

Physicians' role in addressing the issue of climate change and health during their conversations with patients



INTERNSHIP REPORT – ALANYA DEN BOER

Physicians' role in addressing the issue of climate change and health during their conversations with patients

A qualitative study

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Preface

This report, 'Physicians' role in addressing the issue of climate change and health during their conversations with patients', is part of my internship which I followed at University of California, San Francisco (UCSF) from February to July 2016. Human health is impacted by several social and physical determinants and at this moment there is one health threat in particular: climate change. For my study Applied Communication Science, specialization Health and Society at Wageningen University and Research Centre (WUR), I decided to study the links between climate change and health through a social lens. Since UCSF is a medical university it was a logical decision to study the role of health professionals related to climate change, in particular physicians. This led to a qualitative research for which several interviews were conducted with physicians from all over the United States.

I would like to thank my supervisors from UCSF, Arianne Teherani and Gail Lee and from the WUR, Carlijn Wentink. You supported and helped me in different ways and I can say I learnt very much from you during my internship. Secondly, I want to thank all participants for their willingness to take the time for an interview.

I hope this study will contribute to the existing knowledge on how we can communicate the links between climate change, health and the environment with the ultimate aim to improve the health and well-being for us all,

Kind regards,

Alanya den Boer

Wageningen, 2016

Abstract

Climate change has several health impacts and the health care sector has a vital role to play. Physicians in particular might be well-positioned to raise awareness about climate change and health during conversations with patients, since they can be viewed as health educators, are seen as trustful sources of information and see a majority of the public. For this qualitative study interviews were conducted with physicians from the USA with different specialties. It was asked whether they think it is possible to raise awareness during conversations with patients, what these discussions might encompass, how this will differ for different specialties and whether there are challenges. Data showed that all physicians think it is important to raise awareness. However, the clinical encounter was not always considered the right place, mainly because climate change has become politicized and there are ethical issues related. Raising awareness seems not to be easy, since discussions have to be personal relevant, actionable and without the creation of feelings of fear or powerlessness. There are possibilities to link climate change and health during conversations, although discussions about the environment rather than climate change per se seem to be more appropriate. Opportunities per specialization has to be identified to develop materials and tools that can be used during and outside the clinical encounter. Currently, physicians lack knowledge and skills, meaning there is a strong need to educate and guide physicians about the links between climate change, the environment and health and the ways in which they can communicate these links without undermining the physician-patient relationship.

Keywords: Climate change and health, raising awareness, physicians, health educators

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1. Introduction

'Climate change is the biggest global health threat of the 21st century' (Costello et al., 2009, p.1659). This statement was made by the Lancet Commissions in 2009. It is estimated that climate change is already causing tens of thousands deaths each year worldwide (Chan, 2015). By 2030 climate change will cause approximately 250.000 deaths each year caused by malaria, diarrheal disease, heat stress and malnutrition only (Chan, 2015). Furthermore, climate change is responsible for a significant amount of disability adjusted life years (DALYs), in both developing and developed countries (Costello, 2009). Although climate change threatens populations globally people living in developing countries or cities, people already suffering from disabilities or illness, children and elderly are affected the most, which means already existing health inequities will further increase (Michael & Jeremy, 2008).

However, climate change is not only a significant threat for global health. The most recent report of the 2015 Lancet Commissions on Climate Change states that climate change could be the greatest global health opportunity of the 21st century, given the many health co-benefits of mitigating climate change (Watts et al., 2015). Since climate change is both a threat as well as an opportunity for global health, the health sector in particular has an important position to address the issue (Patrick et al., 2011). According to Roberts and Stott (2010), responding to climate change could be the most important challenge for health professionals at this moment. Health professionals can and have to take action in several ways. One of the most important roles health professionals have to play is raising awareness among policy makers, the community and the public about the impact of climate change on health (Ryan & Crowley, 2016).

According to several articles, physicians in particular have a unique position to inform the public about climate change and health and to stimulate people to act both in healthy as well as environmental friendly ways. Several experts and some physicians themselves even state that physicians have the duty or responsibility to raise awareness, to stimulate people to change their behavior and to change the public discourse (Roehr, 2007, Schwartz et al., 2006, Faergeman, 2007, Al-Lamki, 2008 and Parker, 2011). One of the recommendations of a recently published position paper of the American College of Physicians (2016) is that physicians have to advocate for change and to communicate with their community about the health co-benefits of climate change mitigation. The viewpoint that physicians have an active role in protecting and informing their community is not entirely new and is in line with a review from Leaf written in 1989, stating that physicians 'have been educated and given a mandate by society to be the guardians of health' (Leaf, 1989 in Faergeman, 2007). Besides opinion papers and essays, two studies have been identified in which physicians were asked about their experiences with climate change and health in the clinical encounter and their viewpoints about whether physicians have to inform their patients about the impact of climate change (Sarfaty et al., 2014 and Sarfaty et al., 2015). These studies included two specific groups of physicians, respectively African-American physicians from the National Medical Association (NMA) and physicians from the American Thoracic Association (ATS). In both studies the majority of physicians had already clinical experiences with climate change and believed physicians should play a role, including addressing climate change during the clinical encounter (Sarfaty et al., 2014 and Sarfaty et al., 2015). However, existing papers are mainly editorials. Less is known about the specific role of physicians in addressing this issue with their patients, meaning the way in which physicians can raise awareness about climate change and its impact on human health and how

patients can protect their health against climate change, whether they are in the position to stimulate patients to behave in environmental friendly as well as healthy ways, whether there are barriers or challenges to talk about climate change and whether physicians think they are in the position to talk about climate change with their patients.

The aim of this study is to contribute to the existing literature by investigating the potential role of physicians to raise awareness about climate change and health among their patients. The following research question is formulated: *What is the potential role of physicians in addressing the issue of climate change during their conversations with patients and do these physicians themselves see to be in the position to address this issue?*

The word *physicians* in this study refer to both primary and secondary care physicians. This means physicians with different backgrounds and specialties, from family medicine to highly specialized medicine.

2. Theoretical Framework

To be able to investigate the potential role of physicians to address climate change and health during their conversations with patients, it is essential to have an understanding of climate change and the links between climate change, environment and health first. Secondly, an understanding of the role and specific position of physicians and how this relates to the opportunity to address climate change and health with patients is important, which is investigated using the framework of physicians as health educators. In this chapter, climate change and the impact on human health will be explained first. Subsequently, the role of physicians as health educators and how this relates to their opportunity to address climate change and health during conversations with patients is investigated. Furthermore, it is investigated whether physicians already have experience with discussing climate change with their patients and whether they perceive specific challenges or needs to do so. Papers used for this part are included (Appendix 1). Based on this framework specific sub-questions are formulated to investigate the research question of the following qualitative study.

2.1. Climate change and its impact on human health

Anthropogenic climate change caused by greenhouse gasses (GHGs), primarily carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), has already changed the climate by an increased average land and ocean temperature (Costello et al., 2009 and Watts et al., 2015). This has several environmental consequences, including decreased air quality, sea-level rise, ocean acidification and extreme weather events. Strictly, there can be made a difference between climate change or global warming and other environmental forms of degradation, including air pollution, water contamination, deforestation, overfishing, soil degradation, pesticide use and dead zones in the ocean and biodiversity loss. However, the same dynamics are causing both climate change as well as these forms of environmental degradation (Rudolph, Gould and Berko, 2015). For instance, forests are natural sinks for CO₂ which means deforestation will lead to more CO₂ in the air. Ocean acidification will reduce the amount of fish, already impacted by overfishing (Bernstein and Chivian, n.d. and Rudolph et al., 2015). The many complex interactions and positive feedback loops between climate change and ecosystems lead to several direct as well as indirect health outcomes (figure 1).

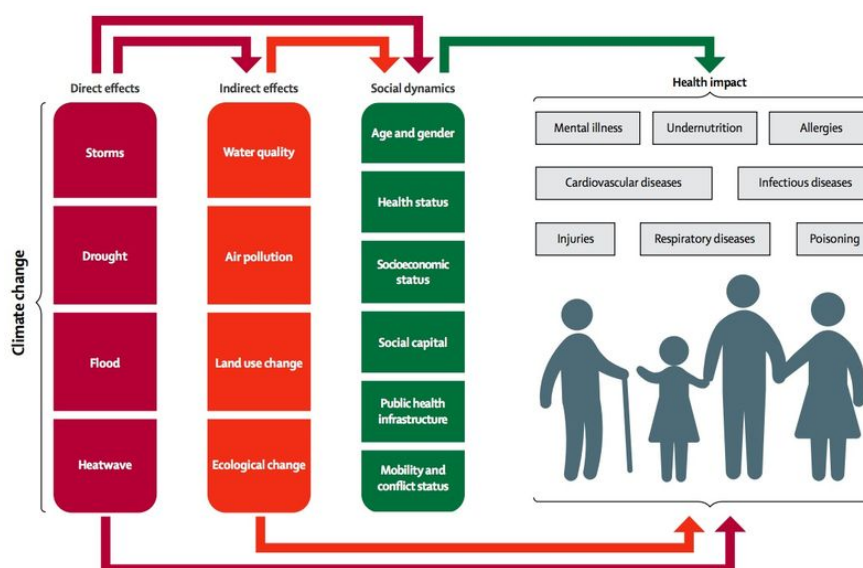


Figure 1. The direct and indirect effects of climate change on health and wellbeing. Reprinted from: Watts et al. (2015). Health and climate change: policy responses to protect public health. *The Lancet*: 386, p.1867.

Furthermore, these direct and indirect mechanisms interact with social dynamics, including age and gender, health status, socioeconomic status and social capital and public health infrastructure. Although the effects of climate change on health are hard to predict, the impact on health is pervasive and is related to the prerequisites and basic needs for health, including food, air and water, since climate change influences the (natural) environment (Watts et al., 2015). The direct as well as indirect health effects are shortly described below.

Direct effects on human health

Climate change has a direct impact on human health via extreme weather events such as heatwaves, forest fires, droughts, storms and floods. Several extreme weather events, such as the California drought in 2013 and the most severe heatwave in Russia in 2010 are linked to anthropogenic influences (Watts et al., 2015). High temperatures are in particular linked to cardiovascular diseases. The relationship between high temperatures and cardiovascular mortality is well-established and there is strong-evidence that mortality as result of higher temperatures will increase (Watts et al., 2015). Besides cardiovascular mortality, both high and low temperatures are associated with respiratory deaths (Costello et al., 2009). While extreme weather events can lead to injuries or deaths, there is a link between high temperatures and morbidity as well. Extreme heat and cold are primarily associated with cardiovascular diseases such as chest pain, and variations in cardiac dysrhythmias and act as stressors for people with pre-existing cardiovascular disease (Portier et al., 2010). Especially the elderly, overweighted people or people not capable of protecting themselves face high risks. Increasing frequencies of heatwaves, migration, urbanization and population growth will lead to an increasing number of people exposed to high temperatures. Besides extreme temperatures, floods and storms are directly associated with morbidity and mortality as well. For instance, hurricanes and floods between 1940 and 2005 caused in total around 11,300 deaths in the United States, mainly because of injuries and drowning (Portier et al., 2009). The intensity and frequency of these extreme weather events will change as result of climate change with increased mortality and morbidity as a result.

Indirect effects on human health

Indirect effects of climate change on health are more complex and are related to water quality, air pollution, land use changes and ecological changes (figure 1). Extreme weather events have besides direct also indirect effects via several pathways. For instance, hurricanes can lead to the mixing of clean and contaminated water, causing decreased water quality and the spread of diseases such as cholera (Watts et al., 2015). Also outbreaks of the harmful algal blooms in recreational waters are linked to extreme weather events, in combination with increasing temperatures (Costello, 2009). These toxic blooms are associated with a variety of diseases, including gastrointestinal illness, asthma exacerbations and neurodegenerative diseases such as ALS and Alzheimer's (Fleming et al., 2014).

Furthermore, extreme weather events can lead to economic collapse, destruction of health care services and infrastructures, migration, food shortages and violent conflicts, increased risks of limited access to healthcare, malnutrition and mental health problems. For instance, floods can lead to ecosystem change, including loss of wetlands which forms a threat for food production and human health indirectly (Portier et al., 2009). Agriculture is highly sensitive to increasing temperatures and

the resulting extreme weather events (Santer, 2014). Besides, diminishing food production, climate variability and extreme weather events influence the transmission of chemicals used in agriculture, resulting in transport of chemicals in the environment. Simultaneously, climate change will lead to an increased use and need for pesticides and chemicals in the agricultural sector, resulting in even higher rates of transmission of chemicals and pesticides (Boxall et al., 2009). Other indirect health effects include mental health problems. Mental health can be affected as a consequence of the loss of family members and friends, increased perceptions of insecurity and influences on cultural identity (Watts et al., 2015). Involuntarily displacement of people can have significant mental health impacts.

In addition, ecological changes together with globalization and migration or involuntarily displacement of people, can help spread diseases. For instance, migration and displacement of people is associated with the spread of HIV/AIDS. Simultaneously, HIV/AIDS will aggravate food insecurity, already threatened by climate change (Boko, et al., 2007). Also, foodborne, as well as waterborne and vectorborne diseases form potential risks for human health (Portier et al., 2010). The intensity of various infectious diseases will increase and their patterns will change as result of global warming and climate change.

The links between climate change, air pollution and health are even more complex. Climate change influences the formation, as well as the transport, dispersion and deposition of pollutants which is related to several allergic diseases, respiratory diseases and cardiovascular diseases (Watts et al., 2015). The concentration of pollutants is highly variable per region, meaning that some people are significantly more exposed to poor air quality than others (Watts et al., 2015). Ambient temperature effects particulate pollutants, especially fine particulate matter (PM_{2.5}), and ground-level ozone (GLO), meaning that higher temperatures will result in decreased air quality (Portier et al., 2010). Fine particles can go deep into the lungs and can cause several respiratory as well as cardiovascular issues, including chronic bronchitis, aggravated asthma and irregular heartbeat. GLO can also trigger several cardiorespiratory issues, including chest pain and throat irritation and can even reduce lung function (Portier et al., 2010). Higher temperatures are also linked to longer growing seasons and therefore more natural allergens. Furthermore, higher levels of CO₂ are linked to an increase in pollen, resulting in increasing rates of respiratory issues (Szema, ch. 9 in Pinkerton & Rom, 2014).

2.2. The Physician as Health Educator and the Potential Role to Address Climate Change

The many health impacts described means this can not be unnoticed by physicians. One of the most fundamental concepts of medical practice is patient education (Streiffer & Nagle, 2000). The potential role of physicians to address climate change and the different ways and already perceived challenges and needs to do so viewed through the lens of the physician as health educator are explained in this paragraph.

The word 'doctor' originates from the Latin *docere*, which means 'to teach' (Streiffer & Nagle, 2000). Educating patients include both provision of information via direct communication as well as use of patient education materials. Patient education is associated with higher patient satisfaction, which in addition is a prerequisite for adherence to physicians' recommendations and advice (Streiffer & Nagle, 2000). Quality and ways of education will influence the degree of patient satisfaction and therefore effectiveness. Studies have shown that patients are more satisfied when they see their

physician as partner rather than someone who controls the relationship. Use of patient materials also increases patient satisfaction and adherence to the advice. However, studies have shown that patients are more likely to make use of patient materials and are even more satisfied when patient education materials are given to them by a physician instead of freely available in the clinical practice. Satisfying physician-patient interactions are associated with more effective education processes and are linked to patient-centered care. Often, the ultimate goal of patient education is to change patient's behavior, for which a relationship based on trust is one of the pre-requisites (Streiffer & Nagle, 2000). Physicians are seen as one of the most trustful sources of information (Sarfaty & Bourzaid, 2009). Surveys have shown that the public has more trust in medical professionals than in governmental organization or scientists, even when it is about environmental related issues (Guidotti, Hancock & Bell in Rice 2014). Trust in doctors is based on individual patient-physician contact experiences and perceptions that physicians can be trusted both for individual health issues as well as community and national health issues (Ballard, 2011). While only few people have contact with politicians or scientists, the majority of the public has contact with a physician, especially a general practitioner (GP) (Sarfaty et al., 2014). Since patients see their physician as trustful source of information, they might be effective actors to increase patients' knowledge about the potential impacts of climate change on health. Furthermore, physicians have experience with behavior change and counseling (Schwartz et al., 2006) and can easily understand the parallels between human and planetary health (McCoy & Hoskins, 2014).

2.3. Health Education and Climate Change: Adaptation versus Mitigation Related Advice

One of the questions arising from the framework of physician's as health educators is whether the provision of information about climate change and health is part of patient education, thus whether there is a role for physicians to talk about climate change and health with their patients and in what way. Several of the health problems described in the first part of this chapter are already visible for physicians and it is likely that this trend will continue (Sarfaty et al. 2015). This means diseases directly or indirectly caused by climate change are relevant for physicians (Faergeman, 2007). The survey of Sarfaty et al. (2015) among members of the ATS who were asked about their experiences with climate change and health within the clinical practice and their suggestions about actions that can or should be taken by physicians showed that a majority considered it as important and relevant for patient care and believed physicians should inform their patients on the health effects of climate change. According to Villigran et al. (2010) physicians' role as health educator means they can raise awareness and increase patients' knowledge and even actively motivate patients to change their behavior both to protect their own health as well as to help mitigate climate change. Results of this study show that patients who have more information and knowledge about the risks of climate change feel more empowered to take action related to adaptation as well as mitigation efforts. Adaptation to climate change refers to interventions aiming to lessen or protect against adverse health effects, while mitigation refers to primary prevention interventions to combat climate change, mainly the reduction of greenhouse gasses (McMichael, Woodruff & Hales, 2006). The opportunity for adaptation related advice was showed in a study from Sheffield et al. (2015), in which health professionals, including physicians, mentioned their interest in the identification of vulnerable patients and tailored clinical advice to serve these patients. For instance, more frequent and intense heatwaves mean especially elderly, children and overweight people have to know how to protect themselves against higher temperatures. More air pollution means patients with asthma or other respiratory diseases has to be informed about how they can reduce their exposure. Other examples

of discussions about adaptation related advice are the potential threat of increased amounts of algal blooms in recreational waters or pesticide, oil and chemical contamination of water supplies caused by more frequent and severe floods and storms. This means adaptation related advice primarily focusses on high risk population groups and how they can protect themselves against adverse health outcomes.

Besides the study of Villigran et al. (2010), several authors argue that there are opportunities as well to give mitigation related advice to patients, since individual behavior change is an important component to mitigate climate change and since many mitigation strategies benefit both the environment as well as human health, called co-benefits (Griffith et al., 2010 and Parker, 2011). Already in 1990, a paper was published by McCally and Cassel (1990), describing the importance of prevention as response to climate change, the importance of behavior changes by masses of people to prevent bad social and health outcomes and the unique position and role of physicians as educators. According to Griffith et al., (2010), all people living need to take responsibility and should have an equal share in combatting climate change by reducing greenhouse gasses, since the earth is a global good. Physicians can simply talk with their patients about ways to improve their health and simultaneously reduce their carbon emissions meaning stimulating their patients in adopting low-carbon lifestyles (Griffith et al., 2010). According to Parker (2011), it is reasonable to suggest that individuals could take action to reduce greenhouse gasses, since climate change is anthropogenic (Parker, 2011). Patients are more likely to adopt low-carbon lifestyles if their physician asks them to do this and leads by example (Parker, 2011). In the study of Villigran et al. (2010), one of the recommendations for physicians is to talk about behaviors their patients can easily adopt to help mitigate climate change, to tell them individual actions are necessary to stop climate change and to show how these actions benefit their health and their children's health. In the United States cardiovascular disease is the leading cause of death (Portier et al., 2010). Less physical activity as a result of increased use of automobiles is both strongly associated with cardiovascular diseases and obesity as well as climate change. Obesity and overweight increase the risk for several non-communicable diseases, including diabetes, cardiovascular disease, certain types of cancer and stroke (Griffith, 2009). Although the causes of these diseases cannot be attributed to the use of fossil fuels directly, the connections are clear (figure 2). Finally, increased walking, cycling and use of public transport can improve well-being and is simultaneously environmental friendly (Griffith, 2010). In the same way, the health co-benefits of eating less environmental harmful products such as meat can be illustrated by physicians according to Faergeman (2007).

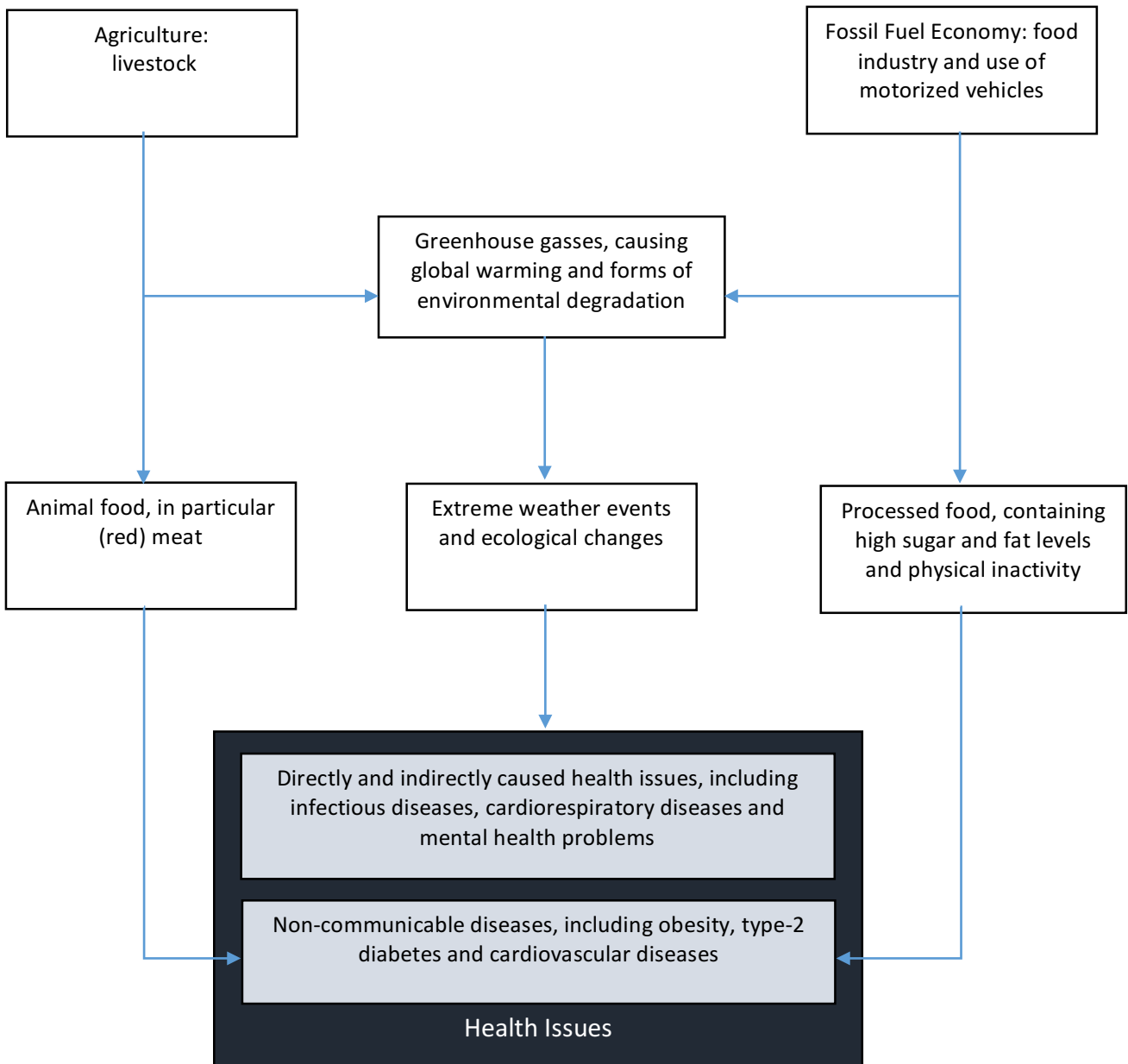


Figure 2. The links between agriculture, the fossil fuel economy and health. Based on 'Connecting clinical and climatological concerns' in Faergeman (2007). *Climate change and preventive medicine. European Journal of Cardiovascular Prevention and Rehabilitation* 2007, 14: p. 728.

2.4. Health Education and Climate Change: Tailored versus General Discussions

Besides differentiating between adaptation and mitigation related advice, there can be made a difference between tailored and general information (table 1). Especially, mitigation related advice can be either tailored or general. Traditionally, during a clinical encounter physicians talk about individual health issues and prevention of future individual health risks (Schwartz et al., 2006). According to the literature, most people respond best to personal relevant messages, addressing their own interest and concerns (Villigran, 2010). Messages tailored to patients, taking into account their personal beliefs and interests, are in line with a patient centered approach. It has been shown that patient-centered discussions, including shared-decision making, usage of simple and understandable messages, and information giving, are more effective and helps patient

understanding of information. However, some physicians, including Schwartz et al. (2006) and Guggenheim (2016), argue that physicians can talk as well about behaviors that benefit the environment and therefore other individuals or the population overall. According to Guggenheim, the doctor’s office can be a place to reflect on aspects of quality of life in general, also when it is not directly related to individual’s health, which means climate change in more general can be discussed within the clinical encounter. At this moment, behaviors in industrialized countries form a significant threat for individuals around the world. According to the opinion paper of Schwartz et al. (2006), physicians can stimulate patients for instance to use energy efficient light bulbs while telling them this will help protect the health of other individuals as well as reducing electricity costs. According to Chivian (2014), physicians have to provide people with concrete examples about how climate change impacts their health or their needs. One of the examples he gives is about the cone snail, living in tropical reefs and important for humans since the toxins of the snail are used to develop medicines. However, the tropical reefs and therefore the snails are threatened by climate change, since the oceans are warming up. These kind of examples will make the threats of climate change concrete and tangible. The before mentioned means advice can be related to adaptation or mitigation and simultaneously can be tailored or more general.

Table 1. The meanings of adaptation, mitigation, tailored and general advice and their connections.

Adaptation related advice		Mitigation related advice
Tailored advice	Advice about how to protect against a specific health issue relevant for that patient, caused by climate change (for instance, how patients with increased risk on cardiovascular disease can protect against heatwaves)	Advice about how to behave in a way that both helps mitigate climate change as well as promote one’s individual’s health (for instance, the benefits of eating less (red) meat for patients with higher risk on cardiovascular disease)
General advice	Advice about how to protect against climate change in general, meaning good for health in general or not related to specific health issues.	<ul style="list-style-type: none"> • Advice about how to behave in a way that helps mitigate climate change as well as is good for health in general (for instance the benefits of biking, walking and use of public transport for patients without specific relevant health issues, thus prevention) • Advice about how to behave more environmental friendly without direct health effects (for instance, changing light bulbs or driving an electric car).

2.5. Health Education and Climate Change: Challenges and Needs

The characteristics of physicians and their position to educate the public does not mean there are no challenges when raising awareness about climate change and health. The study of Sarfaty et al. (2014) in which members of the NMA were surveyed aimed to investigate whether these physicians were seeing the effects of climate change in their practices and what actions should be taken to address these health problems. This survey revealed two significant barriers for physicians to address the issue of climate change, including physicians’ lack of knowledge about how to approach the issue and lack of time. Other challenges mentioned were disinterest among patients and a lack of

perceived impact (Sarfaty et al., 2014). Disinterest among patients is linked to another potential challenge, which is the amount of knowledge patients have about climate change and whether they believe climate change is happening and anthropogenic. Personal beliefs vary around the world and especially in the United States many people still do not believe climate change is anthropogenic. In 2014 only 54% of the population agreed they believe climate change is caused by humans. Especially in the United States climate change has become a political issue, slowing action and influencing individual attitudes (Ryan & Crowley, 2016). However, according to Ryan and Crowley (2016), physicians can talk about climate change with their patients in an objective way, helping depoliticize the issue.

Not only the amount of knowledge about climate change among patients might be a challenge. Also physicians do not have explicit knowledge about climate change and its impact on health. Physicians need to have knowledge about how climate change impacts health, at least to be able to respond accurately to the changing needs of patients as a result of climate change (Abelsohn, Rachilis & Vakil, 2013). Traditionally, medicine focuses on pathogens and disease processes rather than the impact of environmental health related issues. According to Auerbach (2008), it is needed that this viewpoint will be broadened. Also in a study of Villigran et al. (2010) it was showed physicians need additional information and knowledge. In this study a health literacy framework was used, including four components: cultural and conceptual knowledge, listening and speaking, writing and reading and numeracy. It was showed that physicians need additional information about climate change and health that includes all four components of health literacy, meaning physicians have to be enabled to communicate effectively about climate change with patients from different cultures, avoid usage of jargon or complex terminology and are aware of the patient's ability to read, understand and act on information. Patients with a higher degree of health literacy feel more comfortable to speak about the issue of climate change with their physician. According to this study, patients who do not address health issues related to climate change during a clinical encounter might lack health literacy.

In the same survey of Sarfaty et al. (2014), physicians were asked ways to overcome the before mentioned barriers of lack of physicians' knowledge, lack of time and disinterest among patients. There was mentioned a need for three resources, including medical education on climate change and health, referring to Continuing Medical Education (CME), materials to educate patients and policy statements provided by professional associations. According to Sarfaty et al. (2014) physicians have to be actively enabled to address the issue of climate change during conversations and raise their patients' awareness by doing so. At this moment, some patient materials are already developed, available and in use by physicians. One of the materials is developed by the American Academy of Family Physicians (2011), called: 'Global Warming and Your Health'. This general document describes global warming, how it can affect health and what individuals can do.

Besides patients' attitudes, also physicians' personal beliefs might be a potential barrier. The survey of Sarfaty et al. (2015) among ATS members, showed that part of these physicians still do not believe climate change is anthropogenic or relevant to patient care, although the health effects of climate change on respiratory health are already clearly visible in the clinical practice.

Besides these barriers, physicians' self-efficacy is an important factor in the likelihood of addressing the issue of climate change. High self-efficacy mean physicians believe they can contribute to effective action on climate change in their personal or professional lives. Self-efficacy is a significant

condition for effective action on climate change (Swim et al., 2009 in Sarfaty et al., 2014). This means physicians' self-efficacy is a requirement for effectively addressing the issue of climate change with patients and currently might be a barrier for some physicians.

Table 2. Facilitators, challenges and potential ways for physicians to address climate change and health during conversations with patients.

Physician as health educator addressing climate change and health	
Facilitators	<ul style="list-style-type: none"> • Physicians seen as trustful source of information • Physicians see majority of the public • Physicians can easily link climate change and health
Challenges	<ul style="list-style-type: none"> • Lack of time • Politicized issue • Patients' personal beliefs • Physicians' personal beliefs • Lack of knowledge and or self-efficacy among physicians • Lack of knowledge among patients
Potential ways of addressing climate change and health	<ul style="list-style-type: none"> • Adaptation related advice • Mitigation related advice • Tailored advice • General advice

2.6. Rationale and Sub Research Questions

Aim of this study is to investigate the potential role of physicians to address climate change during their conversations with patients and whether they see themselves in the position to do this. Physicians as health educators and trustful sources of information might be well-positioned to inform patients about climate change and health and there can be made a difference between adaptation and mitigation related discussions and tailored versus general information. A few challenges and needs were identified in order to address climate change during conversations with patients. However, the available studies are focused on specific groups (ATS and NMA members), or are opinion papers written by individual physicians. There is a need for a deeper understanding and more evidence based research about the possibilities, topics, levels and specific ways of discussing climate change and health with patients. Therefore, based on the conceptual framework specific sub-questions have been formulated in order to investigate the research question of this study:

1. *Can addressing the issue of climate change and health be part of physicians' patient education and why or why not? If yes, is the clinical encounter an appropriate place to do this or are there other opportunities for physicians?*
2. *What can or should discussions about climate change and health encompass?*
 - a. *Do these discussions encompass the impact of climate change on health and how to protect against the impact of climate change?*
 - b. *Do these discussions encompass how to change patient's behavior in order to help mitigate climate change and to what extend does this information need to be tailored to patients?*

3. *Does the potential role to address climate change and health during conversations with patients differ among specialties? If yes, what are the differences for different specialties?*
4. *What are ways and moments do address the issue of climate change with patients and is there a need for a specific way of communicating these links?*
5. *Are there any additional barriers or challenges and needs for physicians to address the issue of climate change and health during their conversations with patients and can these barriers be overcome?*
6. *Do physicians themselves see to be in the position to address this issue of climate change and health during their conversations with patients and to they feel self-efficacy to address this issue?*

3. Methods

In order to investigate the potential role of physicians in addressing climate change a qualitative study has been carried out. This section describes the sampling and analysis methods used in order to investigate the research question.

3.1. Selection of participants and instruments used

This study is related to a research at the University of California, San Francisco (UCSF) aiming to bring environmental sustainability and health (ESH) into the health professions curricula. Although the objectives differ for both studies, there are several links and overlapping areas and for both researches interviews were the most appropriate method. Therefore, interview questions were combined for both studies and there was developed one interview protocol consisting of two parts. Interview questions for this study formed the second part of the interview protocol and are included (*Appendix 2*). Participants for this study were also participants of the ESH research but not vice versa, since the ESH study also included other health professionals besides physicians. Semi-structured interviews were considered the most appropriate instrument, since this study has the objective to investigate physician's experience, viewpoints and experienced barriers or challenges. Interviews allow to obtain a deeper understanding and to ask for additional information when necessary.

Physicians invited for this study were both physicians from UCSF School of Medicine as well as community physicians, meaning physicians not necessarily related to UCSF. Inclusion criteria were that physicians had to believe climate change is real, are aware it has an impact on human health and are or were practitioners in the recent past (meaning face-to-face contact with patients). Since California is not representative for the United States and since this study aims to investigate the potential role of physicians in general to talk about climate change and health, it was decided to include physicians from other states as well. Physicians were selected using a mix of convenience and snowball sampling and were invited by e-mail after their background was checked online. Two pilot interviews were conducted among colleagues of the researcher of the ESH study and were asked for potential participants. Besides this snowball technique, there is made use of the network of one of the researchers including the American Public Health Association (APHA) and the US Climate and Health Alliance. Since it was not possible to conduct interviews face-to-face because of distance or time constraints, all interviews were conducted by phone. Both researches took notes and all interviews were audio recorded. The study was approved by The Human Research Protection Program (HRPP) at UCSF and informed consent was obtained from all participants.

3.2. Participants

In total, interviews were conducted with nineteen physicians between March and June 2016, including five pediatricians, four family physicians, four obstetricians/gynecologists, three internists, one immunologist, one infectious disease specialist and one anesthetist. Three of the nineteen physicians were not practitioners anymore because of retirement or change of occupation, but had seen patients in the recent past. Physicians came from California (n=14), Massachusetts (n=1), Texas (n=1), Iowa (n=1), Minnesota (n=1) and Washington D.C. (n=1). All participants except one had already experience related to climate change and its impact on health or environmental health, meaning they authored one or more articles or books, are a public speaker or are actively involved within an organization, department or committee related to one of these areas. The physician who

did not have experience believed climate change is real and knew it has an impact on human health. The interviews took around fifteen minutes.

3.3. Data analysis

Data from the interviews included notes and transcripts of the interview records. Data were analyzed using the grounded theory techniques and procedures, including open, axial and selective coding. A list of codes and sub-codes was developed by the two researches independently, after the two pilot interviews and first three interviews were conducted. Subsequently, the lists of codes were compared and modified to develop one list. New interviews were coded using this list and additional codes were added when data did not fit the initial codes. The final list of codes is included in this study (Appendix 3). To code and analyze the data systematically a special software program was used, called *Dedoose*. After open coding, categories were each summarized. Comparisons were made and statements were checked against the data, meaning a constant alternation between inductive and deductive methods. New data was obtained until there was reached saturation.

4. Results

In this chapter results of the interviews are presented. Seven main categories were identified: *Importance of Raising Awareness and the Position of Physicians, Topics, Challenges, Personal Relevance and Actionability, Advice and Specialty, Strategies, and Knowledge, Skills and Education.*

4.1. Importance of Raising Awareness and the Position of Physicians

All physicians said it is important to raise awareness about the impact of climate change on health. Answers included: *'Oh yeah, I don't have ambiguity about that'* (7) and: *'Yes, yes, of course, absolutely'* (13). Reasons mentioned were that physicians are seen as trustful source of information, health is a good angle to talk about climate change and many patients do not think about climate change at the individual level and do not understand the multiple levels of impact it has on their own and on everyone's health. Two participants said physicians do have an obligation to help patients understand the threat of climate change to their health and knowledge is the only way for patients to be able to adapt. Others said their patients accept or are even very receptive to their advice.

Among the participants, the majority thought there are possibilities to talk about climate change with patients. However, most of them talked about environmental health, the impact of environmental changes on health or environmental friendly and healthy behaviors, meaning they did not explicitly talk about or refer to climate change per se. A few physicians explicitly referred to climate change and its impact on health, but had not all experience themselves with doing this.

However, three physicians questioned the clinical encounter as the right place to raise awareness. One of them said: *'I do, but I also have mixed feelings'* (19). Three physicians explicitly said they think the clinical encounter is not the right place. They said it is not ethical to do this, especially for people with a low socio economic status (SES), who face more pressing issues and for whom the advice will not be actionable. Their answers were: *'Do I think a physician's office is the right context? No. Do I think my work as an advocate and public speaker is the right place? Yes.'* (10), *'I think it's sort of a double-edged sword. I personally don't, unless it's something that someone asks directly'* (1), and: *'I like to think it's important but it isn't practical or reasonable to have that as a goal. I don't think raising awareness about climate change is where I want to be ethically'* (2). Besides ethical considerations, they both mentioned climate change is seen as political issue and patients do not have the knowledge about climate change:

'I think to start with the level of, and just talking the United States, the level of understanding among the general American public about climate change is very, very small. To get people within a 15-minute clinical encounter to understand not just climate change and potentially what it means to their health, and what they would do with that information if they had it that would be different from other, what I would call anticipatory guidance, is hard.' (1).

One physician said she never specifically thought about this question before and one physician said she thought raising awareness among patients is important but not enough. She mentioned the importance of advocating as physician for overall public health interest.

4.2. Topics

Several physicians said they already have experience with talking about the links between their patient’s health and the environment or the links between certain behaviors and the benefits for their patient’s health as well as for the environment or came up with potential topics to discuss. Four of the participants specifically made a distinction between talking about climate change and health and talking about the environment and health. Topics raised are outlined per specialty (table 1).

Table 1. Topics mentioned per specialty

Specialty	Topics mentioned
Pediatrics (General Specialty)	<ul style="list-style-type: none"> • Waste – Disposable versus cloth diapers • Environmental co-benefits of: <ul style="list-style-type: none"> - Breast milk instead of formula milk - Eating fruits and vegetables - Walking, cycling and taking public transport • Controlling unwanted pregnancies
Internal Medicine (General Specialty)	<ul style="list-style-type: none"> • ‘Individuals’ role within the community and the choices we make to be able to try to save the planet’ • How climate change might affect our diet, transportation system and access to water and food • Connections climate change, travelling and the ZIKA-virus • Reduction of red meat consumption and how this benefits both the climate as well as human health
Family Medicine (General Specialty)	<ul style="list-style-type: none"> • Food – Low nutrient dense food and link to monocultures • Waste – Recycling • Respiratory diseases and links to environment • Over usage of antibiotics and impact on environment and public health
Infectious Diseases	<ul style="list-style-type: none"> • HIV/AIDS and other infectious diseases linked to climate change
Allergy/Immunology	<ul style="list-style-type: none"> • Symptoms of asthma or allergies linked to climate change
Anesthesia	<ul style="list-style-type: none"> • <i>No topics mentioned for this specialty</i>
Obstetricians/Gynecology	<ul style="list-style-type: none"> • Environmental chemicals and pollution • Food – Safety of seafood with regard to chemicals
In general	<ul style="list-style-type: none"> • ‘Healthy environmental choices’ • Proper disposal of medication

The different topics raised can be divided in *environmental exposure to chemicals and other forms of pollution, respiratory diseases, infectious diseases, environmental friendly as well as healthy behaviors and environmental sustainable behavior.*

Environmental exposure to chemicals and other forms of pollution

Exposure to chemicals or other forms of pollution and how to avoid exposure by using preventive methods is mentioned by several physicians. One of the participants mentioned to discuss exposure to lead or mercury. Another participant mentioned exposure to chemicals in certain seafood and the

potential consequences for pregnant women. Although these topics are indirectly related to climate change, it is primarily about environmental health.

Respiratory diseases

Another topic mentioned was respiratory diseases including asthma and allergies and how this relates to air pollution and the changing climate. Two of the five physicians, including an immunologist and a pediatrician, who explicitly said they have experience with linking climate change to health did this related to respiratory diseases. The immunologist said she explains to her patients how 'the changing climate is effecting their health'. The pediatrician said she primarily talks about how air quality affects her patients' asthma or allergies, which then lead her to talk about climate change and how that is related to heat, the role of fossil fuels and the creation of ozone which is bad for the lungs.

Infectious diseases

The infectious disease specialist mentioned the possibility to link HIV/AIDS or other infectious diseases to climate change and to discuss this with travelers in particular. Also one of the internists mentioned the possibility to talk about infectious diseases, such as the ZIKA-virus, and climate change.

Environmental friendly as well as healthy behavior: the co-benefits

Five physicians mentioned the topic of food and how this is related to health as well as the environment. One of the internists mentioned the possibility to discuss the topic of red meat, which he called one of the 'low-hanging-fruits': '*If I could tell patients one thing they could do, it would be discouraging the consumption of red meat. In the same way we would encourage them to stop smoking. I have done this with my patients, there are surprising results*' (9). The other physicians mentioned the possibility to link low nutrient dense foods to monocultures existing within the agriculture system and the importance to choose for 'healthy environmental friendly food'.

Besides food there were mentioned several other topics both related to health as well as the environment. Five physicians explicitly said it is important to talk about 'co-mitigation' too, referring to talking about behavior or choices which are both healthy as well as environmental friendly. Walking, cycling and taking public transport were mentioned and linked to asthma and the benefits of exercising for health. Another participant mentioned the possibility to link the benefits of breastfeeding instead of formula feeding for the baby's' health as well as the environment, since this will reduce waste. Another topic mentioned was the importance of controlling unwanted pregnancies for the environment, especially in developed countries where people have a high ecological footprint in comparison to developing countries. However, this participant immediately followed this topic by saying this is obviously not a topic to discuss when a patient would like to become pregnant which suggests the possibilities are limited.

Environmental sustainable behavior

Besides stimulating patients to behave both environmental friendly as well as healthy, physicians also mentioned possibilities to talk about environmental sustainable behavior more in general. Three topics were mentioned, including medical waste, recycling, and use of cloth diapers versus disposable diapers. These topics relate to environmental friendly behavior and are linked to one's specific situation, but are not directly linked to one's individual health.

4.3. Personal Relevance and Actionability

Most physicians said they think discussions about climate change needs to be personal relevant, meaning patients have to be able to relate the discussion to themselves or their family. Reasons given were that patients come in with a particular health issue, patients do not expect their doctor to talk about something that is not directly related to their own health, physicians are not trained to talk about 'the greater good', it would be the easiest and it would have the most impact to make discussions personal relevant, it helps patients to understand what is going on, discussions between patients and physicians in general are pretty tailored most of the time and personal relevance is needed because there is little time during a consult. One physician considered giving personal relevant advice as challenge: *'I think that many physicians are going to wonder if their patients are going to get upset if you start talking about this area unless you're really good at making it really relevant and tying it all together'* (17).

One of the physicians said she would make an exception to discuss the use of antibiotics and the consequences for everyone's health. This is related to the answer of another participant who said she thinks it is possible to raise the issue as public health issue, meaning she would go beyond one's individuals' health. She said it is necessary to link climate change to health, personal or public health, instead of discussing climate change in general. One participant said she thought the discussion can be both general as well as personal relevant, dependent on the situation with that patient and referred to the importance of talking about being a 'good global citizen'. Another participant said she usually only discusses how the climate is impacting specific symptoms. She said she sometimes discusses climate change more generally, but patients do want to hear what is of direct relevance for their own health.

Another factor mentioned is actionability. Three participants mentioned they knew that certain environmental friendly choices, such as eating organic food or breastfeeding instead of formula feeding, were not affordable or possible for some patients. Therefore, these physicians did not recommend this to their patients:

'Also how to deal with the fact that some of the changes require money. If I recommend that people eat organic, I know that some of my patients aren't going to be able to afford that. Trying to assess that so that I'm not making the women who are poor feel guilty because they can't afford organic' (19).

The importance of actionability for patients was mentioned by five other physicians as well. According to one physician, raising awareness only could even be potentially harmful: *'I think it does make sense to raise awareness if you can give them tools and resources to address it, but I think raising awareness by itself could be viewed as potentially harmful to patients'* (6).

4.4. Advice and Specialty

According to all physicians, advice, discussions and potential materials will differ for different specialties, since patient populations and health issues differ. Five physicians said they think general specialties, including general practice, family medicine, pediatrics, general internal medicine and obstetrics/gynecology, are more appropriate than subspecialties to address climate change. One of them said:

'Environmental health is fundamentally public health. It is about prevention, largely. That is why I think some specialties are a lot further away from considering or being interested at all in prevention, by the nature ... so I think that is an issue. The majority of specialties should, at least, be interested' (5).

Another participant said specialties have to deal with very specific health issues which makes it less appropriate to link this to climate change. However, two of the four obstetricians/gynecologists mentioned that specialties such as obstetrics and gynecology and pediatrics have to deal with emotional topics, since parents are really protective of their offspring. They said these patients are probably more receptive, but the chance to create fear is also higher. Therefore, they thought that general practice would be more appropriate than specialties such as obstetrics/gynecology and pediatrics. On the contrary, one participant said it is important to address environmental issues early on, referring to the importance to address climate change already in obstetrics/gynecology instead of starting to talk about these issues in pediatrics. A few specialties in particular were mentioned as less appropriate by some physicians, including anesthesia, surgery, radiology and critical care. Another participant said it is possible to discuss climate change within every specialty, since climate change will affect all specialties:

'I think that there are different opportunities for all specialties, because climate change is going to affect all medical specialties. You know, the nephrologists with the heat-related problems, the infectious disease people with the vectors, and the pulmonary cardiology people with the air pollution issues. So it will affect all of those. So all the sub-specialties and specialties need to be aware of this' (13).

One participant said whether you can discuss climate change within a particular specialty is dependent on whether the advice will be actionable for that patient. This answer is related to another participant, who said her patients are pregnant women in the third semester, which means they already have had a potential exposure. Therefore, she said this is not a good moment to talk about climate change or environmental exposures, since the discussion will not be actionable and will only create fear or feelings of guilt. One participant said it is probably not a possibility to talk about climate change with really sick patients, which obviously is more often the case for certain subspecialties.

4.5. Ways to address climate change and health during conversations with patients

Several ways of addressing climate change and health are mentioned, related to the way of communication, timing and usage of materials or tools.

Communication

Ways of communication with regard to specific formulations or words were mentioned several times. One participant mentioned the need to communicate differently about climate change and health with patients from different cultures. Two participants explicitly said they do not use the word climate change. Two physicians said they focus on the health benefits of certain behaviors and mention the environmental benefits secondly. They said they do talk about the 'environmental co-benefits', rather than about the 'health co-benefits'. One physician said it is important to talk about environmental friendly behaviors such as walking and cycling rather than having an ongoing

discussion about climate change itself. It was also mentioned that physicians need to discuss in 'non-judgmental' and 'non-blunt' ways. One of the participants said she shows parallels between the environment and human health. She explained to one of her patients that 'her skin was suffering the same way as the land was suffering'.

Timing

One third of the physicians mentioned the possibility and the opportunity for physicians to talk about climate change when a patient addresses the issue in some way. Answers included: *'It is a good time to link to climate change when a patient says how much time he or she spend in his car'* (12). Another participant said it would be possible to reinforce specific environmental friendly ideas or behaviors, such as walking and cycling, and explicitly link this to the environmental benefits: *'When someone brings up the fact that they took public transportation to clinic, I would say "Oh, that's great. It's so good for the environment. More like reinforcing some of these ideas, so yeah, I don't know'* (4).

Two physicians said it would be hard to address the issue every time and that it is important to make the link when there is one. One of them said it would be a good idea to address the issue of climate change during the intake or first encounter, when someone's social history is being discussed. This physician mentioned the possibility to integrate questions on the form patient's have to fill in in advance, in order to trigger the patient to talk about this issue during the encounter. This is related to another physician's answer who mentioned the importance of taking someone's occupational and social history to know what kind of environmental related challenges someone face. One participant explicitly mentioned the importance of finding out what their patient's level of interest or concern is, to be able to advice accordingly and effectively.

Materials and tools

Several physicians mentioned the possibility to use take home materials, such as brochures or handouts, during the encounter. One participant explicitly said these materials are additional and do not substitute face-to-face discussions, but need to function as guidance. The need for guidance is mentioned by five other physicians as well. They mentioned the need for tools, such as checklists, computerized tools, scripts, suggested phrases or specific evidence-based resources to be able to respond appropriately to patients in a non-political way: *'Doctors want easy tools so that they can do this quickly and consistently. Whether it's like a checklist that you go on with patients or very concise brochure that you can take or computerized tool that's on a smartphone that you can give them'* (16). Besides strategies for discussing climate change and health during the encounter, there were mentioned some strategies to raise awareness outside the clinical encounter as well, including a focus group or discussing this issue with a nurse. Also the use of posters, brochures and similar materials in the clinical practice or waiting room were mentioned by four physicians as ways to raise awareness.

4.6. Challenges

Different challenges were mentioned, including lack of time and other urgent issues to discuss, complexity, the threat to patient-centeredness, personal beliefs of patients and physicians and the risk to create feelings of fear or powerlessness. The majority of these challenges are related to the condition of either the patient or the physician and will influence the possibility to have a discussion

about climate change or environmental health related issues. Therefore, these challenges are formulated as needs (figure 4).

Lack of time

Lack of time was the most frequent mentioned challenge, raised by seven physicians. The amount of time is dependent on potential other urgent issues to discuss and specialty. According to one participant there is more time to discuss certain issues in general practice, although there have to be discussed a lot of issues within primary care. Another participant said she usually only has time to talk about prevention or protection, since there is not enough time to talk about mitigation efforts as well: *'But I have to be honest with you, and this is just the reality of the clinical practice ... most of the time, I can only do adaptation, not mitigation. But at least they know that climate change is there and climate change is real'* (13).

Complexity

Besides time, complexity is mentioned as challenge by two participants. These participants mentioned the difficulty for physicians to have enough knowledge about the safety of certain products in terms of chemicals and to advise their patients accordingly. As one of the participants said there is a risk for *'regrettable substitutions'* (19), meaning it is both for physicians as well as patients difficult to know, if it is known anyway, whether alternatives are indeed better for one's health. Products might contain chemicals people do not know off. Another participant gave the example of disposable versus cloth diapers and the difficulty to know which of the two is least harmful for the environment.

Scope Physician-Patient Relationship and Patient-Centeredness

An aspect mentioned several times is whether discussing climate change and health is within the scope of the physician-patient relationship. One family physician said she did not know whether addressing this issue would fall within the scope of the relationship. Other physicians said that patients do not expect their physician to talk about this issue and physicians are not used to talk beyond someone's individuals' health or that of their family. The same family physician explicitly said it is not patient centered enough to talk about climate change during a consult. One of the internists referred to patient-centeredness, but in another way, stating:

'Patient centeredness is coming more and more into the forefront to avoid some of our paternalistic behaviors of the past. It's always been about your health and your illness needs and not about situating you as a human being in the larger health of the planet. That has not traditionally been a part of that discourse. I think that's probably a barrier to change ones thinking to say it's permissible to bring that into the conversation' (3).

One of the obstetricians said it is possible to talk about this issue as long as it is in line with the ethical principles and the personal preferences and values of that patient, referring to the importance of patient-centeredness. The importance of the specific situation of a patient was also mentioned by another participant. She said she will not recommend specific options, breastfeeding for instance, if she knows this is not a good option for that patient.

Personal Beliefs of Physicians and Patients

Also personal beliefs of patients were mentioned as challenge. Some participants mentioned that patients might see this subject as political issue, which they do not want to discuss: *'You don't know who you are educating. You don't know who will pull out a shot gun and say don't talk to me about the government conspiracy. In this country only – it's the only insane country'* (18). Patients might not believe in the science of global warming. Not only attitudes and personal beliefs of patients, but also the personal beliefs of physicians were mentioned as challenge. One of the participants mentioned that some physicians might not believe in the science of global warming:

'I'm not sure that we should assume that every physician believes in the science of global warming even though they base their practice on science, because personal beliefs get in the way of those kinds of things. We see that all the time around polarized issues' (3).

Another physician said she had to be convinced about the importance of this topic before she is willing or able to address this issue. There are many issues physicians can or are supposed to talk about with their patients, which makes it a priority issue and which is related to the personal beliefs of that specific physician and how important he or she considers this issue.

Timing and Risk of creating Fear

The potential risk of causing fear when talking about climate change came forward several times and was mentioned by two family physicians, two obstetricians, a pediatrician and an internist. Especially for receptive or vulnerable groups, such as pregnant women, the risk is considered to be higher, since there is more *'emotional heat'* around it. The risk of creating fear has a lot to do with timing and specialty. One of the obstetricians said: *'I'm doing their second trimester anatomy ultrasound and I don't feel like that's a great time to counsel patients, because they've already had their exposures and mostly what I'm going to do is freak them out'* (19).

Other Challenges

Other challenges mentioned were that there is not always enough evidence of the benefits of certain behavior or certain choices and the need for a culture change in general within clinical practices. Five of the participants mentioned climate change is seen as political issue which makes physicians have to reframe it, makes patients do not want to talk about it, or makes it impossible to talk about climate change with patients. One of them said:

'If I bring up climate change there's a good chance I could alienate the family if they believed that it's a political hoax, and therefore everything I would say would be considered non-credible. I'm not going to have the time to engage in a meaningful dialogue about what it is'. Engaging in that in a clinical encounter at best is contentious and at worst is disruptive (1).

The health system in general is mentioned two times. One of the participants said there is a focus on treatment instead of prevention, while environmental health is about public health and prevention. Another participant said productivity is measured by quantity rather than quality and the fact there is little encouragement to discuss environmental issues. Also the need for more research about how to stimulate people effectively in changing their behavior was mentioned.

4.7. Knowledge, Skills and Education

All participants mentioned the need for physicians to have at least a certain level of knowledge to be able to talk about climate change and health with their patients. The majority of physicians said physicians lack knowledge about this issue, which is illustrated by the following answer: *'I think that physicians themselves need to start to understand the connection, as is the case with most of these topics, it always seems to me like physicians are the last ones to learn about it'* (10). Answers about the level of knowledge needed varied, from the need for basic facts, to specific education.

Three participants said physicians lack knowledge about how to address the issue of climate change and health. It was mentioned that there is no formal education at this moment for physicians, although they only talk about issues they have expertise in or knowledge about. Another participant said it can even be problematic when climate change is discussed in unexperienced hands. It was also mentioned by one participant that it never occurred to her to talk about this issue. Two participants mentioned the need to provide physicians with objective and evidence based knowledge, in order to be able to talk about this issue in a politically neutral way. Besides knowledge, some participants said there is also a need for specific skills. Two participants mentioned the need for physicians to better learn how to counsel patients related to environmental health. One of them said counseling techniques used for diet and smoking can potentially be applied to environmental health. Another participant mentioned the need for physicians to learn how to make it personally relevant. One participant explicitly mentioned physicians' lack of self-efficacy and that they routinely ask for more information. Three physicians mentioned they have no idea how to talk about this issue with their patients, or they had to learn this before they were able to respond and talk about this issue appropriately.

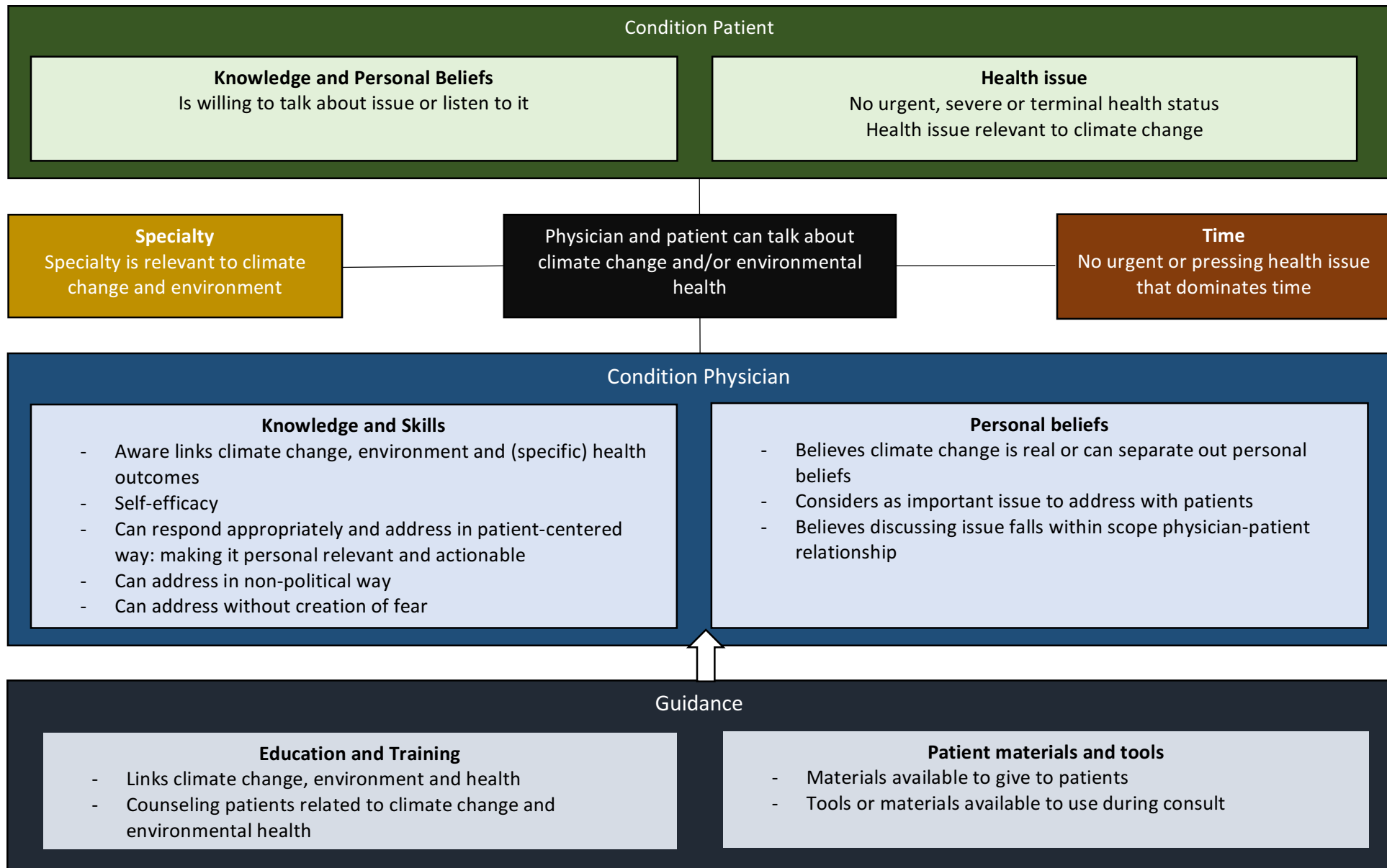


Figure 4. Needs to be able to talk about climate change and/or environmental health during the clinical encounter

5. Discussion

This study aimed to investigate the potential role of physicians in addressing the issue of climate change and health during conversations with patients and whether physicians see themselves in the position to do this. This chapter will answer the research question, and discuss the strengths and limitations of the study.

5.1. Physicians' role to address climate change

It was shown that all interviewed physicians think it is important to raise awareness about climate change and its impact on health. Some physicians considered the position of physicians as appropriate to do this, since physicians are seen as trustful sources of information and since they have a duty to inform and help patients to protect their health, which is in line with the opinion papers found in the literature. However, one third of them questioned the clinical encounter as the right place to do this or said the clinical encounter is not the right place to do this, meaning they do not see themselves in the position to raise awareness during clinical encounters. Talking about climate change and health during the clinical encounter does not seem to be without risks and there were identified several challenges, including lack of time, personal beliefs of patients and physicians about climate change, lack of knowledge and self-efficacy among physicians to talk about or address climate change, complexity of the issue and the risk to create feelings of fear or powerlessness among patients. The majority of these challenges can be linked to patient-centeredness, which is considered as important within the physician-patient interaction. The importance of patient-centeredness is in line with what has been found in the literature. However, the outcome that addressing climate change during the clinical encounter can threaten patient-centeredness and the physician-patient relationship is new. As described in the theoretical framework, a physician-patient relationship based on trust is important regarding patient's adherence to the advice given. Addressing climate change during the clinical encounter can undermine the physician-patient relationship and decrease patient satisfaction, when feelings of fear, guilt or powerlessness are created by the information given. The likelihood that patients will listen to their physician and adhere to specific recommendations will decrease in this case. In other words, addressing climate change could have adverse effects. One of the aspects of patient-centered discussions is personal relevancy. According to Myers et al. (2012), framing climate change as health problem and linking this to the specific health status of the patient makes the issue more personal relevant. Although different levels to talk about the environment or climate change were identified, the majority of physicians considered personal relevant advice to be more effective and more appropriate. Patients come in with specific health issues and do not expect to have more general discussions with their physician. However, informing patients about climate change and how this impacts their particular health status raises ethical questions. For instance, patients with asthma or allergies who are told about the impacts of climate change on their health might feel powerless, since there is nothing they can do about climate change as individual. On the other hand, patients have the right to know what their disease or health issue causes or aggravates, which means it is ethically responsible to tell patients about the impact of climate change on (their) health. Since climate change is the most serious health threat at this moment and very urgent as well, it could be argued it would be unethical not telling patients how climate change is related to their health. Linking the risk of algal blooms not only to warmer waters but also to climate change as underlying cause will help raising awareness among the general public. However, it is important to discuss possibilities for action as well, meaning the ways

in which patients can act upon the information given to them and protect themselves. One of the physicians said that patients need to know about climate change, since this is the only way they will be able to adapt to the consequences. This means raising awareness has to be supplemented with adaptation related and actionable advice. When desired, patients can be given mitigation related advice as well. Besides ethical considerations, the fact that climate change has become a politicized issue forms another factor which might threaten the physician-patient relationship and can result in disinterest or unwillingness of patients to talk about this issue. Personal beliefs of patients about climate change might undermine the relationship as well. These ethical concerns and challenges together with the fact that climate change has become politicized has several implications for the role and opportunities for physicians to talk about climate change and health during their conversations with patients. The identified possibilities for physicians are discussed below.

Timing: Patients' initiative to address climate change

One of the possibilities identified to talk about climate change and health which seems to be possible and patient centered is to only discuss this issue when patients address the issue themselves. Even physicians who questioned the clinical encounter as a right place to raise awareness or said the clinical encounter is not the right place to do this said there is an opportunity to talk about this issue when it is patient's own initiative. In this case, physicians have to be able to respond appropriately and this forms an opportunity for physicians to talk about climate change and its effects on health.

Indirectly addressing climate change: talking about the environment

Besides talking about climate change when patients address this issue themselves, it seems like there are some opportunities for physicians as well to address this issue. Almost one third of the participants said there are opportunities to talk about climate change with patients, especially for general specialists, infectious disease and respiratory diseases specialists. The link between respiratory diseases, such as asthma and allergies, and climate change seems to be an opportunity. However, half of these physicians talked about environmental changes or environmental health rather than climate change and its links to health per se, although the word climate change was explicitly used in the interview question. This suggests a majority of physicians has a broad definition of talking about climate change. However, it also suggests they do not talk about climate change specifically with their patients. To avoid political related discussions, it seems to be an opportunity to talk about climate change indirectly, meaning discussions about the environment and health. Environmental health issues, such as chemicals in the environment or in food are related to climate change, since climate change can aggravate the adverse health effects of these chemicals by transmission. Therefore, advice to consume organic products is not only of direct benefit for one's individual health, it will also help against the adverse health effects of climate change for public health. This means discussions are about the environment and some physicians even explicitly said they do not use the word climate change. Instead, they refer to 'the benefits for the environment', 'ecological responsibility' or 'being a good global citizen'. In this way, patients are stimulated to behave in environmental friendly ways, which ultimately helps mitigate climate change. The importance of formulation and usage of specific words and therefore the importance of patient centeredness also becomes clear in the suggestion of some physicians to talk about the 'environmental co-benefits' rather than the 'health co-benefits' of certain behavior, to put emphasis on health first. One of the ways to link to the environment found in the literature as well as in this

qualitative study is the opportunity to make parallels between the environment or the earth and human health to help people understand the links between the environment and our health.

However, also when physicians address environmental health related issues rather than climate change per se, advice needs to be personal relevant and actionable. Discussions about environmental health rather than climate change per se can cause fear or powerlessness as well, in case patients cannot act upon information given to them. In the literature it was found that patients who have more information will feel more empowered to take action. This study shows that information refers not only to explaining the links between a specific health issue and the environment or climate change but also to provide patients with the information about how to respond or act upon this information. Giving information without discussing possibilities for action can create feelings of fear, guilt or powerlessness, especially among vulnerable patient population groups such as pregnant women or parents.

Different roles for different specialists; general specialties well-positioned

The risk to create fear or powerlessness is linked to the different opportunities for different specialties. Almost one third of physicians explicitly said general specialists, including general practitioners or family physicians, pediatricians and internists are better positioned to discuss climate change or environmental related issues than subspecialists. General specialists are considered to be well-positioned in particular, since climate change is about prevention and public health which is in line with what has been found in the literature. Although some physicians think climate change or environmental related issues can be discussed within all specialties, a few specialties were explicitly mentioned as less appropriate or relevant, including gynecology/obstetrics, anesthesia, surgery, radiology and critical care. Gynecology/obstetrics was considered as risky to discuss environmental health or climate change related issues, since this specialty is more emotionally charged. However, this also makes that pregnant women in particular are receptive for the information given to them. Timing and way of communication, meaning advice is actionable, might help avoid feelings of fear.

Besides the opportunities mentioned for general specialties, there are opportunities to address climate change as well for respiratory disease and infectious disease specialists, since the links between climate change and respiratory diseases and between climate change and infectious diseases are relatively clear and were mentioned several times. Furthermore, these specialties are considered less emotionally charged in comparison to obstetrics/gynecology and pediatrics.

From adaptation to mitigation and environmental sustainability

As is in line with the literature, this study identified different sorts of advice and discussions, including protection or adaptation related advice and mitigation related advice. Protection or adaptation related advice included how to protect against chemicals and pollution in the environment and in food, how to adapt to a changing climate in case of allergies, asthma and other respiratory diseases and how to protect against infectious diseases such as the ZIKA-virus or HIV. Mitigation related advice mentioned included environmental friendly as well as healthy behaviors such as walking, cycling and use of public transport, reduced consumption of (red) meat, eating fruits and vegetables and breastfeeding instead of formula feeding. However, this study also revealed some possibilities to talk about environmental sustainable behavior relevant to the individual but not necessarily relevant for one's individual health status, such as proper disposal of medication and

recycling. This can be linked to the statement of Schwartz et al. (2006) about the role of physicians to stimulate behavior that will benefit humans in general rather than one individual directly. Several authors clearly stated that physicians can stimulate patients in adopting low-carbon lifestyles, since the earth is a 'global good' and all individuals need to take responsibility. Furthermore, one could argue that physicians are the guardians of health and therefore not only need to care about their own individual patients, but also about other peoples' health, nationally and internationally. Obviously, this raises the question whether this kind of advice is patient-centered and within the scope of the physician-patient relationship. However, advice that does not benefit patients' health immediately, does not necessarily mean the advice is not patient centered. When recycling and proper disposal of medication is mentioned during a conversation about medicines this can become naturally part of the conversation. In this case referring to the environment is relevant within that conversation, and is even tailored although it is not related to one's individual health status. To be able to do this and discuss these kind of topics naturally, the importance of environmental sustainability need to become part of the culture, which was indeed mentioned by one the participants.

The Need for Guidance: Education, Training and Patient Materials and Tools

Regardless of whether physicians think it is possible and appropriate to raise awareness about climate change or environmental health related issues within the clinical encounter, the need for education is mentioned by all physicians and in line with what has been found before. Since climate change has an impact on our health and since physicians need to be able to respond appropriately when patients address this issue, it is of critical importance that physicians are educated and trained about climate change and its impact on health. Without knowledge and skills physicians will not address this issue or will address this issue with the potential risk to undermine the physician-patient relationship or even harm their patients. The majority of participants said physicians currently lack knowledge or skills. Physicians not only need to be educated about the impact of climate change on health, but also about environmental health related issues and how to counsel patients about environmental related issues. Physicians who had experience mentioned they had to learn how to address environmental health related issues and how to make it personal relevant. Only when physicians have knowledge and when they feel self-efficacy to address this issue, they will be able and willing to address or respond to this issue. Not every encounter will be suitable to refer or make the link to climate change or the environment. Physicians have to make the link when there is one, meaning they have to know when there is a link. Although it is outside the scope of this paper to outline the ways in which physicians can obtain knowledge and skills, physicians mentioned the need to integrate climate change and environmental health in the health professions curriculum to educate future practitioners and to integrate it in CME to train current physicians, which also has been found in the survey of Sarfaty et al. (2014). Besides education and training, materials and tools seem to be important. Materials to give to patients and to use during the consult are desired to help both patients as well as physicians, which is also in line with earlier results of the study of Sarfaty et al. (2014) to enable physicians to have discussions about climate change and health with their patients and to increase effectivity. Besides materials to guide discussions during the clinical encounter, the use of materials such as posters, brochures and flyers in the clinical practice in general will be helpful. These materials will be appropriate for different reasons. First of all, it can trigger patients to address the issue during the clinical encounter which can start the discussion in a natural way. Secondly, it helps raising awareness among patients when there is no opportunity or

time to do this during the clinical encounter. Finally, in this way there is no risk of an undermined or disturbed physician-patient relationship.

5.2. Strengths and Limitations

A strength of the study is that almost all participants were already active in the field of climate change or environmental health and were therefore able to give rich, extended and underpinned answers about whether they think physicians are in the position to raise awareness about climate change among their patients. Besides, the list of codes and categories to analyze the data is developed by more than one researcher, enhancing the quality of data-analysis. However, a few limitations might have influenced the results of this study. Although participants had different backgrounds and specialties, relatively a lot of physicians were pediatrician, family physician or obstetrician/gynecologist. One immunologist, one infectious disease specialist and one anesthetist took part in this study, meaning it was not possible to compare interview results for these specialties. In total, seven different specialties were included. This means results cannot be generalized to other specialties. Some specialties were mentioned to be less appropriate, including radiology, surgery and critical care, while physicians from these specialties did not take part in this study and thus could not be asked for their opinion directly. Secondly, all participants were from the USA. Only six states were included, with the majority of participants coming from California. The fact that the effects of climate change will manifest in different ways depending on a complex set of factors, including region and nation, social and physical determinants, personal characteristics and degree of health care access, mean that physicians have to respond to different climate related health problems and to different groups of people. Accordingly, information or advice given to patients will vary across regions and nations. Participation by physicians from other states or other countries might have identified other challenges or opportunities. Especially the fact that climate change is a strongly politicized issue in the USA may not be true in other parts of the world. The theoretical background of this paper showed climate change is already visible in the clinical encounter and opinion papers suggested it could be part of the conversation between physician and patient. This is the first time physicians from different states and with different specialties are asked about the possibilities to raise awareness about climate change and health during conversations with patients, including what these conversations might encompass and when and how they might take place. Furthermore, this study outlines the possibilities, challenges and needs for physicians to be able to address this urgent issue and discusses the ethical considerations related.

6. Conclusion and Recommendations

This study showed there are opportunities for physicians to talk about climate change and health during a clinical encounter, especially for general specialists and respiratory and infectious disease specialists where there are clear links. Talking about climate change seems to be appropriate in particular when patients address this issue themselves. However, results of this study show there are more opportunities for physicians to link to the environment rather than to climate change per se, meaning discussions about environmental health or environmental friendly behavior or discussions without mentioning the word climate change per se. First of all, this can be explained by the fact that climate change has become politicized. Personal beliefs of patients regarding climate change are not known by physicians in most cases, which can threaten the physician-patient relationship. Secondly, linking climate change to health and especially behavior change raises ethical concerns, since people might become feeling powerless. Therefore, discussions about the environment seem to be more appropriate. However, both for discussions related to climate change as well as environmental health one of the most important challenges besides time is the ability to talk about this issue in a patient centered way. There are a few needs to be able to do this. First of all, advice has to be personal relevant, meaning related to one's individual needs and interests or that of him or her family and naturally part of the conversation. Secondly, advice has to be actionable, meaning raising awareness only is not enough, since this can make patients feel powerless, afraid or guilty.

Before physicians will be able to discuss climate change or environmental health related issues, they need to have the right knowledge and skills. Currently, no education, training or encouragement to discuss environmental health related issues exist. Physicians are supposed to talk about many issues during clinical encounters and have to be convinced of the urgency of the impacts of climate change on health first. There is an urgent need to educate and train physicians about climate change and its impact on health. However, besides climate change physicians need more knowledge about the environment and the links to health in general. In some cases, the importance of patient centeredness will interfere with the importance of the environment, since physicians have to act in the best-interest of their patients. However, lost opportunities exist since physicians either lack knowledge, skills or self-efficacy about how to talk about climate change or the environment in a way that does not undermine the physician-patient relationship or because windows of opportunities are not recognized. Climate change already has an impact on human health and physicians need to be able to respond appropriately to the changing needs and concerns of patients. Education or training also has to incorporate information about how to counsel patients related to environmental health and how to talk about climate change or the environment in a patient centered way, especially related to respiratory and infectious diseases. This includes physicians have to be able to link to the environment when this can be naturally part of the conversation, for instance proper disposal of medication which is not directly related to one's individual health status. Besides education there is a need for specific materials to be given to patients and to guide and enable physicians. This can include tools, brochures, guidelines, links to specific resources and specific examples physicians can use. In this study many so-called 'low-hanging fruits' were mentioned. Further research and identification of these 'easy to address topics' is needed for the different specialties and has to be integrated in materials tailored per specialty. These materials have to be shared and spread on a larger scale. General specialists seem to be well-positioned in particular, which will be a good starting point. Besides the opportunities to discuss this issue during the clinical encounter, there are opportunities to raise awareness outside the clinical encounter as well where there is no time limit.

Development of materials such as posters, flyers and leaflets for the general patient population which can be showed in waiting rooms for instance can trigger patients to address this issue during clinical encounters and can stimulate a broader movement and consciousness among both physicians and patients about the links between the climate, the environment and human health.

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Appendix 1. Papers Included

Obtained from databases

Author(s), year and title	Type of document	Relevance: summary or essence of document
Abelsohn, A., Rachlis, V. & Vakil, C. (2013). "Climate change Should family physicians and family medicine pay attention?"	Commentary	The health effects of climate change both within Canada and internationally, and the roles family physicians might need to consider playing in the years ahead.
Al-Lamki, L. (n.d). Physicians, Climate Change and Health.	'Message from the editor in Chief', Lamk al-Lamki	The responsibility of physicians to raise awareness about the impact of climate change.
Auerbach, P.S., Rachlis, V. and Vakil, C. (2008). Physicians and the Environment.	Commentary	Role of physicians in responding to climate change.
Blashki, G., Abelson, A., Woollard, R., et al. (2012). General Practitioners' response to global climate change – lessons from clinical experience and the clinical method.	Commentary	Particular contributions of GPs to debate and action on climate change.
Faergeman, O. (2007). Climate change and preventive medicine.	Opinion	The responsibility of physicians to contribute to the public discourse about climate change and what to do about it.
Gill, M. (2008). Why should doctors be interested in climate change?	Personal View	The role of physicians, in particular GPs, with regard to stimulating their patients to adopt environmental friendly and healthy lifestyles.
Guggenheim (2016). The health threat of climate change: working in partnership with patients.	Opinion paper	The role of physicians in addressing climate change.
McCally, M., Cassel, K. (1990). Medical Responsibility and Global Environmental Change (1990)	Opinion paper	The threat of climate change and the role of physicians.
Parker (2011). Slowing global warming: benefits for patients and	Editorial	The role of family physicians to help mitigate climate change, including stimulating their patients in adoption

the planet.		of environmental friendly and healthy lifestyles.
Sarfaty, M., Mitchell, M., Bloodhart, B. et al. (2014). A Survey of African American Physicians on the Health Effects of Climate Change.	Article	In this study a survey was conducted. 'The survey included open-ended questions that invited respondents to provide clinical anecdotes about their patients, barriers they face to discussions about climate and health with patients, and additional resources they would find useful.'
Sarfaty, M., & Abouzaid, S. (2009). The physician's response to climate change.	Essay	The role, responsibility and position of physicians to raise awareness about the impact of climate change in health among colleagues and communities.
Sarfaty, M., Bloodhart, B., Ewart, G.D. et al. (2015). American Thoracic Society members survey on climate change and health.	Article	The American Thoracic Society (ATS), in collaboration with George Mason University, surveyed a random sample of ATS members to assess their perceptions of, clinical experiences with, and preferred policy responses to climate change.
Schwartz, B.S., Parker, C., Glass, T.A., Hu, H. (2006). Global Environmental Change: What can Health Care Providers and the Environmental Health Community Do About It Now?	Commentary	We call on health care providers to inform themselves about these issues and to become agents of change in their communities. It is our responsibility as clinicians to educate patients and their communities on the connections between regressive policies, unsustainable behaviors, global environmental changes, and threats to health and security.
Sheffield, P.E., Durante, K.T., Rahona, E. and Zarcadoolas, C. (2015). Emerging Roles of Health Care Providers to Mitigate Climate Change Impacts: A Perspective from East Harlem, New York.	Article	This article presents results from a qualitative study using focus groups conducted with health care providers serving the low-income, ethnic minority population in East Harlem, New York. The focus groups sought to identify and explore providers' perceived health threats of climate change, as well as their perceived role as frontline disseminators of information and detectors of disease for their patients.

Obtained via reference lists

Reference	Type of document	Relevance: summary or essential quotes
Ballard, (2011). Climate change and health: time to adopt environmental probity?	Viewpoint	About the moral and ethical challenges that face GPs in particular.
McCoy and Hoskins (2014). The science of anthropogenic climate change: what every doctor should know.	Analysis	Why health professionals, including physicians, can and have to inform the public about climate change.
Roehr, B. (2007). Doctors should speak out on climate change, expert says.	Opinion	Shows the opinions of different experts about the duty and responsibility of doctors regarding climate change and health.
Villigran, M., Weather, M., Keefe, et al. (2010). Medical Providers as Global Warming and Climate Change Health Educators: A Health Literacy Approach.	Article	Study that used the health literacy framework and developed recommendations for physicians to educate patients about the health risks of climate change.

Appendix 2. Interview protocol – second part

Thank you for your willingness to participate in this research. This interview should take no longer than 15 minutes. We will be recording the interview and will ensure we do not share your personal information with anyone outside the research team.

Our interview today will be focusing on the potential role of physician's to address the issue of climate change and health during their conversations with patients.

Any questions? If no, let's launch into the interview.

1. Do you think it is important to raise patients' awareness about the impact of climate change on health?
2. Could you tell us a little bit about your own experience with this issue?
Do you witness health effects of climate change on your own patients? What health effects are this?
3. Have you ever addressed the issue of climate change during your conversations with patients?
 - a. If yes, why and how did you do that?
 - b. If no, why not? And are you planning to do this in the future?
4. Do you think physicians are in a position to raise their patient's awareness during consultations? Would you please elaborate on this?
 - a. If yes, could you talk about ways and moments physicians can do this?
 - i. PROBE: Does this include raising patient's awareness about the health co-benefits of 'low-carbon' lifestyles? *Health co-benefits refer to the fact that many measures to reduce greenhouse-gas emissions have ancillary health benefits. For example, reduced car use and more walking and cycling or reduced consumption of environmentally unfriendly products (which can be aspects of a low-carbon lifestyles), also benefits health.*
 - ii. Are there other ways to address the issue of climate change?
 - b. If no, why not?
 - c. Do you think this is different for different specialties?
5. Do you think physicians need specific skills to raise their patient's awareness about climate change and health and the co-benefits of mitigating climate change?
 - a. If yes, what skills are needed and do physicians have these skills?
 - b. How can physicians learn these skills?

Do you have any additional comments? If no, thank you very much for participating in this interview.

Appendix 3. Final list of codes

CODE	DESCRIPTION OR EXAMPLE QUOTES
Patient Awareness (PA)	Raising patient awareness about climate change (CC) and Health during consult
PA: Importance	Important to raise patient’s awareness Yes (1) but to some extent (2) Yes, but not enough. Important for physicians to advocate and change at higher level Patients are likely to listen to physicians
PA: Own Experience	Not directly, don’t see patients that much
PA: Communication and Timing	Communication with patients critical (how you do it to not turn them off, making sure what you suggest is doable) (3) Advise is best in context of direct health issue Timing of counseling patients critical
PA: Personal Relevance	I am all for educating patients but it has to be relevant. Yes, its tied to the personal health so more buy in. In case of antibiotics its different, would tell patients consequences regardless of personal health
PA: Facilitators	I think the medical professionals are among the most trusted bearers, particularly for health-related information. People still trust their doctors and nurses for the top sources of information
PA: Challenges	
<ul style="list-style-type: none"> PA: Challenges: Attitude and Personal beliefs physicians PA: Challenges: Attitude and Personal beliefs patients PA: Challenges: Complexity PA: Challenges: patient centeredness PA: Challenges: Scope doctor-patient relationship PA: Challenges: time PA: Challenges: Health System in General 	<p>Personal beliefs about climate change</p> <p>Personal beliefs about climate change</p> <p>Physician fear that recommending something might get patient to another unsafe thing as a substitute</p> <p>Ethical considerations (avoid fear, hopelessness)</p> <p>Physicians are not trained to talk about the greater good’ Don’t know whether this is the job of physicians</p> <p>Lack of time</p> <p>There is a focus on quantity rather than quality of care</p>
PA: Topics	Topics not falling within Co-Mitigation (CM) or Advice Prevention (AP)
Strategies (S)	Strategies used and recommended to raise patient awareness during consult
S: Specific Strategies	Easier to talk to patients who broach topic Low-hanging fruit: Get patients to change behaviors easy to change first Large scale education (e.g. through posters, brochures)
Co-mitigation (CM)	Discussing behaviors that benefit health as well as environment (both direct as indirect)

CM: Importance	Important to discuss Important, but limited opportunities
CM: Challenges	Outside scope patient-physician relation; patients don't expect their physicians to advise them on this topic Attitude patients: personal beliefs of the patient can interfere with message (e.g. patients who don't believe in science, guns) (2) Unavoidability of certain toxics
CM: Topics	Red meat consumption perfect topic Ecological responsibility and healthy environmental choice
Advice Prevention (AP)	Giving advice to prevent bad health outcomes related to CC but not necessarily to help combat climate change (adaptation related advice)
AP: Importance	Yes, considers important
AP: Topics	Helping patients with eczema during droughts Giving advice about Lyme disease and how to avoid getting Lyme Giving advice about avoiding certain fish that contains toxics (for pregnant women)
Physician Specialty (PS)	Physician specialty and how this relates to possibility to address topic CC and health
PS: Advice Varies by Specialty	Yes, varying advice by different specialties Pediatrics type counseling vs adult Affecting change by specialty (e.g. reproductive medicine)
Physician Education (PE)	Physician education Important to Counseling Patients
PE: Specific Skills or Knowledge needed	Yes, definitely Only basic facts