

[REPORT]
October 2017

Preparing for the Health Impacts of Climate Change

Success Stories from Local Health Departments across the United States



NACCHO

National Association of County & City Health Officials

The National Connection for Local Public Health



Introduction

The climate is changing and the effects of these changes are expansive and indiscriminate. Various indicators are used to quantify the changing climate and then to predict future changes based on the evidence and trends. In 2016, the Environmental Protection Agency (EPA) published a comprehensive report about the indicators of climate change.¹ The EPA report identified 37 indicators or changes observed over time related to climate change; these 37 indicators are grouped into six areas: greenhouse gases, weather and climate, oceans, snow and ice, health and society, and ecosystems. Recognizing the health impacts associated with climate change, the latest edition of the EPA's Climate Indicators Report includes new indicators on several health-related topics and a new section on the connections between climate change and health.

The effects of climate change on human health has garnered more attention and research of late, contributing significantly to the plans and actions of local health departments across the country. The U.S. Global Change Research Program released a report in 2016,² *The Impacts of Climate Change on Human Health in The United States: A Scientific Assessment*. This report summarizes the current science and data trends that illustrate how climate change (e.g., extreme heat, droughts, extreme weather events, air pollution, water- and food-borne diseases, vector-borne diseases) relates to overall health and well-being (e.g., food and water sources affected, poor air quality and respiratory distress, evacuations and relocations due to storm-brought destruction, increased and new threats from mosquitoes and ticks spreading disease, the mental trauma inflicted by the increased stressors).

The Centers for Disease Control and Prevention (CDC) created a five-step framework to enable health officials to develop strategies and plans to help communities identify, prepare for, and mitigate the health effects of climate change. This framework, Building Resilience Against Climate Effects (BRACE), outlines five steps: (1) forecasting climate impacts and assessing vulnerabilities; (2) projecting the disease burden; (3) assessing public health interventions; (4) developing and implementing a climate and health adaptation plan; and (5) evaluating impact and improving quality of activities.³ A total of 18 states and cities received grant funding through the CDC's Climate-Ready States and Cities Initiative.⁴ The initiative helps states and cities develop ways to anticipate health effects by applying climate science, predicting health impacts, and preparing flexible programs.

The National Association of County and City Health Officials (NACCHO) develops and manages projects related to climate change through funding from the CDC. The goal of these projects is to increase the knowledge of local health departments, CDC, and

NACCHO develops and manages projects related to climate change through funding from the CDC. The goal of these projects is to increase the knowledge of local health departments, CDC, and NACCHO about the current state of local health department engagement of the health effects of climate change, preparedness to address the health effects of climate change, and barriers and facilitators to departmental efforts.



NACCHO about the current state of local health department engagement of the health effects of climate change, preparedness to address the health effects of climate change, and barriers and facilitators to departmental efforts. NACCHO and CDC strive to help health departments prepare for and respond to the health effects of climate change and to expand access to strategies and tools to do so. Partnering with the local health departments across the country, NACCHO has collected a number of case profiles of climate change programs at local health departments. This report highlights 11 local health departments across the country engaged in climate change adaptation, mitigation, and resilience strategies.

Methods

In collaboration with CDC and members of NACCHO's Global Climate Change Advisory Group, NACCHO developed and distributed a questionnaire to several local health departments across the country to determine current status, goals, objectives, and progress towards climate change mitigation, adaptation, and resilience efforts. Based on user-provided responses, follow-up key informant interviews were performed to obtain additional information to gain a better understanding of their climate change program including capacities, needs, and existing and future challenges. The results of both the questionnaire and key informant interviews are presented here. Efforts were taken to obtain geographically and socioeconomically diverse local health department profiles to cover the expanse of climate change effects (e.g., heat waves, storms and floods, droughts, sea level rise, air pollution, health equity, vector-borne disease, water- and food-borne disease, mental health conditions, quality or quantity of fresh water, food safety and security).

Profile Demographics

Profiles of local health departments were solicited from cities and rural areas with a range of climate change issues faced, including diverse populations, mountain ranges, watersheds, river basins, coastal areas, high populations, and destination cities.

Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

New York City Department of Health and Mental Hygiene

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the New York City Department of Health and Mental

Hygiene (NYC DOHMH) as one of 11 local health departments (LHDs) to better understand how city and county health departments are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

Home to 8.5 million people, New York City is the most populated city in the United States.⁵ Of this very diverse population, 20.6% live in poverty. Densely populated within 302.6 square land miles (27,000 people per square mile), the city sits at the mouth of where the Hudson River feeds into the Atlantic Ocean. NYC DOHMH serves vulnerable populations, service and healthcare providers, and policymakers. NYC DOHMH is one of the largest public health agencies in the world, with an annual budget of \$1.6 billion and more than 6,000 employees.

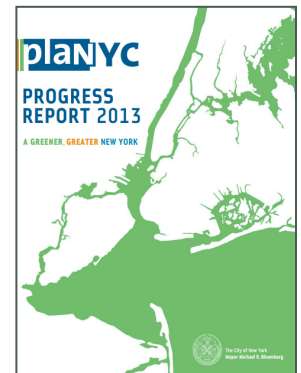
Climate Challenge

Scientists predict that New York City will face numerous challenges related to climate change (e.g., heat waves, rising sea levels, flooding, storm surge, poor air quality), all with interrelated health impacts (e.g., heat-related illness and death, asthma and allergies, vector-borne diseases, food- and water-related illnesses, mental health and stress-related disorders). The

department is preparing to respond to the health impacts of climate change by understanding health impacts of current and future climate hazards; identifying vulnerable populations and disparities; and examining challenges to climate health resiliency.

Goal

NYC DOHMH is addressing the challenges of climate change by understanding current and future health impacts of climate or climate-related hazards and developing interventions and adaptations to reduce and prevent those impacts. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Inform citywide climate change adaptation, mitigation, and resiliency planning efforts with partner agencies;
- Continue to assess the health impacts of hot and cold weather and power outages;
- Provide situational awareness and contextualization of health risks during extreme heat emergencies;
- Characterize disparities of climate-related health impacts; and
- Develop strategies to enhance community resiliency in New York City communities with higher levels of risk inequities.

Achievements and Successes

- Integrated a public health lens to citywide planning related to resiliency and sustainability;⁶⁻⁸
- Worked with local National Weather Service office to lower criteria for issuing a heat advisory in the city based on an assessment of health risks and inform messaging of heat-health risks by media;
- Based on findings from focus groups and a heat-health behavior survey, developed the “Be A Buddy” outreach campaign to encourage service and healthcare providers and social contacts to check on at-risk clients, family, and neighbors; and
- Developed a Heat Vulnerability Index with researchers at Columbia University’s Mailman School of Public Health to describe neighborhood-level vulnerability to heat in the city.⁹

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October 2017

Chicago Department of Public Health

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected

the Chicago Department of Public Health (IL) as one of 11 local health departments to better understand how city and county health departments are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

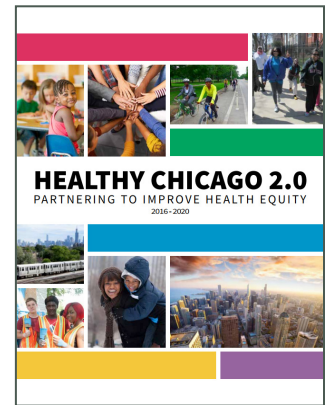
Chicago is the third-most populous city in the United States, with 2.7 million residents.⁵ Located 578 feet above sea level on the southwestern shore of Lake Michigan, Chicago also has two rivers, the Chicago River and the Calumet River, that flow entirely or partially through the city. Chicago is an international hub for finance, commerce, industry, technology, telecommunications, and transportation. The mission of the Chicago Department of Public Health (CDPH) is to promote and improve health by engaging residents, communities, and partners in establishing and implementing policies and services that prioritize residents and communities with the greatest need.

Climate Challenge

Climate change is predicted to impact Chicago in a variety of ways, including increases in temperature, adverse impacts on human health and welfare, decreased air quality, an increased frequency of vector-borne and water-borne disease outbreaks, and changes in precipitation patterns.¹⁰

Goal

Through Healthy Chicago 2.0, CDPH works to minimize the negative effects of climate change and its impacts on public health. Healthy Chicago 2.0 is a four-year plan providing 200 actionable strategies to improve health equity, focusing on both traditional health issues and social determinants of health. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Coordinate with partner organizations to collect data that can inform education, advocacy, resource development, and planning efforts related to minimizing and responding to climate change;
- Launch public education campaigns to address the response to climate change;
- Ensure emergency response plans address the health impacts of climate change on vulnerable populations and assure essential health services for these populations in an emergency; and
- Expand efforts to support community-specific systems and strategies to prevent and respond to climate change.

Achievements and Successes

- Developed and launched Healthy Chicago 2.0,¹¹ a four-year plan providing 200 actionable strategies to improve health equity, focusing on both traditional health issues and social determinants of health;
- Used predictive analytics to predict emergent health issues among populations at highest risk for health effects of climate change and extreme weather events, thus allowing officials to minimize these negative impacts;
- Partnered with the Chicago Office of Emergency Management and Communications and other First Responders to develop a comprehensive All Hazards Emergency Operations Plan;
- Collaborated with city hospitals and other health care agencies to conduct syndromic surveillance to anticipate outbreaks or other factors that can inform CDPH planning efforts;
- Worked with the U.S. Department of Health and Human Services Office of the Assistant Secretary for Preparedness and Response on the emPOWER Initiative— data mapping using Medicare data, severe weather tracking, and GIS to “better anticipate, mitigate, plan for, and respond to the potential electrical needs of at-risk persons with access and functional needs prior to, during, and after a disaster”;¹²
- Participated in a collaboration to develop an urban sensing network made up of sensor nodes that relay environmental data in real time on airborne pollutants and climate factors; and
- Awarded a 2017 ENERGY STAR Partner of the Year for accelerating and promoting energy efficiency strategies through local programs and policies. Chicago is the first major city to receive this award.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Green River District Health Department

Project Summary

The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the Green River District Health Department (KY) as one of 11 local health departments (LHDs) to better understand how city and county health departments are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. This project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

The Green River District Health Department (GRDHD) is located in Daviess County, KY (City of Owensboro, KY). GRDHD provides health care programs and services to seven Kentucky Counties (Daviess, Hancock, Henderson, McLean, Ohio, Union, and Webster) and serves a total population of nearly 217,000.⁵ These land-locked counties in northwest Kentucky border Illinois and Indiana, separated by the Ohio River. All counties in the district are predominantly rural (>27% rural), with aging, less affluent, and less educated populations compared to their urban counterparts (15–19% are older than 65 years of age). The counties also have greater than the national average number of people living in poverty (>13.5%).

GRDHD is studying how climate events such as extreme heat, drought, and flooding affect the health of local populations and using data to identify public health interventions to protect the health of vulnerable populations living in the district.

Climate Challenge

The mission of GRDHD is to improve quality of life by promoting, protecting, and enhancing the health and well-being of the public. With satellite offices in each of the seven counties, GRDHD is faced with the many public health challenges that accompany such regions of poverty and gaps in education levels. The district also has higher rates of obesity, diabetes, heart disease, asthma, and cerebrovascular disease than the national averages. Despite these challenges, GRDHD is studying how climate events such as extreme heat, drought, and flooding affect the health of local populations and using data to identify public health interventions to protect the health of vulnerable populations living in the district.

Goal

The goal of GRDHD is to identify local climate hazards and implement evidence-based policies and programs in areas of epidemiology, community health assessment, and emergency

OBJECTIVES

- Train health department staff in research and policy development for climate change;
- Incorporate climate-related health indicators in epidemiological surveillance, community health assessment, and emergency preparedness;
- Communicate climate-related health policy recommendations to community partners; and
- Procure funding to continue research and analysis of local climate-related health indicators.



preparedness to address hazards related to climate change. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.

Achievements and Successes

- Received a grant from Kentucky's state environmental health tracking system, EnviroHealthLink, which provided funding and technical assistance to identify local climate-related health indicators; and
- Using these health indicators, GRDHD conducted a community health assessment and developed policy recommendations for internal and external use.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Austin Public Health

Project Summary

The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected Austin Public Health (TX) as one of 11 local health departments (LHDs) to better understand how city and county health departments are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The program sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

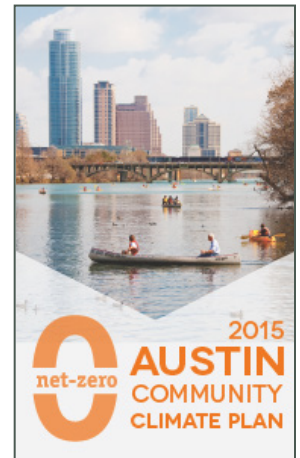
The City of Austin, located in Travis County, TX, lies along the Edwards Plateau at the edge of the Great Plains. The Colorado River winds through the county from west to east, forming a series of man-made lakes. According to the latest population estimates, 1.2 million people live in Travis County,⁵ nearly 80% of whom reside in the City of Austin; this reflects a 17% growth rate since the 2010 Census.

Climate Challenge

Austin Public Health oversees the public health services of the residents in Travis County, including the City of Austin. Successfully preparing for environmental events associated with climate change, such as extreme heat, flooding, and extreme weather evacuees, will require leveraging public health and emergency management infrastructure to coordinate adaptation and mitigation interventions. In particular, the increasing growth rate in the county can have significant environmental and public health consequences, increasing the urgency to respond to climate change.

Goal

Austin Public Health is addressing the health impacts of climate change by increasing climate change coordination and capacity building through community engagement to enhance environmental public health in its jurisdiction. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Build on the research and analysis from the Climate Change Projections project;¹³
- Provide internal training on climate change and the health department's role in local climate change initiatives;
- Increase the knowledge base of LHDs and all community partners regarding the public health and long-term consequences of climate change;
- Expand surveillance activities initiated during the Environmental Health Indicators Project both within the Health Department and in surrounding counties; and
- Convene a steering committee to identify capacity and funding needs.



Achievements and Successes

- Celebrated 10 years of leadership on the front lines of climate change in February 2017;
- Developed a toolkit of educational materials, tips, and resources for community action;¹⁴ and
- Developed a Community Climate Plan for communications and outreach that (1) engaged 5,000 people through online discussions, community events, and group presentations; and (2) reached 500,000 people with educational content about climate change and how to take action through digital and advertising platforms.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Crook County Health Department

Project Summary

The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected Crook County Health Department in Oregon as one of 11 local health departments (LHDs) to better understand how city and county health departments are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

Crook County, located in the geographic center of Oregon, encompasses 2,982 square miles and is home to 22,570 people.⁵ Although considered rural, the county and region have experienced tremendous growth recently. Crook County Health Department, serving the county's residents, is assessing key climate risks, identifying populations most vulnerable to the related health impacts, and formulating adaptation strategies.

Climate Challenge

The environmental and public health consequences of climate change for Crook County include drought and air quality issues. A drought was declared in the area in 2015 and since the county

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relies on water for agriculture, livestock, and recreation/tourism, the health department has worked with the community to prepare for such events. The county is also working to build and engage interdisciplinary partnership to further enhance public readiness to take action. If left unaddressed, climate change impacts will continue to affect community health, the local economy, food production, and health care needs.

Goal

The Crook County Health Department strives to increase coordination and community participation in climate work in its jurisdiction. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Develop strategies for public health staff to be a source of leadership, expertise, and guidance concerning sustainable development in Crook County;
- Raise awareness in Crook County as to the important responsibilities and actions regarding sustainable development and climate change;
- Shape local policy promoting sustainable development and strategizing to mitigate climate change for Crook County; and
- Focus on specific issues identified in Crook County including drought, air quality, and vector-borne and communicable disease.

Achievements and Successes

- Participated in the CDC BRACE project, completed the local plan, and included the work in the emergency management response plans, focusing specifically on drought;
- Helped the City of Prineville facilitate an ongoing Air Quality Committee; and
- Recognized for climate change efforts in the State of Oregon Plan.¹⁵

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

San Francisco Department of Public Health

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the San Francisco Department of Public Health as one of 11 local health departments (LHDs) to better understand how county and city health departments are

preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

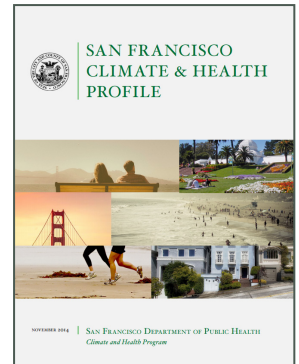
San Francisco is a dense, urban city with an estimated population of over 860,000 people.⁵ The city supports 530,000 jobs and is host to approximately 17 million visitors per year. As a peninsula with a bay on one side and an ocean on the other, San Francisco is threatened by climate change more than most U.S. cities (e.g., sea level rise, storm surge).

Climate Challenge

Locally, climate change is expected to cause more variable weather, including extreme heat days and heat waves, intense storms and heavy precipitation events, sea level rise and flooding, droughts, and air pollution. These effects have significant and cascading impacts on public health. To address this challenge, the San Francisco Department of Public Health's Climate and Health Program is transforming climate change data into strategies, tools, and trainings to connect with communities to design solutions to improve health and resilience.

Goal

The goal of the San Francisco Department of Public Health's Climate and Health Program is to use cross-sector collaboration to support healthy and climate-ready communities. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Explicitly address vulnerable populations in programs and policies focused on climate health impacts with the goal of reducing health disparities;
- Inform and engage communities about the health impacts and health co-benefits associated with taking action to prepare for and reduce the effects of climate change;
- Enhance planning and preparedness for emergency response to protect the public's health against negative impacts associated with climate change-related stressors and disasters;
- Expand and enhance partnerships to ensure climate change is a recognized public health issue and provide guidance to reduce health risks and create more resilient communities; and
- Build the capacity of departmental staff and programs to monitor health impacts, integrate climate preparedness, and improve climate response.



Achievements and Successes

- Won the National Institute of Environmental Health Science’s Climate Change and Environmental Exposures Challenge for San Francisco’s Climate and Health Profile,^{16,17} which was also recognized by the Obama Administration, incorporated into the U.S. Climate Resilience Toolkit, and disseminated to communities and decision-makers nationally;¹⁸
- Selected for the global publication Cities100,¹⁹ the Climate and Health Program was presented at the 2015 United Nations Climate Change Conference as a concrete urban solution that can be scaled and replicated across the world;
- Developed innovative tools (e.g., heat vulnerability index and flood health vulnerability index) to address health, demographic, and environmental factors linked to climate change that help professionals respond to extreme weather events and to support climate action;^{20,21} and
- Released the Climate and Health Adaptation Framework,²² the first comprehensive health adaptation plan for the City and County of San Francisco that is rooted in health equity and uses a place-based, data-driven approach to assessing climate change and solutions.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Boston Public Health Commission

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the Boston Public Health Commission as one of 11 local health departments (LHDs) to better understand how city and county health departments are preparing for

the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

Boston is the capital city of Massachusetts, is the largest city in New England, and makes up the majority of Suffolk County. It is a relatively dense city (estimated 667,137 residents in a 48-square mile area)⁵ comprising 16 culturally diverse neighborhoods containing many sub-populations. As one of America's gateway cities, Boston has a large population of recent immigrants; 26% of residents are born outside the United States. The Boston Public Health Commission (BPHC) is the city's health department. BPHC's mission is to protect, preserve, and promote the health and well-being of all Boston residents, particularly the most vulnerable.

Climate Challenge

As a coastal city, sea level rise and flooding associated with storm surge is a top climate change-related concern for Boston.

The city has already experienced localized flooding and major storm events. Emerging climate change concerns also include increasing summer temperatures, an increased number of heat wave days, increased severity of both summer and winter storms, and expanding vector-borne illness.

Goal

Because of the widespread impact of climate change and the diverse nature of the agencies and populations affected by it, BPHC has two broad goals related to climate change. The first is to integrate considerations of public health, environmental justice, and particularly vulnerable populations into all aspects of city policy related to climate change mitigation and adaptation. The second is to develop and maintain a robust infrastructure for public health response to natural disasters. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.

OBJECTIVES

- Lead by example organizationally both for other city agencies and the public through efforts to mitigate BPHC's impact on climate change;
- Set a Health in All Policies objective to integrate consideration of public health into the broader scope of all city policies beyond BPHC's internal processes; and
- Maintain a world-class emergency response and preparedness public health infrastructure that is able to respond to climate-related and other public health emergencies, including the Stephen M. Lawlor Medical Intelligence Center.²³



Achievements and Successes

- Became the first city agency to purchase hybrid vehicles in 2001, leading the way for Boston's current vehicle fleet made up almost entirely of hybrid vehicles;
- Led the Clean Air Cabs program, launched in 2006, to replace a significant portion of the city's licensed taxi cabs with hybrid vehicles;
- Integrated public health into larger city discussions around climate change in pursuit of the Health In All Policies objective;
- Played a significant role in developing the city's first greenhouse gas emissions inventory and climate action plan;
- Implemented physical activity and injury prevention into citywide policies, including Boston's Complete Streets program;²⁴ and
- Participated in the citywide multi-agency climate change adaptation planning efforts in coordination with BPHC's Office of Public Health Preparedness and Environmental and Occupational Health divisions.

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October 2017

City of Milwaukee Health Department

Project Summary



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Background

Milwaukee, the largest city in Wisconsin and the seat of Milwaukee County, is located on the western shore of Lake Michigan. The City of Milwaukee has an estimated population of 595,047; Milwaukee County has an estimated population of 951,448.⁵ The City of Milwaukee Health Department proudly serves as Wisconsin's largest local public health agency, ensuring that services are available to enhance the health of individuals and families, promote healthy neighborhoods, and safeguard the health of the Milwaukee community. Within the health department, the Division of Disease Control and Environmental Health is actively involved in the promotion and improvement of childhood immunizations within childcare and school settings.

Climate Challenge

Milwaukee faces climate change challenges such as extreme heat, flooding, and extreme cold weather. These environmental concerns require leveraging public health, emergency management, healthcare coalitions, and business infrastructures to coordinate adaptation and mitigation interventions.

Goal

The City of Milwaukee Health Department's goals focus on obtaining additional grant funding to support climate change projects, collaborating with business recovery planners, increasing climate change coordination, and building capacity through community engagement to enhance environmental public health in Milwaukee. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.

OBJECTIVES

- Increase the knowledge base of local health departments and all community partners regarding the public health and long-term consequences of climate change;
- Develop, maintain, and continuously improve emergency operations plans to guide departmental response activities for all hazards emergencies;
- Convene a group of stakeholders who represent multiple community sectors to develop a list of emergency preparedness needs and identify capacity and funding needs; and
- Build community, resiliency, government preparedness, response, and recovery.



Achievements and Successes

- Partnered with Reflo Sustainable Water Solutions to implement rainwater harvesting systems at Alice’s Garden, an urban community garden, and provide community educational sessions on climate change and public health;
- Partnered with University of Wisconsin to develop a buoy that provides real-time data about Milwaukee’s beaches;
- Developed Water Commons Partnership and display at the Bradford Beach in Milwaukee;
- Convened a focus group between the Business Recovery Planners Association of Southeastern Wisconsin and the Southeast Wisconsin Homeland Security Partnership to discuss issues of climate effects, public health adaptation, and community resilience;
- Participated in the 2016 Business Resiliency Showcase exhibit booth and presented at the Kohl’s Innovation Center;
- Collaborated and partnered with the City of Milwaukee’s Environmental Collaboration Office and presented at the Sustainability Summit in 2016; and
- Participated in educational event at the summer musical event Chill on the Hill and Rock the Green Sustainability Festival.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Salt Lake County Health Department

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the Salt Lake County Health Department as one of 11 local health departments (LHDs) to better understand how county and city health officials are preparing for the health impacts of climate

change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

Salt Lake City, the seat of Salt Lake County and the capital of Utah, is located on the Wasatch Mountain Range. Over a third of the entire state population lies within Salt Lake County's 16 incorporated cities and an additional unincorporated area. Salt Lake County occupies the Salt Lake Valley,⁵ the Wasatch and Oquirrh Mountain Ranges, and part of the Great Salt Lake and the Jordan River watershed.

Climate Challenge

Climate change is causing warmer temperatures, droughts, and more frequent extreme weather events in the region. Many responses to climate change could positively impact the region in multiple ways, simultaneously reducing the burden of disease, saving money, protecting the environment, developing community, and addressing inequality. Salt Lake County's development of a regional Climate Change Adaptation Plan for

Health will provide an organized plan for the county to respond to the health impacts of climate change, serving to build a healthier, more resilient community, and setting an example for other local health departments in Utah.

Goal

The Salt Lake County Health Department's goal is to collaborate with agencies across Salt Lake County to develop a simplified, unified Climate Adaptation Plan for Health. By partnering with local stakeholders, the department is working to put together

OBJECTIVES

- Complete a Climate Change Adaptation for Health framework;
- Host stakeholder forums for inclusive participation in completing the planning document;
- Host annual Climate and Health Symposium to provide education on climate issues; and
- Participate (as initial convening member) of the Utah Climate Action Network.²⁵

Salt Lake County's development of a regional Climate Change Adaptation Plan for Health will provide an organized plan for the county to respond to the health impacts of climate change, serving to build a healthier, more resilient community, and setting an example for other local health departments in Utah.



a comprehensive plan to protect the health of its population from the heat waves, water shortages, water quality issues, outbreaks of new diseases, poor air quality, and extreme weather events that it will need to address in the coming decades. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.

Achievements and Successes

- Hosted Climate and Health Symposium in 2014, 2015, and 2017;
- Partnered with the National Weather Service to provide health impact information included in regional weather forecasts;
- Developed the Utah Climate Action Network in partnership with Salt Lake City Sustainability Department, University of Utah, Park City, and Alta Ski Area;²⁵ and
- Participated in fact-finding sessions with Senator Sheldon Whitehouse (D-RI) on regional climate impacts.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

San Luis Obispo County Health Department

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for Disease Control and Prevention (CDC), selected the San Luis Obispo County Health Department in California as one of 11 local health departments (LHDs) to better understand how city and county health departments are

preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The project sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

San Luis Obispo (SLO) County has a population of approximately 279,000 people and is located midway between Los Angeles and San Francisco on the Central Coast.⁵ The County includes seven cities (San Luis Obispo, Morro Bay, Pismo Beach, Grover Beach, Arroyo Grande, Atascadero, and Paso Robles) but most of the county's 3,326 square miles are unincorporated. The majority of residents live along the coast or along the main highway corridor. According to the 2015 County Health Rankings, a project of the Robert Wood Johnson Foundation, SLO is ranked ninth in health outcomes out of 58 California counties.

Outsideln SLO highlights the co-benefits of climate change mitigation and health promotion, focusing on key strategies for reducing greenhouse gas emissions that also have a beneficial effect on health and quality of life.

Climate Challenge

Climate change threatens the lives of SLO County residents now and will impact their way of life in the future. Some of these local changes include increased temperature, extreme storms, wildfire, rising sea level, decreased air quality, and drought.

Goal

The primary climate change work in the department has centered on a climate change communication campaign, *Outsideln SLO: We take Health and Climate Change Personally*.²⁶ *Outsideln SLO* highlights the co-benefits of climate change mitigation and health promotion, focusing on key strategies for reducing greenhouse gas emissions that also have a beneficial effect on health and quality of life. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.



OBJECTIVES

- Educate and train staff, clients, and the community on the relationship between climate change and health;
- Motivate individuals to take personal responsibility in climate change solutions and become active participants these solutions; and
- Execute the *Outsideln SLO* campaign within current budget constraints.

Achievements and Successes

- Created OutsideIn SLO, the first formal climate and health education campaign implemented by an LHD in California;
- Released Public Service Announcements in over 1,500 spots on local radio;
- Held creative outreach activities at farmer's markets with interactive displays;
- Garnered exposure through print media, online articles, radio interviews, and social media;
- Provided education and training to over 700 people through 20 presentations;
- Integrated campaign messaging into the WIC nutrition curriculum and educated 1,100 WIC families about climate and health connections, active transportation, and the co-benefits of buying local, seasonal produce; and
- Utilized over 1,700 hundred hours of staff time and hired one student intern to execute the program, requiring little additional funding to make the program operational.

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Local Health Departments are Preparing for the Health Impacts of Climate Change

October 2017

Public Health – Seattle and King County

Project Summary



The National Association of County and City Health Officials, with funding from the Centers for

Disease Control and Prevention (CDC), selected Public Health – Seattle and King County as one of 11 local health departments (LHDs) to better understand how county and city health officials are preparing for the health impacts of climate change. The goal of this project was to highlight local efforts to prepare for and build resiliency to the health impacts of climate change and to share these success stories to support new and ongoing initiatives in other LHDs. The program sought to identify best practices and provide real-world case studies. LHDs play an important role in connecting health impacts with the effects of climate change. This project highlights only a few of the many departments actively engaged in climate change efforts.

Background

King County, WA, is the 14th most populous county in the United States, with 1.93 million people.⁵ Covering 2,134 rural and urban square miles, King County is home to two tribal nations, 39 cities, 130 special purpose districts, and over 150 spoken languages. It is also home to one of the most diverse zip codes and one of the most diverse school districts in the nation.^{27,28} Almost one quarter of residents speak a language other than English and almost one-fifth of residents were born in another country. Although deemed one of the healthiest counties nationally, there is significant disparity in life expectancy, years of

Reports indicate that climate change in Washington will likely lead to larger numbers of heat-related injuries and deaths and that the greater Seattle area in particular can expect substantial mortality during future heat events.

healthy life, and levels of education and causes of death across geographic and racial groups. Public Health – Seattle and King County (PHSKC) is a large metropolitan health department with approximately 1,500 employees, 40 sites, and a budget of \$318 million that serves all county residents. PHSKC’s mission is to identify and promote the conditions under which all people can live within healthy communities and achieve optimum health.

Climate Challenge

King County is situated in the unique geography and climate of the Pacific Northwest and the Puget Sound Region. In 2009 and 2013, the University of Washington’s Climate Impacts Group released reports describing the serious health impacts that climate change will have on Puget Sound residents.^{29,30} These reports indicate that climate change in Washington will likely lead to larger numbers of heat-related injuries and deaths and that the greater Seattle area in particular can expect substantial mortality during future heat events. The reports document other

OBJECTIVES

- Implement an engagement process with both internal (PHSKC and other governmental partners’ leadership and staff) and external (community-based organizations and community leaders) stakeholders to solicit input and create ownership;
- Draft a climate and public health framework based on the findings from the engagement process with stakeholders; and
- Implement a communication strategy to raise awareness about climate change and health, and share the framework broadly with organizational and community partners.

adverse effects, including more severe and frequent weather events, increased vector-, water-, and foodborne diseases, increased allergies and asthma, and increased social impacts that will affect the public's health.

Goal

Currently, PHSKC is working to develop a climate and public health framework for public health that reflects the values, concerns, and priorities of the local community and public health staff. The health department developed several objectives to address this overarching goal and has achieved a number of successes so far.

Achievements and Successes

- Participated in the Public Health Institute's Center for Climate Change and Health learning collaborative with 12 other local health jurisdictions;
- Partnered with two local climate justice-oriented community-based organizations to inform this work and to ensure that equity and social justice are at the core of the process and the final version of the framework;
- Conducted interviews with departmental leadership and community stakeholders on what they perceive as the role of PHSKC related to climate change mitigation and preparedness;
- Integrated public health considerations into King County's Strategic Climate Action Plan; and
- Established a voice for public health impacts of climate change in the region.

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Conclusion

This report presents a wide range of strategies that local health departments (LHDs) are employing to build resiliency to the health impacts of climate change. As shown in each of the profiles, the challenges faced by each LHD are unique, varying from sea level rise, flooding, and storm surge threats to extreme temperatures, air quality, and drought. Despite the unique challenges, many of the departmental climate change goals are similar:

- Identify and understand current and future health impacts of climate and climate-related hazards;
- Develop a comprehensive plan or framework that reflects local values, concerns, and priorities; includes evidence-based results; and presents interventions and adaptations to reduce and prevent health impacts of climate change;
- Increase climate change coordination (i.e., cross-sector collaboration);
- Build climate change capacity;
- Increase community participation in climate change adaptation and mitigation efforts through communication campaigns; and
- Integrate considerations of health equity, environmental justice, and particularly vulnerable populations into jurisdictional climate change policies.

As each LHD faces unique climate change challenges, they also face unique challenges in terms of resources (e.g., funding, personnel) and support for climate change-related initiatives at the departmental, jurisdictional, community, county, and state levels. Depending on the level of resources and support, each LHD may develop more conservative or more progressive objectives to address the health impacts of climate change. The following objectives may be considered for your LHD:

- Educate and train health department staff on the health impacts of climate change and the health department's role in local climate change initiatives;
- Inform city-wide climate change adaptation, mitigation, and resiliency planning efforts with partner agencies;
- Characterize disparities and explicitly address vulnerable populations in programs and policies focused on climate-related health impacts with the goal of reducing health disparities;
- Launch public education campaigns to increase knowledge of community partners to the public health and long-term consequences of climate change;
- Procure funding to sustain research and analysis of local climate-related health indicators;
- Implement a communication strategy to raise awareness about climate change and health;
- Build the capacity of departmental staff and programs to monitor health impacts, integrate climate preparedness, and improve climate response; and
- Expand and enhance partnerships to ensure climate change is a recognized public health issue and provide guidance to reduce health risks and create more resilient communities.

The case studies presented in this report can provide example goals and objectives to further other LHDs' climate change initiatives. Regardless of how your department is currently preparing for the health impacts of climate change, you can set any number of goals and objectives to begin to, or continue to adapt, mitigate, and build resilience to climate change.

As each LHD faces unique climate change challenges, they also face unique challenges in terms of resources (e.g., funding, personnel) and support for climate change-related initiatives at the departmental, jurisdictional, community, county, and state levels. Depending on the level of resources and support, each LHD may develop more conservative or more progressive objectives to address the health impacts of climate change.

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NACCHO

National Association of County & City Health Officials

The National Connection for Local Public Health



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