

Views of health professionals on climate change and health: a multinational survey study



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Climate change arguably represents one of the greatest global health threats of our time. Health professionals can advocate for global efforts to reduce emissions and protect people from climate change; however, evidence of their willingness to do so remains scarce. In this Viewpoint, we report findings from a large, multinational survey of health professionals (n=4654) that examined their views of climate change as a human health issue. Consistent with previous research, participants in this survey largely understood that climate change is happening and is caused by humans, viewed climate change as an important and growing cause of health harm in their country, and felt a responsibility to educate the public and policymakers about the problem. Despite their high levels of commitment to engaging in education and advocacy on the issue, many survey participants indicated that a range of personal, professional, and societal barriers impede them from doing so, with time constraints being the most widely reported barrier. However, participants say various resources—continuing professional education, communication training, patient education materials, policy statements, action alerts, and guidance on how to make health-care workplaces sustainable—can help to address those barriers. We offer recommendations on how to strengthen and support health professional education and advocacy activities to address the human health challenges of climate change.

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Introduction

In 2020, nations participating in the Paris Agreement on climate change were expected to submit their revised Nationally Determined Contributions (NDCs) to reduce their greenhouse gas emissions. However, as of December, 2020, only a handful of nations have submitted their revised NDCs and only a fraction of those actually included enhanced ambition to reduce their emissions.¹ Although two-thirds of countries mention health in their NDCs, most did not have the funding or the necessary collaboration between health and other sectors, or both, to implement the needed plans and policies.²

Multiple scientific assessments have outlined the varied and substantial effects of climate change on human health and wellbeing,^{3–5} and a diverse body of evidence suggests that actions to reduce climate change have beneficial effects on public health.^{6,7} Together, these findings have led two separate *Lancet* Commissions to conclude that climate change represents the biggest global health threat⁸ and the greatest global health opportunity⁹ of the 21st century.

Despite the tremendous opportunities and challenges, many people around the world remain unaware of the human health implications of climate change.¹⁰ Thankfully, a growing body of evidence suggests that providing people with information about the health harms of climate change, as well as solutions to address them, can increase public support for the actions needed to reduce emissions.^{11–15} As a result, health professionals have an extraordinary opportunity to become trusted voices in support of global efforts to reduce emissions and protect people from the threat of climate change.¹⁶ Indeed, some health professionals have recognised this opportunity and have begun to encourage their colleagues to get involved in efforts to advocate for increased action.^{17–20} For example, there are at least three major things that health professionals could do to increase the

odds of meeting the goals of the Paris Agreement. First, health professionals can lobby their nation's leaders directly, making the health case for climate action. Second, health professionals can educate the public and other relevant stakeholders (eg, business leaders and civil society leaders) in hopes of building public will for climate policies. Third, health professionals can lead by decarbonising their own practices (at work and at home) and advocate for decarbonising the hospitals and health-care systems with which they are affiliated.

Although these developments are promising, the extent to which health professionals around the world are themselves aware of the human health relevance of climate change, feel personally engaged with the issue, and are willing to advocate for increased action to address these issues, remains unclear. When people are highly engaged with an issue—ie, they worry about the issue and feel the personal importance of it—they are more likely to support and advocate for policies to address this issue.^{21,22} Findings from a 2018 review of the literature showed that most health professionals understand that climate change is happening and is affecting the health of those they care for; however, many still feel that they have insufficient knowledge about the topic.¹⁰ Some evidence also suggests that physicians, at least in the USA, are supportive of the idea that they and their professional associations should be involved in advocating the health effects of climate change.^{23–25}

Even if health professionals are open to advocating for increased action on climate change, social science has identified a well understood gap between people's intentions and their actual behaviours.²⁶ Much of this gap is explainable by the fact that, often, various kinds of barriers can inhibit people from initiating new behaviours that are consistent with their attitudes. When barriers are reduced—ie, when the path is cleared—performance of the behaviours becomes more likely.²⁷ To our knowledge,

few studies have systematically characterised the barriers to climate change advocacy faced by health professionals and the resources that might help alleviate those barriers.^{28,29}

Finally, the current evidence on health professionals' perceptions of the health implications of climate change remains scarce, and most studies have been done in English-speaking countries, particularly the USA.⁹ Moreover, many of these studies have focused on specific medical specialties (eg, thoracic specialists, allergy, and asthma specialists) and public health experts; although, a recent study has begun to examine nurses' views on climate change.³⁰

In this Viewpoint, we address this gap in the literature by surveying a sampling of health professionals around the world, which includes paediatricians, family physicians, general adult medicine physicians, and nurses. Specifically, we ask and answer the following exploratory research questions in this study: do health professionals have a strong understanding of key facts about climate change and feel personally engaged with

See Online for appendix

	Survey dates	Distribution method	Total participants	Number of members invited	Participation rate
Association of General Practitioners of Jamaica	Oct 09 to Nov 17, 2020	3	10	110	9.1%
British Medical Association	Nov 20 to Dec 17, 2020	2	320	87 924	0.4%
Canadian Medical Association	Oct 09 to Oct 25, 2020	2	2852	68 398	4.2%
Indian Academy of Pediatrics	Oct 09 to Nov 17, 2020	1	385	9196	4.2%
Kuwait Medical Association	Oct 09 to Nov 17, 2020	3	78	1000	7.8%
New Zealand Nursing Organization	Nov 17 to Dec 12, 2020	3	143	5000	2.9%
Royal Australasian College of Physicians (Australian pediatric members)	Nov 04 to Dec 17, 2020	3	194	4930	3.9%
South African Medical Association	Oct 20 to Nov 27, 2020	3	334	10 564	3.2%
Chilean Society of Family and Community Medicine	Nov 11 to Dec 09, 2020	1	83	395	21.0%
Colombian Society of Family and Community Medicine	Nov 17 to Dec 15, 2020	1	29	129	22.5%
Uruguayan Society of Family and Community Medicine	Nov 03 to Nov 27, 2020	1	57	259	22.0%
World Medical Association (Associate members)	Oct 09 to Nov 17, 2020	3	169	900	18.8%

Distribution method 1: survey conducted and distributed with the authors' software using email addresses provided by the participating organisation. Distribution method 2: survey conducted and distributed by the participating organisation using the own software. Distribution method 3: survey conducted with authors' software but distributed by the participating organisation using their own email system.

Table: Survey timing and sample size for each organisation

the issue; to what extent do health professionals view climate change as a threat to human health; to what extent are health professionals willing to engage with the public and policymakers about the issue, and advocate for more ambitious climate action; to what extent are health professionals supportive of policies within their professional societies that would reduce their contribution to emissions; and what barriers reduce health professionals' willingness to communicate about climate change and health, and what resources would be helpful to them?

Methods

Study Design

To answer our research questions, we surveyed the members of twelve health professional organisations around the world to assess their views about climate change as a human health issue. The questionnaire was developed with measures derived from previous studies of health professionals' views on climate change and health.^{23–25} All procedures described below received the Institutional Review Boards' approval before data collection (IRBNet #1629592). To ensure clarity and that the length was appropriate, the instrument was pilot tested with members (n=176) of an organisation of medical professionals who work on public engagement on climate change and health. The median time to complete the survey was 11 min. A copy of the questionnaire is provided in the appendix (pp 1–41). Participants had the option to take the survey in English, Spanish, French, or Arabic.

Participants

In July, 2020, we set out to survey three health professional organisations (one adult medicine, one paediatric, and one nursing organisation) from each of the six WHO regions to provide geographic and professional diversity. Our project partners at WHO, World Medical Association, and Global Climate and Health Alliance leveraged their connections to help recruit participating professional organisations. After a 3 month recruitment process, when it became clear that we would not be able to meet our original target of 18 geographically dispersed organisations, we elected to move forward with the project with those organisations that had agreed to participate.

The surveys were administered online from October to December, 2020, in collaboration with participating health professional associations. In total, 4654 health professionals responded to the survey and 3977 completed the survey. The average participation rate across societies was 10%, although, participation varied considerably from one society to another. A list of the participating societies and their participation rates are shown in the table. Although many societies from various countries were represented, by far, the largest proportion of participants came from the Canadian Medical Association. Moreover, we did not meet our goal of surveying an equal number of adult medicine, paediatric, and nursing

organisations. Ultimately, only one nursing organisation participated, the New Zealand Nursing Organization. Nevertheless, we felt it was important to retain these participants in our analysis to obtain the broadest possible understanding of health professional views on this issue.

Men (47.4%) and women (50.3%) participated in the survey in approximately equal numbers. The age of participants ranged from 19 to 109 years, with an average age of 51 years. Most participants described their primary occupation as physicians (95%), whereas a small number of participants identified as nurses (2%), midwives (0.1%), public health professionals (0.6%), mental health-care professionals (0.4%), or as other (1.7%).

Protocol

The basic protocol for each survey was as follows: each participating organisation emailed an initial endorsement letter from the professional organisation's president or executive director, inviting members to participate in the survey. Approximately 3 days later, members received an emailed invitation to take the survey online; the email included a website link to the survey. Our survey platform (Qualtrics) prevents individuals from taking the survey more than once. For people who did not respond to the invitation, up to five reminders were sent over the following 4–5 weeks (spaced approximately 1 week apart) to increase participation.

Three distribution methods were implemented on the basis of the requirements of the participating professional society. Distribution method 1 included our research team who did the survey using the email addresses provided by the professional society. Distribution method 2 included the professional society who did the survey on their own survey software platform using our survey instrument and protocol; in these cases, our research team did the quality assurance before the survey launch to ensure that instrument was correctly programmed into the survey software of the professional society. Distribution method 3 included the professional society distributing a website link to the survey on our survey software platform using their email distribution software rather than sharing member email addresses with us.

Analysis

All analyses were done in SPSS 26.0, with unweighted data. To answer each research question, simple frequency distributions were calculated for all variables associated with the relevant question. Crosstabs for each professional association are available in the appendix (pp 1–44).

Results

Understanding of key facts and issue engagement

With one exception—misunderstanding the degree of the scientific consensus about climate change being caused by humans—survey participants have a basic understanding of the fact that climate change is

happening and is caused by humans: 95% of participants think climate change is happening, whereas only 2% think it is not happening, and another 2% do not know climate change is happening. 81% of participants think climate change is mostly or entirely caused by human activities, whereas 14% think it is caused equally by human activities and natural causes, and about 5% think climate change is mostly or entirely caused by natural causes or is not happening at all. Multiple studies have found that between 90% and 100% of climate scientists are convinced that climate change caused by humans is happening, with the most rigorous study estimating the consensus at 97%.³¹ In our study, 57% of the participants estimated the consensus to be in excess of 90%, with 38% estimating consensus at 97–100%, 32% estimating consensus at 71–90%, 10% estimating consensus at 36–70%, and 2% estimating consensus at 0%–35%. A majority of participants showed a high degree of engagement with the issue. 40% of participants said the issue of climate change is very important to them personally and 35% said it is extremely important. 91% of participants are at least somewhat worried about climate change, and 62% are very worried.

Risk perceptions of climate change as a human health threat

66% of the survey participants think climate change will cause a moderate amount or a great deal of harm to them personally, 77% said the same for their patients, 81% said the same for the people in their community, 57% said the same for the people in their country, and 93% said the same for the future generations. In terms of specific health effects, a majority of participants reported that climate change has already adversely affected the health of people in their nation in various ways, either a moderate amount or a great deal, including 65% of participants reporting illness due to reduced outdoor air quality, 63% reporting physical or mental harm from forest fires or brush fires, 60% reporting anxiety, depression, or other mental health conditions, 56% reporting physical or mental harm from storms (including hurricanes) and floods, and 51% reporting increased poverty due to economic hardship and resulting health problems (figure). A third to about half of participants also affirmed other current adverse health effect including loss of housing for residents displaced by extreme weather events (48%), hunger and malnutrition due to rising food prices (47%), heat-related illnesses (47%), vector-borne infectious diseases (46%), disruptions to health-care services for people with chronic conditions during extreme weather events (46%), physical or mental harm from droughts (46%), water-borne and food-borne diseases (36%), and violence, conflict, or resulting dislocation (33%). 60% or more of the survey participants said they think climate change will make all 13 health issues more frequent or severe in their country over the next 10 years (figure).

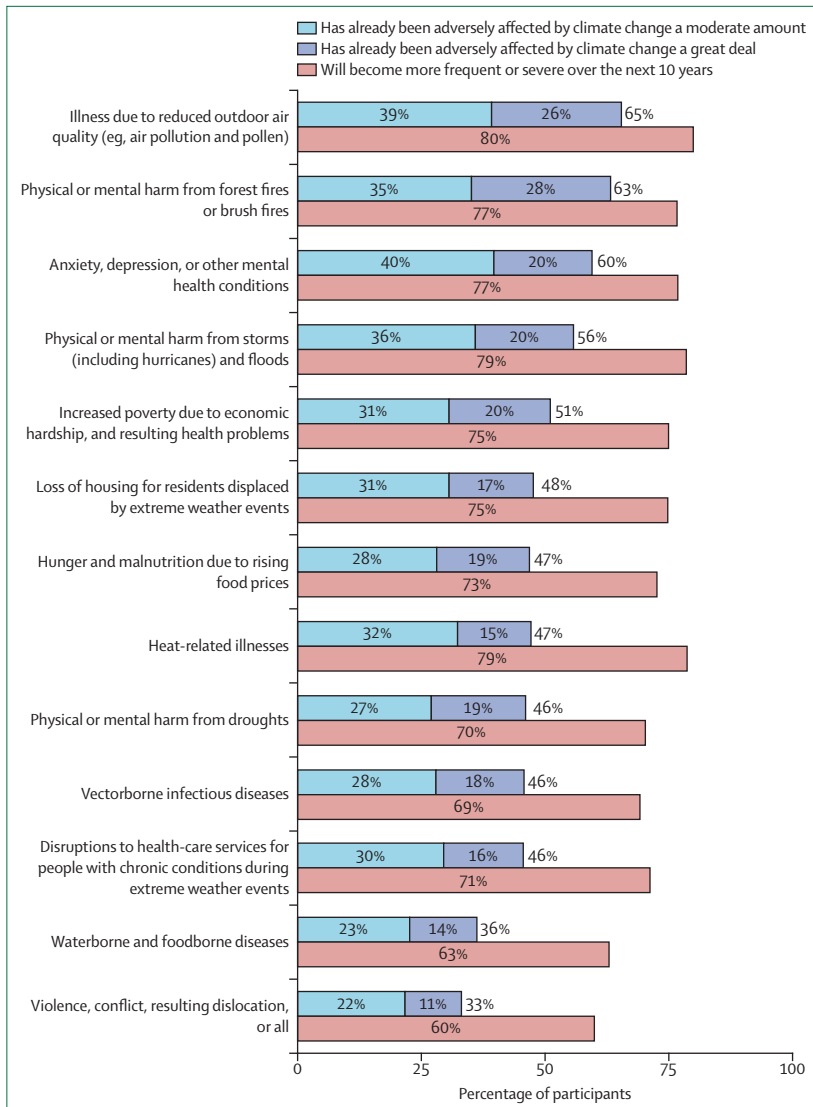


Figure: Health professional's perceptions of the current and near-term health effects of climate change in their nation

Public and policymaker engagement

A majority of participants said they felt that health professionals have a responsibility to bring the health effects of climate change to the attention of the public (86% somewhat or strongly agreed) and policy makers (90% somewhat or strongly agreed). A majority of participants felt that health professionals should actively encourage their nation's leaders (89% somewhat or strongly agreed) and all world leaders (89% somewhat or strongly agreed) to strengthen their nation's or all nations' commitments to achieving the goal of the Paris Agreement. 95% of participants said health organisations should advocate with national leaders for increased investments in health, with only 2% saying this was inappropriate, and 4% saying they were not sure. 26% of survey participants said they were personally willing to

participate in a global advocacy campaign by health professionals to encourage all world leaders to strengthen their commitment to achieving the goal of the Paris Climate Agreement. 37% of survey participants said they might participate but would first need further information, and 27% said they would support such a campaign but could not personally participate. Only 10% of survey participants said they would not support such a campaign.

Policies of a professional society

Most survey participants feel their professional societies should change their practices in several ways. 69% of survey participants felt their professional society should cut ties with fossil fuel companies including divestment from stocks and bonds. The Canadian Medical Association chose to omit the question about divestment from the survey of their members; therefore, the base size for this question was much lower than others (n=1512). 85% of survey participants felt their professional society should provide opportunities for members to participate virtually in the meetings and conferences they host, to reduce the emission of climate pollutants.

Barriers to engagement and helpful resources

54% of survey participants said time constraints reduced their willingness (by a moderate amount or a great deal) to communicate with the public about climate change and health. Less than half said other factors reduce their willingness to communicate, including their lack of knowledge (41%), their belief that engaging with the public would not make a difference (31%), little support from their peers (22%), their perception that the topic is too controversial (16%), and their perception that it engaging with the public is too risky for them professionally or personally (14%). A majority of participants said the following resources about climate change and health would be moderately or very helpful to them: continuing professional education on climate change and health (76%); policy statements on climate change and health by their professional associations (76%); guidance on how to make their workplace sustainable (72%); action alerts (timely information) on when and how to advocate with policy makers (69%); training to communicate effectively about climate change and health (69%); and patient education materials (65%).

Limitations

The participation rates in our survey were low in many nations, and the findings might not reflect the views of the full membership of these professional societies. The fact that this survey was done during the COVID-19 pandemic, when most health professionals were facing unusually challenging situations,³² might have contributed to the low response rates. Although the median completion time for the survey was only 11 min, survey length might have

reduced participation. Also, most survey participants were members of a single participating medical society, the Canadian Medical Association.

Discussion

Consistent with previous research in the USA,^{23–25} and to a lesser degree, worldwide,¹⁰ participants in this survey had a strong understanding that climate change is happening and caused by humans, viewed it as a substantial and growing cause of health harm in their country, and felt a responsibility to educate the public and policymakers about the problem, including engaging with world leaders to encourage them to strengthen their commitments to the Paris Agreement goals. Our study builds upon existing knowledge by providing new evidence about health professionals' views on climate change in a multinational context that extends beyond previous studies primarily limited to English-speaking countries.

Despite their high levels of commitment to engaging in education and advocacy to respond to the health threat of climate change, many survey participants indicated that a range of personal, professional, and societal barriers impede them from doing so. Time constraints was the most identified barrier; previous research shows that this barrier is an endemic problem for scientific experts,³³ and even more so for health professionals now as a result of the COVID-19 pandemic. Climate and health campaign organisers can address this barrier by creating opportunities for health professionals to efficiently engage in education and advocacy within their time constraints. Organisations that employ health professionals can also help address this barrier by creating programmes that specifically support their employees to engage in such actions. For example, some have proposed the creation of sabbaticals, sponsored in part by professional societies, to give physicians sufficient time to focus on policy advocacy.³⁴ Other efforts have focused on giving health professionals a menu of different meaningful actions they could take, arranged according to the amount of time required.³⁵ One study found that some health professional organisations have been able to alleviate time constraints by recruiting and developing more volunteers into leadership positions, which helped to diffuse responsibility across a greater number of people and reduced the demands on any single individual.³⁶ Further research is needed to identify effective actions that organisations can take to reduce time constraints for policy advocacy by health professionals.

Despite the high rates of concern expressed by survey participants about the health threats of climate change, more than four in ten participants felt insufficient knowledge about the topic was an impediment to engaging with the public on the issue. This is consistent with the findings of other studies.¹⁰ Given the magnitude of the problem, and the large number of health

professionals who feel their lack of knowledge poses a barrier to engagement, efforts to offer such education—in medical, nursing, and other health professional curricula and through continuing education—should be accelerated, and research should be done to investigate efficient and effective ways of providing such education, especially in light of the time constraints being identified as the greatest barrier to engagement. Thankfully, efforts to provide such education are already underway by several organisations (the Global Consortium on Climate and Health Education hosted by the Columbia University Mailman School of Public Health, NY, USA, the Medical Society Consortium on Climate and Health, the *Lancet* Countdown, the International Federation of Medical Students' Associations, and the University of California San Francisco Medical School, CA, USA).

Another major impediment to public engagement by health professionals is the belief held by nearly one in three health professionals that engaging with the public would not make a difference. A large body of social science research indicates that this belief—believing a recommended corrective action would not make a difference in solving a worrisome problem—can be a highly consequential factor contributing to gaps between attitudes and behaviours.³⁷ On one hand, it is understandable that individual health professionals might feel their actions might not make a difference in the face of an escalating climate crisis and widespread absence of governmental leadership. On the other hand, health professionals should consider the instances in which they have acted collectively and achieved important results (eg, the Nuclear Test Ban Treaty, the global HIV epidemic, the successful smallpox elimination campaign, and the ongoing polio elimination campaign). In the past year, in a major mobilisation of the health community, organisations representing 40 million doctors, nurses, and other health professionals sent a letter to G20 leaders calling for economic recovery responses to the COVID-19 pandemic to be aligned with the necessary action to address climate change (a healthy recovery)—influencing public discourse with media coverage in over 500 articles in news outlets around the world.³⁸ Efforts to engage health professionals in campaigns to limit global warming and stabilise the climate should take seriously the need to help health professionals see that they have a unique and possibly necessary role to play in the global effort.^{18,39}

Another set of barriers to public engagement on climate and health—believing that one's peers will not support such an effort (reported by 22% of our survey participants), and believing that public engagement is too risky for them professionally or personally (reported by 14% of participants)—speak to the need for a culture shift within the health professions. However, it is hard to imagine that health professionals would not feel supported by their peers for efforts to educate the public about the dangers of other health threats, such as tobacco

use, unsafe sex, obesity, air pollution, or unsafe water. Educating members of the health community about climate change, and highlighting the priority this issue is given by leading health agencies, such as WHO,⁴⁰ should help to create a culture shift whereby traditional public health measures, such as public education and policy advocacy,^{41,42} focused on climate change will be widely accepted and supported in the health community. Tailored educational efforts might be required for clinicians, and for public health professionals, given that these two groups of health professionals have different cultures and work in different environments.

A final barrier to public engagement by health professionals uncovered in this research is the perception that the topic is too controversial, a barrier identified by 16% of survey participants. This barrier might partly be attributable to a misperception held by a small proportion of survey participants that there is a substantial disagreement among climate scientists about the existence of climate change caused by humans. Previous research has found that correcting misperceptions about the scientific consensus around climate change and providing normative information about the extent of other people's concern about the topic can lead to more support for societal action and willingness to speak up about the issue.^{43,44}

Fortunately, most participants in this survey felt that a range of resources, which can easily be produced by their professional societies and others, can help them engage in education and advocacy. Continuing professional education on climate change and health is clearly needed because so many health professionals report their insufficient knowledge about climate and health presents a barrier to them engaging on the issue. In turn, most survey participants said such education would be helpful to them. A small but growing number of educational institutions and medical and nursing societies are beginning to offer continuing education courses on climate and health,⁴⁵ but surprisingly little research has been done on the competencies that should be developed in such education.⁴⁶ A majority of survey participants also said that training to communicate effectively about climate change and health, and patient education materials, would be helpful. Providing continuing education courses and communication training, and producing patient education materials, are core competencies of most health professional associations; those competencies must be mobilised in service of addressing climate change as a health issue.

Policy statements are a standard mechanism by which health professional societies make their views and recommendations known about a range of important health issues. Health professional societies should develop, or update, their policy statement on climate and health, and should explicitly encourage climate and health advocacy consistent with the goals of the Paris

Agreement. A majority of our survey participants said such a policy statement would be helpful to them.

The use of action alerts—ie, timely information about when and how to effectively engage in advocacy—is also a standard mechanism by which health professional societies mobilise their members to advance the society's advocacy goals.⁴⁷ Receiving action alerts about opportunities to endorse climate and health policy proposals, and when and how to contact relevant policymakers, might help interested members overcome the most common barrier to their climate and health advocacy—their time constraints.

The notion that change begins at home—or at work—is supported by a large body of social science.^{48–50} For example, health professionals are more comfortable with and effective at helping their patients take preventive measures when they themselves have taken those measures,^{51,52} and therefore would be more likely to be comfortable advocating for policy change when they have themselves taken all reasonable measures within their purview to deal with the problem. A majority of our survey participants said that guidance on how to make their workplace sustainable would be helpful to them. Practice Greenhealth, VA, USA, and My Green Doctor are examples of organisations that produce resources to help health providers implement more sustainable practices.

All of these resources—continuing professional education, communication training, patient education materials, policy statements, action alerts, and guidance on how to make health-care workplaces more sustainable—can be produced or acquired by most health professional associations. Collaboration among health professional societies to produce or acquire these resources for their members might reduce the costs per person served.

Behavioural scientists (and health professionals) have long understood that even highly motivated people often do not engage in the actions that are consistent with their motivations.⁵³ An important insight from the social marketing literature is that moving members of a motivated audience to take action is often effectively accomplished by removing or reducing the barriers that make the recommended action difficult for them to do.⁵⁴ Making these resources, identified in the current study, widely available is a promising strategy for reducing the barriers that impede motivated health professionals from taking climate and health advocacy actions.

Conclusion

The views revealed in this survey represent the views of just a sampling of health professionals globally; additional research must be done. However, the fact that many health professionals hold these views suggests considerable potential to engage a large number of health professionals in countries around the world in educational and advocacy activities to help their community, their nation, and the world rise to the human

health challenges posed by climate change. Efforts to support these willing health professionals with the kinds of resources identified in this survey are most likely to help translate the good intentions of these health professionals into effective educational and advocacy actions.

Contributors

JK, EM, and JM conceived and designed the study. JK and EC collected and analysed the data. JK and EM wrote the first draft of the manuscript and revised it on the basis of feedback from JM, EC, LA, MM, and AW.

Declaration of interests

JK and EC report grants from WHO, and JM reports a grant from the Canadian Medical Association, during the conduct of the study. All other authors declare no competing interests.

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