorf</b>, Professor, University of Saskatchewan; President, Urban Public Health Network  <b>Melissa Lem</b>, Director, PARx; Board President, Canadian Association of Physicians for the Environment  <b>Dr. Joel Kaufman</b>, Professor, University of Washington; Editor-in-Chief, Environmental Health Perspectives</p>

	<p><b>Evelyne De Leeuw</b>, Professor of Urban Health and Policy, Director, Healthy Urban Environments Collaboratory, University of New South Wales, Australia Research Centre for Primary Health Care &amp; Equity</p> <p><b>Carolyn Jarvis</b>, Chief Investigative Correspondent, Global News</p>
<b>12:00 pm</b>	LUNCH
<b>12:45 pm</b>	<p>(V) (L) <b>Lightning round presentations</b></p> <p>The goal of this session is for each Environments and Health Research Team to deliver the highest-level message about their research in a 2-minute pitch to give participants a preview of what they will hear in the World Café.</p>
<b>1:30 pm</b>	<p><b>World Café with Environments and Health Signature Initiative Projects grouped by themes</b> <i>(in person only; online participants to view selected pre-summit webinars)</i></p> <p>The first goal of this session is for Summit participants to learn more about EHSI projects of their interest. Secondly, questions and feedback from participants will assist the individual research teams to better appreciate interests of different types of stakeholders and which concepts from their work are more-difficult to explain, ultimately to generate additional, more-impactful, clear messages.</p> <p><i>Two Rotations of Attendees - 35 minutes per rotation</i></p>
<b>2:45 pm</b>	<i>Break and move to plenary report back</i>
<b>3:00 pm</b>	<p>(V) <b>What did you learn? Report back from World Café</b></p> <p>In this session EHSI research teams will share insights they gained from engaging with Summit participants in the World Café and/or during their webinar that may help them refine and differentiate their message to meet the needs of different stakeholder groups.</p>
<b>3:30 pm</b>	<p>(V) <b>Workshop</b> <b>Widening the Lens: Developing Broader Key Messages from the Environments and Health Signature Initiative Research</b></p> <p>The goal of this session is for research teams and Summit participants to think across themes, with discussions that cross-fertilize ideas on connections among the research results, subsequently leading to bigger picture communication messages, outreach strategies and future directions for the research.</p>
<b>5:30 pm</b>	<p>(V) <b>Wrapping Up Day 1</b> Brief recap of the day and look forward to day 2 objectives ADJOURN</p>

## Day 2: Looking Forward: Where Does Environments and Health Research Need to Go?

The second day of the Summit will focus on where the field of environments and health research needs to go to address the health challenges posed by a changing environment.

The day will begin with a panel discussion exploring the state of environments and health research in Canada. It will focus on identifying areas where Canadian research needs to improve to be a standard-bearer for international environments and health research.

Following the panel, there will be another discussion focused on what the funding landscape for environments and health research will look like going forward, and what it should include to better support and advance this research in Canada. It will focus on what institutional support and architecture is required to ensure Canada can emerge as an international leader in environments and health research.

In the afternoon, attendees will take what they learned in the morning panels and develop a strategy that helps to move environments and health research into policy, practice and programs. By working in groups, attendees will develop recommendations that will be presented at the end of the Summit to advance environments and health research in Canada. The final recommendations will be included in a summary article in the Canadian Journal of Public Health.

<b>DAY 2 - LOOKING FORWARD</b> (V indicates in-person with virtual option: <a href="https://utoronto.zoom.us/j/87314040870">https://utoronto.zoom.us/j/87314040870</a> ) (L indicates Livestream on YouTube)	
<b>8:00 am</b>	Breakfast/registration
<b>8:30 am</b>	(V) (L) <b>Welcome to Day 2 of the Environments and Health Research Summit</b> <b>Jeff Brook</b> , Associate Professor, University of Toronto; Scientific Director, Canadian Urban Environmental Health Research Consortium (CANUE)
<b>8:35 pm</b>	(V) (L) <b>Reflection on EHSI achievements</b> <b>Nancy Edwards</b> , Professor Emeritus, School of Nursing, University of Ottawa; Former Scientific Director, CIHR Institute of Population and Public Health (2008-2016)  <i>Reflections from participants</i>
<b>8:55 am</b>	(V) (L) <b>Updates to the Canadian Environmental Protection Act</b> <b>Senator Stan Kutcher</b> , Independent Senator, Nova Scotia
<b>9:15 am</b>	(V) (L) <b>Panel Discussion</b> <b>Strengthening Canada’s Environments and Health Research Profile: Perspectives from Canadian and International Researchers</b> The goal of this session is to discuss over-arching directions such as One Health, Planetary Health, Indigenous Knowledge, Equity and Exposome, while recognizing unique Canadian priorities and strengths. What would a program that bridges these

	<p>ideas and that serves the needs of research, government and Canadians in light of global challenges look like?</p> <p><b>Moderator:</b> <b>Lise Gauvin</b>, Professor, Université de Montréal</p> <p><b>Panelists:</b> <b>Trevor Hancock</b>, Public health physician; former professor, University of Victoria <b>Samira Mubareka</b>, Associate Professor, University of Toronto; Lead, Royal Society of Canada One Health Task Force; <b>Nicole Redvers</b>, Associate Professor, Western University; Western Research Chair and Director of Indigenous Planetary Health, Western University <b>Michael Brauer</b>, Professor, School of Population and Public Health, University of British Columbia; Affiliate Professor, Institute for Health Metrics and Evaluation <b>David Balshaw</b>, Chief, Exposure, Response and Technology Branch, National Institute of Environmental Health Sciences</p>
<b>11:00 am</b>	BREAK
<b>11:15 am</b>	<p>(V) (L) <b>Panel Discussion</b> <b>The Future of Environments and Health Research Capacity: Perspectives from Canada’s Funding Bodies and Relevant Ministries</b></p> <p>The goal of this session is for the panelists to discuss the visions held by Canada’s funding bodies and other research-oriented departments in government in regards to priorities for environments and health research. This discussion will help inform future initiatives to work together towards a sustainably funded integrated Canadian program(s).</p> <p><b>Moderator:</b> <b>Daniel Fuller</b>, Associate Professor, University of Saskatchewan</p> <p><b>Panelists:</b> <b>Dr. Brian Rowe</b>, Professor, University of Alberta; Scientific Director, CIHR Institute of Circulatory and Respiratory Health <b>Sylvie Lamoureux</b>, Professor, University of Ottawa; VP Research, Social Sciences and Humanities Research Council <b>Tim Singer</b>, Director General, Environmental and Radiation Health Sciences, Health Canada</p>
<b>12:30 pm</b>	LUNCH
<b>1:30 pm</b>	<p>(V) <b>Workshop</b> <b>Developing recommendations for interdisciplinary environments and health research directions</b></p> <p>The goal of this session is for research teams and Summit participants to draft a set of recommendations that will motivate a future Environments and Health Research</p>



	Initiative that addresses priority research areas, strengthens multi-stakeholder partnerships and achieves sustainable, long-term funding.
<b>2:45 pm</b>	<p>(V) <b>Charting a Path Forward: Presentation of Recommendations</b></p> <p>In this session each working group will present their draft recommendations which can serve to guide future directions in Canada. These will be built upon and promoted widely after the Summit.</p>
<b>3:45 pm</b>	<p>(V) <b>Wrapping Up the 2023 Environments and Health Research Summit</b>  <b>Jeff Brook</b>, Associate Professor, University of Toronto; Scientific Director, Canadian Urban Environmental Health Research Consortium (CANUE)</p>
<b>4:15 pm</b>	<p>(V) <b>Indigenous Closing Ceremony</b>  <b>Simon Brascoupé</b>, Anishinabeg/Haudenauanee – Bear Clan is a member of Kitigan Zibi Anishinabeg First Nation, Maniwaki, Quebec; Adjunct Research Professor, Carleton University &amp; Former Chair of the CIHR Institute of Aboriginal Peoples Health Advisory Board</p>
<b>4:30 pm</b>	ADJOURN