FROM RUBBLE TO RESILIENCE

STRENGTHENING PUBLIC HEALTH PREPAREDNESS AND RESPONSE FOR DISASTER DEBRIS

Region 4AB Public Health Emergency Preparedness Coalition

Response Framework Seminar Participant Workbook

May 8, 2025

METRO REGIONAL PREPAREDNESS COALITION
Building partnerships for preparedness

This seminar is sponsored by the Region 4AB Public Health Emergency Preparedness (PHEP) Coalition with support by the PHEP Cooperative Agreement from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the CDC.

Table of Contents

Seminar Overview

Purpose

Disasters, like hurricanes, can leave behind large amounts of debris that create serious health and safety risks for communities. Managing this debris is key to protecting public health, especially for high-risk populations.

This seminar brings together local public health officials to review and improve a draft **Public Health Preparedness and Response Framework for Disaster Debris**. This framework will help local health departments **plan for, respond to, and reduce the health impacts of disaster debris** in their communities.

Participants will **explore the health impacts of disaster debris, identify challenges, and share strategies to strengthen community response**. Through interactive discussions and scenario-based activities, participants will refine the framework to better support local health departments in preparing for and responding to disaster debris events.

The feedback gathered during the seminar will help shape a **Multi-Year Integrated Preparedness Plan (MYIPP)**, ensuring that communities are better equipped to manage disaster debris and protect public health.

Objectives

By the end of the seminar, participants will:

1. **Understand the Framework** – Review the draft Public Health Preparedness and Response Framework for Disaster Debris and identify at least three areas for improvement based on local experiences and challenges.
2. **Identify Health Risks** – Discuss and document at least three major health risks associated with disaster debris, especially for high-risk populations, to ensure that the framework includes clear public health strategies.

3. **Evaluate Public Health Roles** – Define the role of local public health in disaster debris management and identify at least two actions health departments can take to improve preparedness and response efforts.
4. **Apply Knowledge to Real-World Scenarios** – Work through a hurricane disaster debris scenario and develop at least three practical strategies that local health departments can use to protect public health in a disaster debris event.
5. **Strengthen Regional Collaboration** – Gather feedback from participants to refine the framework, ensuring it aligns with the needs of local communities and informs a Multi-Year Integrated Preparedness Plan (MYIPP).

Structure & Scope

The seminar follows the **Homeland Security Exercise and Evaluation Program (HSEEP)**, which is a standard approach for emergency planning and exercises. HSEEP helps to ensure that our efforts are **practical, measurable, and useful** for real-world emergencies.

HSEEP-based seminars **orient participants to concepts and ideas**, in this case a Public Health Preparedness and Response Framework for Disaster Debris. The seminar is planned for 90 minutes and will include discussions, a scenario-based activity, and time to share ideas.

Participant input will be collected to shape the final framework and help the Coalition build a Multi-Year Integrated Preparedness Plan (MYIPP) that strengthens how our communities manage disaster debris and protect public health.

Seminar Agenda

Welcome & Seminar Overview (10 minutes)	• Facilitator Introduction (2 min) • Seminar Objectives & HSEEP Framework (3 min) • Why Disaster Debris? (5 min)
Presentation of Draft Framework (20 Minutes)	• Health Impacts • High-Risk Populations/Disproportionate Effects • Overview of the Framework Structure • Public Health Roles & Responsibilities
Interactive Discussion (40 Minutes)	• Scenario & Activity Introduction (5 min) • Breakout Group Assignments (20 min) • Report Back & Discussion (15 min)
Framework Refinement & Next Steps (20 Minutes)	• What's Missing? – Group Discussion (10 min) • Action Planning for the MYIPP (5 min) • Next Steps & Closing Remarks (5 min)

Why Disaster Debris?

When a hurricane or other disaster hits, it can leave behind large amounts of debris – damaged buildings, fallen trees, hazardous materials, and more. This debris isn't just a cleanup issue – it's a serious public health challenge. It can spread disease, contaminate water, block emergency response, and create risks for people who are already vulnerable.

In Region 4AB, 98.3% of local Hazard Mitigation Plans document debris as a potential community impact following a disaster. However, these plans do not examine the health and population impacts associated with disaster debris.

What types of debris can impact public health?

There are several types of disaster debris that can impact public health.

- **Vegetative Debris** includes fallen trees, branches, leaves, shrubs, and other plant material. This type of debris is common after storms, floods, or other natural disasters. High winds, heavy rain, or ice can cause trees and plants to break or uproot.
- **Construction and Demolition (C&D) Debris** includes waste materials from building, renovating, or tearing down structures. This type of debris can include wood, concrete, drywall, bricks, metal, insulation, glass, roofing materials, and hazardous substances like asbestos and lead-based paint. C&D debris is often generated after natural disasters, such as storms, floods, and earthquakes, when buildings and infrastructure are damaged or destroyed.
- **Household Hazardous Waste (HHW)** includes common household items that can be dangerous if not handled properly. These items are often flammable, toxic, corrosive, or reactive. Examples include paints, cleaners, oils, batteries, and pesticides.
- **Electronic Waste (E-waste)** includes discarded electronic devices such as computers, mobile phones, televisions, and household appliances.

These items often contain hazardous materials like lead, mercury, cadmium, and brominated flame retardants. Improper disposal or recycling of e-waste can release these toxic substances into the environment.

Health Impacts

Exposure to debris can lead to **injuries, illness, and long-term health problems**, especially for vulnerable populations. Debris can also **block roads, delay emergency response, and shut down critical services** like hospitals and pharmacies, making it harder for people to get the care they need. The **main health impacts** of disaster debris include the following.

Infectious Diseases

✓ Debris contaminated with soil, dust, or animal feces can expose individuals to ***Clostridium tetani*, the bacterium causing tetanus**. Wounds from sharp objects in debris increase the risk.

✓ Debris contaminated with sewage or decaying organic material can harbor pathogens like ***E. coli* and *Salmonella***.

Physical Injuries

✓ **Sharp objects, unstable structures, and electrical hazards** can cause cuts, broken bones, and electrocution.

✓ **Heavy debris** can cause crush injuries and can trap individuals.

✓ Cleanup workers and residents may face **slips, trips, and falls** in unsafe conditions.

Exposure to Hazardous Materials

✓ Many buildings contain **asbestos, lead, and toxic chemicals** that can be released into the air and water when damaged.

Exposure to Hazardous Materials

✓ Floodwaters can spread **sewage, mold, and bacteria**, leading to infections and respiratory problems.

✓ **Burned debris** from fires can contain **toxic ash and fine particles** that harm lung health.

✓ Debris containing hazardous materials can lead to **burns or toxic exposures**.

Air & Water Contamination

✓ Dust and smoke from disaster debris can worsen **asthma, bronchitis, and other lung conditions**.

✓ **Damaged pipes and flooding** can contaminate drinking water with chemicals, sewage, and bacteria.

✓ **Standing water** in debris piles can attract mosquitoes, increasing the risk of diseases like West Nile Virus.

Mental Health and Stress-Related Illnesses

✓ Living in an environment filled with debris can cause **chronic stress, anxiety, and depression.**

✓ Loss of homes and personal belongings can create **long-term emotional distress** for survivors.

✓ **First responders and cleanup workers** may experience **mental health strain from exposure to hazardous conditions and traumatic events**.

Why does Public Health matter in disaster debris response?

Local health departments play a **critical role** in reducing the health risks of disaster debris. By **monitoring air and water quality, educating the public, and ensuring safe cleanup efforts,** public health officials help protect communities from long-term health impacts.

Population Impacts

Disaster debris does not affect everyone equally. Some populations face **higher risks of injury, illness, and long-term health impacts** due to their physical, social, or economic conditions. These groups may have **more difficulty preparing for, responding to, and recovering from debris-related hazards.**

Who is most at risk?

Older Adults

✓ **More vulnerable to injuries** from unstable debris, falls, and heavy lifting.
✓ More likely to have breathing problems worsened by dust, mold, and smoke.
✓ **Limited mobility** may make evacuation or debris cleanup difficult.

Children

✓ **Higher risk of exposure to toxins** due to frequent hand-to-mouth contact.
✓ **Developing lungs and immune systems** make them more sensitive to poor air and water quality.
✓ More likely to **play near debris piles**, increasing injury risks.

People with Disabilities & Chronic Health Conditions

✓ **Mobility limitations** may make it harder to avoid hazards or evacuate safely.
✓ **Medical needs (oxygen, dialysis, medications)** can be disrupted by debris blocking access to healthcare.
✓ More vulnerable to **stress-related health issues**, such as anxiety and PTSD.

Low-Income Communities

✓ **May lack resources** for safe cleanup, protective equipment, or relocation.
✓ More likely to **live in areas prone to environmental hazards** (e.g., flood zones, industrial areas).
✓ Often have less access to healthcare and emergency assistance.

Outdoor Workers & Cleanup Crews

✓ **Higher exposure to toxic materials** like asbestos, mold, and chemicals.
✓ Increased risk of heat exhaustion, dehydration, and physical injuries during debris removal.
✓ **May not have proper protective equipment** or training on safe handling of hazardous debris.

Why must Public Health address these disproportionate impacts?

Understanding which populations face the greatest risks helps health departments plan better, respond faster, and reduce long-term health impacts.

✓ **Ensure targeted outreach** – Health messaging should be clear, accessible, and available in multiple languages.

✓ **Coordinate resources for vulnerable populations** – Help connect residents with medical care, safe shelter, and protective equipment.

✓ **Monitor health effects after a disaster** – Track long-term health issues related to exposure to toxins, mental health stress, and lack of medical access.

Framework Structure

The **Public Health Preparedness and Response Framework for Disaster Debris** is designed to help local Health Departments **identify risks, take action, and protect public health** before, during, and after a disaster. The framework is divided into **four main sections**.

1. Understanding Health Risks from Disaster Debris

✓ Identifies the **main health concerns** caused by disaster debris, including:

- Exposure to **hazardous materials** (asbestos, lead, chemicals, mold).
- **Injury risks** from unstable structures, sharp objects, and electrical hazards.
- **Water and air contamination** that can spread disease.

✓ Highlights **high-risk populations**, including:

- Older adults, children, and people with disabilities.
- Low-income communities with fewer resources for safe cleanup.
- Workers and volunteers involved in debris removal.

✓ Implements or enhances **surveillance systems** to track debris-related injuries, illnesses, and environmental exposures.

2. Public Health Preparedness Actions

✓ Provides steps for local health departments to prepare for disaster debris, such as:

- Conducting a **debris health risk assessment** to understand local vulnerabilities.
- Developing **community education programs** on safe debris handling.
- Coordinating with emergency management, public works, and environmental agencies.

✓ Includes **tools and templates** to help communities assess risks and plan for disaster debris management.

3. Public Health Response During and After a Disaster

✓ Outlines **key public health responsibilities** when disaster debris is present, including:

- **Monitoring air and water quality** to prevent contamination-related illnesses.
- **Issuing public health guidance** on safe cleanup and personal protective equipment (PPE).
- **Ensuring access to medical care** for injuries and health complications caused by debris.

✓ Helps local health officials **prioritize public health needs** and address challenges in real-time.

4. Coordination and Communication

✓ Defines the role of local health departments in:

- Working with emergency management, public works, and environmental health agencies.
- Ensuring public messaging is clear, accurate, and accessible to all residents.
- Supporting **community recovery** by identifying long-term health concerns linked to debris exposure.

How does the framework help local Health Departments?

✓ **Provides a structured, step-by-step approach** to managing disaster debris from a public health perspective.

✓ Ensures that **public health risks** are addressed in emergency response and recovery plans.

✓ Helps local communities prepare and respond more effectively, **reducing health impacts and disparities** after a disaster.

Public Health Roles & Responsibilities

Local health departments play a **critical role** in disaster debris management by helping to **protect community health, prevent illness and injury, educate the public, and support safe recovery efforts.** While other agencies focus on debris removal and disposal, public health ensures that these efforts do not **create new health risks for residents and workers.**

The Public Health Preparedness and Response Framework for Disaster Debris outlines key actions that local health officials can take before, during, and after a disaster to manage health risks from debris.

What is Public Health's role in disaster debris management?

Preparedness: What Public Health Does Before a Disaster

✓ **Assess Community Risks**

- Help identify **high-risk areas** for disaster debris, including industrial sites, flood-prone zones, and older buildings with asbestos or lead.
- Conduct **community vulnerability assessments** to determine which populations are at the highest risk from debris exposure.

✓ **Develop Public Health Guidance**

- Create **educational materials** on safe debris handling, personal protective equipment (PPE), and exposure risks.
- Work with **emergency management and public works** to include public health concerns in local disaster plans.

✓ **Strengthen Coordination & Partnerships**

- Build relationships with waste management teams, environmental agencies, hospitals, and emergency responders to ensure a coordinated approach.
- Develop **communication plans** to quickly share health warnings and cleanup safety guidance after a disaster.

Response: What Public Health Does During a Disaster

✓ **Monitor and Assess Health Risks**

- Evaluate **air and water quality** for contamination from debris, chemicals, or sewage.
- Track injuries, respiratory illnesses, and other health impacts linked to disaster debris exposure.

✓ **Issue Public Health Warnings & Cleanup Safety Guidelines**

- Provide **clear, timely messaging** about debris hazards, safe cleanup procedures, and where to seek medical help.
- Ensure that information reaches **high-risk populations** (e.g., seniors, non-English speakers, people with disabilities).

✓ **Support Safe Cleanup Efforts**

- Work with emergency management and public works to **ensure debris removal does not create new health hazards** (e.g., dust exposure, contaminated floodwaters).
- Help distribute **PPE (masks, gloves, goggles)** for residents and workers involved in debris removal.

✓ **Ensure Access to Medical Care**

- Assist hospitals and clinics in preparing for an increase in injuries, respiratory illnesses, and stress-related conditions.
- Provide **mental health support** for first responders, cleanup workers, and affected residents.

Recovery: What Public Health Does After a Disaster

✓ **Continue Health Monitoring & Support**

- Track **long-term health impacts** of debris exposure, including respiratory conditions and environmental illnesses.
- Address mental health concerns related to **stress, trauma, and displacement.**

✓ **Evaluate & Improve Disaster Debris Response Plans**

- Conduct **after-action reviews** to assess the public health response.

Recovery: What Public Health Does After a Disaster

- Work with partners to **improve future preparedness efforts** based on lessons learned.

✓ **Support Safe Rebuilding & Environmental Cleanup**

- Advocate for **safe rebuilding practices** to reduce future debris-related health risks.
- Provide guidance on **removing or mitigating hazardous materials** in homes and public spaces.

Why do these roles matter?

✓ **Reduces injuries and illnesses** caused by exposure to hazardous debris.

✓ Ensures vulnerable populations receive necessary support and resources.

✓ **Strengthens collaboration** between health departments and emergency response agencies.

✓ Helps communities **recover faster and more safely**.

Framework Discussion

This section of the seminar is designed to **help participants apply the Public Health Preparedness and Response Framework for Disaster Debris in a real-world scenario**. Participants will break into small groups to **discuss specific challenges and solutions**, then share their findings with the full group. Each group will focus on a **different public health challenge related to disaster debris**. Groups will have **20 minutes to discuss** and prepare a short summary of their key takeaways.

INSTRUCTIONS

1. **Break into Four Groups** – Each group will focus on a different aspect of public health response to disaster debris.
2. **Review the Scenario** – Read the provided scenario and discuss how the situation impacts public health.
3. **Answer Key Questions** – Work together to identify risks, challenges, and solutions based on the framework.
4. **Prepare to Share** – Each group will have **one person report back** to the larger group after 20 minutes of discussion.

SCENARIO

Hurricane Orion, a **Category 2 hurricane**, made landfall in **Region 4AB**, bringing heavy rain, flooding, and winds up to 100 mph. The storm left behind **massive amounts of disaster debris**, including:

✓ **Downed trees and power lines** blocking roads.

✓ **Flooded homes and buildings** contaminated with mold and sewage.

✓ **Collapsed structures** containing asbestos, lead, and hazardous materials.

✓ **Industrial site damage**, leading to potential chemical spills.

✓ **Trash and debris piling up**, creating concerns about rodents and air quality.

Local public health officials must work quickly to **assess risks, issue health guidance, and coordinate response efforts** with emergency management, public works, and community organizations.

Group 1: Identifying High-Risk Populations & Disproportionate Impacts

Goal: Identify the populations most at risk from disaster debris and discuss how to protect them.

Discussion Questions:

- Who is most vulnerable to health risks from the debris (e.g., older adults, children, low-income communities)?
- What barriers might these populations face in receiving public health information or cleanup resources?
- What strategies can public health use to reach and support these populations?

Notes:

Group 2: Assessing Public Health Response Capabilities

Goal: Evaluate local health department readiness to respond to disaster debris issues.

Discussion Questions:

- What public health resources and personnel are available for debris response?
- What challenges do health departments face in addressing disaster debris risks?
- What partnerships or tools would strengthen the public health response?

Notes:

Group 3: Strategies for Coordination with Emergency Management

Goal: Explore ways public health can collaborate with emergency management and public works to ensure a safe, effective response.

Discussion Questions:

- How should local health departments work with emergency management before, during, and after a disaster?
- What information does public health need from emergency responders to assess debris risks?
- What are some effective ways to **share public health messaging** with emergency management partners?

Notes:

Group 4: Environmental and Regulatory Considerations

Goal: Identify key environmental health concerns related to disaster debris and discuss regulatory requirements.

Discussion Questions:

- What environmental health hazards (e.g., chemical spills, asbestos exposure, mold growth) must be addressed?
- What regulations or guidelines must be followed for safe debris removal and disposal?
- How can public health officials help ensure compliance with environmental safety laws?

Notes:

Framework Refinement and Next Steps

Now that we've explored the Public Health Preparedness and Response Framework for Disaster Debris through discussion and a real-world scenario, we will focus on **refining the framework and planning the next steps**.

This session will help ensure that the framework is **clear, practical, and useful for local health departments**.

Step 1: Identifying Gaps & Improvements (10 Minutes)

Group Discussion:

1. **What's missing?** Are there any **critical issues, challenges, or strategies** that should be added?
2. **What could be clearer?** Are any sections **too complex, too broad, or difficult to apply?**
3. **What works well?** Which parts of the framework **best support local health departments** in their role?

Step 2: Prioritizing Action Items (5 Minutes)

Group Discussion:

1. What are the **top three changes** that should be made first?
2. Are there existing **resources or partners** that could help strengthen this framework?
3. What **guidance or support** do you need from the Region 4AB Coalition to apply this framework in your community?

Step 3: Next Steps & Closing (5 Minutes)

What Happens Next?

✓ The feedback from today's seminar will be used to **revise and improve the framework**.

Step 3: Next Steps & Closing (5 Minutes)

✓ The framework will serve as the foundation for a Multi-Year Integrated Preparedness Plan (MYIPP) to **guide future planning, training, and exercises**.

How can seminar participants stay involved?

✓ Region 4AB will provide **updates on implementation, training opportunities, and next steps** for integrating the framework into local plans.

✓ Health departments are encouraged to **apply the framework in upcoming preparedness efforts** and share lessons learned.