Coupling Public Health with Climate Resilience

San Francisco’s Climate and Health Adaptation Framework

Health Commission – March 7th 2017

Office of Policy & Planning
San Francisco Department of Public Health
City and County of San Francisco

Climate and Health Program
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Presentation Objectives

• Provide information about of the San Francisco Department of Public Health Climate and Health Program and City-Wide Initiatives

• Explain why it is important for Public Health professionals to know about climate change and the projected impacts of climate change on health.

• Learn about some of the past initiatives and highlights of the Climate and Health Program

• Learn about San Francisco’s Climate and Health Adaptation Framework and upcoming strategic activities
Climate Change is Happening Now

Northwestern Glacier melt, Alaska from 1940 (left) to 2005 (right)
If the U.S. healthcare sector were ranked as a nation, **it would be the world’s 13th-largest** emitter of greenhouse gases.
San Francisco Climate Projections

Extreme Heat days to increase up to 40 days by 2050 and 90 by 2100

Sea level rise 24 inches by 2050 and 66 inches by 2100

Air Quality will decline

Extreme Storms could increase by 11%

Frequency and severity of drought will increase
Health Impacts

Heat-related illness and death, cardiovascular failure

Extreme heat

Air pollution

Environmental degradation

Changes in vector ecology

Forced migration, civil conflict*, mental health impacts

Increasing CO2 levels

Water and food supply impacts

Malaria*, dengue, encephalitis, hantavirus, Rift Valley fever*, Lyme disease, chikungunya*, West Nile virus

Malnutrition*, diarrheal disease

Water quality impacts

Respiratory allergies, asthma

Cholera*, cryptosporidiosis, campylobacter*, leptospirosis, harmful algal blooms

Injuries, fatalities, mental health impacts

Severe weather

Asthma, cardiovascular disease

Increasing allergens

Rising sea levels

Rising temperatures

More extreme weather
A harmful algal bloom in 2015 closed fisheries from Alaska to Mexico due to high level of neurotoxins.
Extreme heat events cause more deaths annually in the U.S. than all other extreme weather events combined.
Cost of Mortality from Air Pollution
% of GDP in 2010, 15 Largest CO2 Emitters

China
Russia
India
Germany
Korea
Iran
Japan
UAE
Saudi Arabia
United States
Indonesia
Mexico
Canada
South Africa
Brazil
People exposed to climate-related disasters may suffer from post-traumatic stress disorder, depression and/or anxiety.

A significant proportion of exposed individuals develop chronic psychological dysfunction.
Who is Most Vulnerable to Climate Change?

- The poor
- The elderly
- Infants and children
- Those with pre-existing medical conditions
- The mentally ill

Reducing health disparities: part of the climate justice agenda
Tackling climate change could be the greatest global health opportunity of this century ~ Lancet
Climate and Health Profile

San Francisco Climate and Health Profile

Climate change threatens public health.

The San Francisco Climate and Health Profile is a report that links climate change projections with their associated health outcomes, and identifies populations and locations most vulnerable to these health outcomes. The goal of the Climate and Health Profile is to support local public health climate adaptation efforts, and advance urban health and environmental justice in the climate and health field.

Download Full Report

View the Highlights

San Francisco Climate Projections
Health Impacts
Neighborhood Summary
Community Resiliency Indicator Maps

www.sfclimatehealth.org
Assessments & Data Analysis: Extreme Heat

Climate and Health
Understanding the Risk:
An Assessment of San Francisco’s Vulnerability to Extreme Heat Events
Climate and Health
Understanding the Risk:
An Assessment of San Francisco’s Vulnerability to Flooding & Extreme Storms

San Francisco Department of Public Health
City and County of San Francisco
Population Health Division
San Francisco Department of Public Health
Extreme Heat Response Plan
An Annex to the SFDPH Emergency Operations Plan

San Francisco Department of Public Health
Response to a Flood Tabletop Exercise
After-Action Report/Improvement Plan
Exercise Date: September 29, 2015
The most likely health outcomes of extreme storms and flooding include:

**Physical injuries** may increase due to slips and falls, automobile or bicycle collisions, or downed trees or power lines. These injuries are directly caused by flood inundation and extreme storms.

**Waterborne illnesses** are caused by proximity to contaminated water. San Francisco has little risk of contaminated drinking water, but stormwater overflows may result in raw sewage seepage onto streets or into the Bay.

**Respiratory illnesses** that impact the lungs, throat, and airways can be spread through airborne particles. Mold growth from water intrusion or flooding in buildings, as well as water damage which may cause exposure to toxic building materials, can trigger asthma, allergies, and other respiratory illnesses.

**Vector-borne disease** can be exacerbated by flood events since rainy seasons, particularly after dry seasons, have been proven to be correlated with rodent vectors such as hantavirus. Standing water may additionally attract mosquito vectors.

**Foodborne Illnesses** may increase if a significant power outage impacts refrigeration in residents and food establishments, as well as if a combined sewer overflow impacts shellfish and other coastal seafood.

Any disruption to the city medical services, either by power outage or transportation network disruption, may cause additional health impacts. Residents dependent on methadone clinics or dialysis may need to find alternative treatments during service disruption.

**Carbon monoxide poisoning** is a potential health impact of power outages after hazard events. The poisoning is typically caused by improper usage of generators which that emit a harmful, odorless gas.

We are all at risk of increased sensitivity to **mental health impacts** before, during, and after hazard events. These impacts can be caused, triggered, or exacerbated by stress, isolation, or anxiety associated with events.

Any major flood inundation or extreme storm event may lead to income loss. Income loss has been correlated with many public health impacts.
Health Impacts of Mold Exposure Include...

- Cough or Wheeze
- Pneumonia
- Asthma Attacks
- Dermal (skin) and Ocular (eye) Irritation
- Nasal Congestion
- Upper Respiratory Tract Infections
- Mental Health Impacts (Depression, Memory Loss, Difficulty Concentrating)
- Headache
- Diarrhea
- Pulmonary Hemorrhage (in Infants)

People living in moldy homes are...

- ...50% more likely to currently have asthma.
- ...39% more likely to have ever been diagnosed with asthma.
- ...50% more likely to cough.
- ...44% more likely to wheeze.
- ...52% more likely to have upper respiratory tract symptoms.
- ...linked to a 50% increase in the odds of having at least four colds in a year.

that threaten human health and safety. Weather patterns will trend towards the extremes: storms and drought, heat waves and cold snaps, and these events will have robust and cascading impacts on your health. A major health

http://bit.ly/1Sw0Y57
What is climate change?

Climate change is any major change in climate that lasts a long time. Right now, we’re experiencing global warming — the average surface temperatures on earth are rising. The burning of fossil fuels — coal, oil, gas — releases carbon dioxide and other greenhouse gases into the atmosphere. The gases trap heat. The temperature goes up. This will cause more variable weather, heat waves, heavy precipitation, flooding, droughts, more intense storms, sea level rise, and air pollution.

How much is the planet heating up?

The planet has heated up about 1.7 degrees Fahrenheit (1.0 degree Celsius) since the Industrial Revolution. It doesn’t sound like a lot, but as an average across the planet, it’s actually a big number. It explains why glaciers are disappearing and why the oceans are rising at a quicker pace.

So, are we cooked?

Not if we act. Scientists believe we can stop the worst effects of climate change if we keep the average surface temperatures on the earth from rising to less than 2 degrees C. To do that, we’ll need to make a transition to 100% clean energy. Clean energy will need to stay in the ground. That isn’t easy, but we can do it. Nearly 200 countries have agreed on the global need to cut greenhouse gases.

What can we do about climate change?

Everyone can take steps in their own lives to reduce their carbon footprint. Reduce your solid waste, take 1/2 of your trips by foot, bike or bus and choose power from renewable resources. But we also need laws at the state and federal level to drive a transition to clean energy and to help communities affected by the change.

Why is my health department involved?

Climate change is one of the greatest public health challenges of the 21st century. The health impacts of climate change will affect us all, but will have a greater impact on disadvantaged communities and threaten the systems on which human life depends — our air, water, food, shelter, and security. Our Climate and Health program is working to develop solutions to support healthy and climate ready communities.

Visit www.sfclimateandhealth.org and follow @sfclimateandhealth.

San Francisco Department of Public Health • Climate and Health Program
Outreach and Stakeholder Engagement
New! Climate and Health Adaptation Framework

1. Review of Vulnerability Assessments

2. Climate Health Risks and Responses
   - Baseline Conditions
   - Proposed Strategies & Activities
   - Indicators

3. Assessment of Public Health Preparedness
   - 2016 Survey
   - Assessment of Guiding Documents
   - Infrastructure Analysis
Climate and Health Adaptation Framework

Strategies for Consideration: Themes across Literature Review, Best Practices and Interviews:

**Climate Risk 3: Extreme storms, sea level rise, and flood inundation will have cascading direct and indirect impacts on public health, housing, and city services.**

**Interventions & Adaptations**

3.A Research and update the power cutage annex of the SFDPH emergency operations plan (EOP) with special consideration to vulnerable populations.

3.B Foster cross-disciplinary partnerships between the San Francisco Department of Public Health and other City agencies to support ongoing efforts to promote climate mitigation and adaptation in the health care sector.

3.C Evaluate use and effectiveness of public information services during and after extreme weather events.

3.D Develop engagement resources on how to properly address in-home dampness and water intrusion, explain tenant and landlord responsibilities, and how to select a professional contractor.

3.E Work with City departments to use community resiliency indicators to prioritize Citywide climate adaptation or climate mitigation improvements to areas with vulnerable communities.

3.F Support Citywide vulnerability and risk assessment work to ensure focus on human health and equity.

2016 SFDPH Survey

Health Network Question 11: Do you believe climate change will impact your branch or program or the populations you serve?

- Yes: 24
- No: 3
What’s next . . . .

Finalize a plan to conduct public outreach to understand existing community concerns about climate change and priority health issues.

Continue to work with a range of stakeholders

Develop a five year strategy on activities to explore development to implement selected adaptations and interventions. Strategy will include:

• Implementation plan
• Communication plan
• Monitoring and evaluation plan