Are We Ready?

Report 3

Preparing for the Public Health Challenges of Climate Change

TABLE OF CONTENTS

PAGE 03
Executive Summary

PAGE 04
Background

PAGE 07
Methods

PAGE 08
Trends Over Time (2008 to 2012)

PAGE 10
Results

PAGE 22
Conclusions

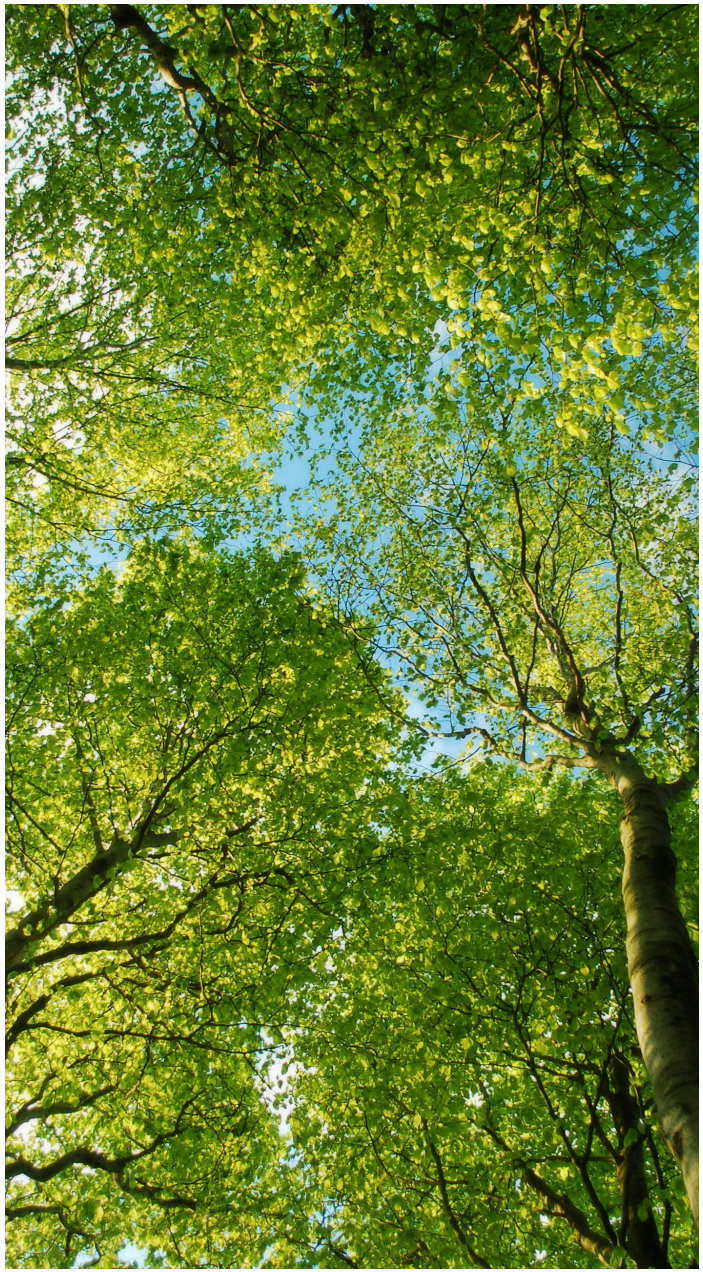
Executive Summary

The National Association of County and City Health Officials (NACCHO) surveyed a sample of local health departments (LHDs) across the country to better understand the scope and frequency of climate-related public health activities at the local level. The 2023 version of *Are We Ready?* is the third such iteration of this survey. It was last fielded in 2012, and prior to that, completed in 2008 for the first time.

As climate science over the past decade has vastly expanded our understanding of how a changing climate will affect both the environment and human health, this iteration of the survey has an updated set of questions, distinct from the ones published in 2012 and 2008. While the individual questions from the 2008, 2012, and 2023 surveys are not directly comparable over time, the central finding of all three assessments remains the same: local public health officials across the country do not feel ready to confront either the present or predicted health effects of climate change.

Lack of funding emerges as one of the key barriers to building a climate-ready public health system. Ninety percent of LHDs reported no full-time staff dedicated to climate change. Without funding, and in the absence of trained and dedicated staff, LHDs cannot fully address the health challenges their communities face as temperatures around the country continue to climb, bringing with them an increased risk of floods, wildfires, hurricanes, and other dangerous weather events.

The findings in this report suggest an urgent need to invest in a climate-ready public health system, one that is fully equipped to keep communities safe, informed, and healthy under the rapidly changing environmental conditions of the 21st century.



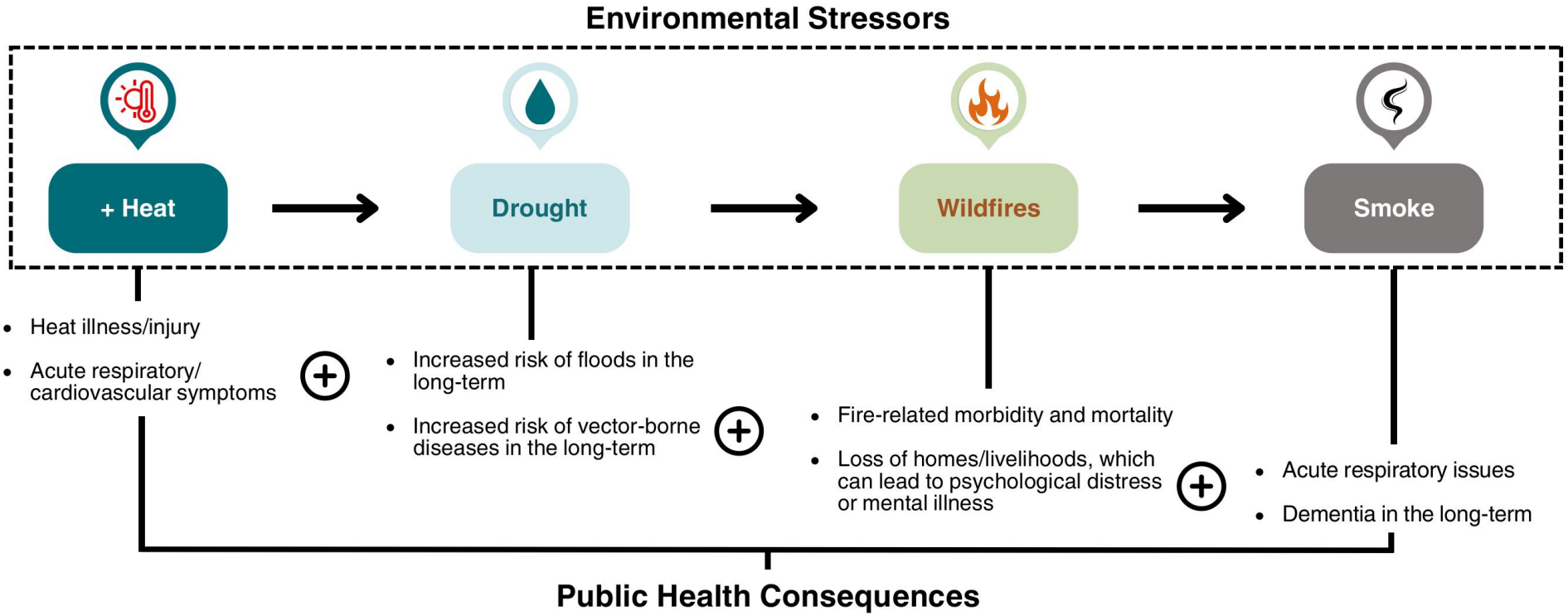
Background

In the context of public health, climate change can be understood as a disruptive and sustained deviation from long-term weather patterns, primarily driven by human activity, including changes in land use and the extraction and burning of fossil fuels on a mass scale (IPCC, 2023). These human activities have led to a build-up of greenhouse gases, including carbon dioxide, that trap excess heat within the earth's atmosphere (IPCC, 2021). There are numerous downstream consequences from this excess heat, many of which present a risk to human health.

Excess heat raises the planet's average temperature, the most direct effect of which is hotter weather as well as longer periods of hot weather overall (NASEM, 2016), both of which can increase the risk of heat-related injury or death (Sarofim, et al., 2016). Excess heat can also lead to more droughts, as hotter air leads to increased water evaporation, which in turn can increase the risk of other disasters, such as wildfires (NASEM, 2016). In addition to the direct risk of fire-related morbidity and mortality, wildfires also present indirect risks as wildfire smoke can travel much further than the initial site of the blaze and the smoke contains hazardous particles that can increase the risk of illness and injury with both short-term and long-term exposures (EPA, 2023; Zhang et al., 2023).

Higher average air temperatures can also result in more intense storms when it does rain, as hotter air holds more moisture (NOAA, 2020). Increased instability in the natural environment also presents indirect risks to human health. For example, periods of drought followed by intense rainfall can lead to an increased risk of both flooding and vector-borne diseases such as West Nile virus disease (Shaman et al, 2005). Furthermore, climate-related risks to human health, livelihoods, food security, and safe water supplies are projected to increase with each degree of increased global warming (IPCC, 2023).

Figure 1. The environmental consequences of climate change can have multiple and sometimes compounding effects on human health.



While a complete understanding of climate change and its full effect on human health is still developing, some key findings have emerged. Climate patterns can be understood to affect human health through three primary pathways: 1. environmental conditions, 2. social infrastructure, and 3. public health capability and adaptation. LHDs primarily work to prevent adverse outcomes through the second and third pathways.

Public health infrastructure, which can be understood as a subset of social infrastructure, is made up of the systems and resources that LHDs need in order to deliver essential services. Examples of such infrastructure include up-to-date data and information systems that can be used to perform disease surveillance, and resources such as workforce development opportunities and stable annual funding. (HHS, 2024; NACCHO, 2022a)

Changes to public health infrastructure can help mitigate the direct effects of climate change, such as heat-related illness or injury, as well as the indirect effects of climate change, including an increased risk of exposure to air pollution and vector-borne diseases (NACCHO, 2022b) as a result of warmer weather. In addition, strong public health infrastructure can help mitigate the consequences of economic and social disruptions that may occur as a result of climate change, including an increased risk of mental illness or psychological distress. (IPCC, 2014; NACCHO, 2022c)

Public health capability includes core LHD activities such as clinical services and primary care, environmental health services, and health education and community outreach (IPCC, 2014), while adaptation includes the changes LHDs make to their programs and services in order to meet the evolving needs of their communities as a warming environment presents new and more serious risks to human health.

Other NACCHO surveys provide some information about the scope of activities LHDs may conduct within each of these prevention pathways. For example, the *2022 National Profile of Local Health Departments* indicated that most LHDs already support disease surveillance efforts for their community, as well as outreach and education activities, and clinical services including primary prevention services. Most LHDs reported conducting environmental health surveillance specifically and most also reported that they employ environmental health workers. All these findings suggest that the capacity to conduct disease prevention and environmental health activities already exists within most LHDs. (NACCHO, 2024)

Methods

The 2023 *Are We Ready?* survey was conducted through Qualtrics© survey software. It included 14 total items. The assessment was sent to a nationally representative sample of 1,009 LHDs. The random sample was stratified by population size served and selected from NACCHO's database of 2,512 LHDs serving 49 states and the District of Columbia. Rhode Island is not represented in the study population because that state's health agency operates on behalf of local public health without sub-state units. The updated 2023 survey instrument was piloted among a subset of NACCHO members with expertise in climate and health programs. The survey was fielded for eight weeks between June and August of 2023.

After the survey was initially distributed via Qualtrics©, routine follow-up emails were sent, and NACCHO staff directly followed up with as many LHDs as possible via phone and email. A total of 302 LHDs responded, accounting for a 30% response rate. In comparison, the 2012 and 2008 surveys had a 50% and 61% response rate, respectively. The sampling design has been continually updated to reflect emerging best practices and changing characteristics of NACCHO membership.

Statistics were computed using post-stratification survey weights to adjust for oversampling and non-responses. National estimates were generated using these survey weights based on size of population served. Some detail may be lost in the figures due to rounding.

Trends Over Time (2008 to 2012)

Results from the 2008 and 2012 *Are We Ready?* surveys showed that most LHD directors thought climate change was already occurring and would continue to occur in their jurisdiction (NACCHO, 2008; NACCHO, 2012). A majority also reported they believed that climate change would lead to more serious public health problems in their jurisdiction in the future. In addition, directors were less likely to report not knowing about experiences and impacts of climate change in their jurisdiction in 2012 than in 2008, suggesting an increase in awareness about climate change as a public health issue over time.

However, directors were also less likely to believe that preparing to deal with the public health effects of climate change was an important priority for their LHD in 2012 than in 2008. Notably, the proportion of LHD directors who strongly disagreed with this statement substantially increased from 2008 to 2012. When reviewing data on the attitudes of the general public over this same time period, LHD directors' priorities match the overall trends observed. Over the same time period, Gallup polls showed a decrease in concerns over climate change among the general public (Gallup, 2021; Brookings, 2019).

Respondents also indicated limited capacity to prepare for the public health impacts of climate change. In both 2008 and 2012, more than three out of four directors believed their LHDs lacked the expertise to assess the potential impacts of climate change on their jurisdictions or to create effective plans to protect residents from those impacts. In addition, in 2012, 87% of directors believed their LHD did not have the resources to effectively protect their residents from the public health impacts of climate change.

The two prior iterations of this survey focused primarily on the attitudes of LHD directors toward climate change and climate-related public health activities, as well as the perceived attitudes of partner agencies toward such activities. The 2023 version explores the scope of climate-related public health activities that may now be occurring within LHDs, in addition to exploring the knowledge and perceived knowledge about climate-related public health activities among both LHD staff and their partners. While an 11-year time lapse between the last survey and the most recent one makes direct comparisons over time a challenge, general trends over time are noted throughout the report.

Results

This survey had a 30% response rate, with 302 responses received out of 1,009 total recipients. The majority of LHDs that responded served small populations of less than 50,000, which is characteristic of NACCHO's overall membership where most of the more than 3,300 LHDs across the country serve small populations.

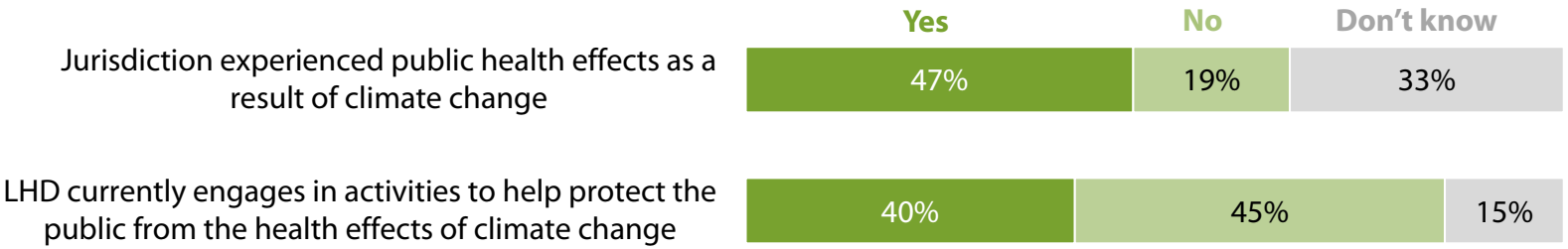
LHDs from the Midwest census region were slightly more likely to respond to the survey than LHDs from the Northeast or West census regions and much more likely to respond than LHDs from the South census region. LHDs with local governance structures were more likely to respond than LHDs with either shared or state governance structures. These population characteristics do not appear to indicate any significant trends but are noted for the purposes of understanding the overall characteristics of the sample and observing any potential sources of response bias.

Q1. In the past ten (10) years, our jurisdiction has experienced public health effects as a result of climate change.

Q2. Our local health department currently engages in activities to help protect the public from the health effects of climate change.

Figure 2. Experiences and Activities Related to the Public Health Effects of Climate Change

Percent of LHDs *(n=300)*

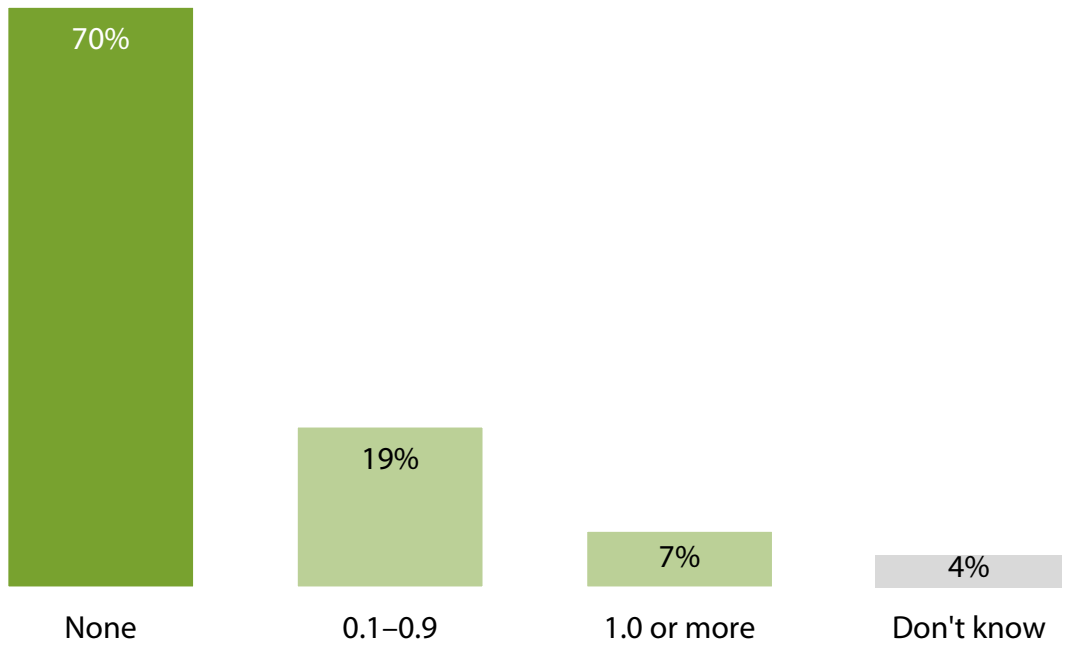


Approximately half of LHDs reported that their jurisdiction experienced public health effects as a result of climate change over the past decade. However, only two out of five LHDs reported that they engage in activities to protect the public from these effects. The proportion of LHDs that reported no current activities to help protect the public from the health effects of climate change was slightly larger than the proportion that reported they are currently engaged in these activities.

Q3. Full-time equivalent staff dedicated to climate programming

Figure 3. Number of Full-time Equivalent (FTE) Staff Dedicated to Climate Programming

Percent of LHDs *(n=297)*



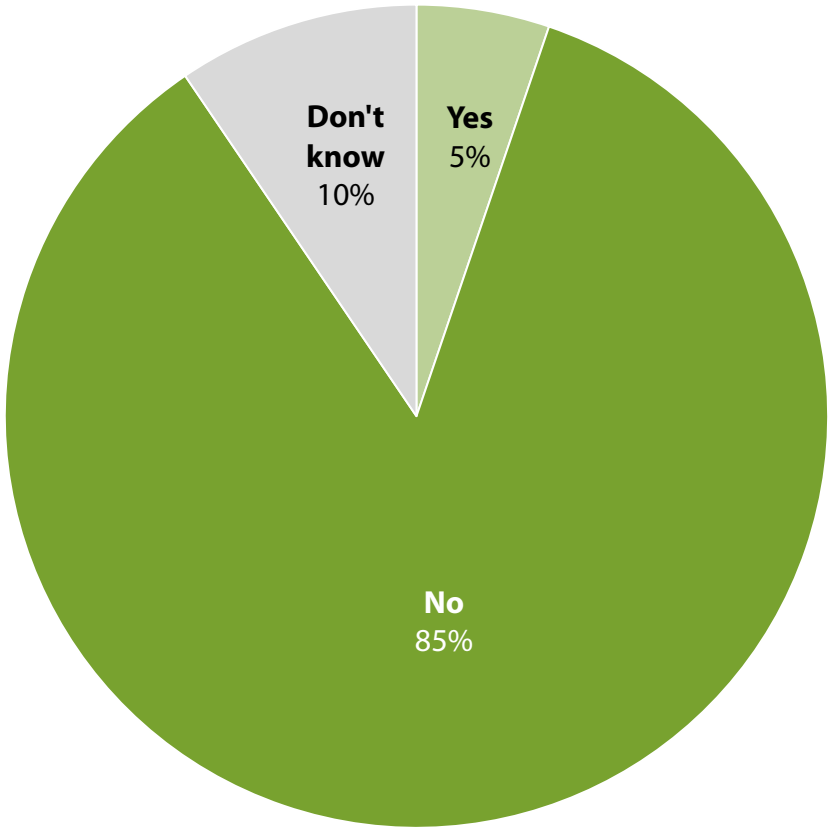
Most LHDs indicated they do not have any staff dedicated to climate programming, while 7% reported having at least one FTE.

Encouragingly, however, about 20% of LHDs reported part-time staff dedicated to climate programming.

Q4. Does your program have dedicated funding to address the health effects of climate change?

Figure 4. Availability of Dedicated Funding to Address the Health Effects of Climate Change

Percent of LHDs *(n=295)*



The vast majority of LHDs did not have dedicated funding to address the public health effects of climate change. Among the five percent of LHDs that did report having dedicated funding, most served medium or large jurisdictions.

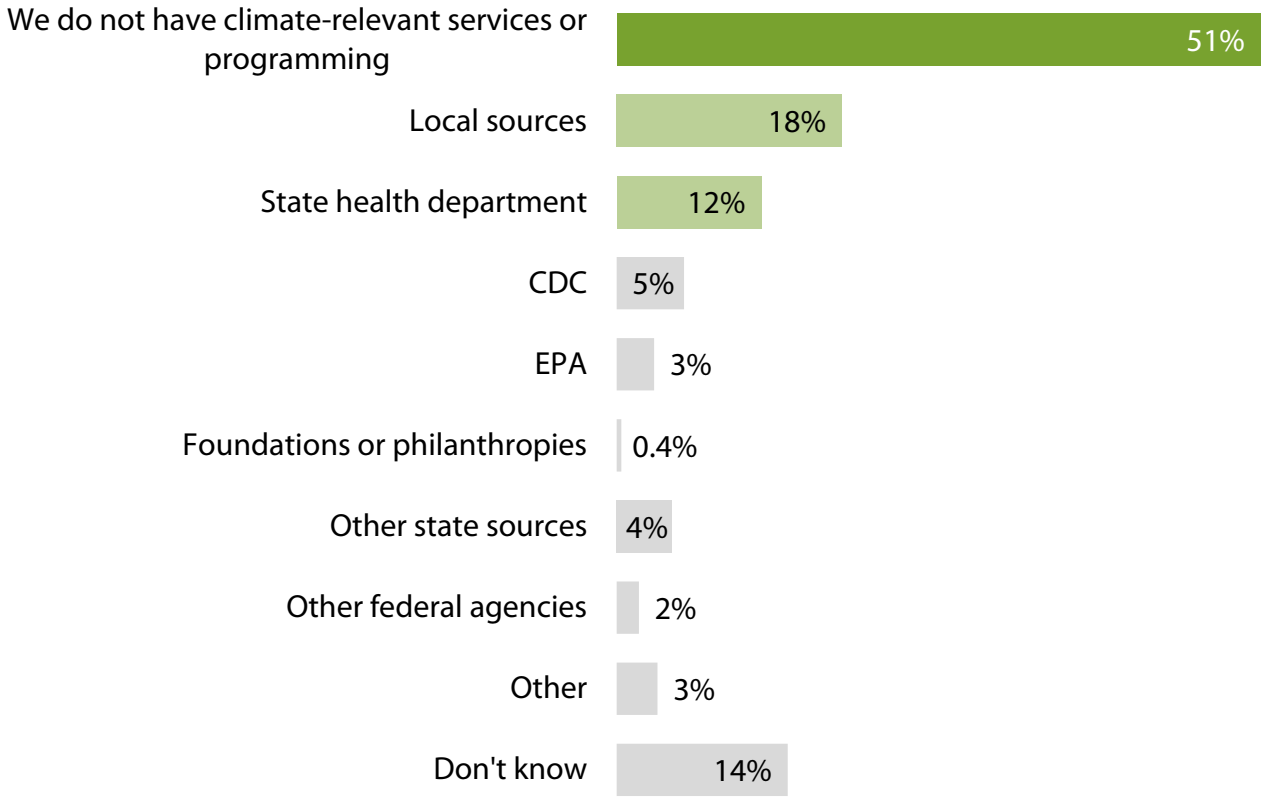
LHDs located in the West census region were more likely to report having dedicated funding than LHDs in other regions. Notably, no LHDs in the Northeast census region that responded to this survey reported having dedicated funding.[1]

[1]It should be noted that this does not necessarily indicate that no programs in the Northeast region have dedicated funding.

Q5. What sources fund your current climate-relevant services and programming?

Figure 5. Funding Sources for Climate-relevant Services and Programming

Percent of LHDs *(n=302)*



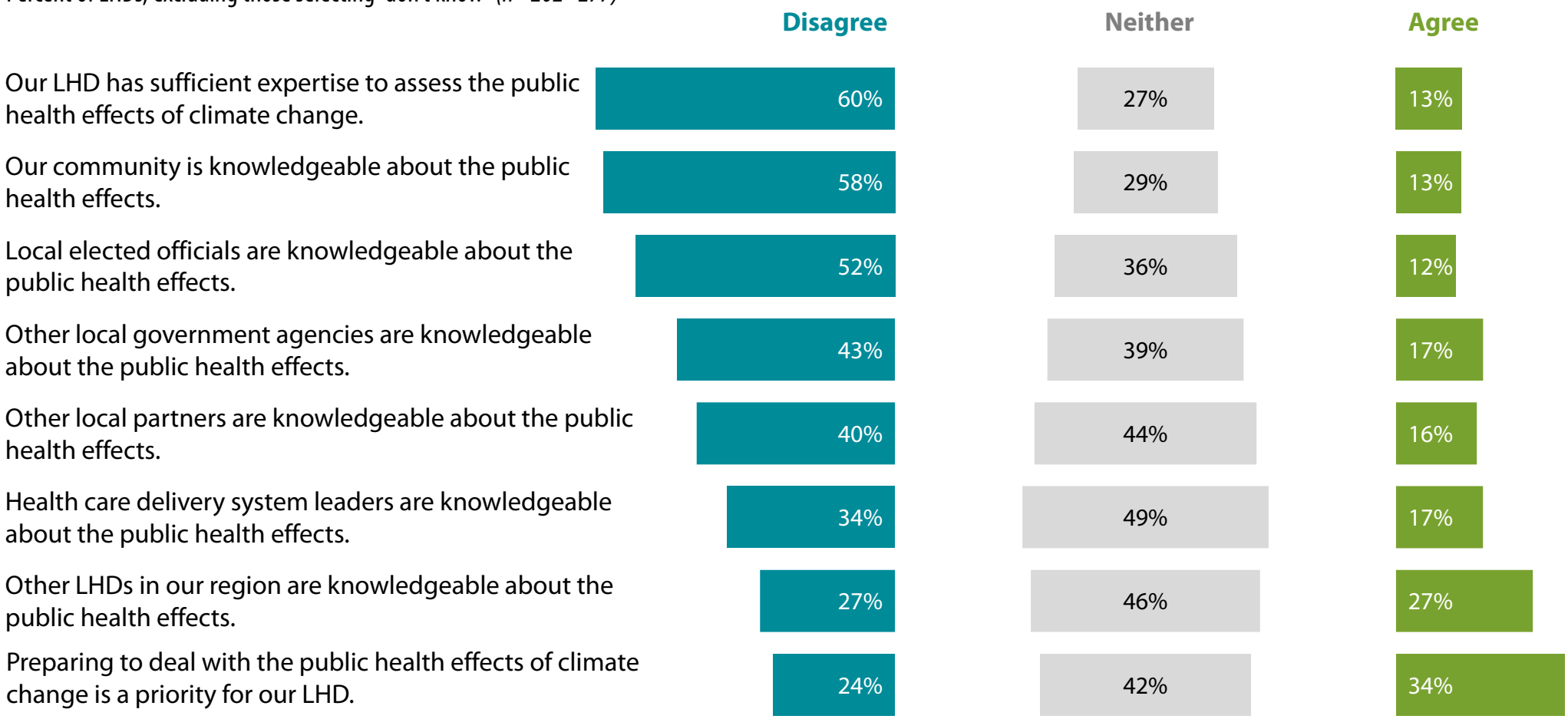
While approximately half of LHDs did not have climate-relevant services or programming, the most common sources of funding among the ones that did were local government and the state health department.

Among LHDs that reported federal funding, CDC was the most common funding source.

Q6. Perceived knowledge about the health effects of climate change

Figure 6. Agreement with statements about addressing the public health effects of climate change

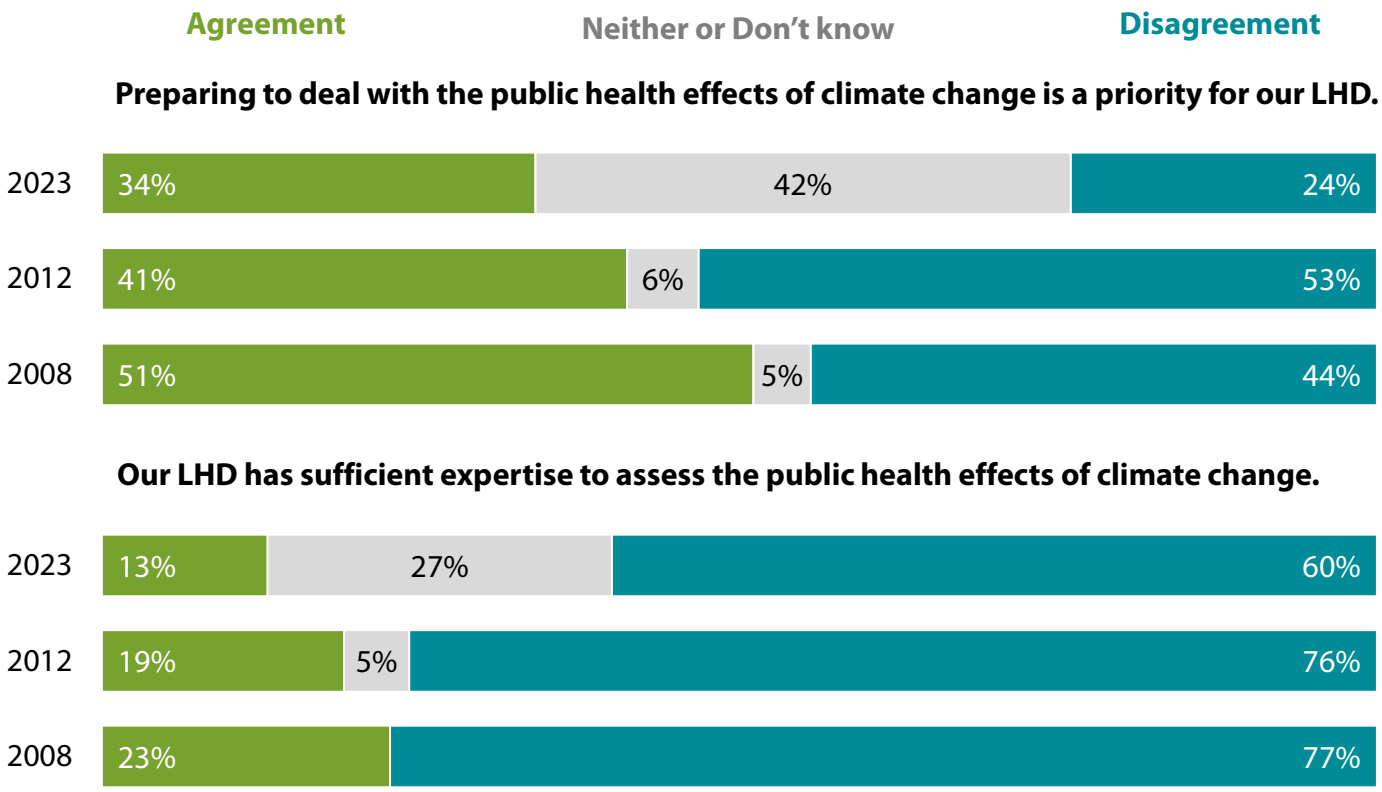
Percent of LHDs, excluding those selecting "don't know" *(n=202–277)*



Most LHDs reported their agency did not have the necessary expertise to assess the public health risks of climate change in their jurisdictions. More than half also did not believe their communities or local elected officials were knowledgeable about those risks.

Figure 7. Agreement with statements about addressing the public health effects of climate change, over time

Percent of respondents *(n,2023=272–277; n,2012=158; n,2008=133)*



Agreement is inclusive of respondents selecting "agree" in 2023 and "somewhat agree" or "strongly agree" in 2008 and 2012. Disagreement is inclusive of respondents selecting "disagree" in 2023 and "somewhat disagree" or "strongly disagree" in 2008 and 2012. No neutral option was provided in 2008 or 2012. Estimates in 2023 exclude LHDs selecting "don't know," while these are included in 2008 and 2012 estimates.

While the responses for some of these items have been adjusted over time, the general results can be compared between 2008, 2012, and 2023.

From 2008 to 2023, the proportion of LHDs that agreed their agency has the expertise needed to assess the potential public health effects of climate change, or that preparing to deal with the public health effects of climate change was a priority for their LHD, has steadily and notably declined.

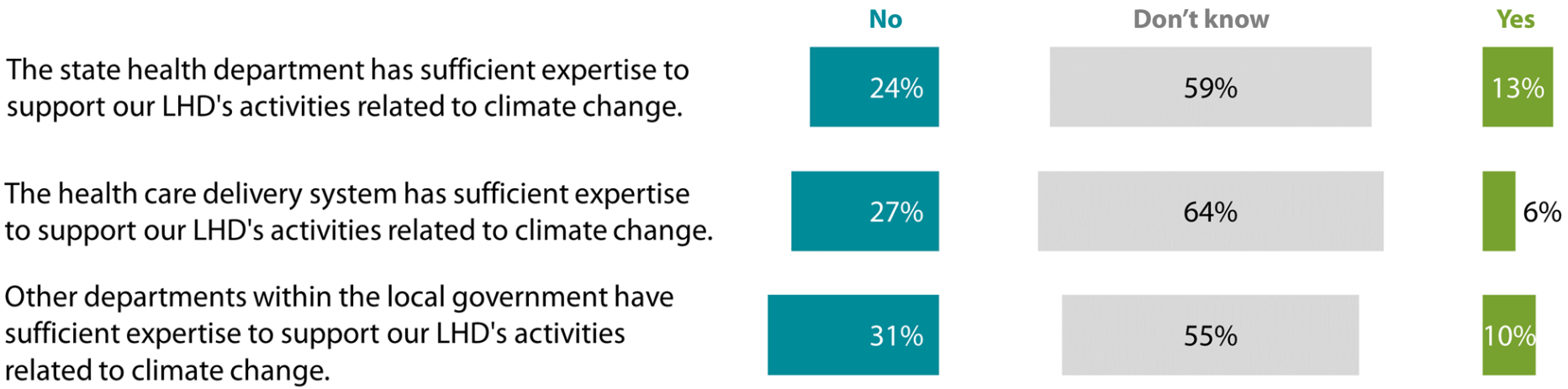
Q7. Do you agree with the following statement? The state health department currently has sufficient expertise to support our local health department's activities related to climate change.

Q8. Do you agree with the following statement? The health care delivery system in our jurisdiction, including the hospitals and medical groups, currently has sufficient expertise to support our local health department's activities related to climate change.

Q9. Other departments within the local government currently have sufficient expertise to support our local health department's activities related to climate change.

Figure 8. Perceived partner expertise to support LHD climate change activities

Percent of LHDs; proportion of LHDs selecting "N/A" not displayed *(n=289–291)*

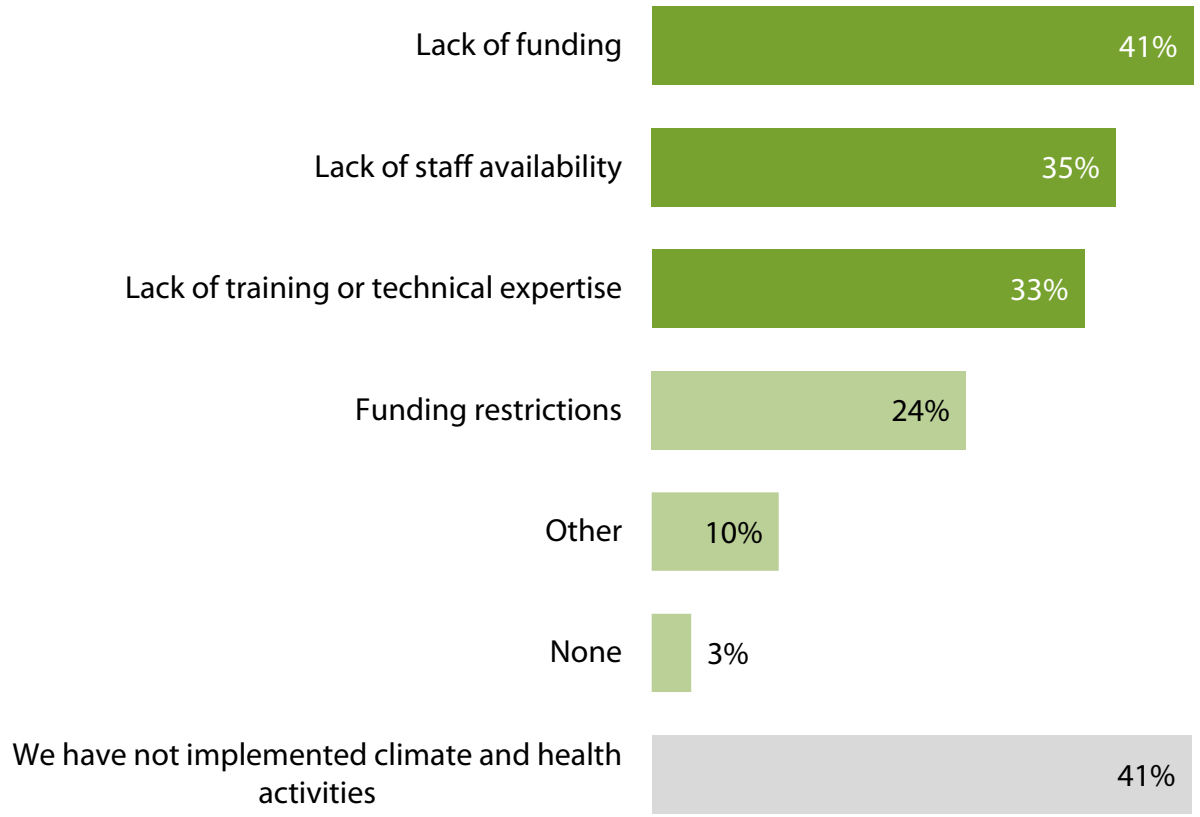


Most LHDs were unsure if their state health department, the health care delivery system, or other local government agencies had sufficient expertise to support their activities related to climate change. However, LHDs serving large jurisdictions were at least twice as likely to believe these entities did have the expertise compared to LHDs serving small jurisdictions.

Q10. What barriers, if any, has your department experienced while implementing or trying to implement climate and health activities? (Select all that apply.)

Figure 9. Barriers to implementing climate and health activities

Percent of LHDs *(n=286)*



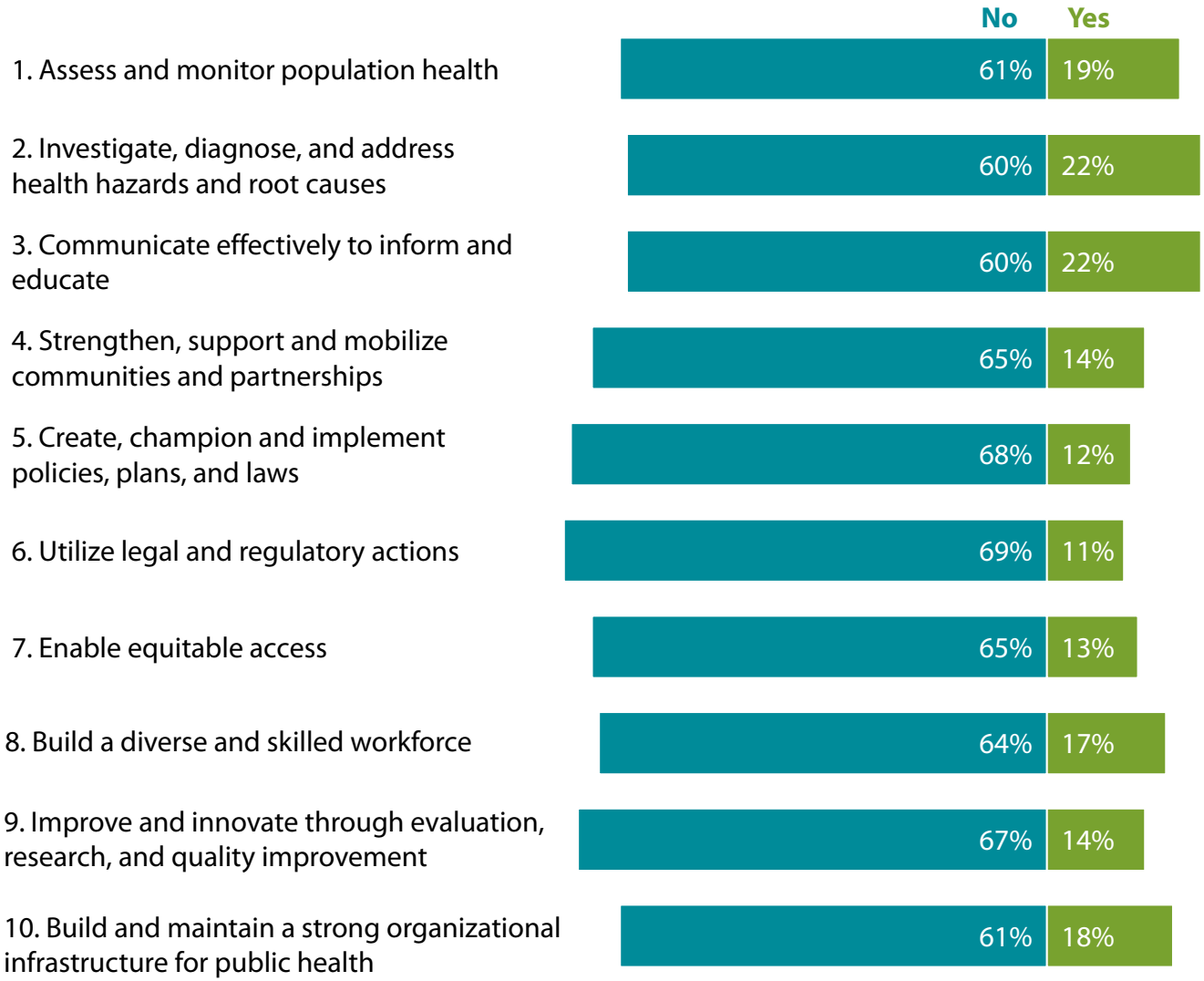
Among LHDs that have tried to implement climate related programs, the most common implementation barriers reported were related to funding, including lack of sufficient funding or restrictions on existing funding.

LHDs serving small jurisdictions were almost twice as likely to report having never implemented climate and health activities as compared to LHDs serving large jurisdictions.

Q11. In the past 10 years, has your department integrated knowledge or activities related to climate change into delivery of the 10 Essential Public Health Services?

Figure 10. Integration of climate change into delivery of the 10 Essential Public Health Services

Percent of LHDs; proportion of LHDs selecting "don't know" not displayed *(n=280–284)*

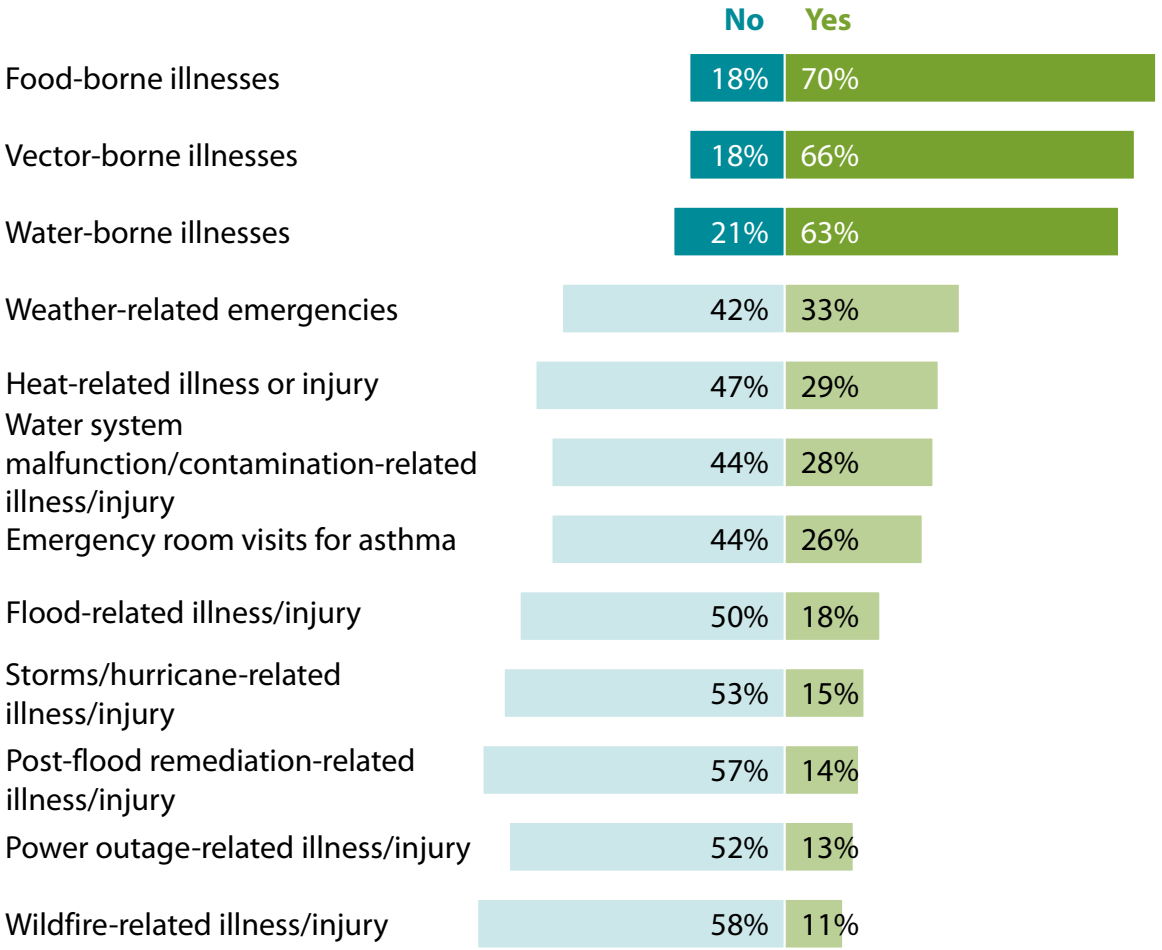


Most LHDs reported that knowledge or activities related to climate change had not been integrated into their delivery of the 10 Essential Public Health Services.

Q12. Does your department have sufficient data to monitor 10-year trends for these indicators?

Figure 11. Availability of sufficient data to monitor 10-year trends for climate change indicators

Percent of LHDs; proportion of LHDs selecting "don't know" not displayed *(n=279–281)*

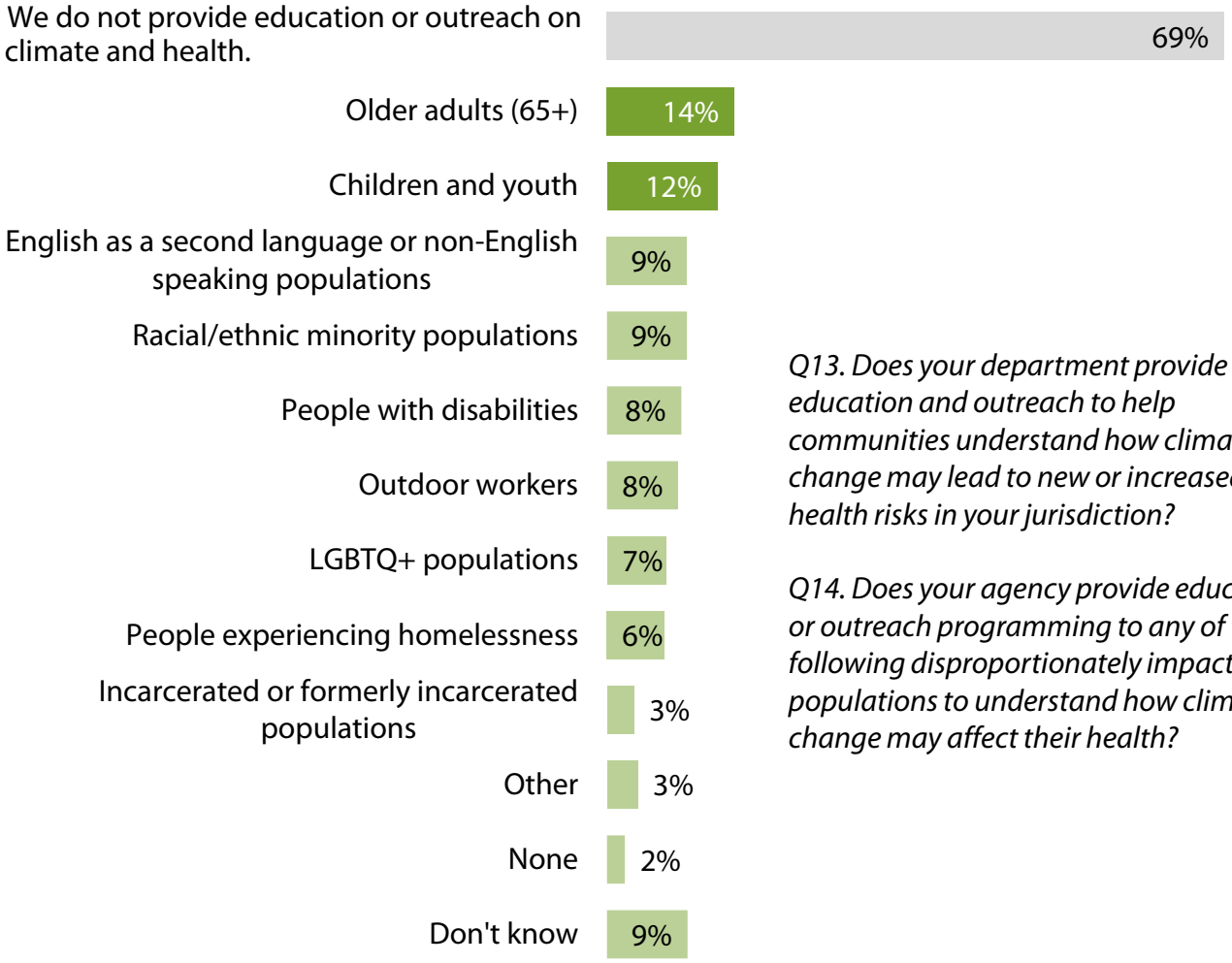


Most LHDs reported having sufficient data to monitor 10-year trends for food-borne, water-borne, and vector-borne illnesses. However, most LHDs did not have sufficient data to monitor 10-year trends for other illnesses or injuries that may be exacerbated by climate change, particularly those associated with natural disasters.

This question has been updated since the 2008 and 2012 surveys to ask about surveillance data to monitor 10-year trends among health issues that may be exacerbated by the predicted effects of climate change, rather than activities in these areas. Surveillance is a critical function of LHDs, and a prerequisite to assessing and providing appropriate services to each community.

Figure 12. Provision of education or outreach programming to disproportionately impacted populations

Percent of LHDs *(n=281)*



Q13. Does your department provide education and outreach to help communities understand how climate change may lead to new or increased health risks in your jurisdiction?

Q14. Does your agency provide education or outreach programming to any of the following disproportionately impacted populations to understand how climate change may affect their health?

Most LHDs reported that they did not provide any education or outreach to help their communities understand how climate change may lead to new or increased health risks.

For LHDs conducting outreach, the most common groups targeted were adults over the age of 65 and children and youth.

Conclusions

• Most LHDs **do not feel ready** to address the health risks of climate change.

• Most LHDs are **not working specifically to address the health risks of climate change.**

• Among the small percentage of LHDs that have tried to implement program activities dedicated to addressing the health risks of climate change, funding issues, including a **lack of funding or restrictions on funding,** were the most commonly reported barriers.

• Most LHDs **have sufficient data** to monitor 10-year trends **for food-borne, water-borne, and vector-borne diseases**. However, most LHDs **do not have sufficient data** to monitor 10-year trends for illness and injuries related to **wildfires and smoke, floods and post-flood remediation, or hurricanes,** and nearly half **do not have sufficient data** to monitor 10-year trends **for heat-related illness and injuries.**

• Most LHDs are **uncertain** about how ready their partners—including other local departments, the local health care system, and the state health department— are to **support their climate and health activities.**

• Most LHDs are **not engaged** in education or outreach related to the health risks of climate change within their communities.

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The mission of the National Association of County and City Health Officials (NACCHO) is to improve the health of communities by strengthening and advocating for local health departments.

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