

HEALTH AUTHORITY PERCEPTIONS AND CAPACITY FOR ACTION: HEALTH IMPACTS OF CLIMATE CHANGE IN BC



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■ ACKNOWLEDGEMENTS

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■ EXECUTIVE SUMMARY

In 2013, BC Healthy Communities Society (BCHC), an independent not-for-profit organization, in partnership with BC Ministry of Environment's Climate Action Secretariat and the BC Ministry of Health, undertook a survey and conducted key informant interviews of health sector representatives to gauge how BC health authorities perceive and integrate the health effects of climate change in their work. Specifically, this research explored how health authorities:

- perceive the health effects of climate change in BC and across different health authority regions
- respond to climate change in their work
- build capacity and collaborate with other partners to address climate change within the health sector.

The research revealed that the majority of participants believe that climate change has already had an effect on the health of BC's population and its communities, and that it will continue to impact human health issues in the province over time. While most indicated they are aware of and are seeing direct health impacts of climate change in their region, they do not believe that addressing or responding to these impacts is currently a priority for their department within the health authority. Although many health authorities are currently undertaking activities to adapt to and mitigate the health effects of a changing climate, they are generally not approaching this work through the lens of climate change. These links are rarely articulated and, sometimes, not understood. Participants identified a number of barriers to incorporating more of a focus on health and climate change into their work, and overall indicated that they have little time, budget or authority to make this a priority.

Based on the survey responses and interviews, this research highlights the following opportunities for moving forward and strengthening health authorities' capacity to respond to the health effects of climate change:

1. Increase the role of the public health sector overall in proactively addressing and responding to the health effects of climate change.

Many respondents believe health authorities should play an increased role in addressing the health effects of climate change. They indicate that health authorities are particularly well positioned to educate the public and could also help the public to reframe and broaden the understanding of climate change from solely an "environmental issue" to a "human health" issue.

2. Provide provincial leadership and support. Nearly all interview respondents highlighted the need for provincial leadership, including policy direction and resources, to support health authorities in integrating this focus into their work. Without this, respondents indicated it would be unrealistic to expect individual health authorities to prioritize this work in an environment of limited resources and competing short-term priorities.

3. Develop local and regional partnerships. Because the health effects of climate change are most likely to be experienced at the local level,

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there is a great deal of opportunity for health authorities to increase partnerships at the local and also the regional level to address these issues. Partnerships between health authorities, local governments, and other community and regional organizations were identified by several respondents as an area with great potential for more strategic risk management, planning, knowledge mobilization, and public education and communication.

4. Support capacity development for health authority staff. In particular, respondents have noted that there is a need for:

- learning opportunities to educate health authority staff about regional and provincial health effects of climate change
- skills building and training on how the health sector can play a role in climate change adaptation and mitigation strategies
- knowledge exchange with other sectors that are working on climate change issues

5. Pursue an integrated approach across health authority departments

Health authority staff have indicated that to more effectively incorporate a focus on health and climate change, work needs to be done to overcome some of the structural barriers that exist within their organizations. This would involve greater support for cross-portfolio activity and communication, and a more integrated approach to this work across the departments operating within a given health authority.

6. Develop evidence-based information and regionally specific data. Many participants noted there is a need for regionally specific data and more evidence-based information related to health and climate change to better inform and build greater understanding among health authority staff, as well as the public.

■ INTRODUCTION

Today, there is agreement that global climate change is occurring due to increased levels of carbon dioxide and greenhouse gas emissions in the atmosphere. Current predictions show that we can expect the impacts of climate change to continue and become more severe in the future.² While climate change is a global issue, we know that there are many adverse human health impacts of climate change that are and will continue to be experienced at the regional and local level in BC communities. Moreover, the World Health Organization has encouraged public health officials to act now to reduce the burden of climate change on specific adverse health outcomes.³

Climate change adversely impacts human health both directly and indirectly. For example, direct impacts on human health include heat-related illnesses and death caused by rising air temperatures, changes in water availability and quality, and displacement due to more frequent and severe weather events. These direct impacts have significant and immediate public health impacts.⁴ Indirect impacts on human health arise from changes in the environmental and socio-economic conditions that are influenced by a changing climate. For example, indirect health impacts include danger from increase in forest fires and flooding, mental health impacts from increased stress due to disaster response, and severe social and economic impacts due to disease patterns such as the mountain pine beetle. Moreover, these indirect health impacts are expected to be most severe for those people that already face significant environmental and socio-economic adversity.⁵

While the World Health Organization⁶ and Health Canada⁷ have undertaken research and activities to respond to the health impacts of a changing climate, in British Columbia little is known about how the health sector—namely, health authorities—is responding to climate change. Given this gap of research at the provincial scale, BC Healthy Communities Society (BCHC), an independent not-for-profit organization, in partnership with BC Ministry of Environment’s Climate Action Secretariat and the BC Ministry of Health, undertook a survey and performed key informant interviews in 2013 of how BC health authorities perceive and integrate the health effects of climate change in their work. Specifically, this research, which is summarized in this report, explored how health authorities:

- perceive the health effects of climate change in BC and across different health authority regions
- respond to climate change in their work
- build capacity and collaborate with other partners to address climate change within the health sector.

“We now face a new and unprecedented change: climate change. [It is] perhaps the greatest environmental health challenge for the remainder of our careers, and perhaps for all those [public health professionals] who will follow us.”¹

Howard Frumkin, MD,
Director,
*National Center for
Environmental Health,
Centers for Disease Control
and Prevention*

■ STUDY METHODS

To gain a better understanding of how BC health authorities perceive and integrate the impacts of climate change in their work, BCHC developed an online survey instrument for health authority staff in specific departments (see Survey Participant section for list of departments included). The survey asked participants about program activity and planning within their health authority department, their perceptions about the health effects of climate change in their region, their level of knowledge and awareness of climate change and related health effects, and their perception of their health authority's organizational capacity to respond to effects. Key informant interviews were also conducted with key managers and staff from each health authority in BC.

Some of the questions, which focused on participant perceptions, included five-point Likert-type questions (i.e., strongly disagree, disagree, neutral, agree, strongly agree, or don't know). For questions associated with perceived health risks in their region, participants were asked to rate these as either high risk, moderate risk, low risk, no risk, or don't know. In addition to these rating questions, several questions were open-ended to allow for participant comments. Questions for both the survey and interviews related to the health impacts of climate change were developed based on a review of publications and information from Health Canada.⁸ Many survey questions were adapted from a US survey of public health directors in 2008.⁹

The online survey was pre-tested by nine key stakeholders including representatives from three BC health authorities, BC Ministry of Health, BC Ministry of Environment's Climate Action Secretariat, and other professionals and academics specializing in health and climate change. Based on feedback received from the pre-test, the survey tool was further revised. For example, the original survey included numerous questions to the health authority overall. Many pre-test respondents indicated that due to the size of each health authority and departmental structures, it would be difficult for respondents to comment on the health authority overall and recommended that the questions be reframed in relation to participants' specific department. These recommendations were incorporated into the final survey.

STUDY PARTICIPANTS

Following the pre-test, an email invitation to participate in the online survey was sent to 436 health authority staff including:

- Medical Health Officers
- Health Protection and Environmental Health Directors, Managers, and Officers
- Population Health Directors, Managers, and Staff
- Healthy Living/Healthy Communities Directors, Managers, and Staff
- Planning or Sustainability Department Managers and Staff (for health authorities with these departments)

In addition to the online survey, eight key informational interviews were conducted via telephone and in-person with representatives from each of the five regional health authorities. The purpose of the interviews was to provide an opportunity for more in- depth discussion about how

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health authorities are perceiving the health impacts of climate change. Interviewers asked open-ended questions and allowed for in-depth discussion on the survey themes. Interviews were conducted with:

- Chief Medical Health Officers (3)
- Population Health, Director (1)
- Health Protection and Environmental Services, Director and Regional Manager (2)
- Corporate Environmental Sustainability, Manager and Coordinator (2)

Participation in the survey was voluntary, and in total 86 respondents from each of the five regional health authorities and the Provincial Health Services Authority completed the survey, demonstrating a 20% response rate. The breakdown of survey respondents by health authority was as follows: Northern Health (27%), Interior Health (22%), Vancouver Coastal Health (20%), Vancouver Island (17%), Fraser Health (14%) and the Provincial Health Services Authority (3%) (Chart 1). The largest number of participants came from Environmental Health departments (42% of respondents), followed by Population Health departments (25% of respondents), and Public Health /Public Health Protection (24% combined) (Table 1).

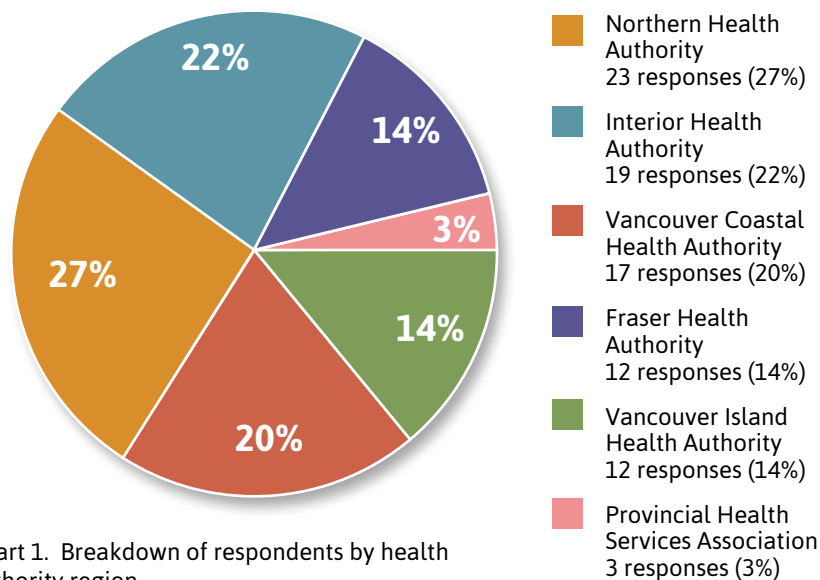


Chart 1. Breakdown of respondents by health authority region

■ Survey participants by health authority department

Response	Chart	Percentage	Count
Environmental Health		42%	36
Population Health		25%	21
Public Health		9%	8
Public Health Protection		13%	11
Sustainability		2%	2
Policy & Planning		2%	2
Primary Health Care		1%	1
Office of the Chief Medical Health Officer		6%	5
Healthy Living & Communities		9%	8
Other, please specify...		4%	3
Total Responses			85

Table 1. Survey participant count by health authority department.

It is our belief that the information returned is relevant to identify opportunities and next steps for strategies that health authorities can use in addressing the health impacts of climate change in BC.

While the voluntary response rate for the online survey is moderately low, it is our belief that the information returned is relevant to identify opportunities and next steps for strategies that health authorities can use in addressing the health impacts of climate change in BC. We believe that the non-response rate is largely related to the fact that the survey was voluntary, and many public health professionals simply could not make time to participate given workloads and competing priorities. It is possible, however, that more of the non-respondents may believe that climate change is less relevant for the public health community and this would therefore have an impact on our findings. Based on this, it is also possible that we are overestimating the general level of awareness of climate change impacts if voluntary respondents generally consider these issues to be of greater concern or importance for the public health sector than many non-respondents.

■ FINDINGS

This research resulted in findings related to four themes: knowledge and understanding of the health impacts of climate change, perceived risks and potential health impacts related to climate change, health authority programming and planning, and organizational capacity to take action. The results will be presented by a discussion of the theme and subthemes, followed by supporting tables and comments from participants.

KNOWLEDGE AND UNDERSTANDING OF THE HEALTH IMPACTS OF CLIMATE CHANGE

Our research indicates that health authority staff have a reasonably high awareness of climate change and its health impacts for BC communities.

For example, a strong majority of respondents believe the climate change is occurring (81%) and that it is caused by greenhouse gas emissions (90%). All respondents agreed with the statement that climate change is happening and that it poses health risks for communities, or that it is indeed important to consider health risks of climate change. Two-thirds of respondents (66%) agreed or strongly agreed that they are knowledgeable about potential health impacts of climate change. Most participants (79%) agreed or strongly agreed that climate change impacts pose future risks for BC communities and citizens, and 65% agreed or strongly agreed that climate change has already had an effect on the health of BC's population and its communities.

Participants rated their own knowledge and understanding as reasonably high. However, they were less certain about the overall level of knowledge and awareness of others within their health authority department.

Respondents expressed uncertainty about the level of knowledge and awareness within the health authority with many commenting that climate change was simply not discussed or talked about within their health authority department. For example, 43% did not know or did not agree that other senior managers and staff in their department are knowledgeable about this topic. When asked to rate the general level of awareness within their health authority department, only 21% believe their colleagues are aware of the health effects of climate change, whereas 54% indicated they did not know or were "neutral" on this question. Similarly, 47% did not know or did not agree that other relevant officials in their region outside of the health system (such as environmental, agricultural, forestry, wildlife, energy and transportation officials) are knowledgeable about the potential health effects of climate change.

While overall personal knowledge of the potential health impacts of climate change was rated high, participants indicated a lack of understanding of how to assess health risks of climate change, and where to find this information. Only 22% of participants, for example, felt they had a good understanding of how to assess health risks of climate changes. Only 31% knew where to find information about climate change to inform their management decisions and planning. **When asked if their health authority has a climate change adaptation strategyⁱ or action plan in place, 80% indicated they do not know.**

When asked if their health authority has a climate change adaptation strategy or action plan in place, 80% indicated they do not know.

i. A climate change adaptation strategy is a plan to adapt to the unavoidable impacts of climate change, some of which will affect human health.

Several interview participants indicated that **while they believe some health authority staff may be generally knowledgeable about climate change, their public health work is not often understood with respect to climate change, and rarely are the links between health and climate change articulated.** Several respondents mentioned the lack of an integrated approach that would “connect the dots” between human health and climate change. They indicated that since climate change is still largely understood as an “environmental issue” as opposed to a “human or public health issue” this creates a barrier to including it in health authority planning.

■ Knowledge related to health impacts of climate change

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Don't know	Total Responses
I am knowledgeable about the potential health effects of climate change.	2 (2%)	11 (13%)	14 (16%)	31 (36%)	26 (30%)	2 (2%)	86
The other relevant senior managers in my health authority department are knowledgeable about the potential health effects of climate change.	2 (2%)	11 (13%)	15 (17%)	23 (27%)	9 (10%)	26 (30%)	86
Many of the other relevant appropriate officials in my health authority region outside of the health system (such as environmental, agricultural, forestry and wildlife, energy and transportation officials) are knowledgeable about the potential health effects of climate change.	0 (0%)	8 (9%)	16 (19%)	23 (27%)	6 (7%)	33 (38%)	86

Table 2. Knowledge related to health impacts of climate change.

PERCEPTION & UNDERSTANDING

■ Perception and understanding of health impacts of climate change

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Don't know	Total Responses
Globally and at continental scales, the climate is changing faster now than it has changed for millennia.	0 (0%)	0 (0%)	7 (8%)	39 (45%)	31 (36%)	9 (10%)	86
The current pace of climatic change is significantly affected by emissions of carbon dioxide and other gases.	0 (0%)	1 (1%)	4 (5%)	40 (48%)	35 (42%)	4 (5%)	84
Climate change has already had an effect on the health of BC's population and its communities.	0 (0%)	3 (3%)	12 (14%)	37 (43%)	19 (22%)	15 (17%)	86
Climate change impacts will pose future health risks for BC communities and citizens.	0 (0%)	0 (0%)	8 (9%)	35 (41%)	33 (38%)	10 (12%)	86
I think it is important to consider the health effects of climate change.	0 (0%)	0 (0%)	5 (6%)	34 (40%)	45 (53%)	1 (1%)	85
I have a good understanding of how to assess climate change risks and minimize its impacts.	12 (14%)	26 (31%)	27 (32%)	14 (16%)	5 (6%)	1 (1%)	85
I know where to find information to inform my management decisions and planning relative to climate change impacts, risks and opportunities.	10 (12%)	32 (38%)	12 (14%)	19 (22%)	8 (9%)	4 (5%)	85

Table 3. Perception and understanding of health impacts of climate change.

■ Perception of other department staff's level of awareness of health effects of climate change

Response	Chart	Percentage	Count
Very aware		0%	0
Aware		21%	18
Neutral		33%	28
Not aware		23%	19
Not at all aware		12%	10
Don't know		21%	18
Total Responses			84

Table 4. Perception of other health authority department staff's level of awareness of health effects of climate change.

93%

of respondents think it is important to consider the health effects of climate change.

“Many of these vulnerable populations also happen to be at the lower end of the income scale, and therefore do not have the resources to mitigate the risks and/or deal with adverse events. Many of them do not have the same access as non-vulnerable populations do to services and social support networks to help them deal with challenging circumstances.”

Survey participant

Does your Health Authority have a climate change adaptation strategy or action plan in place?

Response	Chart	Percentage	Count
Yes		1%	1
No		19%	16
Don't know		80%	68
Total Responses			85

Table 5. Level of awareness – health authority climate change adaptation/action plans

PERCEIVED RISKS AND POTENTIAL HEALTH IMPACTS RELATED TO CLIMATE CHANGE

The majority of survey participants (63%) believe their health authority region has already experienced climate change in the past 20 years, and many more (81%) believe it will experience climate change in the next 20 years. Additionally, 64% expect that their region will experience health impacts as a result of climate change in the next 20 years. At the same time, nearly half (47%) of respondents do not believe their health authority department has the experience to assess potential health impacts of climate change in their region, and an additional 20% do not know if their health authority department has this experience.

Despite the anticipated health effects of climate change, the majority of respondents (81%) indicated that preventing or preparing for the public health consequences of climate change is not among the current top 10 priorities for their health authority, or if it was, they did not know.

Most interview participants believe that already vulnerable populations are the ones most likely to be at greatest risk to the health effects of climate change. Survey participants believe seniors (90%), people who are chronically ill (87%), people who have low incomes or experience homelessness (72%), and children (71%) are most vulnerable to these effects. Also noted were people living in rural or remote communities, resource dependent communities, and aboriginal people who may be dependent on natural resources such as fish for food. One interviewee noted that many small communities in the northern region, for example, are located along riverbanks, and therefore could be more vulnerable to flooding. Water quality and quantity are also of particular concern for smaller communities and aboriginal communities who may rely on small water systems since these are often minimal treatment systems.

■ **Which populations in your region do you believe are most vulnerable to the health effects of climate change? (Check all that apply)**

Response	Chart	Percentage	Count
Children		71%	61
Seniors		90%	77
People who are chronically ill		87%	75
People who have low incomes and/or are homeless		72%	62
People with disabilities		49%	42
People living off the land		55%	47
People living in rural or remote communities		60%	52
People living in resource dependent communities		53%	46
Aboriginal people		55%	47
Other, please specify...		6%	5
Total Responses			86

Table 6. Perceptions of the most vulnerable populations to health effects of climate change.

Overall, in participants' ranking of health risks related to climate change in their region, the area of greatest concern is social, economic, and ecological impacts on community health and well-being. In this category of health risks, the highest ranking was damage to ecosystem health, with 85% of participants indicating they believe this is moderate or high risk, and 50% ranking this as high risk for their region. Other areas of substantial concern for respondents include: impacts on food or water production/supply (82% rated as moderate or high risk), increased risk for vulnerable populations (82% rated as moderate or high risk), and potential demands on health care services (75% rated as moderate or high risk). Interference with livelihoods (71% rated as moderate or high risk) was also identified as a potential impact of climate change, particularly in northern and resource-dependent communities. Social and mental stress was also identified as a concern (68% rated this as moderate or high risk overall, and 72% rated this as moderate or high risk in relation to potential weather-related hazards such as fires, floods, and severe storms).

Impacts on food and water is the second-highest ranking category of health risks related to climate change. Drinking water contamination from increased runoff was ranked as a moderate or high risk by 79% of survey participants. This was of particular concern for people in the

Drinking water contamination from increased runoff was ranked as a moderate or high risk by 79% of survey participants.

“Every summer there are more northern wildfires, which create abundant smoke in the atmosphere. More and more people are diagnosed with respiratory illness and working, living, or playing during these events is nearly impossible due to symptoms and feeling poorly.”

Survey participant

Northern and Interior regions, possibly due to the considerable number of small-scale water supply and treatment systems that are used in small towns and rural communities. Shortages of surface water and groundwater due to declining snowpack and retreating glaciers were identified as moderate or high risk by 77% of all participants, with 40% categorizing this as high risk. While this is a concern for all regions, it was particularly noted in the Vancouver Island region. Participants indicate that safe drinking water as well as water provision is a public health responsibility and increasingly a growing concern. Throughout the survey, many respondents commented that they believe their region is already experiencing health impacts related to water shortages.

Changes in food security are a risk for all regions, with 76% ranking this as a moderate to high risk for their region. This is an area of particular concern for more remote areas of the province, including the North, where many communities rely on fossil fuel-based transportation from other regions for their food supply. Several interviewees also noted potential impacts on local food production as an area of concern.

Health impacts related to air quality are a concern for all regions, but particularly in the Northern, Interior, and Vancouver Coastal regions. Increased exposure to air pollutants and allergens ranks as a moderate to high risk by 72% of participants, and respiratory diseases were similarly ranked by 72% of respondents. Particularly in the Northern and Interior regions, participants identified links between increased forest fires and respiratory illnesses. Furthermore, they noted that this is of significant concern in communities affected by the mountain pine beetle infestations due to increasing temperatures.

Local economies are an important determinant of health, and the effects of climate impacts on livelihoods and employment were identified as a concern. Particularly in the North, many communities have already seen an increase in logging traffic on highways related to logging activity in mountain pine beetle-affected forests. This has resulted in increased road safety risks and the need for public health programming related to road health in some regions. In many communities the mountain pine beetle has also had a large impact on the local economy.

Several interviewees identified an increase in communicable diseases and vector borne diseases such as West Nile as a risk associated with climate change. Changed patterns of diseases caused by bacteria, viruses and other pathogens carried by mosquitoes, ticks and animals rank as moderate to high risk by 67% of survey participants.

Health effects of weather-related natural disasters and temperature-related health concerns are generally considered to be moderate to high risk for most regions. Several interviewees made reference to risks associated with extreme heat or extreme cold events. Particularly in the North, there is a concern about respiratory and cardiovascular illnesses related to extreme cold temperatures. Extreme heat concerns were particularly noted in the Vancouver Coastal and Fraser regions, possibly in relation to emergency planning already underway by these health authorities. Overall, 72% of participants rated social and mental stress related to weather-related hazards as moderate to high risk, and 68% rated illnesses and injuries associated with these hazards as moderate to high risk.

In addition to the extreme impacts discussed above, the potential impact of changing weather patterns on citizens' lifestyles and healthy living practices was also noted. Some respondents are uncertain, for example, if changes in weather patterns (such as wetter winters and warmer summers for some regions) would impact people's level of fitness and quality of life, which is a part of overall health and well-being.

Finally, 77% of participants consider skin damage and cancer related to exposure to ultraviolet rays as a moderate-high risk.

■ Temperature-related morbidity and mortality

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Illness related to extreme cold and heat events	12 (14%)	41 (48%)	25 (29%)	3 (3%)	5 (6%)	86
Respiratory and cardiovascular illnesses	25 (29%)	33 (38%)	16 (19%)	1 (1%)	11 (13%)	86
Increased occupational health risks	8 (9%)	38 (44%)	23 (27%)	1 (1%)	16 (19%)	86

Table 7. Perception of risk of temperature-related morbidity and mortality.

■ Weather-related natural hazards (e.g., fires, floods and severe storms)

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Damaged public health infrastructure (e.g. hospitals, clinics, etc.)	17 (20%)	32 (37%)	32 (37%)	1 (1%)	4 (5%)	86
Injuries and illnesses	17 (20%)	41 (48%)	23 (27%)	0 (0%)	5 (6%)	86
Social and mental stress	23 (27%)	39 (45%)	14 (16%)	2 (2%)	8 (9%)	86
Increased occupational health hazards	10 (12%)	36 (42%)	25 (29%)	0 (0%)	14 (16%)	85
Population displacement and migration	19 (23%)	21 (25%)	33 (39%)	4 (5%)	7 (8%)	84

Table 8. Perception of risk of weather-related natural hazards.

Air quality

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Increased exposure to outdoor and indoor air pollutants and allergens	28 (33%)	33 (39%)	16 (19%)	0 (0%)	8 (9%)	85
Respiratory diseases	32 (37%)	30 (35%)	16 (19%)	0 (0%)	8 (9%)	86
Heart attacks, strokes and other cardiovascular diseases	20 (23%)	32 (37%)	18 (21%)	0 (0%)	16 (19%)	86
Cancer	12 (14%)	33 (39%)	21 (25%)	0 (0%)	19 (22%)	85

Table 9: Perception of risk related to air quality.

Perception of risk of water and food impacts

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Intestinal disorders and illnesses caused by contaminants	17 (20%)	35 (41%)	23 (27%)	1 (1%)	9 (11%)	85
Drinking water contamination from increased runoff	25 (29%)	43 (50%)	10 (12%)	2 (2%)	6 (7%)	86
Shortages of surface and groundwater due to declining snow pack and retreating glaciers	34 (40%)	32 (37%)	13 (15%)	1 (1%)	6 (7%)	86
Changes in food security	29 (34%)	35 (41%)	15 (18%)	1 (1%)	5 (6%)	85

Table 10: Perception of risk to water and food impacts.

Perception of risk of vector-borne and zoonotic diseases

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Changed patterns of diseases caused by bacteria, viruses and other pathogens carried by mosquitoes, ticks, and animals	21 (24%)	37 (43%)	21 (24%)	0 (0%)	7 (8%)	86

Table 11: Perception of risk to vector-borne and zoonotic diseases.

■ Health effects of exposure to ultraviolet rays

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Skin damage and skin cancer	26 (30%)	40 (47%)	10 (12%)	2 (2%)	8 (9%)	86
Cataracts	8 (9%)	40 (47%)	11 (13%)	2 (2%)	25 (29%)	86
Disturbed immune function	5 (6%)	24 (28%)	23 (27%)	3 (3%)	31 (36%)	86

Table 12: Perception of risk of exposure to ultraviolet rays.

■ Social, economic, and ecological impacts on community health and well-being

	High risk	Moderate risk	Low risk	No risk	Don't know	Total Responses
Increased risks for vulnerable populations and communities	33 (38%)	38 (44%)	8 (9%)	0 (0%)	7 (8%)	86
Demands on health care services	24 (28%)	40 (47%)	14 (16%)	0 (0%)	7 (8%)	85
Disruption of social networks	11 (13%)	34 (40%)	29 (34%)	1 (1%)	11 (13%)	86
Damage to ecosystem health (e.g. oceans, lakes and rivers, forests, etc.)	43 (50%)	30 (35%)	6 (7%)	0 (0%)	7 (8%)	86
Interference with livelihoods (e.g. employment, ability to sustain oneself)	23 (27%)	29 (34%)	27 (31%)	0 (0%)	7 (8%)	86
Impacts on food and/or water production or supply	34 (40%)	36 (42%)	12 (14%)	0 (0%)	3 (4%)	85
Damage to, or unavailability of, housing and shelter	10 (12%)	32 (37%)	30 (35%)	3 (3%)	11 (13%)	86
Damage to critical infrastructures	14 (16%)	38 (44%)	22 (26%)	0 (0%)	12 (14%)	86
Social and mental stress	22 (26%)	36 (42%)	15 (17%)	2 (2%)	11 (13%)	86

Table 13: Perception of risk of social, economic and ecological impacts on community health and well-being.

“We focus on things like food security, built environment, air quality, water quality, and health equity all the time in our work...but it is not conceptualized as (related to) climate change. Of course these issues are linked to climate change, but we are not yet making the links and thinking of it this way.”

Interview respondent

■ HEALTH AUTHORITY PROGRAMMATIC ACTIVITY AND PLANNING

Throughout the interviews, several respondents indicated that **while their health authority may be undertaking activities that ultimately address the health effects of climate change, generally this work is not explicitly understood or articulated as related to climate change.** In general, they indicated that climate change is seen as “beyond the scope” of their health authority’s work, and there is a need within the health sector to better understand and clearly articulate these links and reframe climate change as a public health issue.

Perhaps related to this, a significant number of survey participants indicated that **they do not know whether or not their health authority department is engaged in activities that address the health effects of climate change (adaptation) or activities that might also reduce greenhouse gas emissions (mitigation)**ⁱⁱ. As noted previously, 80% of participants indicated that they do not know if their health authority has a climate change adaptation or action plan in place.

Some respondents indicated that given the size and scope of health authority services, it is often difficult to be aware of all of the programming underway. In particular, several participants highlighted that there is often little “cross-portfolio” communication, making it difficult to “connect the dots” on issues related to climate change and health. Others noted that integration of services or taking a systems approach to complex issues can be challenging within the institutional culture of many health authorities, particularly between public health and acute care. However, respondents cited the healthy schools program and the healthy eating program, Informed Dining, as existing initiatives where health authorities are taking a more integrated approach internally and working with partner organizations to address issues that are interconnected.

While many were uncertain about regional health authority programming overall, several respondents were aware of corporate initiatives to reduce greenhouse gas emissions in health authority operations, acknowledging the role provincial policy has played in establishing these initiatives.

CLIMATE CHANGE ADAPTATION PROGRAMMING

Related to climate change adaptation, public health surveillance—including emergency preparedness—was identified as one key area that several health authorities are working on. 39% indicated that their health authority is currently working on this, though others respondents indicated that this focus is currently minimal. Another 21% of respondents are participating in risk, impact, or vulnerability assessments. **Some health authorities are increasingly collaborating with government and other community partners on climate action and adaptation planning,** and several interview respondents highlighted partnerships with local governments as a growing area of focus with huge potential both for adapting to and mitigating the health effects of climate change at local and regional levels.

ii. Climate change mitigation includes actions to limit the magnitude and rate of climate change. Mitigation activities attempt to mitigate the production of greenhouse gas emissions.

Based on participants' knowledge of their health authority department, they indicated that the greatest level of current activity is addresses the following health effects of climate change:ⁱⁱⁱ

- food safety or security (86%)
- air quality, including air pollution (78%)
- unsafe or ineffective sewage or septic system operation (77%)
- vector-borne infectious diseases (76%)
- water quality/quantity (71%)

Several other health effects were identified as less of a focus for health authorities. Only 29%, for example, indicated that their department is currently undertaking activities to provide health care services for people with chronic conditions during service interruptions (including extreme weather events). Only 19% indicated that they have activities related to housing people displaced by extreme weather events, though some participants indicated they believe this to be a municipal responsibility. For many other issues, such as heat waves or heat-related illnesses, storms, drought, and fires, the majority of participants indicated that they either do not have activities to address these climate change-related health impacts or they do not know if their health authority does.

“We have created a heat health surveillance system along with response in partnership with our local municipalities. This was done in response to recent and emerging understanding of extreme heat as a health hazard for our local area.”

Survey participant

ii. It is important to note that the level of health authority activity noted here is based on respondents' knowledge, and is not a comprehensive inventory of health authority programs and services.

Knowledge of programmatic activity within health authority departments

	Yes	No	Don't know	Total Responses
Heat waves and heat-related illnesses	29 (34%)	27 (32%)	29 (34%)	85
Storms, including hurricanes and floods	35 (41%)	26 (31%)	24 (28%)	85
Droughts, forest fires or brush fires	36 (42%)	27 (32%)	22 (26%)	85
Vector-borne infectious diseases	65 (76%)	4 (5%)	16 (19%)	85
Water and foodborne diseases	71 (84%)	2 (2%)	12 (14%)	85
Anxiety, depression or other mental health conditions?	37 (44%)	24 (28%)	24 (28%)	85
Quality or quantity of fresh water available in your health authority region	60 (71%)	12 (14%)	13 (15%)	85
Air quality, including air pollution	66 (78%)	11 (13%)	8 (9%)	85
Unsafe or ineffective sewage or septic system operation	65 (77%)	7 (8%)	12 (14%)	84
Food safety or security	73 (86%)	6 (7%)	6 (7%)	85
Housing for residents displaced by extreme weather events	16 (19%)	31 (37%)	37 (44%)	84
Health care services for people with chronic conditions during service disruptions, including extreme weather events	24 (29%)	20 (24%)	39 (47%)	83

Table 14: Knowledge of programmatic activity in health authority departments.

CLIMATE CHANGE MITIGATION PROGRAMMING

While participant comments indicate that the co-benefits between healthy living and climate change mitigation may not be generally understood or articulated in health authorities' activities, **most health authorities ARE currently undertaking activities that contribute to climate change mitigation.** Beyond internal programs focused on "greening" of health authority operations, 63% indicated that they have public health initiatives that encourage active transportation such as cycling or walking, 58% encourage people to change the way they purchase food, and 53% have programs that encourage the use of public transportation. While only 23% of respondents indicated that they are currently partnering with government and community partners on climate action and adaptation planning (63% stated they did not know if they were), several indicated that partnership with local governments, such as collaboration on local sustainability planning, is an area of growing opportunity.

Despite this type of activity, it is clear that many health authorities do not yet identify climate change as a public health concern in the way that they do with other public health issues. While several interviewees indicated that they believe the health sector, given its credibility and communications channels, can play an important role in educating the public about the health implications of climate change, very few health authorities seem to be taking on this role. For example, while 50% of respondents indicated that their health authority is working to reduce greenhouse gas emissions in its operations (32% did not know), only 14% said they are helping local residents to reduce their greenhouse gas emissions. Furthermore, **only 12% indicated that their health authority department is currently educating the public about climate change and its potential impact on health.**

■ Knowledge of health authority program focus areas related to the health effects of climate change

	Yes	No	Don't know	Total Responses
Mitigating climate change by reducing greenhouse gas emissions from health authority operations	42 (50%)	15 (18%)	27 (32%)	84
Helping residents in your health authority region reduce their greenhouse gas emissions	12 (14%)	33 (39%)	39 (46%)	84
Reducing fossil fuel use or conserving energy in health authority operations	36 (43%)	18 (21%)	30 (36%)	84
Encouraging or helping people to use active transportation such as cycling or walking	52 (63%)	17 (20%)	14 (17%)	83
Encouraging people to use public transportation	44 (53%)	19 (23%)	20 (24%)	83
Encouraging or helping people to change the way they purchase foods such as buying locally-grown foods, organic foods, or plant-based foods	48 (58%)	18 (22%)	17 (20%)	83
Educating the public about climate change and its potential impact on health	10 (12%)	31 (37%)	42 (51%)	83

Table 15: Knowledge of health authority program focus areas.

■ To your knowledge, in what ways is your health authority department working to address the health effects of climate change?

Response	Chart	Percentage	Count
Research (e.g. use of climate models, projections, longitudinal studies)		8%	6
Experimentation (e.g. small scale pilots, operational trials)		3%	2
Public Health Surveillance (e.g. emergency preparedness to climate risks)		39%	30
Risk, impact and / or vulnerability assessments		21%	16
Incorporating into strategic planning		12%	9
Incorporating into operational planning		9%	7
Monitoring and evaluation		10%	8
Work with communities to support the development and implementation of climate adaptation and mitigation strategies		19%	15
Collaboration with government (e.g. federal, provincial, regional, or local) and other community partners on climate action & adaptation planning		23%	18
Social mobilization and/or public education/communications on the health impacts of a changing climate		5%	4
Education and mobilization of health professionals		13%	10
Integrating health into greenhouse gas reduction strategies (e.g. active transportation planning, the built environment)		34%	26
None of the above		25%	19
Other, please specify...		16%	12
Total Responses			77

Table 16: Knowledge of health authority action to address health effects of climate change.

ORGANIZATIONAL CAPACITY

Without exception, all of the interview respondents and the majority of survey participants cited organizational capacity as a primary reason they are not more engaged in addressing and preparing for the health effects of climate change. For the most part, health authority staff indicated they have little time, budget, or authority to make this a priority. Several barriers were highlighted. Many participants (70%) indicated that current demands take precedent over other activities that are not perceived as an immediate threat or risk. Similarly, 67% pointed out that their existing workloads allow little time for this focus in their work. Several other barriers cited were the lack of decision-making authority; overall awareness, knowledge or expertise among practitioners; and the lack of strategic vision for policies that support innovation or diversification of health authority practices. Nearly half (48%) of respondents indicated they believe that minimizing the health effects of climate change is not seen as relevant to the public health mandate. Interestingly, while budgetary constraints were frequently identified as a barriers by senior staff, only 30% of participants overall believe that the costs of taking on this work are prohibitive.

With competing priorities and limited resources, participants believe that **long range planning is often a challenge within the public health sector overall, and health authorities are often under pressure to respond to issues that are perceived as more urgent in the short term.** Despite the fact that the majority of respondents believe their region has already experienced some effects of climate change, it is often still perceived as a long-term, future issue. According to participants, this view of climate change in the distant future creates a significant barrier to making this a priority for many health authorities.

A consistent theme that emerged from the interviews is the need for provincial leadership, policy direction, and resources to support health authorities to integrate this focus into their work. Several respondents highlighted the fact that health authority activities are ultimately directed by the provincial government. For health authorities to direct their attention to the issue of the health impacts of climate change, leadership from the provincial government is required and the necessary accountability frameworks for health authorities need to be established.

The provincial fragmentation of public health was also identified as a barrier. **With multiple organizations taking a lead on the direction and strategic focus of public health, the locus of leadership on climate change in public health is unclear.** Respondents questioned why climate change does not currently form part of the new public health plan. Had it been embedded in the new plan, health authorities would be in a better position to place more emphasis on the issue even though they are grappling with limited capacity and competing priorities. While respondents clearly indicated that provincial leadership is necessary, they also pointed to the need for leadership from senior management across all departments within the health authorities to ensure traction on this issue.

Notwithstanding the call for leadership support, several respondents believe that **health authorities are well positioned to be educators and spokespeople on issues related to climate change and health.** In many communities, health authorities are viewed as a credible source of information and participants believe they can play an important role in raising awareness of the health implications of climate change.

“Perhaps some lip service is given to these issues, and even a bit of money is thrown at food security initiatives, but overall very little of this filters down to the staff on a day-to-day basis, and outreach to the community on these issues is not at all evident.”

Survey participant

“Public health and population health could be a voice for transforming the public discourse regarding the issues related to climate change. Engaging populations to talk and to plan are a part of the work. However, the silos of authority and the hierarchies in the structure make getting to actual action difficult.”

Survey participant

They are also well positioned to help people reframe their understanding of climate change from that of an “environmental” issue to that of a “human health” issue. Given their autonomy from government, the role of Medical Health Officers was identified as important in educating the public about public health concerns.

While many see this public education role as an opportunity for health authorities, some respondents feel that political barriers often limit their ability to fully engage with the public to improve understanding of the health effects of climate change. Respondents indicated a great demand from communities to better understand the short- and long-term health impacts of industrial activity, particularly in areas of the province undergoing considerable resource-based development from industries such as oil and gas. Health authorities could consider becoming involved in environmental assessment processes as a way to ensure impact assessment from a public health perspective. Despite this identified need, health authorities have limited capacity to take this on. At the same time, participants suggested that current provincial policy is arguably very supportive of resource-based development, particularly in the oil and gas sector, and there is great hope regarding the economic opportunities it could provide for many communities. According to respondents, this creates a political environment within some health authorities where it may be difficult to acquire and present information that could be perceived by the province or by local communities as challenging this type of industrial development.

In order to effectively address issues related to health and climate change, **there is a need for greater evidence-based information and regionally specific data related to the health effects of climate change. In addition, overall capacity building and professional development for health authority staff is necessary.** Only 16% of survey respondents believe that they and other practitioners in their health authority department have access to adequate professional development opportunities to understand and take action to address the health effects of climate change in their region. 82% felt their department is either not currently undertaking activities to build their capacity on these issues, or they do not know if their department is engaged in such activities.

An overwhelming majority of respondents indicated that increased capacity building and professional development opportunities would be useful for their health authority department. Furthermore, they pointed out that these opportunities need to be specifically framed and targeted to health sector professionals. The types of opportunities suggested include education or learning opportunities about the health effects of climate change in their region, knowledge exchange with other sectors that are working on climate change issues, and skills building or training on how the health sector can play a role in climate change adaptation and mitigation strategies.

■ **Within your health authority department, what do you think are the biggest barriers to minimizing the health effects of climate change? (Check all that apply):**





Response	Chart	Percentage	Count
Lack of awareness of effects		53%	44
Lack of regionally specific data and knowledge		49%	41
Lack of interest in minimizing effects		47%	39
Not seen as relevant to public health mandate		48%	40
Lack of personal knowledge, expertise or ability amongst practitioners		51%	42
No authority to make recommendations/decisions		53%	44
Lack of strategic vision or policies that support innovation/diversification of practices		54%	45
Lack of guidance, standards or best practices		51%	42
Costs are prohibitive		30%	25
Workloads allows little time for this		67%	56
Current demands take precedent over something which is not perceived as a current threat or risk		70%	58
Uncertainty about current and future effects of climate change		41%	34
Corporate culture within health authority		36%	30
Lack of connection and/or communication between health authority departments or portfolios		34%	28
Lack of capacity/understanding of how to measure or assess impacts		45%	37
No barriers		1%	1
Other, please specify...		10%	8
Total Responses			83

Table 17: Perception of barriers to taking action to minimize the health effects of climate change.

In your opinion, do you and other practitioners in your health authority department have access to adequate professional development opportunities to understand and take action on the health effects of climate change in your region?

Response	Chart	Percentage	Count
Yes		16%	13
No		59%	48
Don't know		26%	21
Total Responses			82

Table 18: Perception of practitioners’ access to adequate professional development opportunities to understand and take action on health effects of climate change.

How is your health authority department currently building capacity to incorporate climate change adaptation/mitigation into its work? (Check all that apply)

Response	Chart	Percentage	Count
Evaluating/assigning roles and responsibilities within departments		9%	7
Education and learning opportunities (e.g. workshops, webinars, seminars)		13%	11
Information sharing and knowledge exchange		9%	7
Skills building and training opportunities		5%	4
We are not building capacity		38%	31
Don't know		44%	36
Other, please specify...		6%	5
Total Responses			82

Table 19: Current activity to build health authority capacity for climate change adaptation/mitigation.

■ **What type of capacity building opportunities would be useful in your health authority department?
(Check all that apply)**




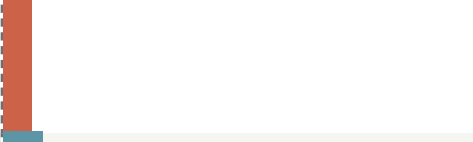

Response	Chart	Percentage	Count
Educational or learning opportunities (e.g. workshops, webinars, etc.) about climate impacts on health in BC and in your region		74%	61
Knowledge exchange with other sectors that are working to address climate change issues within your region		67%	55
Skills building and training on how the health sector can play a role in climate change adaptation and mitigation strategies		77%	63
None of the above		5%	4
Other, please specify...		7%	6
Total Responses			82

Table 20: Perceptions regarding capacity building opportunities for health authorities.

“I think Health Authorities should also focus not just on minimizing health effects from climate change, but also be more aggressive and outspoken advocates for identifying causes of climate change (fossil fuel dependence, consumerism, etc.) and promoting personal, governmental, and societal means of eliminating or reducing the influences of such factors that contribute to climate change. Let’s be proactive, not just reactive.”

Survey participant

■ DISCUSSION: OPPORTUNITIES FOR MOVING FORWARD

Our research findings show that the majority of survey participants believe that climate change has already had an effect on the health of BC’s population and its communities. Furthermore, they are concerned that it will pose future health risks. Given this and other information gathered through this research, survey and interview participants highlighted a number of significant opportunities and ideas for moving forward and strengthening capacity across BC to address and respond to the health effects of climate change. These ideas for moving forward are summarized in the following six opportunities: (i) increase the role of public health sector to address the health effects of climate change; (ii) provide provincial leadership and support; (iii) develop local and regional partnerships; (iv) develop capacity for health authority staff; (v) pursue an integrated approach across health authority departments; and (vi) develop evidence based information and regionally specific data.

1. Increase the role of the public health sector overall in proactively addressing and responding to the health effects of climate change.

In general, many respondents believe that the health effects of climate change are not conceptualized by the general public as well as their health authority colleagues and leaders as a public health issue. Rather, climate change is still largely conceived of as an “environmental issue” that is separate from human health. To get any serious traction within health authorities this understanding must change. Many respondents believe that health authorities should play an increased role in addressing the health effects of climate change; that they are particularly well-positioned to educate the public on health and climate change; and could also help members of the public reframe their understanding of climate change from an “environmental issue” to a “human health” issue. Our findings indicate that overall, this is not currently a priority for BC health authorities and that there are significant barriers preventing health authorities from explicitly working to address health effects of climate change in their activities. While respondents believe their own personal awareness of the issues to be high, they do not believe this level of understanding and knowledge is consistent in their department, and it generally does not translate into programmatic activity..

2. Provide provincial leadership and support.

The majority of interview respondents pointed to the need for provincial leadership, policy direction, and resources to support health authorities to integrate this focus into their work. Without this, respondents indicated that it would be unrealistic to expect individual health authorities to be able to prioritize the health effects of climate change in an environment of limited resources and competing short-term priorities. Respondents cited other examples, such as carbon-neutral operations targets, where provincial policy and programs have significantly influenced health authority mandates and operations. In addition to the need for provincial leadership and support, health authority staff also underscored that leadership from their own senior management is crucial to advancing this agenda.

3. Develop local and regional partnerships.

Because the health effects of climate change will be experienced at the local level, there is a great deal of opportunity for health authorities to increase partnerships at the local and regional level to address these issues. For example, all local governments in BC have undertaken climate action planning and many are now pursuing climate adaptation planning. There is an opportunity for health authorities to contribute a valuable perspective to these processes as well as learn about potential impacts of climate change, on human health and otherwise. The idea of partnerships with local governments and other community or regional organizations was identified by several respondents as an area with great potential.

4. Capacity development for health authority staff.

To support health authorities in playing an increased role in addressing the health effects of climate change, there is a strong need to address capacity issues and increase professional development of health authority staff in this area. While they rated their own awareness as high, they do not believe or do not know if this is shared within their department. In particular, respondents noted that there is a need for:

- learning opportunities to educate health authority staff about regional and provincial health effects of climate change
- skills building and training on how the health sector can play a role in climate change adaptation and mitigation strategies
- knowledge exchange with other sectors that are working on climate change issues

5. Pursue an integrated approach across health authority departments.

Health authority staff have indicated that to effectively incorporate a focus on health and climate change, work needs to be done to overcome some of the structural barriers that exist within their organizations. This would involve improving support for cross-portfolio activity communication and a more integrated approach to this work across health authority departments.

6. Develop evidence-based information and regionally specific data.

The need for greater access to evidence-based information on the health impacts of climate change was noted as an important consideration through the survey and interviews. Additionally, many participants have indicated there is a need for regionally specific data related to health and climate change to better inform and build greater understanding among health authority staff as well as the public. Health authorities can support the collection and generation of this data, however, they have indicated that research and data collection activities would need to be better resourced for them to effectively incorporate this into their work.

“We tend to be very good at information and academics. Telling people how bad it is creates a paternalistic persona for health services that turns people off. We need to be involved in practical engagement that mobilizes awareness and action.”

Survey participant

“We have specialized ourselves out of being able to think about or address things from a global perspective. People have narrow areas of responsibility that are largely problem based. In order to meaningfully address climate change we need to go beyond the concepts that medicine has been built on, that is identifying and treating or alleviating symptoms, and move toward creating change on a positive scale. When budgets are cut the acute care system becomes the protected sector because it deals with current fear and current suffering. Preventative action or positive development seems dispensable to many because the consequences of inaction do not appear to be immediate.”

Survey participant

■ CONCLUSION

The results presented here highlight a number of areas for further investigation and exploration. While these findings come out of a small research project and limited survey sample, many consistent themes emerged, and we encourage future research into the health effects of climate change in BC, the roles that health authorities can play in mitigation and adaptation strategies, and the necessary knowledge, skills, and organizational development for the public health sector to integrate climate change into their work. As the impacts of climate change in BC become more severe, the role of the public health sector to proactively address human health effects will only become more urgent. This research identified a number of potential next steps for the public health sector, both at the provincial and regional levels. It is our hope that these findings will spark further discussion and inquiry in order to develop more fulsome strategies to address and respond to the health effects of climate change across BC.

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