Communicating the Connection between Climate Change and Heat Health

Webcast Transcript

July 22, 2015

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Webcast Agenda and Meeting Logistics

Slide 1 and 2: Introduction Slides

Operator: This is Conference #65722429.

Operator: Good afternoon. My name is Caitlyn, and I will be your conference operator today. At this time, I would like to welcome everyone to the Communicating the Connections on Climate Change and Heat Health Conference Call.

All lines have been placed on mute to prevent any background noise. If you should need assistance during the call, please press star, then zero, and an operator will come back online to assist you. Thank you.

I would like now – I would now like to turn the conference over to Victoria Ludwig. Please go ahead.

Victoria Ludwig: Thank you. And welcome, everyone, to our webinar. We – I am Victoria Ludwig with the local climate and energy program here at EPA. And I also manage our heat island program.

So, today's webinar is going to last about an hour and a half. We have three great, great speakers, and they all come with various experience that relates to this topic. So, it should be a great discussion.

Before we begin, just a quick reminder that you can ask questions throughout the webinar in the box on the right. If you could, please indicate which speaker or speakers the question is directed to.

This webcast is the first of a two-part series that we are doing this summer focusing on the connections among climate change, the heat island effect and public health. As temperatures rise due to climate change, the heat island effect is exacerbated, which leads to increases in heat-related illnesses, death and other health problems.

The first webcast today is going to explore how public health and environmental professionals can effectively communicate and leverage these connections to raise awareness among the public and to promote progress on the issues of climate change, heat islands and public health.

Before we begin, we are going to go over some logistics. And I will turn it to Wendy Jaglom from ICF to explain that.

Slide 3: How to Participate Today

Wendy Jaglom: Thanks, Victoria. And hi, everybody. Thanks for joining today. Just a few quick logistics about GoToWebinar.

If you are hearing me, then you already know this, but audio is only available through a conference line. The information is on your screen. You can open and close your control – GoToWebinar control panel using that little arrow in the red box. As Victoria mentioned, you – we encourage you ask questions of the speakers throughout the webcast. You are on mute. All participants are on mute. So, please type in your questions into the GoToWebinar question pane and hit Send to submit your questions to me.

As Victoria mentioned, please indicate who – which speaker you would like to answer your question so that we can direct the question appropriately. At the end of the webcast, we'll have a question-and-answer session where I will be asking the questions that you send in throughout the webcast. So, again, we encourage you to please send in any questions you have for our speakers.

If you – if there is any technical difficulties with GoToWebinar, with the audio, please feel free to contact me, Wendy Jaglom, at wendy.jaglom@icfi.com. The address is there at the bottom of your screen.

Thanks very much.

Back to you, Victoria.

Slide 4: Webcast Agenda

Victoria Ludwig: Thanks, Wendy.

So, a quick rundown of the agenda. I'm going to speak at the beginning about some resources that we have in our program that will help with communicating. Then, after that, we have Connie Roser-Renouf from George Mason University talking about the public – what the public understands about the health impacts of climate change. Surili Patel from the American Public Health Association will speak next about how to engage your audience.

Kristin Raab from the Minnesota Department of Public Health has an on-the-ground case study of what it means to prepare for heat at the state level. And then, as Wendy mentioned, we will try to have about 15 or 20 minutes for question.

Later, in a couple of weeks, this webcast will be available on our Web site in the form of a podcast and the actual PowerPoint slides. So, check out our Web site at the URL below to find that in a couple of weeks.

So …

Wendy Jaglom: Victoria, do you want to mute …

Victoria Ludwig: Hi. I'm very sorry. There were some major feedback that came through on my phone. Very sorry about that.

Wendy Jaglom: It's ok now.

Slide 5: U.S. EPA's State and Local Climate and Energy Program

Victoria Ludwig: I'm back. I'm back. OK. That was just to raise your anticipation about my presentation.

So, as I mentioned, I'm with the state and local climate and energy program here at EPA, which is in the Office of Air and Radiation. What we do is we work with local governments to promote climate action at the state and local level and action on clean energy programs. A key function that we have is to provide resources to help local governments and state governments implement both climate mitigation and climate adaptation programs.

Our starship program is the Climate Showcase Communities program, which is 50 cities and tribes throughout the nation who have implemented local climate action projects and programs. And they serve as models for the rest of the country as to how to implement public transportation programs, energy, clean energy programs, recycling programs et cetera.

The – out of the Climate Showcase Communities, we have developed the experience of those 50 communities. We have developed several guidance documents and tools. You can see them here. The main one I'm going to talk about is the Local Climate Action Framework, which is a step-by-step guidance. It's a how-to, really, on how to plan, implement and evaluate climate change programs. We also have documents that talk about specific sectors within the climate change action realm and an inventory tool to help you measure your greenhouse gases, newsletter, and we work a lot with other federal programs. And, of course, we do webcasts.

Slide 6: EPA's Heat Island Program

Victoria Ludwig: As well, the local climate program involves the heat island program, which is similar in that it works with local governments and other stakeholders to promote mitigation of the heat island effect. We have a guide book that explains the compendium of strategies that provides case studies, implementation guidance and, also, detailed explaining of the science behind heat island – the heat island effect, what it is, how it's caused and what the impacts are.

We have a Web site where we keep track of conferences and news stories. We have a database of local programs that you can use to see what other communities around the U.S. are doing in this area. We have webcasts, the summer series being the current one, and a newsletter. So, we encourage you to go to our Web site and sign up for the Heat Island newsletter, which comes out roughly every three months.

Slide 7: Climate Change, Heat Islands, and Public Health

Victoria Ludwig: Again, we have a two-part series. And the second one – the second webcast is on August 19, coming up. And that will talk about how to make your communities more resilient to heat through infrastructure planning and design within the urban planning realm and the built environment realm. Here is the registration link. And we will put these PowerPoints up on our Web site, as I said, so that you can always double check to get that registration link later. And, so, we hope you will join us for that one.

Slide 8: What is the Heat Island Effect?

Victoria Ludwig: So, just quickly, the heat island effect is a difference in temperature between the urban areas and the surroundings areas. It's a difference in temperature at the surface and air levels. It's also – it can be different between day and night. And, actually, the – oftentimes, the difference at night is higher in terms of magnitude between the urban area and the surrounding areas. And this is one of the main reason that heat – that health is an issue because people are not able to cool down at night.

Small cities, medium cities, large cities all experience the heat island effect. Obviously, the different – the magnitude of the temperature differences depend on the climate. It depends on – it depends on the geometry of the city. There are many complex factors that dictate example how much of an effect your city will have.

Slide 9: What Causes the Heat Island to Form?

Victoria Ludwig: What causes it. It's mainly because in developing our cities, we have reduced our green areas and our vegetation areas and we have increased the amount of conventional construction materials that tend to store heat. They do – and they don't release it. They don't have a – they don't reflect the sun, and so they store the heat.

And, then, on top of that, the geometry of how many cities are designed causes the heat to, as well, not be able to escape and wind is not able to go through and help with that either. In addition to buildings, the waste heat that our air conditioning units, our cars and even people – that our industries – the waste heat that they produce contribute to the heat island effect.

Slide 10: Heat Island Impacts

Victoria Ludwig: The heat island effect has several negative impacts. It increases the need for air conditioning, which requires more electricity. And, therefore, with more electricity, you often have higher greenhouse gases coming from the fossil-fueled – fossil fuel-powered generation units. There is increased air pollution. There is more ground-level ozone formation because temperature acts as a catalyst to help that be produced. Ozone is a – is a component of smog. It increases storm water runoff and also increases the temperature of that storm water, which can be a shock to the animals and fish in our waterways.

Human health, which is the subject of this webinar, is a very key impact. Not only does it cause increase in respiratory problems, but it increases heat exhaustion, heat cramps and even heat

stroke. And as we have seen in several cities in the U.S. and Europe in the past 20 or so years, it has caused death because of the heat.

Slide 11: Heat Islands and Health

Victoria Ludwig: The other aspect of heat health is that the heat island effect will exacerbate heat waves. And heat waves are what people – what causes people to have the heat effects that I just mentioned. The – using data from CDC, the National Weather Service and NOAA, it is – it is said that extreme heat causes more death each year than these other weather-related incidences combined. So, it is a very serious problem.

Climate change models – this graph on the right is one that you can find in our EPA Climate Change Indicators Report. The models project that we will see an increase in heat waves, the frequency of them, the intensity and the duration. So, this just means that we will have an increase in heat-related health problems.

Slide 12: Working Together

Victoria Ludwig: But, we have solutions. And there are things happening around the country, as we'll hear later in the webcast. So, the things that are happening are the public health and the environmental communities, because they have several similar goals to protect human health ultimately, they have – they have worked together. They are both concerned about the impact of climate change. The public health community has been engaging heavily in climate change projects too – because they realized that it will cause a future impact on public health.

And heat health, particularly, as opposed to some of the other health-related problems caused by climate change, is a very tangible thing that we can see happening today, and it's projected to worsen. So, it's a very – it's a great opportunity for these two communities to work together to help raise awareness of heat health issues, but also to kind of leverage this connection between climate change and heat health to promote action on these two issues.

Slide 13: Local Climate Action Framework: A Step-by-Step Implementation Guide

Victoria Ludwig: As I mentioned earlier, a key resource that we have is our Climate Action Framework. You can see the different steps that are involved in it. And it's a step-by-step process, but it's not necessarily meant to be linear. But, these are key things that we have learned from other communities that have successfully implemented programs. These are key steps that they have used in order to have a successful program.

Slide 14: Reach Out and Communicate

Victoria Ludwig: The one we are going to talk about today is the reach out and communicate module or step. And this is – this is something that helps you maximize the effectiveness of your outreach. And you can do this during the planning stage, during the implementation stage of your program and also afterwards. These steps are organized around the six basic questions of why, who, what, when, where and how.

Again, they are not necessarily meant to be implemented in a linear way. Often, they are implemented simultaneously. But, communities have seen that when they do some of these or all of these, they have a much more – a much more successful program. A key thing to remember that – a recommendation that we have from this experience is that if you – if you use simple messages, you repeat them often, you get them out through multiple channels and you have messages that come from trusted sources, your audience is much more likely to take them to heart.

Slide 15: Contact Information

Victoria Ludwig: So, here is my contact information. Don't hesitate to reach out if you have further questions. This is a very short presentation. And you can also see our Web sites for the local climate and energy program and the heat island program. You can sign up for our newsletter there and find out information about all of our resources, including our webcasts.

Poll Question #1

Victoria Ludwig: So, we are going to get started with a – before we do the next speaker – question to kind of liven up the discussion and get some input from you. So, I will transfer it back to Wendy Jaglom to walk you through that question.

Wendy Jaglom: Great. And everybody should be able to see the poll question on your screen now. And the question is how has your community been addressing heat health issues?

Have you been addressing heat health issues mostly through public health measures, most through environment planning efforts, through a combination of both public health and environmental planning efforts, through collaborative public health and environmental planning efforts? Or have you not been addressing heat health issues?

So, I'll give everybody just a minute to share your answers. Please go ahead and select the one that applies to you. I'll give this a few more seconds.

All right. So, I'm going to go ahead and close the poll and share the results. It looks like the highest percentage, 29 percent, are not addressing heat health issues. Twenty-three percent are addressing heat health issues mostly through public health measures, 23 percent through a combination of both public health and environmental planning, 14 percent through environmental planning efforts and 11 – only 11 percent through collaborative public health and environmental planning efforts.

So, thank you very much for participating in the poll. And I'll hand it back to Victoria.

Victoria Ludwig: Thanks.

And thanks for your responses. I think it's not surprising that the 11 percent have been – have not been collaborating because that's one of the reasons we wanted to do this webcast. It's to show some tools and resources and case studies to help you learn how to do that and do it effectively because it is – it's not – it's not easy.

Public Understanding of the Health Impacts of Climate Change

Slide 1: Introduction Slide

Victoria Ludwig: So, to kick it off with a bit of context of how the public perceives the health impacts of climate change, we are honored to have Connie Roser-Renouf from the George Mason University Center for Climate Change Communication, which is located in Northern Virginian. Connie is an associate research professor at the center.

And her research focuses on understanding how diverse audiences use, interpret and respond to information on the issue of climate change. The objective of her work is to identify effective communication strategies that inform and engage the public while contributing to the theoretical literature on science communication, risk communication and social marketing.

So, Connie, I'll let you take it away.

Connie Roser-Renouf: Thanks, Victoria. Can you hear me OK? Do I sound all right?

Victoria Ludwig: You sound good.

Connie Roser-Renouf: Great. OK.

I'm going to talk to you today about the American public's understanding of the impacts of climate change on human health and, specifically, people's understanding of its impact on heat-related illnesses. And if I were to give this talk a subtitle, it would be, "They Don't Know Much." Americans are more inclined to think about climate change as affecting polar bears than people, particularly people in the U.S.

And I want to start this talk by reminding all of us of a basic principle of effective communication. If we focus solely on what we believe that's important for the audience to know, we are more likely to fail in our communication effort. Effective communication has to begin with the audience, with understanding the audience, their interest, their informational need, their values, what sources of information they trust.

And that kind of information, that understanding, helps us frame messages, target our audiences appropriately, choose appropriate message content and sources and provide people with information they need in a form that they are more likely to accept. I'm going to try to help you with that by talking about some audience research.

Slides 2 and 3: Global Warming's "Six Americas"

Connie Roser-Renouf: We at George Mason has been collaborating with folks at Yale on the Climate Change in the American Mind research program since 2008. We have been tracking American climate change-related beliefs, values and behaviors in bi-annual surveys, and we have

segmented the American public into six audience segments that I will talk about later. Last fall, our survey focused on Americans' understanding of the health risks associated with climate change. And it's mostly data from that survey that I will be presenting to you today.

Slides 4 and 5: Only a Small Minority of Americans Have Thought a "Great Deal" about How Global Warming Might Affect People's Health

Connie Roser-Renouf: Most Americans say they have thought about how global warming might affect people's health not much or not at all. That's 60 percent of the public. And only 10 percent say they have given it a lot of thought. And these figures are probably overestimates given people's general unwillingness to tell survey researchers that they have given no thought for the topic that the researchers obviously care a lot about.

Slides 6 and 7: A Solid Majority of Americans Thinks Global Warming is Bad for the Health of People in the U.S.

Connie Roser-Renouf: But, Americans are ready to accept information on the health effects of climate change. When asked, they are inclined to think the effects will be negative. We asked them to rate how good or bad global warming will be for people's health. And you can see here that close to two-thirds said it will be bad.

Slide 8: Nearly One in Three Americans Things Global Warming is Currently Harming the Health of People in the U.S. a "Great Deal" or "Moderate Amount"

Connie Roser-Renouf: Almost a third said they believe that the health of Americans is being harmed now by global warming, and 40 percent said Americans will be harmed over the coming decade. Seventeen percent said the health of people in their own household is being harmed, and over a quarter said it will be harmed. And on its own health, the numbers are comparable to what you see for health care in – of others in my household.

Slides 9, 10 and 11: When Asked in a Close-Ended Question Whether Climate-Related Health Conditions Will Increase or Decrease Over The Coming Decade, Large Numbers Say They Expect Increases.

Connie Roser-Renouf: We asked people in a closed-ended question. We gave them a list here of all these health threats, most of which are associated with climate change, whether they expect these health threats to increase over the coming decade or not if nothing is done to address global warning. And you can see here that between 20 and 40 percent of the respondents said all these health problems will become more common if nothing is done to address global warning. Over a third said they anticipate increases in the number of heat stroke.

But, many also said they anticipate increases in health problems that are unrelated to climate change. So, you can see almost 30 percent said flu is going to increase due to climate change. Twenty-two percent said infections with Ebola will increase. And neither of those have been linked in the literature to climate change. That's a clue that accurate knowledge is lacking.

Slides 12, 13, 14 and 15: An Open-Ended Question Reveals Much Less Public Understanding of Climate-Related Health Impacts.

Connie Roser-Renouf: A more accurate picture emerges from an open-ended people. That is, we asked people before they saw the list that you just saw on the prior slide – before they saw that, we asked them, "In your view, what health problems related to global warming are Americans experiencing, if any?" And the answers there, then, reflect what they could come up with unprompted. So, these answers represent their deeper understanding of the health threat.

Over half – that's 57 percent – either left the question blank or wrote that they didn't know. Only one in four was able to correctly name a climate-related health problem. Four percent said something heat or cold temperature impact. So, I found that very surprising given that most of the American public think of this issue as global warming rather than climate change. I would have expected that more people would understand that heat health would be impacted than what we see here.

Slides 16 and 17: Few Americans are Aware of the Groups that are More Vulnerable to Global Warming-Related Health Problems

Connie Roser-Renouf: We also ask them if some groups or types of people were more vulnerable to climate-related health problems and, if so, who these people were. Two-thirds either gave no answer or they said no one is more vulnerable than anyone else. But, I'm sure that all of you listening to this webinar today are aware that heat-related illnesses are more likely to affect some populations than others.

This low understand has implications for both personal preparedness and for willingness to support societal preparedness. People who lack understanding of the threat are less likely to protect themselves or to support government action that would help to protect them.

Slide 18

Connie Roser-Renouf: So, these are results of our regression analysis. The numbers you see are standardized regression coefficients, and they vary from zero to one, with higher numbers indicating stronger relationship between the two variables linked by – linked with arrows.

And what we see here is that knowing the health impacts of climate change and knowing the vulnerable group that is responsive to the open-ended question – that's the strongest predictor or taking appropriate action during extreme heat – staying in cool spaces and staying hydrated and things like that. Believing that global warming is harming other nations and that it's likely to harm one's own community – those are also significant predictors of the adaptive behavior.

Slide 19

Connie Roser-Renouf: Support for government action to protect people from the health impacts of climate change – that – by like elected officials like Obama, the Congress, government

agencies – that's also strongly predicted by knowledge and by perception of the severity and likelihood of harm, both here in my own community in the U.S. and in other nations.

Slide 20

Connie Roser-Renouf: And, finally, support for increasing funding to the public health agencies at the federal, state and local levels most strongly predicted by support for government agents – action that's not surprising. But, indirectly, what that means is that all four of the variables on the left increase support for funding by increasing the support for the desire for a government response. And, then, severity and probability of harm where you see the direct arrows have direct effects above their beyond their indirect effects through support.

So, the conclusion here is that knowledge matters. If we increase people's understanding of the threats that we all face, they will more likely to protect themselves and to support government actions that will protect them.

Slide 21: Global Warming's "Six Americas"

Connie Roser-Renouf: Now, let's look at health perceptions among Global Warming's "Six Americas". In 2008, the American public into six groups that share common global warming beliefs, values and behaviors, and we've been tracking those groups ever since. Generally, the groups on the left have the highest belief in global warming. They are the most concerned, the most motivated to take action.

The groups on the right have the lowest belief in global warming. The dismissive, in particular, are inclined to believe that it's a scientific hoax. And the groups in the middle are inclined to think that global warming is real, but they don't think it has any personal relevance and they don't have strong opinions on the topic one way or another.

Slide 22: Primary Differences between the Six Groups

Connie Roser-Renouf: An easy way to understand the differences among the segment is that understanding and concern decrease directly as you move from the left to the right and that personal involvement with the issue falls something like a U shape, with the middle segment and particularly the disengaged giving the issue no thought. I'll show you just a couple of figures that illustrate this pattern.

Slides 23 and 24: Global Warming Belief Certainty and Understanding of Human Causation

Connie Roser-Renouf: Virtually, all of the alarmed are certain that global warming is happening while virtually none of the dismissive are. The same pattern here for understanding that humans are causing global warming. Ninety percent of the alarmed get it. Six percent of the dismissive do.

Slide 25: Over Three-Quarters of the Alarmed Say People in the U.S. are Being Harmed Now, But Close to Ninety Percent of the Dismissive Say People Will Never Be Harmed

Connie Roser-Renouf: In terms of the harm that global warming is causing, you can see that over three-quarters of the alarmed say people in the U.S. are being harmed now by global warming. But, close to 90 percent of the dismissive say people will never be harmed.

Slides 26 and 27: Issue Involvement and Low Ability, Interest, & Trust are Barriers to Communicating about Climate Change for All Six Americas

Connie Roser-Renouf: Here is the second pattern. You can see that the middle segment say they haven't given the issue much thought. And that translates into attitudinal uncertainty, which you can see on the right, where people in those middle segments are more likely to agree, "I could easily change my mind about global warming."

What that means about the middle segment is that it's hard to get their retention. It's pretty easy to change their minds on the issue because they are so uncertain. But, it's hard to make that change stick. They forget about it because they don't think about it and aren't interested. And, then, when they come across another message on the issue, say from a climate skeptic, they are likely to change their minds again.

And that highlights the importance of message repetition. You know Victoria said at the beginning simple messages repeated often through a variety of trusted sources. And this shows you why. Those middle group need many repetitions of the message before it's going to stick with them.

Slides 28, 29 and 30: Three-Quarters of the Disengaged Say They Have Trouble Understanding News on Global Warming

Connie Roser-Renouf: Let's look at barriers to communicating on the issue more generally. There are barriers to talking to all six groups about the issue. Three-quarters of the disengaged say they have trouble understanding news about global warming. But, notice that even among the alarmed, close to quarter agree with that statement. The majority of the disengaged, doubtful and dismissive say they don't want to hear anything about it. And the majority of every single segment believe that news reporting on the issue is biased.

Slides 31 and 32: A Solid Majority of Americans Thinks Global Warming is Bad for the Health of People in the U.S., but…

Connie Roser-Renouf: Let's look specifically at health perception among the segments. Recall earlier that I showed you a slide showing that a majority of Americans think global warming is bad for the health of people in the U.S. But, it's only among the alarmed that the majority thinks the effects will be very bad. That is, they rated it negative three. You can see 75 percent of the alarmed say that it will be very bad. Half of the concerned did. And 15 percent or fewer of the other segments said it will be very bad.

Slides 33 and 34: In the Close-Ended Measures, Close To 70% of the Alarmed Said Heat Strokes Will Increase, but…In the Open-Ended Question, Less Than 10 Percent of the Alarmed Mentioned Heat-Related Illnesses

Connie Roser-Renouf: In the close-ended measures where we gave them the list of health threats and said, "Do you think this will become more or less common over the coming decades?" close to 70 percent of the alarmed said heat strokes will increase and 60 percent of the concerned. But, in the open-ended question, less than 10 percent of the alarmed mentioned heat-related illnesses. You can see there are 7 percent, 4 percent of the concerned and 1 percent of the remaining four segments.

Slide 35: Economic & Demographic Characteristics Associated with Vulnerability are Recognized by Less than a Quarter of any Segment, Including the Alarmed

Connie Roser-Renouf: On the economic and demographic characteristics associated with vulnerability, the other open-ended question, we see that less than a quarter of any segment recognize that certain groups are more vulnerable than others to the effects of climate change.

Slide 36: Accurate Understanding of Health Impacts is Highest among the Alarmed and Concerned, but so is Inaccuracy

Connie Roser-Renouf: So, while accurate understanding of health impacts is highest among the alarmed and the concerned, so is inaccuracies. So, you can see that 60 percent of the alarmed were able to accurately name a health problem associated with climate change. But, 16 percent of them also gave an inaccurate response. Lots of people continue to confuse the ozone hole with climate change and their fears about other health threats, like Ebola, for example, get linked to climate change in their minds if they are already worrying about the subject of climate change.

So, there's lots of room here for clarification and education among all the segments, including among the alarmed and concerned. And they are ones who are most likely to be receptive to this information. One of the very best things you can do is to get them to talk to their friends and family about what they know because we know from a century of research on public opinion that interpersonal communication is much more effective than mediated communication in reaching people and changing their minds. But, since you can't rely solely on interpersonal communication, let's look at sources.

Slides 37 and 38: Trust in Sources of Information on Health Problems related to Global Warming Varies Widely by Segment

Connie Roser-Renouf: Now, trust in information sources on the health problems related to global warming varied wildly by segment. We asked about over a dozen different sources. And I'm just showing you a few of them here. As you can see, the wide polarization here that climate scientists, for example, are trusted by 72 percent of the alarmed, 7 percent of the dismissive; CDC by 68 percent of the alarmed, 8 percent of the dismissive.

But, then, look at primary care doctors. They are in the middle. You see less polarization for primary care doctors than you do for any other source of – mediated source that we talked about or other than friends and family. So, while you can look at your – sorry – CDC and your local public health department to see the polarization. But, trust in a known health professional is less polarized.

What you've got there is interpersonal communication with someone who is trusted on health. And that – you know I don't have data on this. But, my thinking about this is that public health professionals at health department, when they are interacting interpersonally, are going to have comparable influence to primary care doctors. So, it puts you in a – in a pretty good position for talking to the public.

Slide 39

Connie Roser-Renouf: Now, let's talk about the actual content of a health framing of climate change. We have a couple of experiments here that I want to describe to you that show that framing climate change can be effective in reaching across the segments, even to the dismissive. These two experiments use similar methodology. Let me just describe it to you here quickly.

Slide 40

Connie Roser-Renouf: The respondents read a four-paragraph essay. And this one – the introduction frames it as a health problem – global warming is a threat to people to people's health, our health will suffer if we don't action. That's the threat statement in the second paragraph. The third goes on to talk about the benefits to people's health if we take action on climate change. And, then, the conclusion just repeats the framing of it as health.

Slide 41: Messages about Health Benefits of Climate Action were Positively Received Across Segments

Connie Roser-Renouf: The way respondents work with this essay is that they highlighted in pink the sentences that they like and in green the sentences that they didn't like. And when you look then here across the segment at the responses, their average number of positive and negative sentences, you can see that for the disengaged through the alarmed, the response to all four paragraphs was positive. For the disengaged and – I'm sorry. For the dismissive and for the doubtful, the opening paragraph and the threat paragraph evoked mostly negative responses.

But, then, when you've got the benefits – the benefits of taking action to protect people's health from climate change, they respond positively. And there, as a conclusion, they are ending up at a pretty neutral, which for the dismissive, are so hard to reach. That's really quite a promising outcome that they didn't hate it at the end.

Slide 42: Health Framing Elicited More Hopeful Feelings from Cautious, Disengaged & Dismissive

Connie Roser-Renouf: And we can contrast that with health framing in three different kinds of essays, a health essay, a national security essay and an environmental essay, that the health essay evoked hopeful responses from the cautious, disengaged and dismissive to a larger extent than either of the other kind, whereas the national security essay, which we expected to appeal to the dismissive, made them very angry. It backfired. Health worked better than national security.

Slide 43: Conclusions

Connie Roser-Renouf: So, the conclusions here – that Americans' understanding of the health impacts of climate change including the effects on heat-related illness is very shallow that even the most concerned Americans, the alarmed, show little understanding of the health effects of climate change.

People who understand the health impacts of global warming are more likely to be taking action to protect themselves during extreme heat and they are more likely to support action by elected officials and public health agencies to protect the public.

Medical professionals are well positioned to increase people's understanding of the health effects of global warming. And framing global warming as a public health issue is likely to engage segments of the public that are skeptical about climate change or disengaged from the issue.

I want to thank our collaborators at Yale and the other people at George Mason and, also, the funders who pay for these very expensive surveys that we do. Thank you.

Victoria Ludwig: Thank you, Connie. That was a really great presentation. I think, it helps to – and some fabulous. I think it really is great to have that research because it helps – I think it helps illustrate the need for collaboration even more which is – which is the point of this webcast.

It's to promote collaboration. It also shows great guidance. I think it helps us give some guidance for crafting our messages, making them simple and positive, as you mentioned – hopeful.

But, it's obvious that we all have a lot of work to do, particularly with that – those middle groups. But, knowing that the primary care doctors are a key trusted resource – I think that's really great information for especially the environment professionals who may not really think about that. And so, hopefully, since we are in heat wave season around most of the country, folks can take this information and start crafting some messages to help leverage, basically, the heat wave season. So, thanks again, Connie.

Before we go on to the next speaker, just a quick reminder to send your question in throughout in the question pane on the right and try to direct your question to a specific presenter or presenters.

Poll Question #2

Victoria Ludwig: We have another poll question before we go on to the next presenter. And, so, I'm going to read that. And, then, you'll have a chance to answer. The question is what do you see as the greatest barrier to action on climate change-related health impacts?

Is it that there is a lack of public attention or interest in the issue, there is a lack of belief in human-caused climate change, a lack of knowledge that climate change causes health problems, a lack of understanding of the likelihood or severity of those health impacts, and a lack of understanding of the vulnerability factors? Even though it might be hard to do, please just choose one. Go ahead.

OK. Great. Thanks for answering. We see some interesting results. The majority of you feel that there is a lack of knowledge that climate change causes health problems, which was reinforced, I think, by Connie's presentation. The next popular one is lack of understanding of the likelihood. That relates to the uncertainty, I think, that people have around the issue and lack of public attention. So, it gives us all some motivation for our work going forward.

Engaging your Audience

Slide 1: Introduction Slide

Victoria Ludwig: So, now, I'd like to introduce our next speaker, Surili Sutaria Patel. She is going to speak about how to engage your audience and the experience that the American Public Health Association has had in doing that. Surili is the senior program manager within environmental health at the American Public Health Association. Surili oversees the environmental health portfolio of the association, which includes climate change, transportation, working with tribal governments, healthy housing, chemical safety, building partnerships and more. She strives to bridge the gap between program and policy by representing needs and offering solutions to environmental health issues observed across the country.

Go ahead, Surili.

Surili Sutaria Patel: Great. Thank you.

Hi, everyone. I want to take a moment to thank Emma and Victoria for inviting APHA to share our perspective on engaging your audience when it comes to discussion climate change and health.

Today, I will provide an overview of APHA's longstanding work in the space of educating public health professionals, the general public and decision makers on the topic of climate change and public health. But, before I dive in further, I wanted to talk a little bit about APHA's role in climate change and public health and give you a little insight into APHA as an organization.

Slide 2: Central Challenge: Create the Healthiest Nation in One Generation

Surili Sutaria Patel: APHA is a global community of public health professionals and the collective voice for health of the public. Our central challenge is to create the healthiest nation in one generation. We were founded in April of 1872 and hold a 501(c)(3) and non-partisan status. And we are a membership organization, as many of you know.

We have over 50,000 individual and affiliate members. And because we have so many members, we have organized ourselves into sections. And one of the most active sections, I could say, is the environment section, which also has a subcommittee called the Climate Change Topic Committee.

The environment section is comprised of environmental health professionals who work in federal, state or local health and environmental agencies, academia, industry, health care professionals like nurses and so many more. And they decided to join the environment section because the networking with peers and learning the latest environmental health science, technology and findings benefits their home organization.

APHA's goal, and I could say my personal goal, is to engage a greater membership – the greater membership at APHA on the topic of climate change. For instance, extreme weather such as heat will impact other disciplines within – in public health. So, it will impact maternal and child health, infectious disease, injury prevention, epidemiology, mental health and so many more areas within the public health that's beyond environmental health.

And to put it basically, we just can't achieve the healthiest nation in one generation without talking about the imminent threat that occur like climate change and heat health across public health. So, recently, we started an intersectional Listserv to open a discussion to all of our members.

And in order to achieve this goal, we are engaging our members by talking their talk, going up to epis and saying – using terms that they are used to as opposed to the jargon environmental health specialists are used to.

And we are also sharing information in the format and using the channels they are more likely to take it in. So, if we have a section that is more tech-savvy, we will e-mail them information. If another section is very keen on Twitter, we will be sure to you know engage them via Twitter. But, more on this in a moment.

Slide 3: APHA has a Long History of Championing for Climate & Health

Surili Sutaria Patel: Before I dive in a little further on engaging your audience, I wanted to share with you why APHA believe extreme heat is an issue that we must address today. Since the early part of the last century, APHA has investigated and promoted the science behind and advocated for sound public policy to help reduce the harmful health impacts of climate change. As you can see on your screen, we have journal articles that date back to the early 1900s.

Following the best science available, APHA understands that when we burn fossil fuels like coal and gas for energy, we release heat-trapping gas such as carbon dioxide. And this gas builds up in the atmosphere and causes the earth's temperature to rise much like a blanket traps heat. And, then, the extra trapped heat disperses and disrupts many of the interconnected systems in our environment, which, in turn, creates real risks for people's health.

For example, the more heat in our atmosphere and oceans means that there is more available energy to drive the frequency and intensity of storms. These more frequent and intense storms can then lead to injury and death. Another example is longer, warmers seasons or milder winter can contribute to an increase of harmful insect population, which then can add to the spread of infectious diseases.

As the overall temperature of the atmosphere and oceans increase, global circulation patterns of wind, moisture and heat are really changing and distributing shifts in extreme weather events. Extreme summer heat is increasing in the United States, as Victoria mentioned, and the climate projections indicate that extreme heat events will be more frequent and intense in the coming decades. So, APHA is saying here it's to share this information and the science with the masses.

Slide 4: Knowing Your Audience Matters

Surili Sutaria Patel: But, how? This information is rather technical. Knowing your audience matters, especially when it comes to explaining a subject of this technicality at hand and getting it to your audience from your perspective. For starters, ask yourself how informed is your audience on the topic.

Well, a reminder of the science of the consequences of extreme heat is helpful to some. You don't want to risk telling your audience too much information they already know. It may turn them off or they may stop listening to you after a point.

On the other hand, if they don't know much at all, you may want to start from the basics. You don't want to assume people know what you think they know, especially if they are not scientists. And this could apply to different audiences like policy makers, community advocates, business leaders and more.

Another thing to consider is to ask yourself what you do you want them to do with this information. What their takeaway? Why should they care? Basically, what's the what? Is the information purely informational? Do you want them to just think about the information presented and empower them to make smart choices moving forward? Or do you want them to actually take action?

If so, identify what types of action. Do you want them to share this information with their peers and networks? Do you want them to write to their Congressperson? Or would you like them to incorporate what they have learned into their practice or work plan? If so, then give them some tools to help them accomplish your ask.

Something else to consider here is that no all audiences are equal. Some may have limitations. So, you need to tailor your ask based on their capacity. For example, most government employees think we cannot engage in advocacy activities. So, you wouldn't have to ask them to write to their representative.

So, it's often difficult – and we understand that here at APHA. It's often difficult to translate or break down scientific explanations to a level of comprehension to a non-scientific audience or a non-medical community member. To help explain such complex issues in environmental health, APHA has worked with the Frameworks Institute to develop the upstream-downstream metaphor. And we'll show you the video in just a moment.

Slide 5: What we do Upstream will Impact our Health Downstream

Surili Sutaria Patel: But, as we load it, I want to say that this video does a really great job to demonstrate what we do upstream will impact our health downstream. And climate change is really no exception to this metaphor. So, for instance, by burning fossil fuels like coal and gas for energy upstream, we release carbon dioxide into our atmosphere. And the health

consequences, basically injury and death, downstream results from the more frequent and intense heat waves and storms.

So, play the video now.

(Start of video presentation)

Female: The things that could impact our health aren't always visible right in front of us. We all live downstream from a range of environmental factors that travel down to us and end up in our communities, homes and bodies.

By ourselves, we can't control all the things that happen in upstream environments. But, there are people, highly-trained environmental health workers, who specialize in monitoring the upstream conditions that shape downstream health effects.

This behind-the-scenes team includes a wide variety of committed professionals, from research scientists who study how traffic moves in dense urban settings to community planners who pay attention to everything from sanitation to sidewalk design to local agencies that inspect houses and housing materials to make sure they are safe. When upstream solutions are put in place, such as increasing car and fuel efficiency, it affects the health of people downstream who enjoy better air quality.

And these actions can have cascading effects. For example, implementing better air quality allows more people to exercise outdoors, further improving your health and reducing the physical, social and economic cost of health problems like asthma. While we don't always see upstream environmental health professionals at work, what they do makes all of our lives better and healthier downstream.

(End of video presentation)

Surili Sutaria Patel: So, I like to share this video because it does a good job of explaining how a metaphor can help your audience get a better grasp of concepts and remember a message for a longer time.

As you see on the bottom of the screen, there is a link to a toolkit designed to help experts communicate a little better on complex environmental health issues. So, I encourage you to check it out. And, like Victoria mentioned, these slides will be available to you. You don't have to rush to copy them – copy the link down right now.

Slide 6: How APHA Engages their Audience

Surili Sutaria Patel: So, as I mentioned earlier, APHA communicates to several audiences. For us, this means we tailor our message based on whether we are talking to our members, the general public or decision makers.

Slide 7: How APHA engages their Audience

Surili Sutaria Patel: For our members, we know that they are thirsty for the latest science and breakthrough news. So, we hit them with long pieces of communique such as The Nation's Health, which is our quarterly newspaper. We also have the Inside Public Health blog that goes out monthly.

Then, at the same time, we also hit them with shorter pieces of communication through social, including Facebook, Instagram, YouTube and Twitter. And this is a way to deliver more immediate information that's cutting edge, timely and gets to them immediately.

Slide 8: How APHA engages their Audience

Surili Sutaria Patel: For the general public, we use social media and the Get Ready campaigns. And these are designed to give the general public a taste for public health information without going into the weeds as well as giving them actionable intel on how to prepare for or protect themselves against disasters.

The Get Ready campaign is a messaging campaign by APHA that helps Americans prepare themselves, their families and communities for hazards such as the pandemic flu or natural disasters like hurricane season.

Slide 9: How APHA engages their Audience

Surili Sutaria Patel: And, then, when it comes to decision makers, we use all resources that I previously described in addition to educations visits on Capitol Hill, where we often meet behind short concise materials for staff to reference when making important policy decisions that impacts public health programs or funding.

Slide 10: Shaping the National Policy Discussion

Surili Sutaria Patel: In addition to our communications channels, APHA has been influential in shaping the national policy discussion through our partnerships. We do this by leveraging our partnerships to spread the message on climate and health to broader audiences. For instance, we work with NCAnet, which supports the efforts of the U.S. Global Change Research program through stakeholder engagement and on the national climate assessment.

We also work with Momenta, an organization that empowers leaders to effectively communicate and educate their constituents on climate change issues. APHA is part of the climate for health program under Momenta which focuses on medical and public health issues related to climate change. And this is part of a bigger – a larger effort Momenta is putting forward to work across sectors, including business, state, higher education and communities.

And last but not least, we also work with the National Center for Environmental Health at CDC, which has a robust climate and health program led by Dr. George Luber. APHA supports their initiative and the BRACE program, which is the Building Resilience Against Climate Effects

framework, which is a five-step process that allows health officials to develop strategies and programs to help communities prepare for the health effects of climate change.

And by working with these various partners – and there's many more that we engage – we aim to get everyone in public health involved in the conversation. So, it's not just environment, but it's the other disciplines within public health.

We also aim to get public health to the table when debating some of the more difficult climate resiliency and adaptation conversations. We want to work across the health discipline as well – so, that includes health care and not just public health – to strengthen the public health infrastructure and capacity. And, finally, we want to empower the public to make informed decisions that impacts the climate and can improve or potentially save their health.

Slide 11: Resources and Activities

Surili Sutaria Patel: So, we have many resources to help us – to help us reach our audiences and disseminate some really good cutting-edge information, the first of which is a guide book called "Climate Change – Mastering the Public Health Role." This is a document for public health practitioners at level practicing any type of public health.

It's a six-part webinar series that was translated into a guide book. And the topics are basic climate science, health implications, climate change action planning and public health from a local perspective, climate change communication, climate adaptation and, finally, public health and climate change from a federal perspective, from EPA and APHA perspective.

Another resource we have is an infographic. And this infographic is intended to be a resource for the general public or decision makers or even public health practitioners who are addressing their constituents. And the infographic is a simplistic illustration of how climate change will threaten health and well-being of our – of our people.

And, finally, we have the Adaptation and Action Report. And this is meant for state and local health agencies to look for examples of good climate and health adaptation plans. I believe Kristin's health agency has been highlighted in it. So, you will get a taste for what is written in this Adaption and Action Report. This report highlights many ways communities have responded to the climate change challenges.

For example, San Francisco – their climate and health program heat vulnerability index. So, they're really good just in pointing neighborhood most susceptible to health effects of extreme heat. The index guides such efforts are where to designate cooling centers and helps city planners decide where more trees should be planted and offer shade and then boost cooling efforts at the same time.

Another resource which we are completing – and you will see a link at the bottom of the page – is a series of facts sheets. And these fact sheets – when complete, you can find it on our Web site. It's intended for the general public, decision makers and, again, public health practitioners who are addressing their constituents to effectively communicate the linkage between climate

change and health. The topics in these fact sheets include extreme heat, extreme precipitation, air quality, water quality and security and, finally, infectious disease.

As you can see, APHA strives to protect – to provide the latest information on climate and health using the best science available. And while there are many impacts of climate change on our health, extreme heat is happening now and happening everywhere. APHA works very with members and partners to share these useful and digestible information, resources and activities because it's a priority for us.

Slide 12: Thank You

Surili Sutaria Patel: I want to thank you again for the opportunity to speak to you all about APHA's role in climate change and engaging our audiences. Please do contact me to continue this dialogue.

Victoria Ludwig: Thank you, Surili. Very great presentation. I like your video. And, I think, the video and the infographic are especially really great ways to convey messages to the audience. We know a lot of people like to just hang out on YouTube. So, videos are a great way to get their attention. So, thank you very, very much.

Before we begin our next speaker, just a quick reminder. Send your questions in please.

Poll Question #3

Victoria Ludwig: And we're going to do a poll question again. So, if you could participate, that would be great. The question is which of the following outreach and educational materials would be most useful to you in your – in your work? Webinars, guide books, fact sheets, infographics, reports? Again, it might be hard, but please try to select just one. Thanks.

OK. Great. Thank you. Sorry. The answers – I'm sorry. I lost it. There we go.

Wendy Jaglom: I can go ahead and read it. You got it?

Victoria Ludwig: Go ahead, Wendy, please.

Wendy Jaglom: OK. So, it looks like the largest number of folks, 39 percent, said that infographics would be the most helpful. Twenty-two percent said fact sheets and, then, 17 percent guide book, 12 percent webinars and 10 percent reports. So, it looks like infographics is out in front followed by fact sheets.

Victoria Ludwig: Thanks, Wendy.

I think that's what I would want the most, too. It's infographics. So, thanks a lot of your answers.

Preparing for Heat: MN Climate & Health Program Activities

Slide 1: Introduction Slide

Victoria Ludwig: Now, we are going to hear from the state of Minnesota about the on-the-ground work that their climate and health program within the state Department of Public Health has been on the issue – on these issues and how to – how to prepare for heat. Our presenter is Kristin Raab, who is the planning director for the Minnesota Climate and Health Program at the Department of Health.

She has worked in public health for over 10 years and has presented on the health impacts of climate change at numerous local, state and national conference. She has also published articles on the topic. And in addition to her work at the state, she serves as an adjunct professor at the University of Minnesota in the Landscape Architecture Department.

Go ahead, Kristin.

Kristin Raab: Great. Thank you.

Welcome, everyone. It is a pleasure to be speaking with you today. And thank you to EPA for arranging this webinar.

Slide 2: Outline

Kristin Raab: I'm going to start my presentation with a quick description of the Minnesota Climate and Health Program and why we are interested in preparing for extreme heat events. Then, I'd like to talk about the development of several heat-related resources and our progress in disseminating and communicating about these resources.

Before launching into our program, I've been asked to speak briefly about our relationship with our state's environmental agency. I'm happy to say that in Minnesota, we are fortunate to have a strong collaborative relationship with the Minnesota Pollution Control Agency. The Pollution Control Agency leads the Interagency Climate Adaptation Team, or ICAT, which includes all of the state agencies.

MDH actively participates in ICAT and has help author ICAT's most recent report on adapting to climate change in Minnesota. The report identifies ways in which state agencies can work together to improve climate adaptation in Minnesota. Staff from the Pollution Control Agency have also served as technical experts informing some of our tools of development. And that report – the link is on your slide.

Slide 3: CDC's Climate-Ready States & Cities Initiative Grantees

Kristin Raab: So, the Minnesota Public Climate and Health Program began in 2010 when MDH received funding from the CDC through its Climate-Ready States and Cities initiative. The CDC's Climate-Ready States and Cities initiative, which includes BRACE, which Surili just mentioned, is currently funding 16 states and two cities to develop ways to adapt to the public health effects of climate change by applying climate science predicting health impacts and implementing flexible programs. I'd like to thank CDC for the funding, without which we would not have such as robust program.

Slide 4: MN Climate & Health Program

Kristin Raab: The Minnesota Climate and Health Program focuses on five main areas – education, tool and product development, research, policy analysis and providing technical assistance. We work with the Minnesota Pollution Control Agency on several of these areas.

Examples of our work related to education include development of six training modules on topics related to climate change and health, including water quality and quantity, extreme heat events, air quality, agriculture and food security, mental health and a basic climate change and public health 101. We have also developed a health and climate film available online at the Web address listed on the slide.

Developing tools has been an important service that we can provide to local public health and other agencies that are working on climate change mitigation and adaptation. We have developed the Minnesota Extreme Heat Toolkit, which I will be talking about in more detail soon, to help local public health, emergency managers and others prepare for and respond to extreme heat events.

Recently, we have released two substantive reports, the Minnesota Climate and Health Profile and the Minnesota Climate Change Vulnerability Assessment that I will describe later. We partner with universities, national, state and local agencies to research and better understand the impact of a changing climate on health.

One of our projects is working with the National Weather Service to ensure that they current thresholds for heat warnings are protective for health. We also assess and encourage policies to protect the public's health from climate change. For example, we have developed protective health strategies to include comprehensive planning processes. And we provide technical assistance to local governments and other institutions interested in planning for climate change. We have helped several counties and cities use GIS to map vulnerable populations in their communities.

Slide 5: Advancing Health Equity in Minnesota: MDH's Call

Kristin Raab: One of the fundamental goals of our program is to advance health equity. In 2014, MDH produced a report titled, "Advancing Health in Minnesota – Report to the Legislature." That has since become a cornerstone of our work. Our motto is we all do better when those that are less fortunate do better. Climate change disproportionately impacts people who are poor, people of color or people who have pre-existing diseases or illnesses.

So, it is important that we utilized our resources in a way that benefits the people who need them most.

We do this by increasing awareness of the disproportional impacts of climate change in specific populations and by mapping the resources and vulnerable populations to see where there is a mismatch to ensure that places that have more vulnerabilities have the resources to deal with the health impacts of climate change.

Slides 6, 7 and 8

Kristin Raab: So, why focus on heat in Minnesota? When people think of Minnesota, they typically of its long, hard and cold snowy winters. They don't think about it like this. Central Minnesota is warmer than Florida and Texas. But, Minnesota's climate is changing. Heat waves have considerable impact on human health and our ecosystem. In July 2012, it was so hot that hundreds of fish in Northern Minnesota died because of the hot temperature.

Slide 9: Heat and Health in MN

Kristin Raab: This is a chart from 2000 to 2012 that shows an association between the average summer temperatures in Fahrenheit in orange and the rate of emergency department visits due to heat-related illnesses in purple. The largest spikes of emergency department visits were in 2001, 2011 and 2012. In 2001, there were 1,087 visits. In 2011, there were 1,255. And in 2012, there were 1,198 visits due to heat-related illnesses. During that same time period between 2001 and 2012, there were 42 deaths due to heat.

Clearly, heat is a problem in Minnesota. We determined that one of the best ways we could help reduce this preventable heat-related illnesses and death was by developing resources and providing training.

Slide 10: Minnesota Extreme Heat Toolkit

Kristin Raab: So, in order to help local government agencies, emergency planners and public health professionals reduce heat-related morbidity and mortality, MDH developed the Minnesota Extreme Heat Toolkit. We use the communication of strategies of define the objectives and assign and understand your audience as a guide for both the development of the toolkit and our communications strategy. Our objective was not just to increase awareness of the health impacts of heat, but to increase the planning for these events as well.

The toolkit was developed by working with several partners, including doctors, emergency planners, researchers at the University of Minnesota and local public health.

We were particularly interested in having emergency planners and local public health participate in the development as they were able to help us understand these audiences and to ensure that the toolkit was useful to these audiences. We used EPA's Excessive Heat Events Guide Book from 2006 as a model.

The toolkit contains almost anything a planner needs to prepare for extreme heat events and focuses on practical implementable steps and strategies based on best practices.

The toolkit includes an introduction of extreme heat events and Minnesota's warming trend, an explanation of the health impacts from heat, a description of factors that put certain populations more at risk for heat-related illnesses, key steps for planning for and responding to heat events, instructions on how to develop a heat response plan, a list of strategies to prevent heat-related illnesses and several appendices, including a draft heat response plan, a tip sheet for staying cool and a sample media release.

Slide 11: Strategies for Preventing Morbidity and Mortality

Kristin Raab: As already mentioned, the toolkit contains a lot of strategies that can implemented to prevent heat-related illnesses and death. This is just a few of the strategies found in the toolkit. We have recognized that not all jurisdictions in Minnesota will be able to implement all the strategies.

Plans at the local level depend on local resources, constraints and vulnerable populations within the community. The toolkit provides suggested strategies that can be tailored to meet local needs.

Slide 12

Kristin Raab: This is a chart in the toolkit that shows planning for extreme heat events by two different jurisdictions in Minnesota, Omsted County and the city of Minneapolis. It shows the elements in the response plan, as well as strategies. This was important to demonstrate that the toolkit provides strategies for urban and rural areas in Minnesota, making it relevant to everyone.

Slide 13: Identification of High-Risk and Vulnerable Persons

Kristin Raab: As part of the toolkit development, MDH worked with the city of Minneapolis to develop pilot maps of vulnerable populations and environmental characteristics. The maps focused on the elderly, the elderly living alone, population in poverty, buildings with air conditioning, location of public air-conditioned spaces and impervious surfaces as a proxy for the heat island effect and more.

The map on your left shows the percentage of impervious surface over the city of Minneapolis demonstrating where the urban heat island may have the biggest effect. It also shows where cooler areas might be in bright green. The map on your right shows the percentage of residential building with air conditioning and the percent of people who live at or below the poverty line.

It is interesting to note that there is a slight association between the percent of people below the poverty and the percent of buildings with central air conditioning. The greater the percentage of poverty, the less likely it is to have central air conditioning in buildings. A limitation to this data is that we do not know which residential units are using window air conditioners.

The city of Minneapolis used the map to determine areas that may be more impacted by heat, that have higher concentrations of vulnerable populations and that lack resources to cope with extreme heat. The Minneapolis maps are included in the toolkit as an appendix.

Slide 14: Minnesota Extreme Heat Toolkit

Kristin Raab: Because the toolkit was developed for emergency planners and public health, MDH prepared a targeted market media campaign. The toolkit was released as part of the CDC Climate and Health Program webinar series in April 2012. On April 24, MDH presented the toolkit to local public health professionals, emergency planners and elected officials via statewide video conference. The video conference hosted 20 sites throughout the state with over 85 people viewing the video conference.

Additionally, when the Minnesota Extreme Heat Toolkit was released, it was featured in several articles in newspapers in Minnesota. Since its initial release in April 2012, there have been over 9,800 views of the Extreme Heat Web site and over 4,600 views of the toolkit. We also presented the toolkit at several public health conferences.

When Minnesota began its work on extreme heat, only two health departments in Minnesota had a heat response plan or an annex to their hazards plan. Now, over eight local public health jurisdictions have completed an extreme heat assessment and/or a heat response plan.

The Minnesota Extreme Heat Toolkit can be used as a basis to develop your own extreme heat toolkit. We encourage people to take whatever might be useful to their jurisdictions and edit and modify it so it reflects the needs of your communities and your assets and vulnerabilities.

Slide 15: Extreme Heat Training Module

Kristin Raab: Another resource MDH developed is the Extreme Heat Events Training Module that is available for free on our Web site. The Extreme Heat Events Module is a one-hour fully-scripted presentation intended for public health professionals and the public to increase their awareness of the intersection of climate change, extreme heat and public health.

It also provides strategies that health departments can use to protect their communities during an extreme heat event. This resource can again be tailored to meet your organization's audiences. As I mentioned earlier, we have also developed five other climate and health modules that are available online for use and modification.

Slide 16: MN Climate and Health Profile Report

Kristin Raab: Two most recent releases that more broadly describe the health impacts of climate change, including extreme heat, are the Minnesota Climate and Health Profile Report, which we call the Profile Report, and the Minnesota Climate Change Vulnerability Assessment. The Profile Report featured here provides a comprehensive assessment of both the indirect and direct health outcomes of climate change in Minnesota.

Unlike previous reports, the Profile Report uses projections, not just historical data, to describe climate change. In the past, we have avoided talking about projections. We grounded our discussion of health impacts like heat-related illnesses in historic and current trends that are difficult to argue with especially when dealing with climate skeptics.

We now have furthered our discussion of climate change by discussing projections which can be more politically risky in states that deny the existence of climate change. Obviously, like we have talked about today, you must know your audience to craft messages that are more likely to be heard and accepted.

Slide 17: Profile Release: Feb 9, 2015

Kristin Raab: We have a relationship with the Minnesota Public Radio, and we ended up delaying the release of the Profile Report to maximize our impact. Minnesota Public Radio planned a week-long special series on climate change in Minnesota in February, and they wanted to highlight the public health impacts of climate change in one specific day.

We gave them an embargoed copy of the report a few weeks in advance so they could read the report and interview before they ran their special series.

On the day of the release, there was article released on their Web site as well as a live interview on the radio. We also provided a few newspapers a copy of the embargoed document so they could prepare stories. Several other newspapers around the state and online journals picked up the story. We even had an interview on TV.

And, to my knowledge, it is rare that a public health document gets face time on TV. We also used our programs newsletters to broadcast the release. Evidence of our successful can be gleamed from the fact that we've had over 14,000 views of the report on our Web site since February of this year.

Slide 18: MN Climate Change Vulnerability Assessment

Kristin Raab: In 2014, MDH released the Minnesota Climate Change Vulnerability Assessment that describes the past occurrence of five key climate hazards – extreme heat, air pollution, vector-borne diseases, flooding and drought and vulnerable populations to those climate hazards.

MDH used GIS to display vulnerable populations by county and the occurrence of climate hazards at varying geographic scales across the state. MDH produced several composite maps overlaying the occurrence of a particular climate hazard with the corresponding vulnerable populations for extreme heat, air quality and flash floods.

Additionally, the assessment produced two final composite maps, one combining all the climate hazards and one of all the vulnerabilities. MDH used existing statewide datasets of the current population and the historic occurrence of climate hazards.

The maps do not predict future occurrence of climate hazards, nor future changes in population composition. The methodology to develop the vulnerability assessment and the data sources used are well described in the document and can be replicated in other states or at the local level.

The assessment is meant to provide a baseline information for certain climate hazards and the populations vulnerable to those hazards. Out hope is that the report will be used by state and local governments, companies, institutions and community organizations to begin important discussions about the risk of climate to their communities, how best to prepare for them, how to protect everyone including the most vulnerable to ensure a healthy state. So far, we have had over 29,000 views of the report online.

Slide 19: Taking the Show on the Road

Kristin Raab: As part of our process to help communities plan for climate change and extreme heat, we began listening sessions, travelling to the eight regions in Minnesota to share results from the Profile Report and the Vulnerability Report to learn about their priorities and what they are doing to address climate change, to learn about the barriers they are facing and to find out how we might be able to assist them to plan and prepare for climate change.

The audience for the listening sessions has been primarily related to public health and health care, including local public health directors and staff, hospital administrators, emergency managers and EMS staff.

We have also had environmental agencies such as the Department of Natural Resources join these local meetings. So far, we have visited four regions – Northeast, Northwest, Central and South Central – and talked to over 100 people. We asked participants to take a short survey after our discussion.

So, what you'll see is some of the results on your slide. Please note that these are really preliminary results, and they will most likely change as we reach out to more communities.

The first questions we asked was, "In your opinion, is climate change a threat to human health and well-being?" And, fortunately, over 90 percent said yes. If they answered yes, we asked, "Do you think that your organization should begin or continue to prioritize efforts to address climate change impacts on health and well-being?" And 82 percent said yes.

Slide 20: Is your organization/agency/company already planning for climate change?

Kristin Raab: We also asked, "Is your organization, agency or company already planning for climate change?" Less than half said yes. Of those that did say yes, the top two responses were preparing for climate change through either their hazards mitigation plan or their emergency preparedness plan.

Slide 21: What Barriers do you face planning for climate change?

Kristin Raab: Maybe, of most interest is the question we asked on what barriers do you face planning for climate change. The number one response was last of time and resources. That was described as "Do not have money or staff to work on this." The second response was lack of awareness. That was defined was "Community does not identify this was a problem." You will see that, still, 13 people responded that politics is an issue for planning for climate change.

Slide 22: Lessons Learned

Kristin Raab: We have learned several lessons from developing resources and communicating about extreme heat and climate change. First, it is extremely important to work with partners when developing resources and communication. In developing the Minnesota Extreme Heat Toolkit, we had representatives from several different disciplines participate on the review committee, as well as stakeholders that would be using the toolkit. The collaborating and the input from everyone created a much stronger document, and it was well received by its intended audience.

On the other hand, we did much of the work on the Profile Report in-house. And because it was largely based on literature and not input from practitioners, we missed an important climate hazard in Minnesota, wildfires, that we will be adding in the future.

Second, when we began talking about climate change as early as 2009, we discussed observed trends in temperature and precipitation. We did not talk about climate modeling and we certainly did not talk about what is causing climate change. We stuck to local empirical measured observations to show trends. This, in general, was pretty safe and compelling. It hasn't been until recently that we have ventured into the realm of anthropogenic climate change and discussing future climate projections.

For those of you working in an environmental agency or organization, I highly encourage you to work with your state or local public health departments on projects. As we heard earlier from Connie, leading with health when discussion extreme heat or climate change can be much more persuasive and can reach a wider political audience than leading with climate change.

Third, if you are thinking about developing resources or communications around extreme heat and/or climate change, don't reinvent the wheel. There are so many great resources already available that, sometimes, it is simply a matter of using what already exists or tailoring existing tools and resources to your communities.

Slide 23: Thank You! Questions?

Kristin Raab: The Minnesota Climate and Health Program supports a Web site where you can find all of our tools and resources developed thus far. It is listed on the slide. And there is a link on the right hand of the Web site that you can click to sign up for e-mail updates that highlight our latest releases to research and events on climate change. So, thank you very much for allowing me to share some of our information today.

Questions and Answers

Victoria Ludwig: Thank you, Kristin. I really congratulate the state of Minnesota on all the great work that you are doing. And, I think, especially the experience you have in developing different outreach tools and tracking the effectiveness of them and those listening sessions, I think those are great examples of what other states can do. And they can learn from your experience. So, thanks very much.

OK. Folks, we are coming down to the 3:30 mark. But, we want to get a few questions in, at least one for each of the three experts. So, if you can stick with us just a few minutes over 3:30, we would really appreciate it and – because we have been questions and we thank you for that.

So, I'm going to turn it over to Wendy to moderate that Q&A session.

Wendy Jaglom: Thanks, Victoria.

And thanks, everybody, for sending in your questions during the webcast. Feel free to continue to send those in. The questions that we are not able to get to during this Q&A session we'll have the speakers answer in writing, and we'll post those answers to the Web site – to the Web link that was shared earlier and is currently showing on the bottom of your screen.

So, the first question is for Connie. And the question is do you have results stratified by region of the United States? Of particular interest would be areas affected by hurricanes and regions with undeniable temperature increases such as Arizona as an example.

Connie Roser-Renouf: The short answer is no. We do have the data that we could do that. But, we haven't done that kind of an analysis. I can tell you that there is more inclination to accept the reality and danger of climate change in the Northeast and West, less in the South and in the Midwest, particularly in the South.

Wendy Jaglom: Great. Thanks, Connie.

The next question is for Surili. You mentioned a number of different outreach approaches – infographics, videos, fact sheets – that you use. Which have you found to be most effective?

Surili Sutaria Patel: That's a really great question. I think it depends on your audience. If you are talking to the general public, infographics or something that's easily digestible like a video tend to be helpful. If you are talking to policy makers, we've also found the infographics to be helpful, but also fact sheets that we can leave behind on a specific topic with an ask. And, then, for public health practitioners, I know they love their science. So, we like to give them a little bit more meat. But, not everyone has time to read everything. So, a short blog or blurb on a new report is often helpful. So, all of them – all the different avenues are helpful.

The other thing that I didn't get a chance to mention is, it's also really important to think about reaching the same audience through multiple channels – so, not just through a report or a fact sheet but you know combine it—do a report, a fact sheet and a tweet so they get the same information from different ways and it, you know, solidifies that information in their memory.

Wendy Jaglom: Great. Thanks, Surili.

And, then, the next question is for Kristin. And the question is how did you get data on air conditioner availability?

Kristin Raab: Great question. And we get this question a lot. We received that data when we went to the city's assessor office. So, apparently, in the city of Minneapolis, there are assessors that go out to look at buildings and assess them, and there is a database. And one of the things that they collect is air conditioning. So, that is how we received that information.

I don't know if every city does that. And it's, as far as I know, it's not available statewide. I think you would have to look for local sources.

Wendy Jaglom: Great. Thank you.

And we got through those three pretty quickly. So, I'm going to ask one more question. And this question is actually for all speakers. So, whoever wants to chime in, that would be great.

And the question is have any of the speakers created materials and a toolkit for pharmacists? Many medications, including psychotropic drugs, impact the body's ability to handle heat. So, I'm wondering if any of the speakers have created materials or a toolkit for pharmacists. Anybody's welcome to chime in.

Kristin Raab: Yes. This is Kristin from Minnesota. In our toolkit, we have a list of drugs that increase risk for heat-related illnesses. We have not targeted that list to pharmacists. I think that's actually a great idea. But, we did compile a list of those drugs.

Wendy Jaglom: Great. Anybody else have any thoughts on that question?

Doesn't sound like it. Victoria, do you want to wrap it up, or shall I ask another question or two?

Victoria Ludwig: I think we should wrap it up in the interest of being fair for people's time. So, thanks, Wendy. And thank you, again, to Connie, Surili and Kristin for your really great presentations. Thanks to the attendees for joining.

I'd like to remind you that we have – we have a second webcast in this theme coming up in – on August 19. And you can see the registration e-mail or list of URL there.

Again, everything, the podcast, the audio files and the presentations themselves will be available in a few weeks on our Web site. And we will try to answer the questions that we weren't – didn't have time to get to in written form on that same Web site.

So, thank you again. We hope you enjoyed our webcast. And feel free to get in touch with any of us afterwards if you want to chat further. Thanks.

Operator: This concludes today's conference call. Presenters, please hold.

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