



# Community of practice: an effective mechanism to strengthen capacity in climate change and health

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## Abstract

**Setting** Climate change is one of the greatest threats to global health in the twenty-first century and has recently been declared a health emergency. The lack of effective dissemination of emerging evidence on climate change health risks, effects, and innovative interventions to health professionals presents one of the greatest challenges to climate action today.

**Intervention** To identify and address the knowledge gaps at the intersection of health and climate change, the Canadian Coalition for Global Health Research (CCGHR) established a Working Group on Climate Change and Health (WGCCH). WGCCH is evolving organically into a community of practice (CoP) that aims to elevate knowledge brokering on climate change and health and expand to global multi-, inter-, and transdisciplinary realms.

**Outcomes** To date, the WGCCH established a regular webinar series to share expert knowledge from around the world on intersections between climate change and health, developed short summaries on climate change impacts on broad health challenges, supported young professional training, and enhanced climate health research capacity and skills through collegial network development and other collaborative projects that emerged from CoP activities.

**Implications** This paper proposes that WGCCH may serve as an example of an effective strategy to address the lack of opportunities for collaborative engagement and mutual learning between health researchers and practitioners, other disciplines, and the general public. Our experiences and lessons learned provide opportunities to learn from the growing pains and successes of an emerging climate change and health-focused CoP.

## Résumé

**Lieu** Le changement climatique est l'une des plus grandes menaces pour la santé mondiale au 21e siècle et a récemment été déclaré une urgence sanitaire. Le manque de diffusion efficace des données obtenues concernant les risques pour la santé liés au

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changement climatique, les impacts et les interventions innovantes auprès des professionnels de la santé constitue aujourd'hui l'un des plus grands défis de l'action climatique.

**Intervention** Pour identifier et combler les lacunes de connaissances communes à la santé et aux changements climatiques, la Coalition canadienne pour la recherche en santé mondiale (CCRSM) a créé un groupe de travail sur les changements climatiques et la santé (WGCCH). WGCCH évolue organiquement vers une communauté de pratiques (CoP) qui vise à élever le niveau de développement de connaissances liant les changements climatiques à la santé et à s'étendre aux domaines mondiaux multi, inter et transdisciplinaires.

**Résultats** À ce jour, le WGCCH a lancé une série de webinaires réguliers pour diffuser les connaissances d'experts du monde entier sur les liens entre les changements climatiques et la santé, a élaboré de courts exposés sur les impacts des changements climatiques sur les grands défis de santé, a soutenu la formation de jeunes professionnels et a amélioré la capacité et les compétences en matière de recherche en santé climatique à travers le développement d'un réseau universitaire et d'autres projets de collaboration dont ont émergé des activités de la CoP.

**Implications** Cet article propose que le WGCCH puisse servir d'exemple d'une stratégie efficace pour remédier au manque d'opportunités d'engagement collaboratif et d'apprentissage mutuel entre les chercheurs et les praticiens de la santé, d'autres disciplines et le grand public. Nos expériences et leçons apprises offrent des occasions de tirer des leçons des peines et des succès croissants d'une CoP axée sur le changement climatique et la santé.

**Keywords** Global health · Climate change · Community of practice · Equity · Co-learning · Knowledge exchange (or knowledge translation)

**Mots-clés** Santé mondiale · changement climatique · communauté de pratique · équité · co-apprentissage · échange de connaissances (ou transmission de connaissances)

## Setting

Over the past 30 years, research on potential health impacts of climate change has grown exponentially and findings indicate that our changing climate is likely one of the greatest threats to global health in the twenty-first century (Costello et al. 2009). Indeed, the severity and occurrence of floods, droughts, fires, and pest invasions across Canada in the past couple of years have demonstrated not only the financial costs but also the costs to physical and mental health. Recently, climate change was called a health emergency by over 70 public health and medical groups (CAPE 2019). Patz and Thomson (2018) noted that dissemination of emerging evidence on climate change health risks and innovative interventions to health professionals is a key priority. We argue that the lack of opportunities for collaborative engagement and mutual learning between health researchers and practitioners, particularly with other disciplines and sectors, presents one of the greatest challenges to climate action in public health preparedness and applied research today.

## Intervention

We introduce an emerging community of practice, operating under the umbrella of the Canadian Coalition for Global Health Research (CCGHR), as a potentially effective

mechanism to address the identified knowledge exchange gap in climate change and health research and practice. CCGHR is a knowledge network promoting equity in global health worldwide that operates with various working groups. Its members represent 25 Canadian universities and over 400 individual researchers and practitioners across professional health-related disciplines. Over half of this membership constitutes the Student and Young Professional (SYP) network. In early 2018, CCGHR prioritized the intimate linkages between global health and climate change. It has been widely acknowledged that health professionals and health researchers have a critical role to play in climate action and response (MacMillan et al. 2014; Hackett et al. 2020; Travers et al. 2019), yet relatively little has been done so far. To identify and address the knowledge gaps at the intersection of health and climate change, CCGHR established a Working Group on Climate Change and Health (WGCCH). WGCCH started by surveying CCGHR members on climate change-related health issues ( $n = 76$ ); only one in three respondents indicated having knowledge and expertise in the subject matter. Given that these members are primarily trained in health disciplines, a disconnect emerges in terms of the breadth of expertise that can be expected of these individuals and engagement with experts in other disciplines required for understanding interactions between climate change and health. Survey findings revealed particular interest in national and regional workshops, briefing notes on emerging issues, and webinars

focused on vulnerable groups, the intersection with socioeconomic drivers, and food safety, waterborne illnesses, and nutrition. Over the past 2 years, the working group has been addressing the identified knowledge gaps in a self-organizing, organic manner and slowly establishing itself as an emerging community of practice (CoP). The purpose of this paper is to reflect on WGCCCH activities to date and critically examine these in the context of its evolution towards a CoP.

Forming a CoP is a mechanism often used in Canadian public health practice to disseminate new information and bring together individuals with different backgrounds. CoPs tend to be continually evolving and self-organizing as a result of a shared desire for supportive knowledge sharing (Wenger 1998; Bacsu and Smith 2011) and are promoted between researchers and public health professionals as a means to share best practices and lessons learned to overcome current limitations on knowledge sharing (Connor et al. 2010). While engaging CoPs in climate change-related knowledge dissemination is not new (Raymond and Robinson 2013; Kalafatis et al. 2015), climate change and health CoPs are still rare. For instance, the federally funded HealthADAPT CoP (Government of Canada 2019) is currently limited to the 10 funded pilot projects and select health authorities across Canada. The uniqueness of WGCCCH is in its voluntary and fluid nature that operates without any core funding. This paper is a result of internal reflection on the role and value of an emerging heuristic CoP in strengthening capacity to address the challenges related to health impacts and crises of climate change.

Equity is a critical element in both health and climate change discussions (Friel et al. 2008); therefore, we used the CCGHR Principles for Global Health Research (hereafter Principles; CCGHR 2015) as a lens to assess the developments of the WGCCCH towards becoming a CoP. The Principles include authentic partnership, inclusion, shared benefits, commitment to the future, responsiveness to causes of inequity, and humility (Fig. 1) and are integrated into training modules for the Canadian Institutes of Health Research (CIHR) College of Reviewers as a national standard.

The WGCCCH can be thought of as an emerging CoP that coordinates climate change-related activities within CCGHR (Fig. 2). The CoP is volunteer-based and open to all interested participants with regular videoconference meetings. One individual is tasked with logistics and meeting minutes. WGCCCH and related activities are self-organizing, cross-fertilizing, and organic. Individuals or groups come up with initiatives and take action. They move freely between different similarly self-organizing, autonomous operational units, e.g., Students & Young Professionals (SYP), or projects such as organizing provincial Coalition Institutes (i.e., BCCIs in British Columbia). Many members engage in several different activities, which further facilitates mutual learning and knowledge exchange.

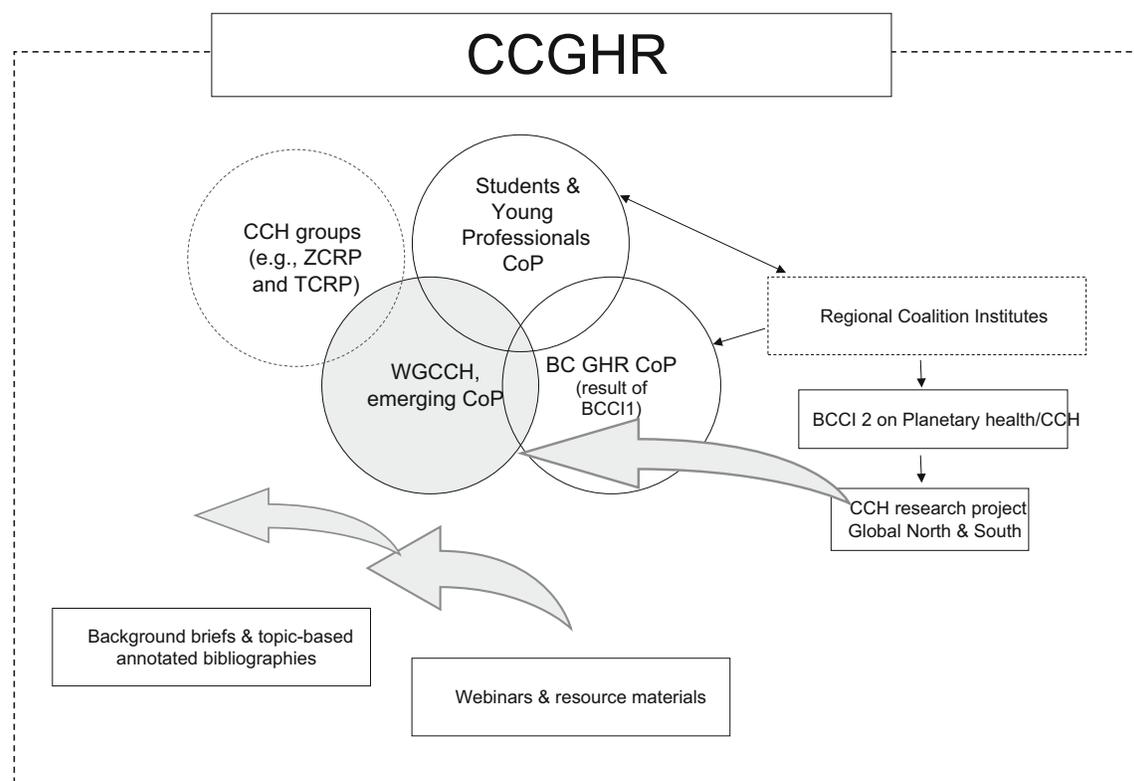


Fig. 1 CCGHR Principles for Global Health Research (CCGHR 2015)

## Emerging outcomes and outputs

While WGCCCH started as a working group, it is evolving into a formal CoP that aims to elevate knowledge brokering on climate change and health and expand to global inter- and transdisciplinary spheres. As mentioned above, WGCCCH based its initial activities on a needs assessment. By actively engaging members and opening the working group to all interested individuals, WGCCCH set a foundation that in a way was also operationalizing the CCGHR Principles, of authentic partnership, inclusion, and humility.

The WGCCCH's activities to date have engaged in knowledge generation, synthesis, and mobilization within the broader scope of global health research through CCGHR, including webinars, briefing notes, an annotated bibliography, learning materials, and a training institute (a regional Coalition Institute). The group reaches out laterally among academic and professional colleagues, with an emphasis on emerging scholars, and actively engages funders when opportunities arise, both within Canada and internationally. WGCCCH's webinar series on climate change addresses topics ranging from food security to urban water shortages, maternal health, wildfires, invasive species, infectious disease, and population health both within and outside Canada, from both research and practitioner perspectives. These webinars provide space for two-way knowledge exchange between researchers and practitioners and climate change tools for participants, as well as links to resource materials. They are recorded and published online alongside additional information resources identified by speakers, serving as a living compendium of



**Fig. 2** CCGHR organization and the WGCCH and its activities. CCGHR: Canadian Coalition for Global Health Research; CCH: Climate Change and Health; WGCCH: Working Group on Climate Change and Health; BC GHR CoP: British Columbia Global Health Research Community of Practice

knowledge. The participant numbers in the live webinars range from 40 to 60 but based on website activity the reach of the webinars extends significantly further.

A good example of WGCCH's vertical outreach activities is its collaboration on the Canadian Institutes of Health Research (CIHR)/Canadian International Development Research Centre (IDRC) consultations on the strategic global health research priorities for Canada. WGCCH prepared briefing notes reflecting the current state of and gaps in knowledge associated with climate change on infectious disease, chronic disease, and health care systems (CCGHR 2018; CCGHR n.d.). For example, a current gap in infectious disease research is the role of human perceptions and behaviours and how they might ameliorate or exacerbate climate change impacts. CCGHR's report on the consultations highlighted that the health impacts of climate change and mitigation strategies are leading determinants of the future health of all populations. In addition, the importance of considering cross-cutting themes addressed by intersectoral and transdisciplinary research teams with the capacity to effectively address inherently complex problems was also highlighted. However, the next iteration of CIHR's strategic plan has not yet been finalized.

One of the key characteristics of successful CoPs is capacity building (Gullick and West 2016), which has also been

prominent in WGCCH activities. As a working group within a larger organization, expansion of the emerging CoP beyond Canadian borders was not unexpected. Yet the speed with which international developments took place illustrates the potential of this type of mechanism for knowledge sharing. For instance, new climate change research groups have been formed within existing CCGHR collaborations, such as the Zambia-Canada Research Partnership (ZCRP) and the Tanzania-Canada Research Partnership (TCRP). A new focus of the Zambezi Ecohealth Partnership, a research group within ZCRP, is "Climate Change and Environmental Degradation." TCRP established a climate change working group that is connected to the WGCCH. It has since held several workshops on climate change and developed a module on "Climate Change Health Impacts in Tanzania" that is being tested in Tanzanian universities and organizations. This global partnering and mutual knowledge exchange further reflects the efforts to actively operationalize the CCGHR Principles, i.e., shared benefits and responsiveness to causes of inequity.

A major modus operandi of CCGHR for engaging future global health researchers and enhancing capacity is through the regional Coalition Institutes. Emerging researchers are introduced to the Principles through workshop-style shared learnings events that include preparation phases; on-site events consisting of hands-on, panel, and open sessions; and specifically designed

follow-up consolidation phases that include capacity strengthening activities. Members of WGCCCH took the initiative to organize the most recent Coalition Institute on the topic of climate change and planetary health in Victoria, BC (BCCI-2). The specific goal was to develop a multi-university research project on climate change and health that would facilitate mutual learning between researchers and practitioners in the Global North and the Global South, under the title “From the Global to the Local.” Students, young professionals, researchers, and faculty came together to better understand a systems approach to health that addresses human well-being within the context of the state of the elements on which it depends.

New to this particular learning experience was the engagement of emerging scholars, researchers, and practitioners from disciplines other than health, such as engineering, animal science, and environmental studies. The background of experienced practitioners ranged from local government staff and consultants to Indigenous representation and Federal politicians. As the well-being of our planet relies on discussions outside of health, the participating emerging researchers found it encouraging to hear practitioners and politicians validate their concerns and discuss concrete actions to address the climate emergency, reaffirming the purpose and importance of establishing CoPs. BCCI-2 also aimed for explicit, respectful inclusion of Indigenous perspectives. In addition to the opening and closing ceremonies, for example, the opening keynote speaker was Dr. Shannon Waters of Stz’uminus First Nation, who is also a local Medical Health Officer.

The organic and expansive nature of the knowledge exchange facilitated by WGCCCH can be illustrated by three examples related to BCCI-2: (1) “distant” participation options were developed for both presenters and Institute participants, removing unnecessary travel and geographical barriers to participating in the on-site event; (2) WGCCCH webinar on the learnings from the on-site event, hosted by SYPs, and solidifying the relationship between the working group and the regional institute; and (3) initiation of a provincial multi-university trans-disciplinary research collaboration investigating climate change and health both in BC and in the Global South, to which other partners have also been invited. According to the feedback from the young professionals, training institutes are effective mechanisms to share most recent knowledge on climate change and health. Moreover, participants without prior experience in climate change become equipped with tools and networks that give them confidence to work on the topic, which results in continued outward expanding ripples of knowledge mobilization. These collaborative learning platforms provide an opportunity to create or expand an existing regional CoP as an organizational approach for further facilitating access to resources, mentorship, training, collective learning, and opportunities to take part in new initiatives.

The activities of the WGCCCH have started to promote and enable action and impact and have expanded to audiences

beyond the potential impact of individual activities. A strength of the CoP approach is the integration of diverse disciplines and sectors engaged in climate-related health, particularly climate change, environmental health, and health systems. It has also provided unique opportunities: notably, it has integrated SYPs from diverse disciplines and regions and provided the space and opportunity for them to continue their professional development, to showcase their expertise, and share resources via webinars, annotated bibliographies, and development of training materials.

A key strength of WGCCCH is also its greatest challenge— inclusivity and diversity mean that members operate from different regions across Canada and internationally. All of the activities undertaken by the working group rely on time volunteered by its members, posing challenges: setting up meeting times convenient for members in different time zones; engaging enough individuals to volunteer their time and expertise; ensuring that we are innovating; and, adding to rather than duplicating existing knowledge and resources.

Next steps involve articulation of a vision, mission, and strategic plan in order to better inform the expansion of this collaboration to other countries, the continuation of webinars, the continued emergence of a CoP, and developing more partnerships and linkages. As part of this planned path forward, we will need to carefully consider the type of CoP that we want to create while allowing for “organic” evolution. This will require some more strategic thinking and potentially more structured self-organization of the core team in the WGCCCH/CoP. It will be important for this network to recognize the strength of its volunteer base, provide opportunities for all to engage at whatever level that they feel comfortable, and harness the invaluable expertise of individuals in the network while ensuring cohesion, a value in our outputs that is greater than the sum of individual members, and avoidance of duplication of efforts in order to maximize inputs and leverage the strength of the network. Ideally, our vision is one of multiple groups of varying size, strength, and energy that function as individual yet connected hub and spoke models in and of themselves, like the BCCI-2.

## Implications

The WGCCCH’s emerging CoP on climate change and global health and the ongoing efforts in BC to actively expand engagement in co-learning to disciplines outside of health is a unique and innovative approach to bridging research, practice, and action that aims to reduce climate change impacts on health. Our experiences provide opportunities to learn from the growing pains and successes of an emerging climate change and health-focused CoP. What distinguishes this approach is the explicit emphasis on equity and inclusion; equity in the efforts to enable and support

different worldviews, perspectives, and ideas as an active part of climate health discourse, such as multi-species equity and Indigenous ways of knowing, and inclusion in our efforts to actively bring together practitioners and academic researchers as well as engage with other disciplines and partners from the Global South and Indigenous communities. As part of this approach, it is important to recognize that adverse climate change impacts are disproportionately affecting subgroups that are marginalized through inequitable social structures. WGCCCH has implemented a coordinated and integrated platform of webinars, young professional training and networking institutes, professional knowledge mobilization and dialogue workshops, bibliographic development and topic-specific briefing notes as a foundation for advancing climate change, and health knowledge creation, dissemination, and collaboration. CoPs and activities such as these bring together diverse disciplines and ways of knowing in response to improving climate action and response as called for by medical and health organizations.

Some of the lessons learned include the importance of supporting and encouraging diverse leads on initiatives, particularly students and young professionals. Given that everyone is volunteering, flexibility and realistic lead times are important for successful events and activities to allow people to balance their competing priorities. Another lesson was the importance of consulting the CCGHR constituency prior to taking actions, such as through the survey distributed at the inception of the WGCCCH. A motivating experience was the heightened empowerment to take action through the CoP and webinars, connecting with diverse individuals with similar concerns about climate change and health which led to emergent ideas and research projects as well as new types of collaborations across borders and cultures. In doing so, this resulted in new levels of research humility, sharing power and learning experiences.

Key concepts exist within the frameworks of eco-health, one health, and planetary health that provide the theoretical underpinnings behind the pathways by which climate change impacts health and infectious and chronic diseases, the importance of equity, and emphasis on the societal structures that produce or perpetuate marginalization of subgroups. The hope is that by drawing on these core competencies and CCGHR's Core Principles, all knowledge-enhancing and training opportunities will translate into greater and more effective research, practice and advocacy—expanding the proportion of members willing and competent to engage in climate change-related health research, education, and advocacy. We believe that a distributed and connected multi-hub and spoke network will provide the opportunity to expand our endeavours and reach, while supporting capacity enhancement to strengthen emergent geographic groups to become nodes within the CoP in and of themselves. In this way, the WGCCCH acts in a

convener role, providing the space and opportunity for collaboration across the CoP with hubs providing leadership for action. The challenges will be to maintain effective communication channels for shared learnings and to ensure that our activities are always designed to meet needs of researchers and practitioners.

These interdisciplinary, multi-pronged approaches are required for collaborative and mutual learning to address the complex issues of climate change, and perhaps more importantly, to innovate more equitable solutions and strategies to respond to the most pressing health issues of our times. As a knowledge network, CCGHR continues to generate and disseminate knowledge around health topics, inclusive of climate change-related health impacts. Sensitizing, engaging, and networking diverse audiences to climate change and associated health issues will encourage lifelong learning and awareness. As a result, these individuals will be better equipped to inform and provide health education, policy guidance, and other services that benefit all Canadians and our global community.

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## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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