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Public Health Research and Surveillance Priorities from the East Palestine Train Derailment: A Workshop

Health and Medicine Division
Board on Health Sciences Policy

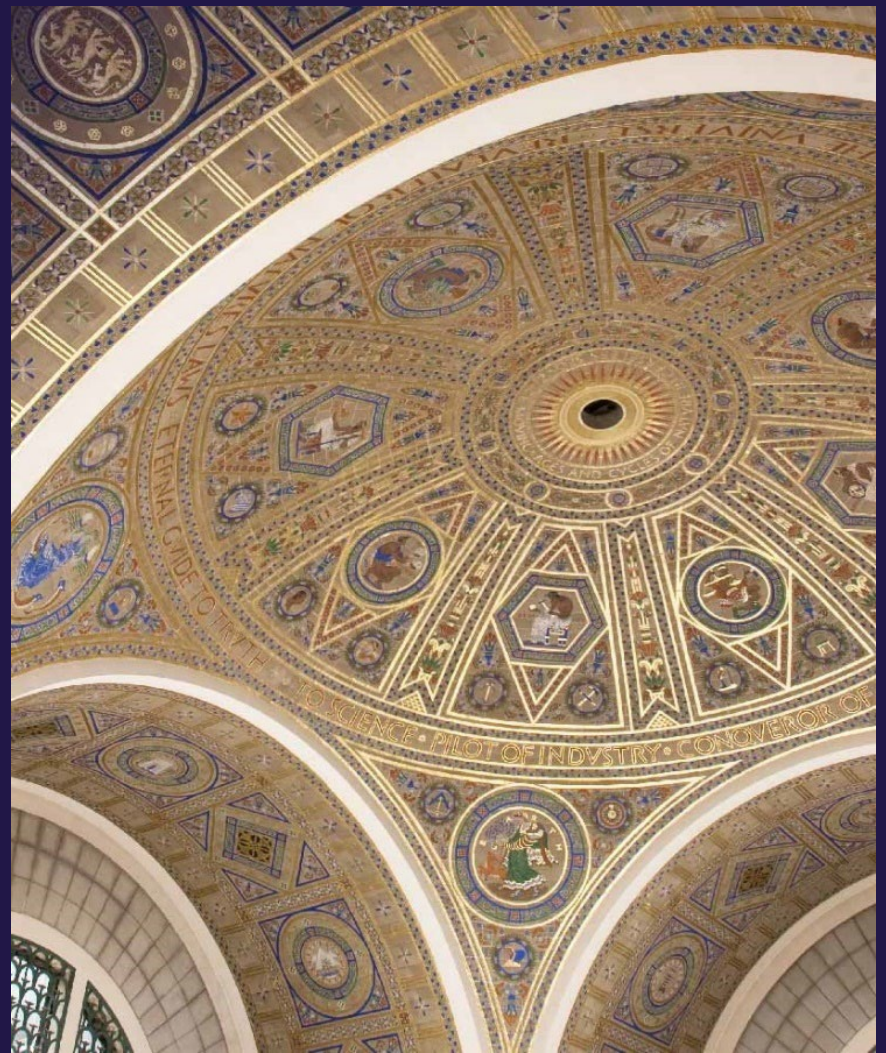
November 6 – 7, 2023

NOVEMBER 2023

Session I
Welcome and Opening Remarks, and Overview of the Agenda

Kristen Malecki, *Workshop Chair*
University of Illinois – Chicago

Richard Woychik
NIEHS



01

Public Health Research and Surveillance Priorities from the East Palestine, Ohio Train Derailment: A Workshop

Workshop Planning Committee

KRISTEN MALECKI, M.P.H, PH.D.
PLANNING COMMITTEE CHAIR
Director, Division of Environmental and Occupational Health Sciences
University of Illinois Chicago

THOMAS BURKE, PH.D.
Professor Emeritus
Johns Hopkins Bloomberg School of Public Health

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Richard Woychik
Director
National Institute of Environmental Health Sciences
National Toxicology Program

Workshop Scope and Objectives

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- Exposures associated with the train derailment;
- Physical, mental, social, and behavioral health impacts;
- Acute and long-term health effects of exposure, including formation of new exposures associated with burning rail cars, as well as complex, mixed exposures and cumulative risks;
- Surveillance regarding health risks, including, for example, specific health endpoints, populations to be followed, and duration of surveillance; and
- Lessons learned from prior disasters that can inform health care measures and public health interventions in the current context.

Agenda

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Welcome and Opening Remarks, and Overview of the Agenda

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Impact of the East Palestine Train Derailment

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Hazards, Exposures, and Risks

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Risk Characterization and Response

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Chair's Reflection and Preview to Workshop 2

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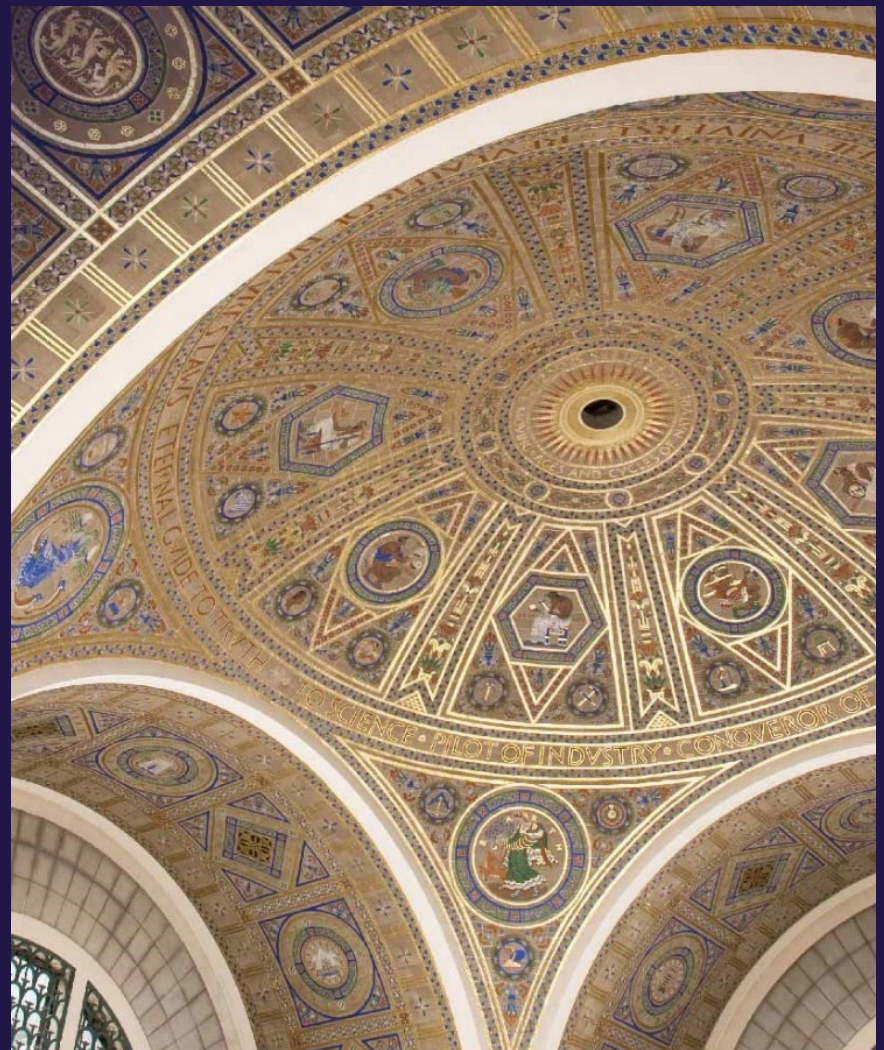


02

Impact of the East Palestine Train Derailment

Community Reflections

Harold 'Fritz' Nelson, *Moderator*
Pastor First United Presbyterian Church of East Palestine
Planning Committee Member

Jess Conard
Appalachia Director
Beyond Plastics

Christa Graves
Resident
Columbiana County

Zsuzsa Gyenes
Resident
Columbiana County

Bill Sutherin
Director
United Methodist Committee on Relief

Impact of the East Palestine Train Derailment

Provider Reflections

Roberta Lavin, *Moderator*
Professor and Deputy Director
Center for Health Equity and Preparedness
University of New Mexico College of Nursing

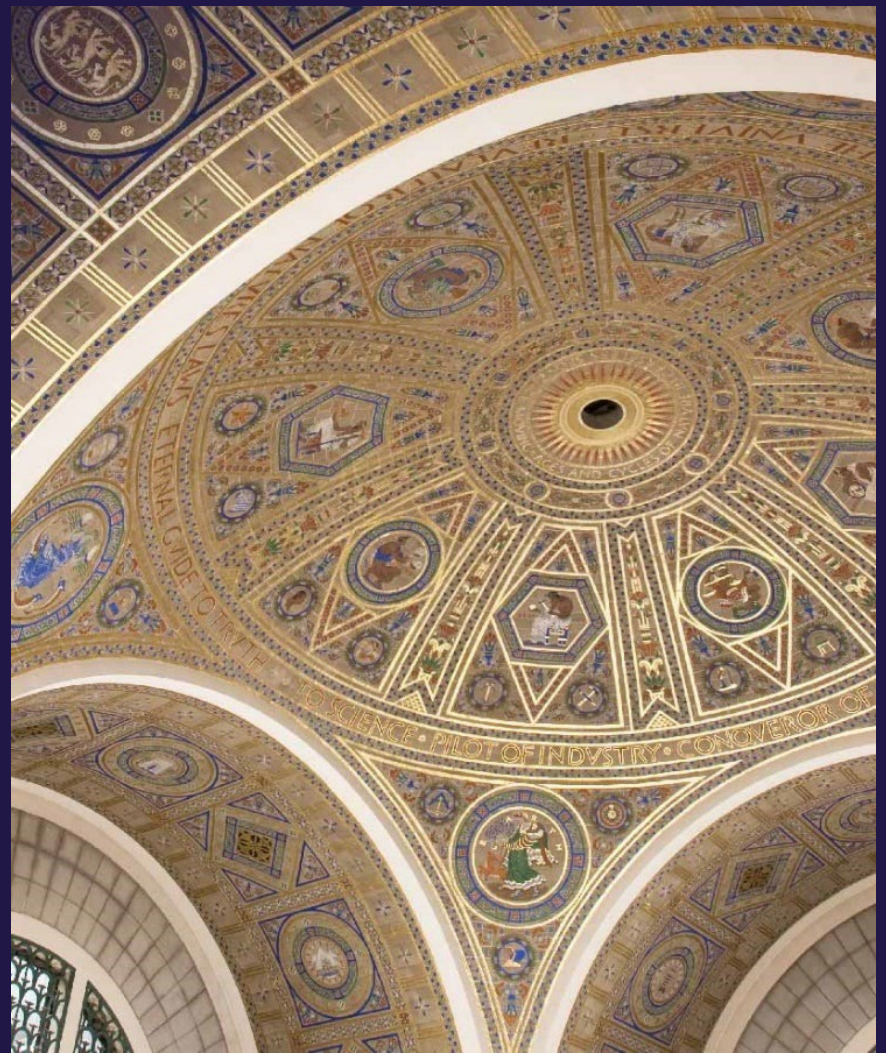
Kristen Barefield
Family Therapist
Metta Wellness

George Garrow
Chief Executive Officer
Primary Health Network

Gretchen Nickell
Chief Medical Officer
East Liverpool City Hospital

Marcy Patton
Executive Director
Columbiana County Mental Health and
Recovery Services Board

Session III
Hazards, Exposures, and Risks



03

Hazards, Exposures, and Risks
Environmental Monitoring and Exposure Science

Andrew Whelton, *Moderator*
Director, Healthy Plumbing Consortium and Center for Plumbing Safety
Professor of Civil, Environmental, and Ecological Engineering
Purdue University
Planning Committee Member

Mark Durno
Homeland Security Advisor
U.S. EPA Region 5

Albert Presto
Research Professor, Mechanical Engineering
Carnegie Mellon University

Hazards, Exposures, and Risks
Human Health Impacts

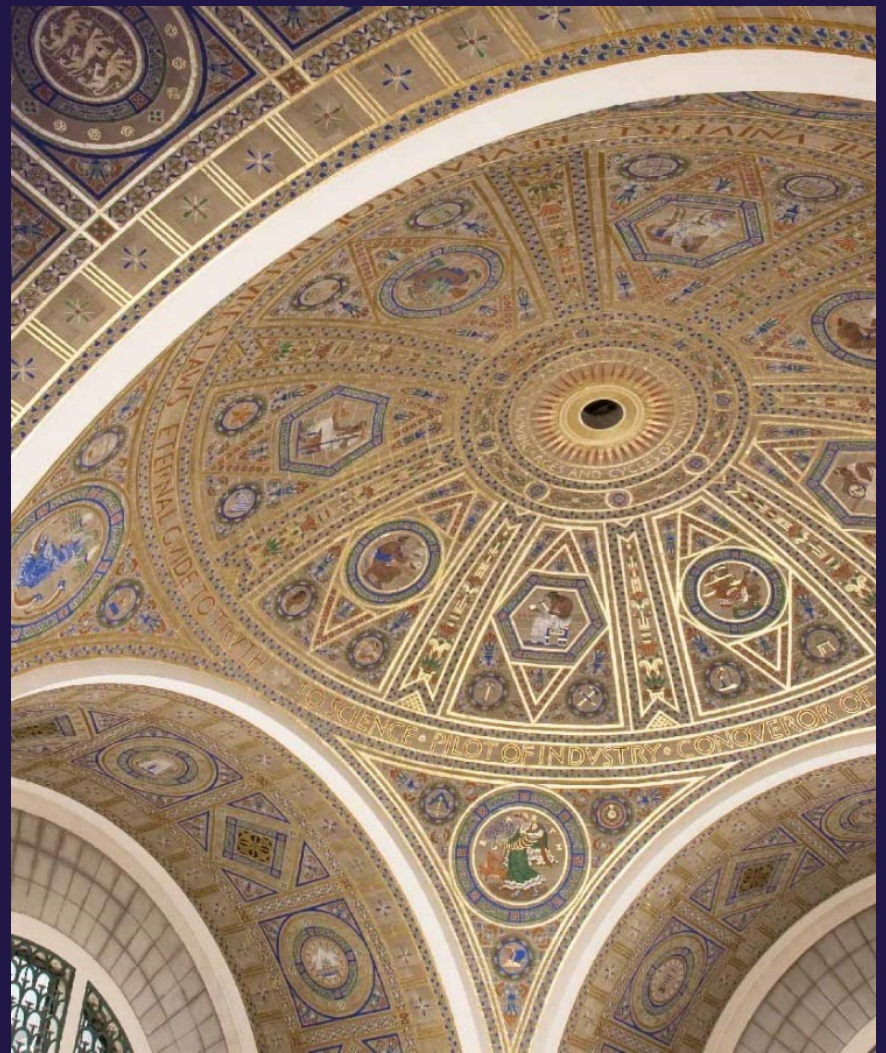
Erin Haynes, *Moderator*
Chair, Department of Epidemiology and Environmental Health
University of Kentucky
Planning Committee Member

Motria Caudill
Regional Director
ATSDR Region 5 Office

Nicholas Newman
Director
Environmental Health and Lead Clinic
Cincinnati Children's Hospital Medical Center

Lauryn Spearing
Assistant Professor in Civil, Materials, and
Environmental Engineering
University of Illinois – Chicago

Session IV
Risk Characterization and Response



04

Risk Characterization and Response
Risk Characterization and Communication

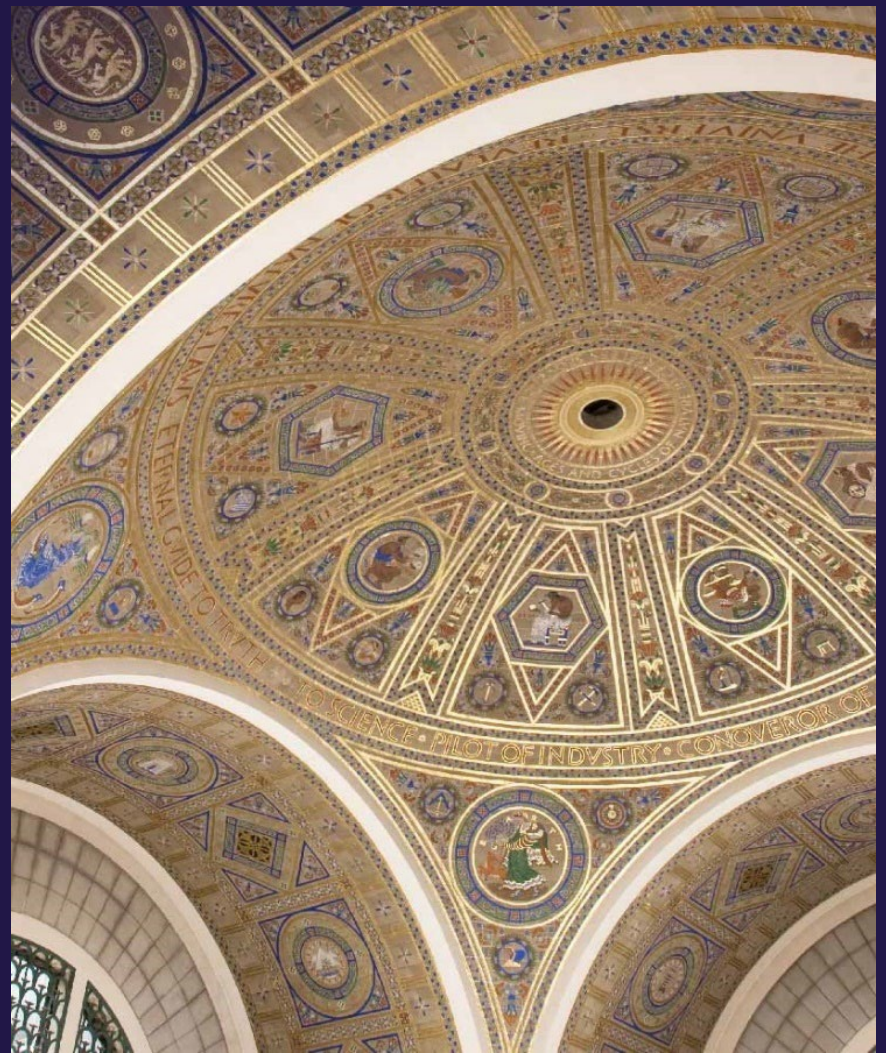
Keeve Nachman, *Moderator*
Associate Professor
Johns Hopkins Bloomberg School of Public Health
Planning Committee Member

Weihsueh A. Chiu
Professor, Veterinary Physiology and Pharmacology
School of Veterinary Medicine and Biomedical Sciences
Texas A&M University

Sue Fenton
Director
Center for Human Health and the Environment
North Carolina State University

Wesley Vins
Health Commissioner
Columbiana County General Health District

Session V
Chair's Reflection and Preview to Workshop 2



05

HOLD for day 1 recap and talking points

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Health and Medicine Division
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Day 2, Tuesday, November 7, 2023

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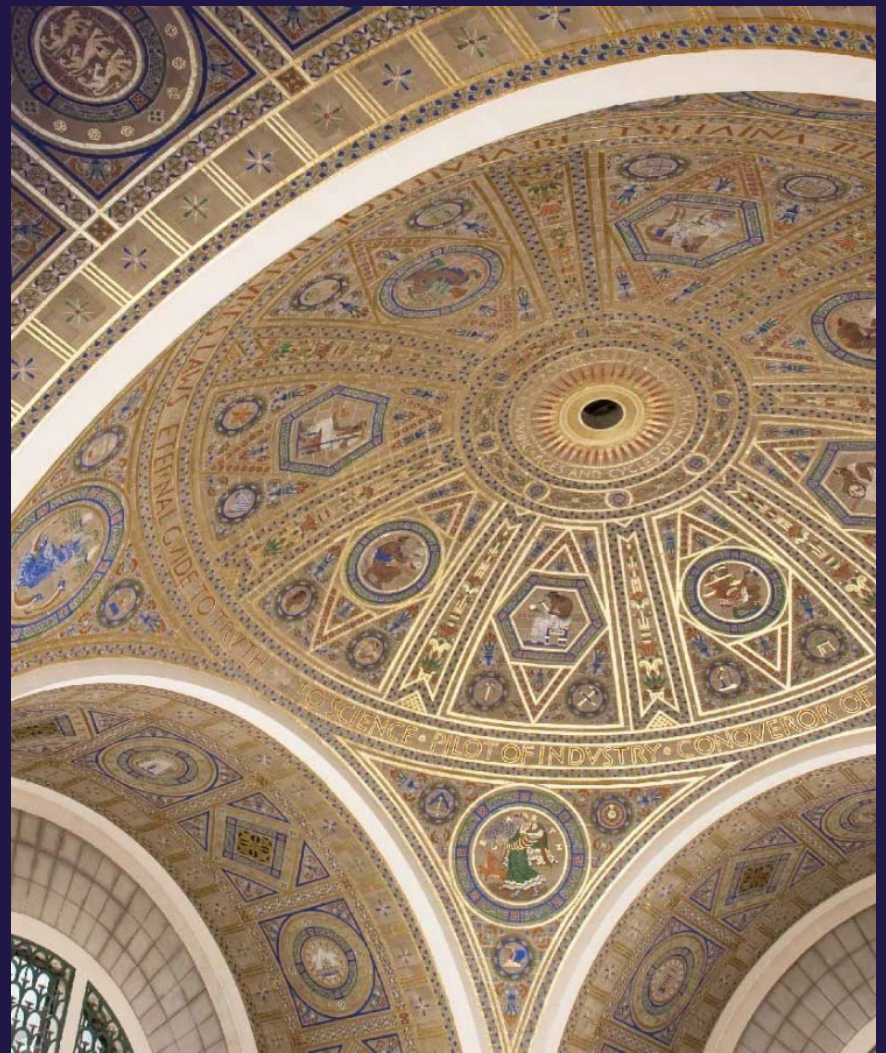
Session VI
Welcome and Overview

Kristen Malecki, *Workshop Chair*
University of Illinois – Chicago



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Day 1 Recap – Where it began and where we are today (Community and Dr. Spearing)

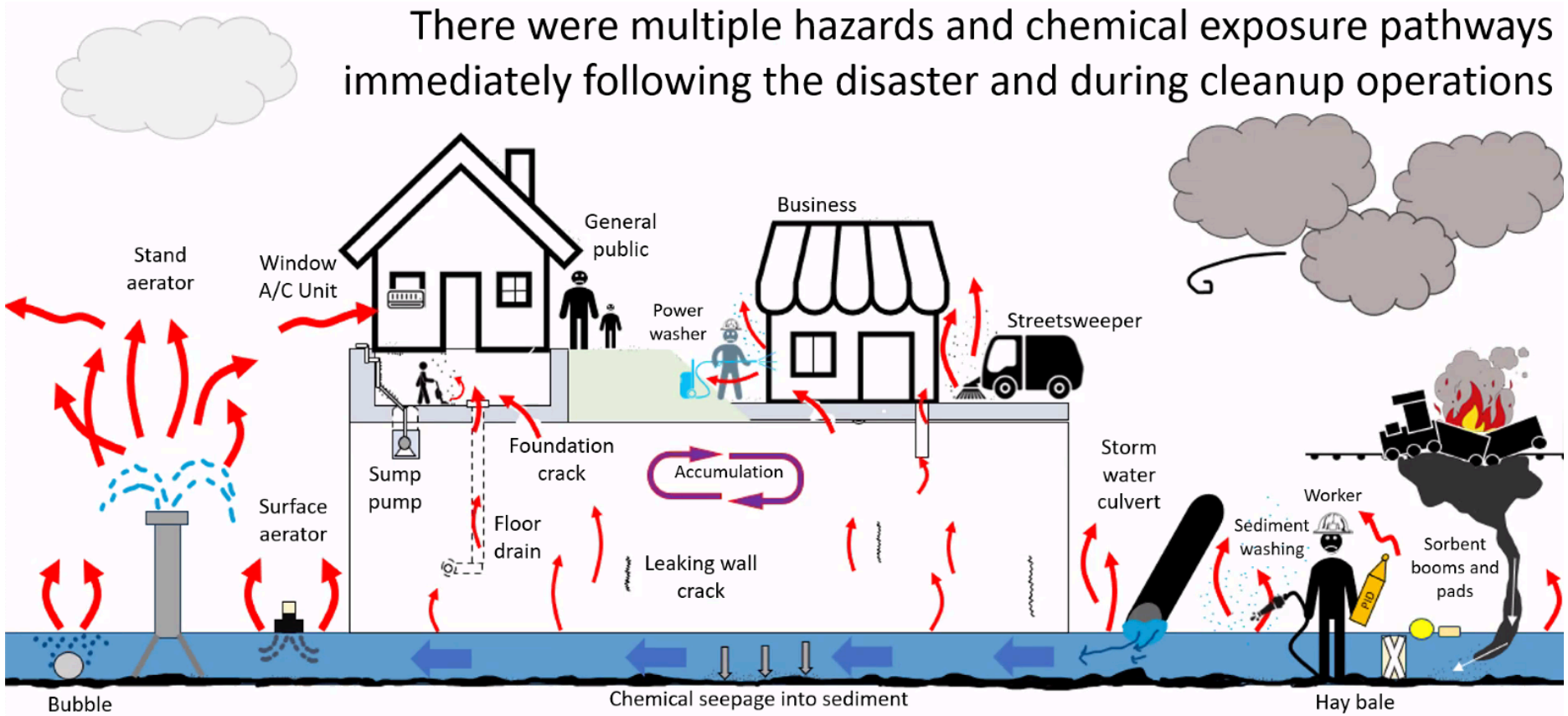
- Multi-State Disaster (Largely Ohio and Pennsylvania)
- Persistent and ongoing challenges with health and well-being in the East Palestine Ohio community
- Nine months post-disaster communities are still experiencing adverse outcomes from the train derailment and subsequent burn
  - Many families were responders, Many young families live in the areas, Many residents were displaced (over 50%)
  - Odors in the home (greater than 61%)
  - The community remains divided and concerned, many remain displaced
  - Looking for action more than future recommendations

Day 1 Recap – Where it began and where we are today (2)

- Primary sources of trusted information were not always considered to be the EPA and CDC
- Feelings of anxiety, depression, stress and hopelessness
- Many psychosocial and mental health impacts attributed to:
  - trauma of disaster, displacement, health impacts, uncertainty of unknown and future impacts
  - gaslighting with Norfolk Southern taking the lead on response
  - uncertainty in data and response
  - a divided community
- Need to monitor populations into the future – particularly the ongoing symptoms and potential unknown symptoms based on exposures.
- Need to get answers and improve the volume and coordination of information and coordination to inform understanding the exposure-response relationships
- **Need to spend resources towards action, rather than more recommendations**

Hazard Assessment: Andrew Whelton, Albert Presto, Mark Durno

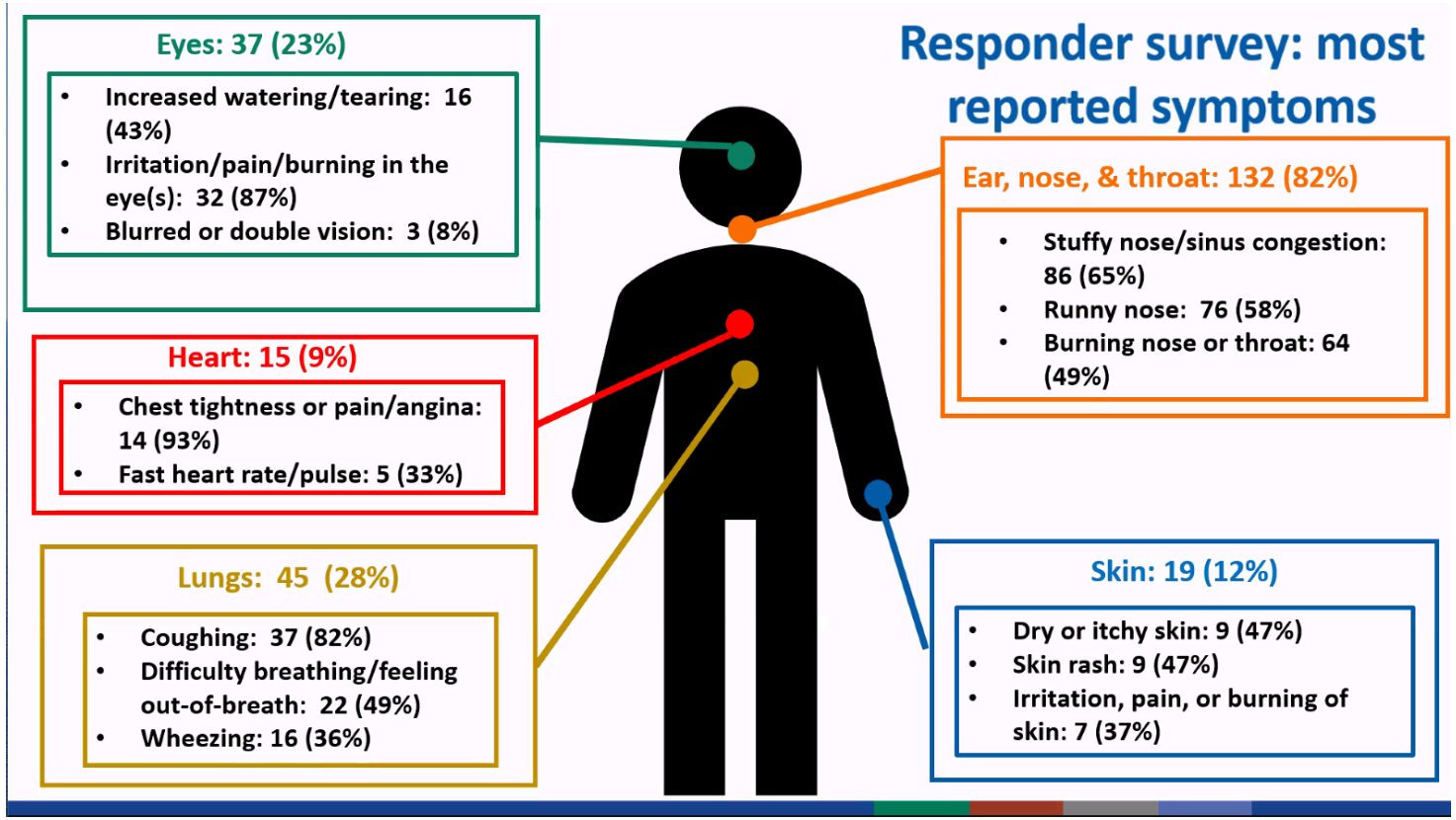
Environmental Monitoring and Exposure Routes are Complex



Early Data Collected Consistent with Community Concerns

- First responders not using PPE = at risk
- The ACE questionnaire and the PCC showed respiratory symptoms of initial concern, multiple symptoms per individuals

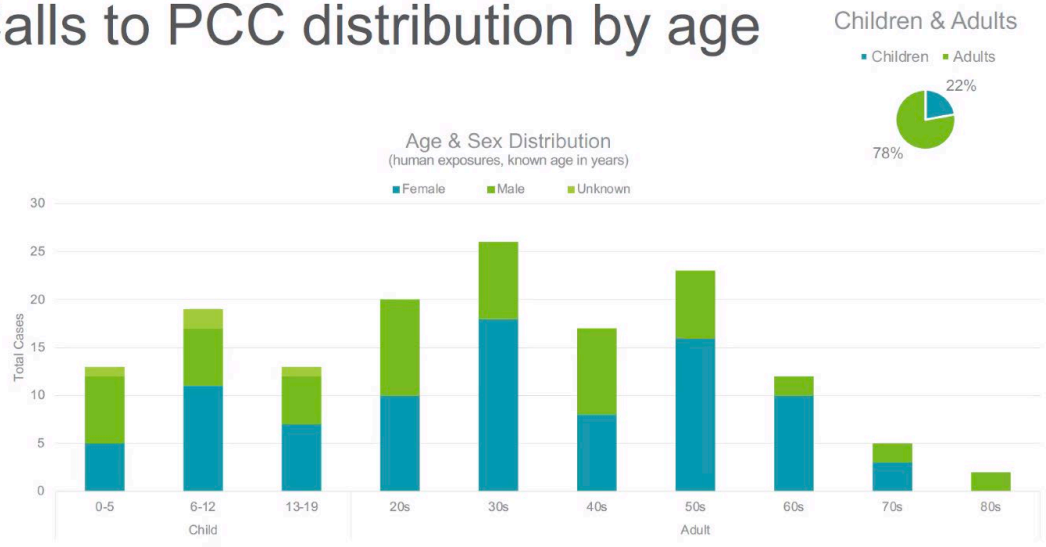
Dr. Motria Caudill,
ATSDR Region 5 Office



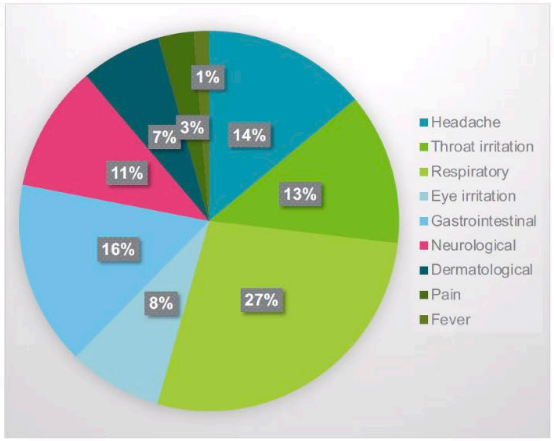
Impacts in the community were experienced across the lifecourse

- Dr. Newman presented that individuals originally reporting symptoms to the poison control centers were across the age spectrum
- Need for more specific information and concise health fact sheets
- Clinical responders were un-prepared to respond to the environmental contamination

Calls to PCC distribution by age



Summary of common symptoms



- Respiratory symptoms were most common
- Neurological symptoms were next most common
  - Headache was most common symptom overall
- Multiple symptoms per caller

Need to prepare clinicians and providers with information to respond rapidly in disasters

- ATSDR information – provided and revised overtime
- Providers wanted and expressed need for more detailed information
- Need easily digestible information
- Need better and easier systems for providers to track and respond within EMR and in their clinical work
- Additional clinical training for environmental health sciences and how to access up to date information

Need for concise health factsheets

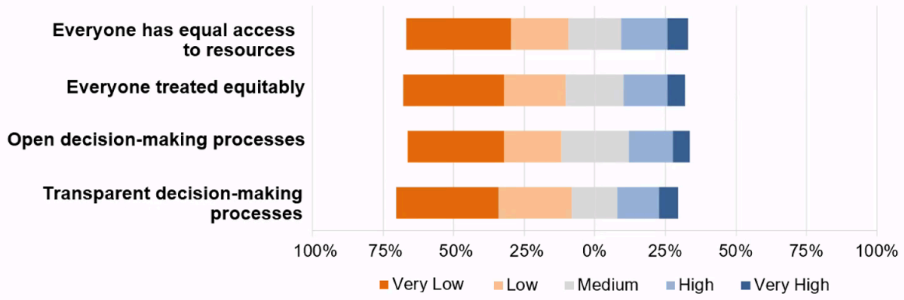
- Many clinical/public health recommendations for East Palestine chemicals very old
- Current documents are encyclopedic in scope
- Studies in children, pregnant women limited
- Difficulties in translating occupational exposure parameters to community exposures
- Overall lack of training of health care providers in environmental health
- Concerns were directed to regional poison centers

Cincinnati Children's | University of Cincinnati

Risk Perceptions and Risk Communication – distributing environmental risk information

Perceptions about equity and fairness

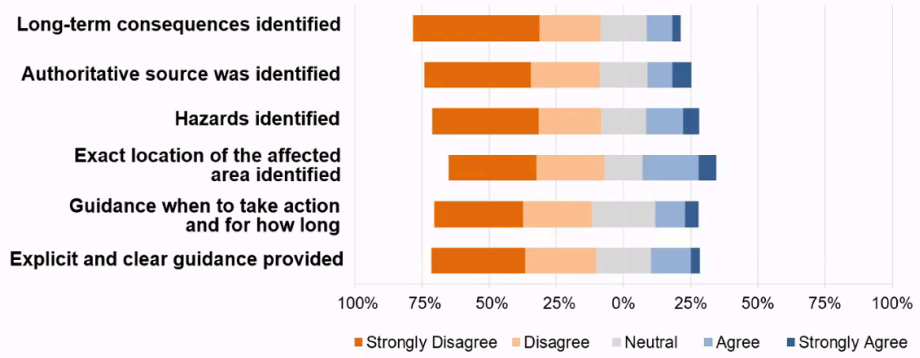
- Equity and fairness were rated low, on average, in the community
- Results show the importance of clearly defining and communicating emergency resource allocation processes



- Community residents felt discouraged by lack of equal access to information
- Limited transparency and openness in response
- Guidance on hazards, exposures, long term impacts and how to take action remained uncertain and unclear
- Recommendations – to improve risk communication for community and providers moving forward

Perceived communication of risks

- Measured based on aspects of effective messaging shown to motivate community members to take protective action (body of work by Mileti et al.)
- Many participants did not feel they received explicit and clear guidance or that long-term consequences were identified



Dr. Spearing NATIONAL ACADEMIES Sciences Engineering Medicine

UIC

Early health impacts persisted 9-months later (Dr. Erin Hayes) – important ongoing research

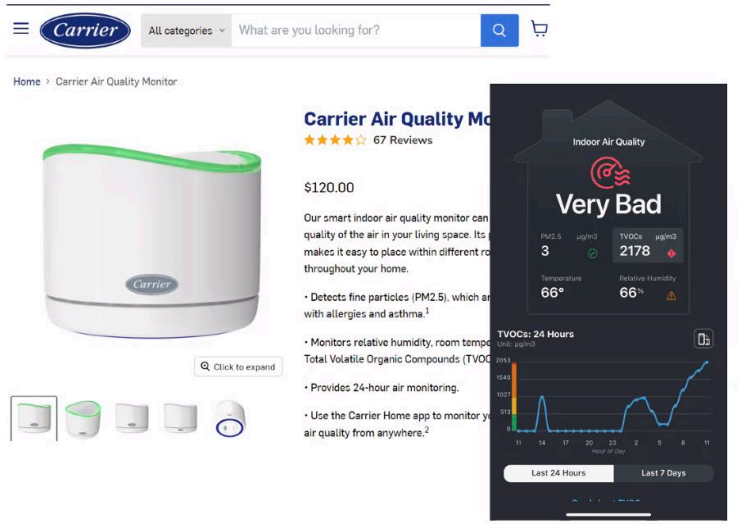
New symptoms as of 9/14/2023	ADULTS, N=386 N(%)	CHILDREN, N=114 N(%)
Upper airway: nose irritation/sinus drainage/sinusitis/eye irritation/lacrimation/sore throat	247 (64%)	72 (63%)
Headache, non-sinus headache	225 (58%)	69 (61%)
Shortness of breath/decreased exercise tolerance	109 (28%)	16 (14%)
Lower airway: cough, wheezing	176 (46%)	48 (42%)
Asthma exacerbation, bronchospasm	42 (11%)	13 (11%)
GI: nausea, vomiting, abdominal pain, diarrhea	120 (31%)	32 (38%)
Rash	91 (24%)	29 (25%)
Lethargy/Tiredness/weak	123 (32%)	26 (23%)

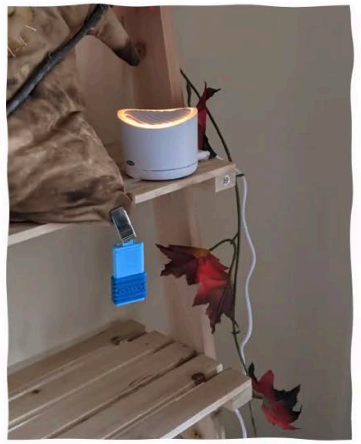
Better Tools for Long-term and Initial Response are Needed – Erin Hayes, Mark Durno

Biological Pilot Study, n=20
July 17-18, 2023
First United Presbyterian Church

- Blood:
  - dioxin (CDC)
  - immune function (Univ of Kentucky)
- Urine:
  - *developing new methods* for vinyl chloride and acrolein metabolites and butyl-acrylate and 2-ethylexyl acrylate (Wayne State University)

Paired Community-Led Air Monitoring with VOC badges





Future Directions – Dr. Whelton

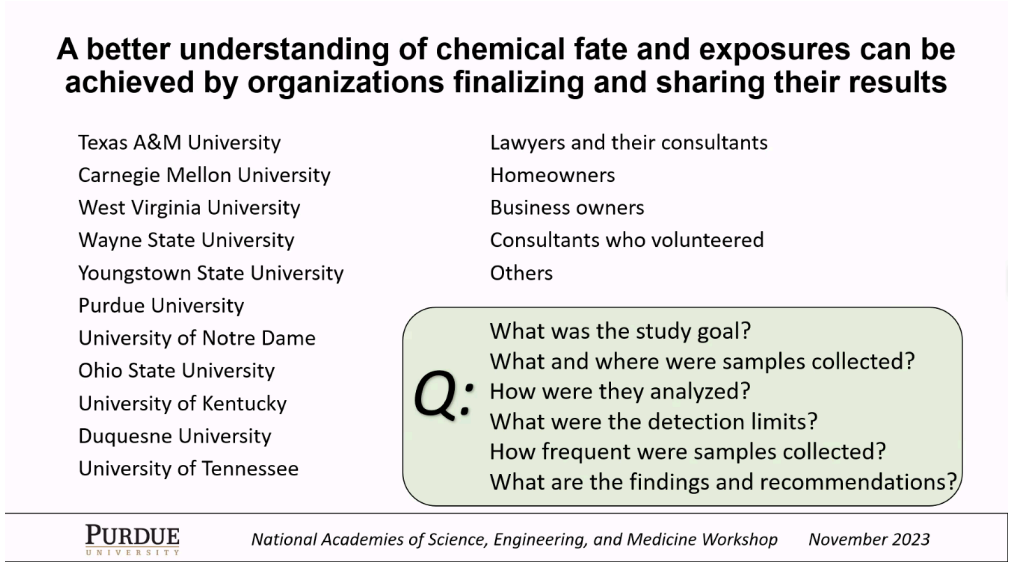
The Next Chemical Disaster:

Research and Policy Needs To Better Protect Public Health and Inform Post-Disaster Health Studies

1. Formal check-down approach to identify the chemical exposure pathways
2. Chemical modeling to predict exposures when creeks are aerated
3. Checklist of pros/cons of equipment and analytical methods
4. Guidance on analytical screening for “unknowns” in water/air/soil and on surfaces
5. Train decision makers about monitoring equipment limitations and PPE
6. Setup mechanisms to rapidly engage academic institutions for advanced analytical capabilities and decision-making which commercial laboratories and government labs often do not have

PURDUE UNIVERSITY *National Academies of Science, Engineering, and Medicine Workshop November 2023*

Dr. Whelton and Dr. Newton – Moving Forward



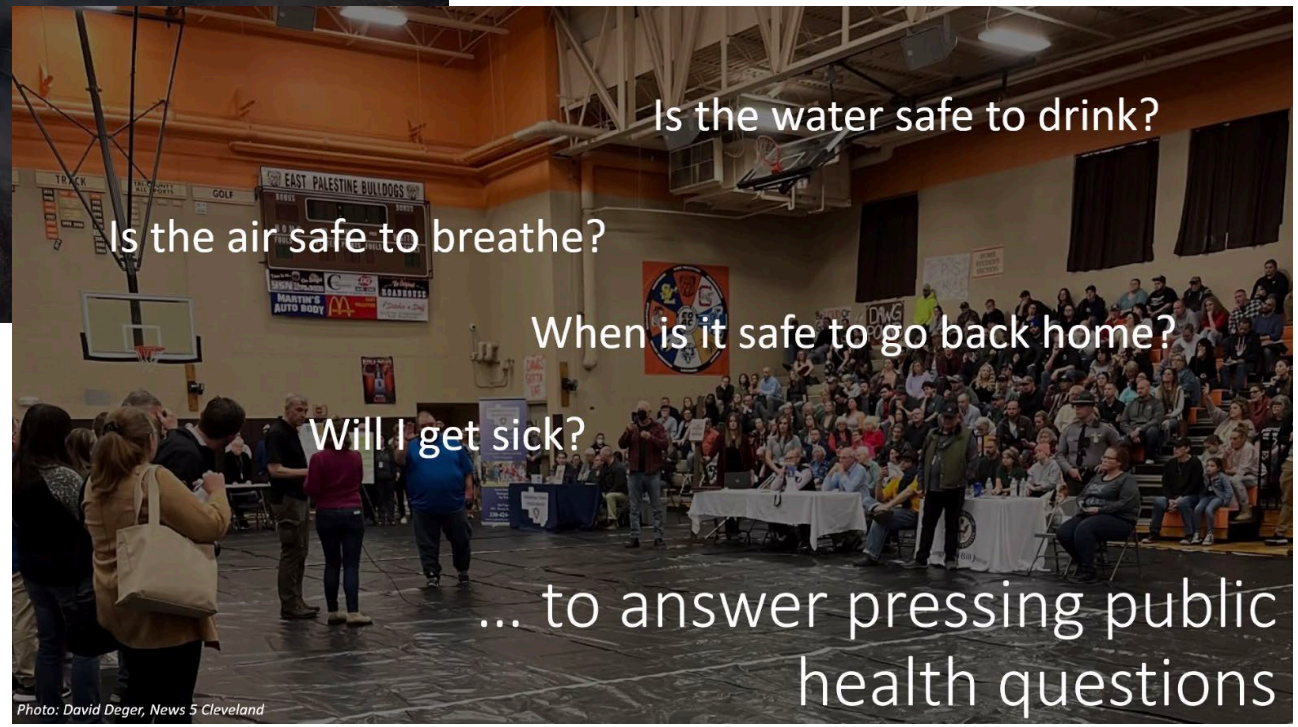
- Dr. Whelton

- Need a broader network of health care and public health providers to coordinate the response
- Constant community engagement during the response and communicating through community groups in disseminating information to the public
- Need to build trust
- Translation of information
- Better coordination of response
- More flexible funding mechanisms to get trusted academics involves
- Better mechanisms to coordinate response across regions
- Multi-agency response needs more centralization– including ATSDR and PCC who are continuing to learn and respond

    - Dr. Newman, Dr. Caudill, Dr. Spearing

Risk Assessment and Risk Communication – Perhaps a Cumulative Impacts Assessment Approach

Dr. Keeve Nachman



Risk Assessment

Planning and Conduct of Risk Analysis

- Hazard Identification
  - *Evaluate evidence describing hazard-outcome relationships*
- Dose-Response Assessment
  - *Quantify dose-response relationships*
- Exposure Assessment
  - *Estimate magnitude of exposure to hazard among populations of interest*
- Risk Characterization
  - *Integrate prior steps to provide estimates of cancer risk and non-cancer hazards and describe associated uncertainties*

In the context of a disaster:

- What evidence suggests exposure to released/newly formed chemicals can make people sick?
- How does the risk of becoming sick change as exposure increases?
- For each chemical, how much did the different groups of exposed persons breathe, ingest, or have contact their skin?
- Given everything we know, how likely is it that different groups of people will get sick?
- What are the most important gaps in our knowledge and how do they influence our confidence in answering these questions?

Acknowledging the complexity and other challenges in the context of disasters

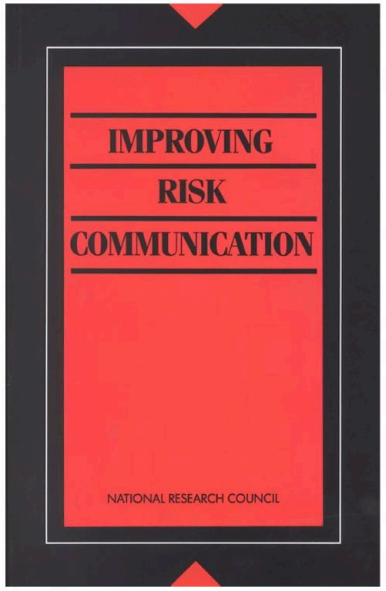
- Approaches to risk assessment were built to handle one chemical at a time vs. reality of many chemicals and other stressors

Risk Management and Communication

- Examine relative benefits and costs of proposed intervention strategies
- Integrate results of risk analyses with other key considerations to weigh intervention strategies
  - Technological feasibility, costs, societal values, tradeoffs, other considerations

Moving towards research and action.....

- Expand the data- advance the research
- We need to act fast
- We need to fill the data and uncertainty gaps
- Empower action



Why Now? Listen to the Community -

- It is exhausting every day to wake up and have to make these decisions.....
- It is now time to get some real work done
- "It is very simple- take care of the people"

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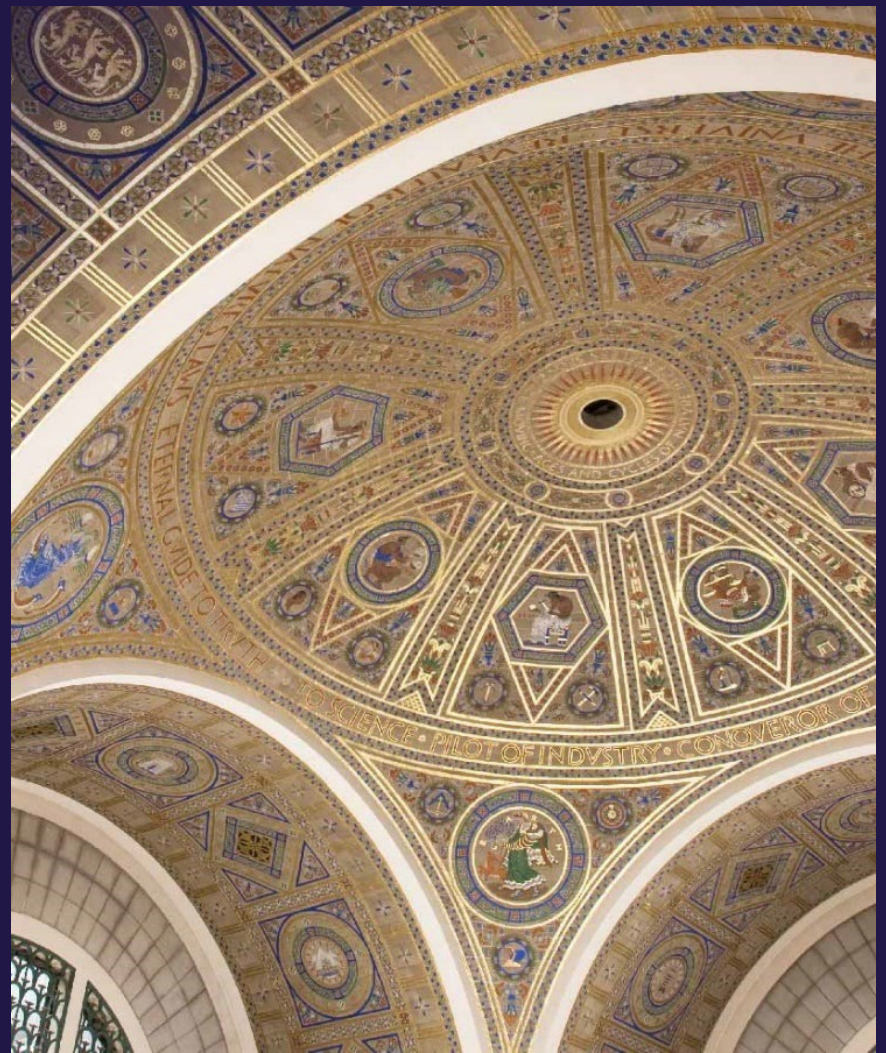

07

Lessons from Past Disasters

Michele Marcus, *Moderator*
Professor, Epidemiology, Environmental Health and Pediatrics
Emory University
Planning Committee Member

Mona Hanna-Attisha
Associate Dean for Public Health
Michigan State University College of Human Medicine

Jennifer Horney
Founding Director and Professor
Epidemiology Program
University of Delaware

Melanie Pearson
Associate Professor of Environmental Health
Emory University Rollins School of Public Health

LEARNING FROM PAST DISASTERS

MELANIE PEARSON, PH.D.
Associate Professor of Environmental Health
Emory University Rollins School of Public Health

MONA HANNA-ATTISHA, M.D., M.P.H.
Associate Dean for Public Health
Michigan State University College of Human Medicine

JENNIFER HORNEY, PH.D., M.P.H., CPH
Founding Director and Professor
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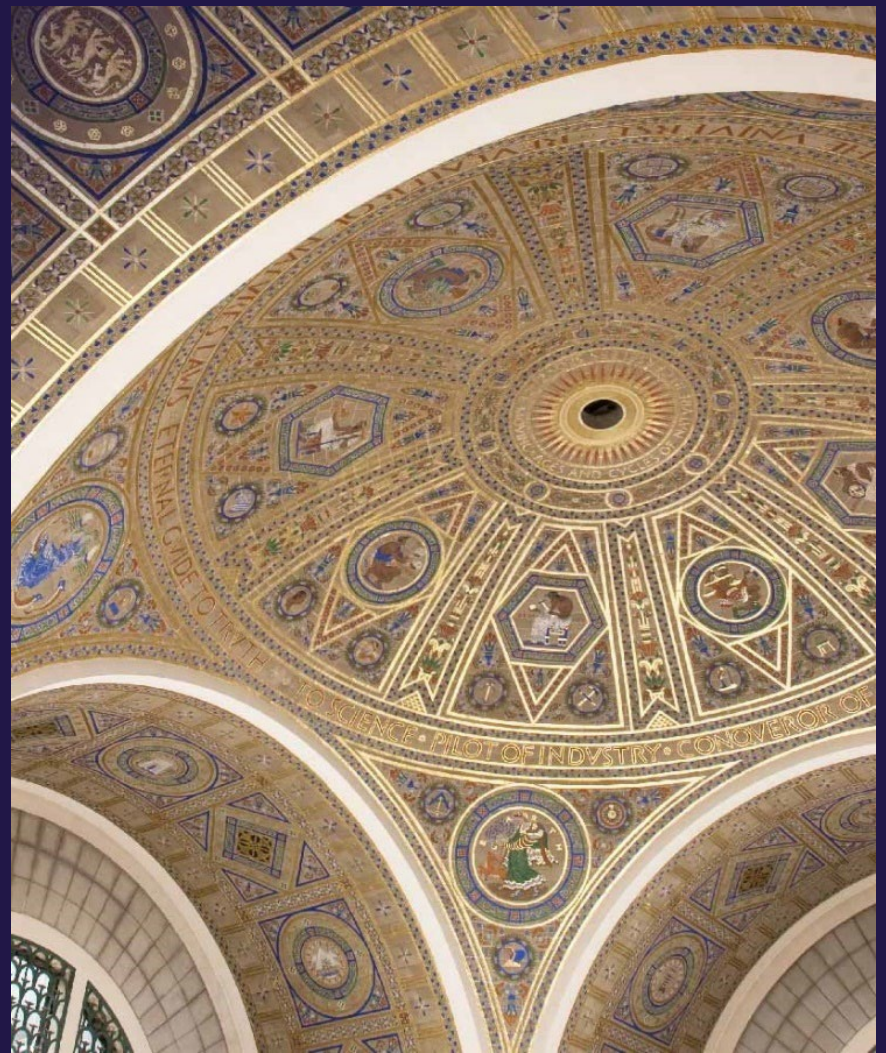
Session VIII
Addressing Potential Long-Term Community Health Impacts



08

Pitt Public Health

Celebrating 75 Years!

Addressing potential long-term Community health impacts

Maureen Lichtveld, MD, MPH
Dean

School of Public Health
Professor, Environmental and Occupational Health
Jonas Salk Chair in Population Health

“We shouldn’t be left here to wait and see”

Christa Graves,
East Palestine, Ohio, resident

Addressing Potential Long-Term Community Health Impacts

Maureen Lichtveld, *Moderator*
Dean
University of Pittsburg School of Public Health
Planning Committee Member

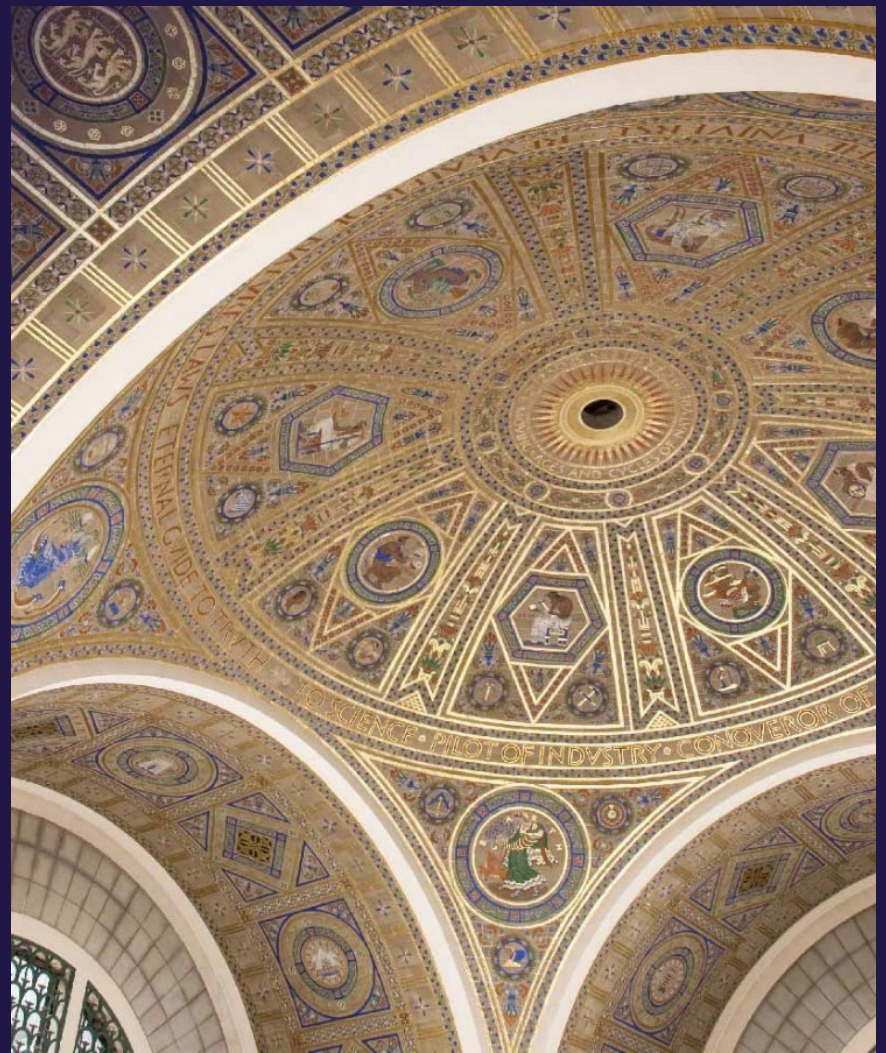
Manish Arora
Professor and Vice Chairman
Environmental Medicine and Public Health
Icahn School of Medicine
Mount Sinai

Julianne Beier
Assistant Professor of Medicine
University of Pittsburgh

Linda Birnbaum
Adjunct Professor
Department Of Environment Sciences and Engineering
University of North Carolina Gillings School of
Global Public Health

Judy Westrick
Director
Lumigen Instrument Center
Wayne State University

Session IX
Centering the Community when Contemplating Research After Disaster



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Centering the Community when Contemplating Research after Disaster

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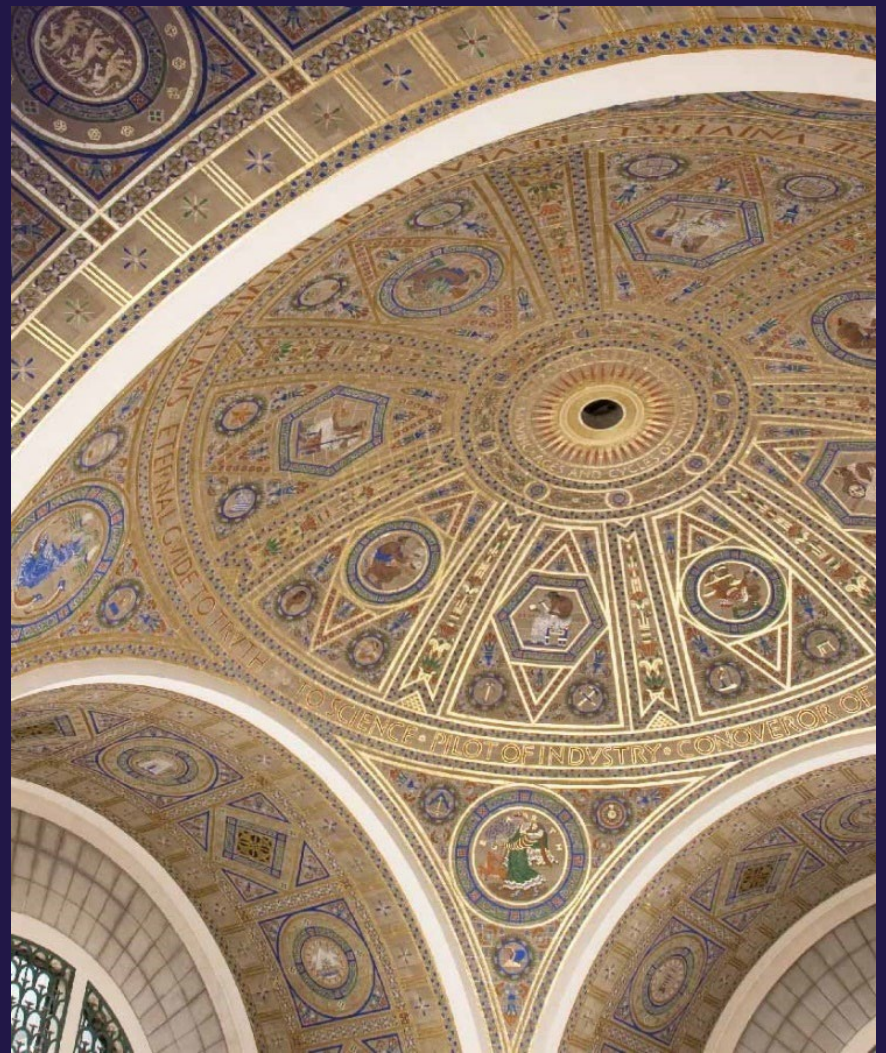
Session X
Recap, Discussion, and Closing Remarks



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Moving Forward to Support Human Health and Well-Being in East Palestine

Reflections from the virtual workshop – Public Health Research and Surveillance Priorities from the East Palestine Train Derailment and Burn

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Audience and Workshop Participants

What are your takeaways?

What are your thoughts from the workshop?

How do we prioritize moving forward – knowing resources are always limited?

Learning From Past Disasters

When there is not a disaster, most often we don't care what is going on…. –Dr. Horney

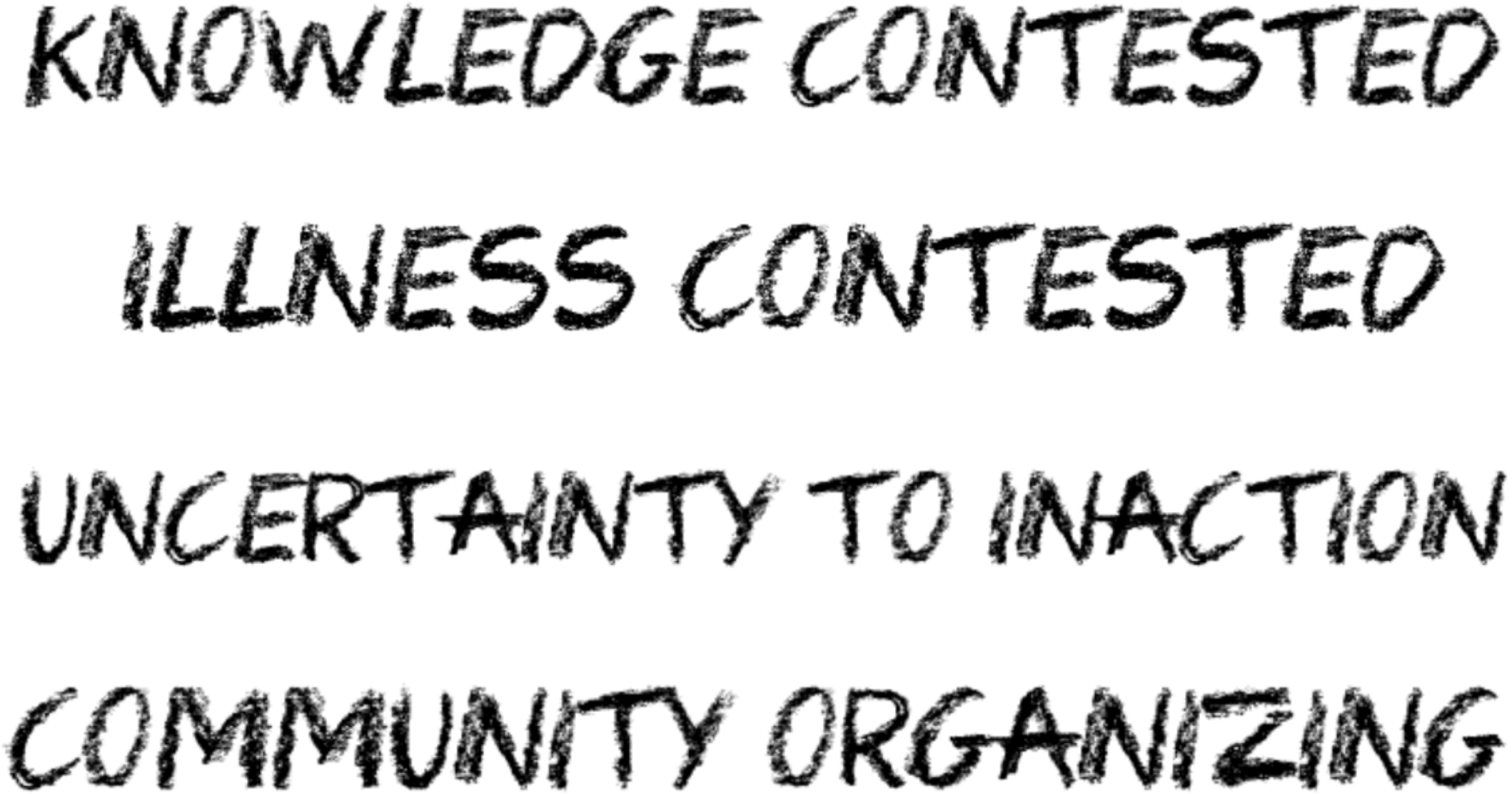
We need to "listen and respond and err on the side of precaution…. We need to be really really good listeners"- Dr. Hannah Attisha

AND

"Morally and ethically", we can't sit back and just listen.. We need to take action

"The trauma is as toxic as the exposures"

"The stakes are high, we have a small window, but we need to get this right"



Citations: Seidman, S. Contested Knowledge: Social Theory Today, 6th ed.; John Wiley & Sons, Ltd.: Hoboken, NJ, USA, 2016.
Brown, P. Toxic exposures. In Toxic Exposures; Columbia University Press: New York, NY, USA, 2007. (Font: www.ffonts.net)

Need for Community-Driven Surveillance and Monitoring

Registries have been shown to be very effective in monitoring long term impacts of past disasters- Resources and more investment in longitudinal studies is key

The Red Hill disaster in Hawaii is a similar disaster with volatile/petroleum based exposures – learning from Flint and WTC disasters in creating the registry

Need to have a trauma informed lense – “The trauma is as toxic as the exposure” and trauma is recurrent and multigenerational

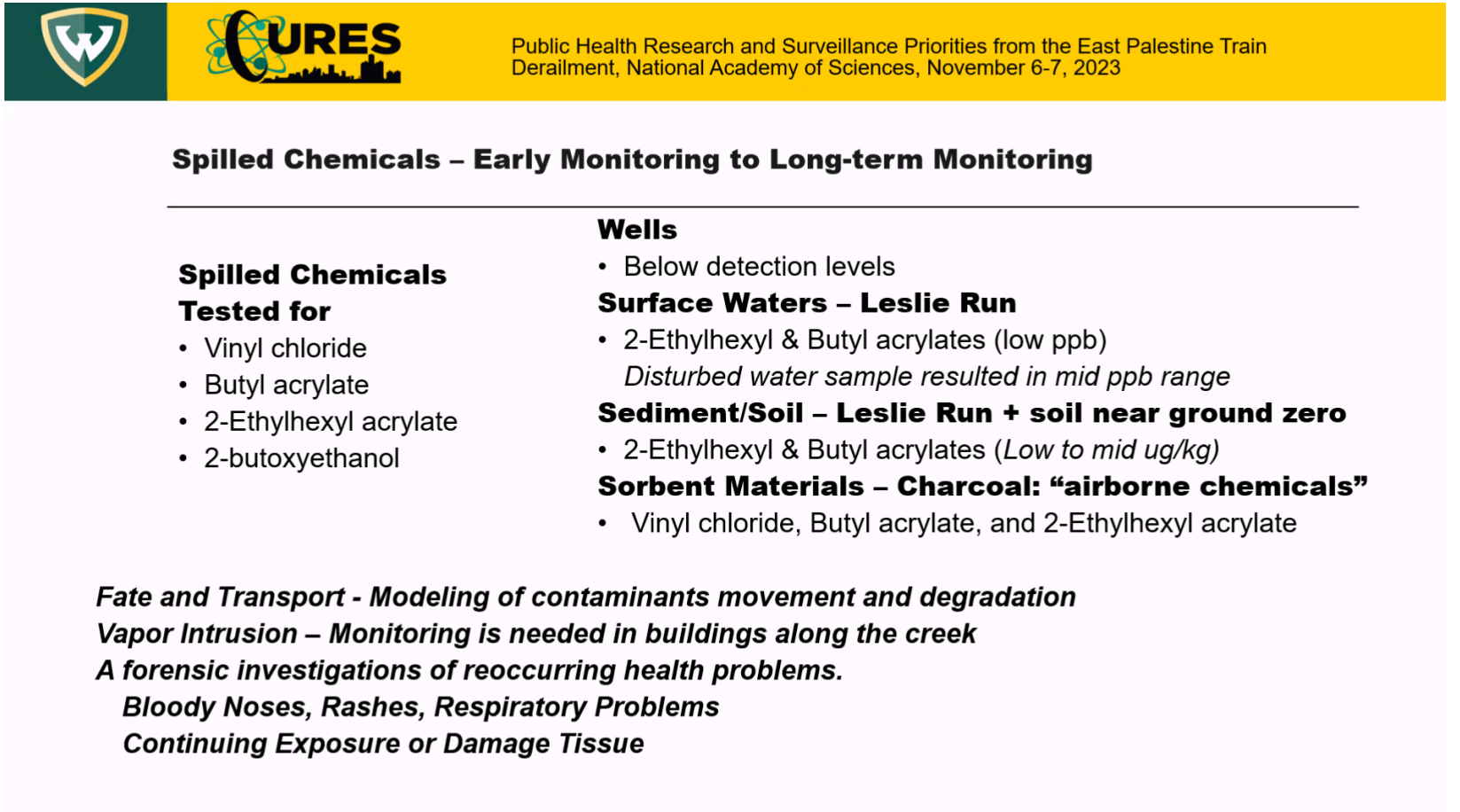
Consider primary prevention right away including fact sheets, information disseminations

In light of the “unknown- unknowns”
take a precautionary approach

Recommendations

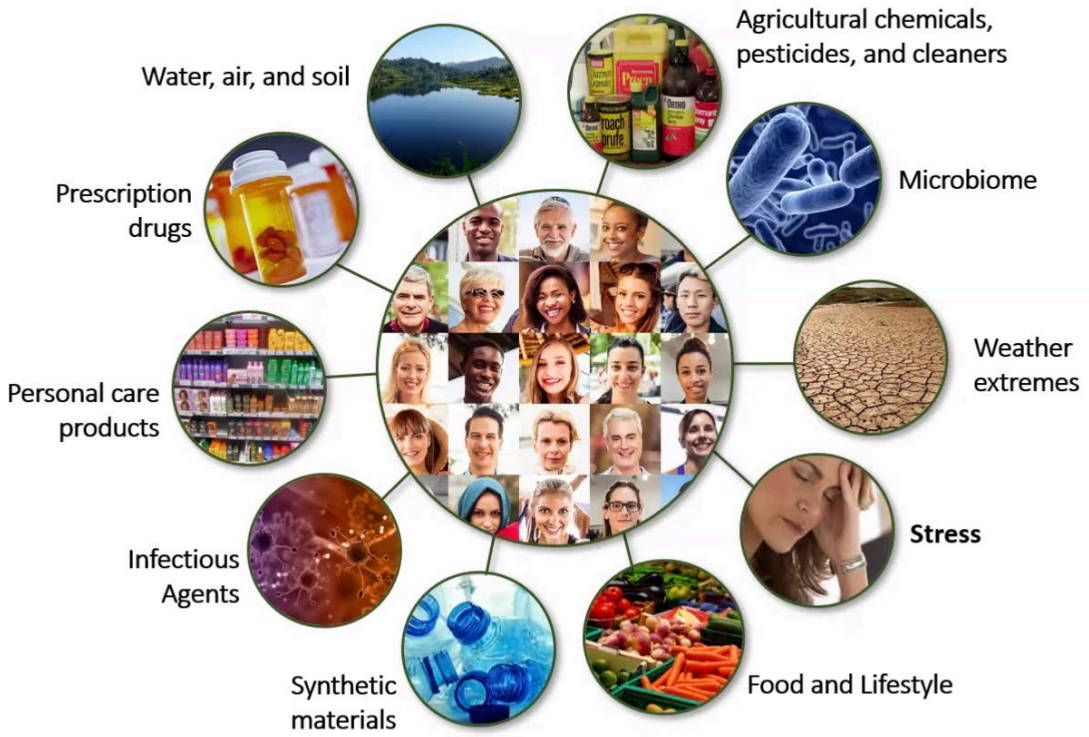
- Don’t reinvent the wheel
- Listen to and work humbly with impacted community
- Consider a holistic and long-term response: a crisis is more than an exposure – betrayal is toxic
- Share stories with journalists and policymakers
- Hold polluters/culprits accountable; justice is key to health and recovery
- Continue to push for stronger policies and investments in public health and environmental regulations to **PREVENT the next crisis**

Early and Long term monitoring still needed
Dr. Judy Westrick



We need to take a broad approach in establishing monitoring for chemical and non-chemical stressors (Dr. Birnbaum)

What is our "Environment"?



We are not all equally sensitive- Some will be more risk than others- risks are still real…….

- Existing disease conditions (e.g. Dr. Judy Westrick's work on VC and Liver Disease)
- Exposure timing and response
- Previous exposures
- Cumulative exposures/the exposome
- Genetics
- Regulatory and human ability

to metabolize and respond

- Proteomics, exposomics,

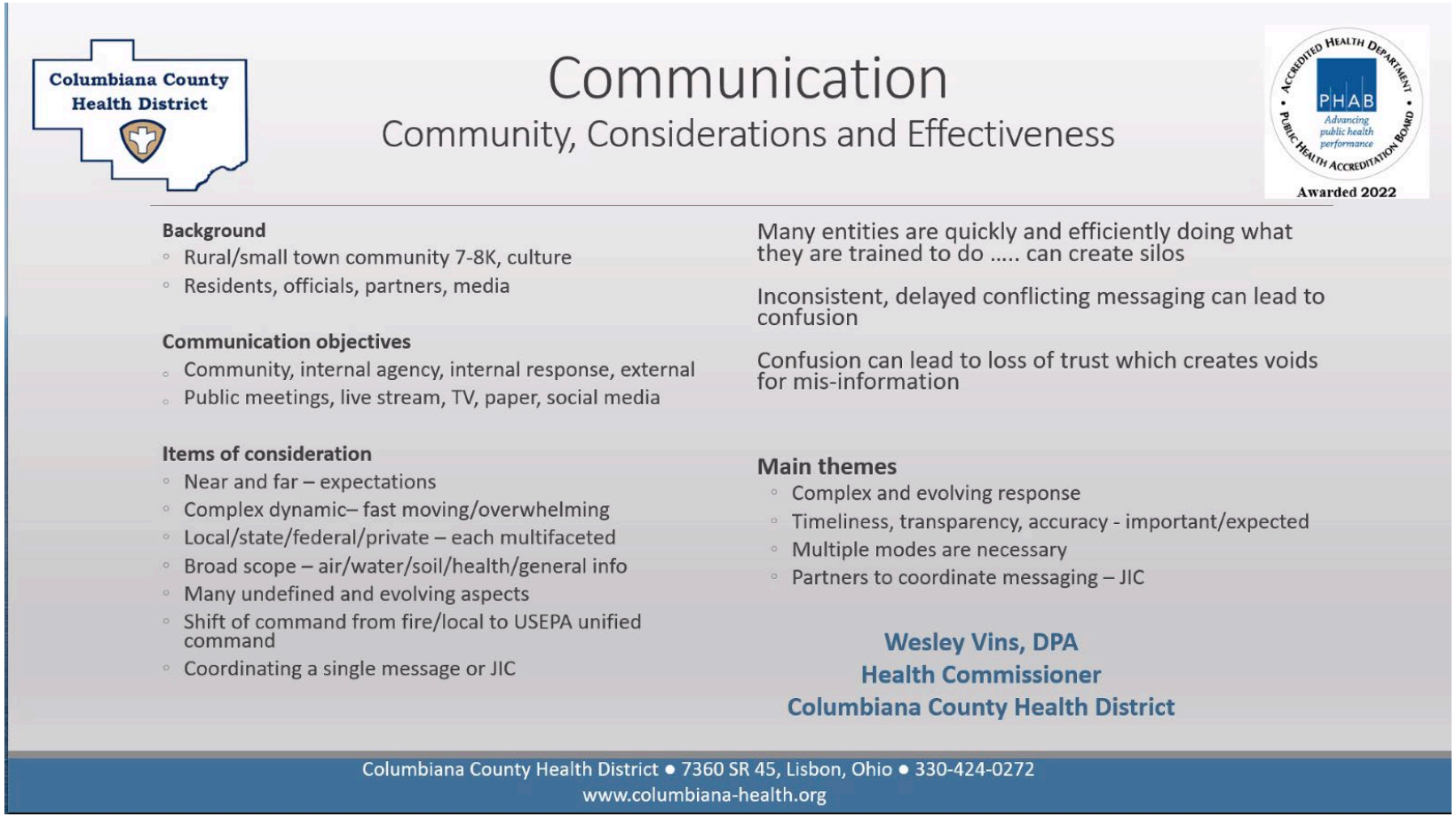
external exposome

Real World Exposure: It's always Mixtures

- To do mixtures, must know dose/responses – can't simply add up effects
- Effect evaluation at realistic exposure levels
- Multiple sources, multiple chemicals, multiple stressors
- Can accumulated low dose (background) exposure to multiple stressors cause harm?
- What about sequential rather than simultaneous exposures?
- For regulatory system, better to assume dose additivity than nothing
  - At low doses, likely to be additive
- Do you cumulate common downstream effect of common upstream target?
  - Must be predictive of adverse outcome!
- Need statistical models for complex mixtures that include multiple pathways, account for potential compensatory mechanisms or antagonism, include species differences, include kinetic interactions, models of sufficient similarity

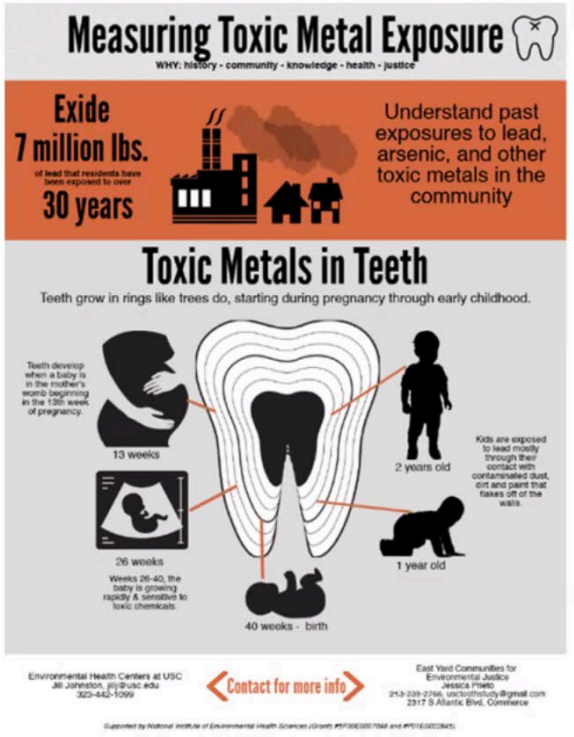
Exposomics

Risk Communication a Priority



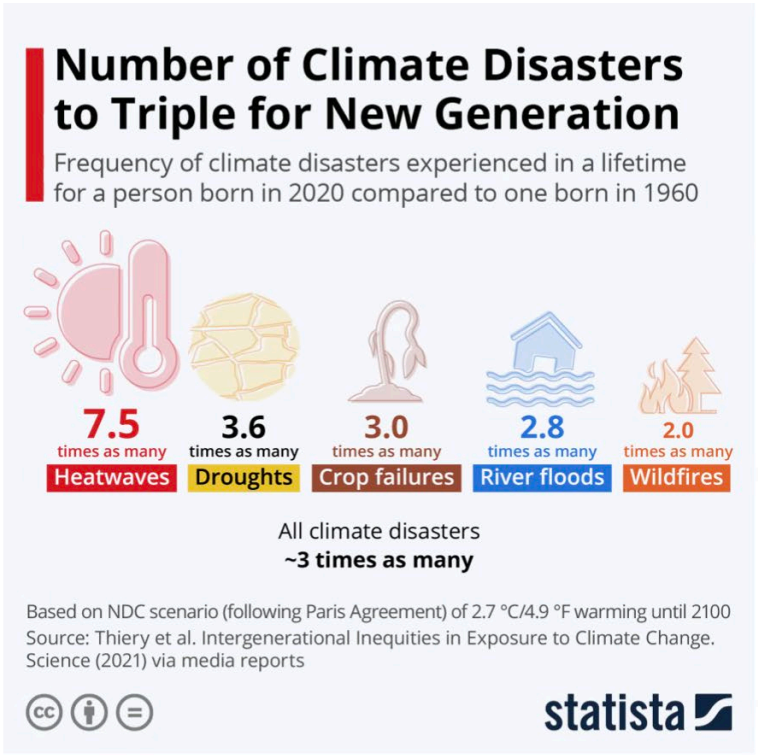
Reporting and working with community to disseminate research results

Reporting results to the community



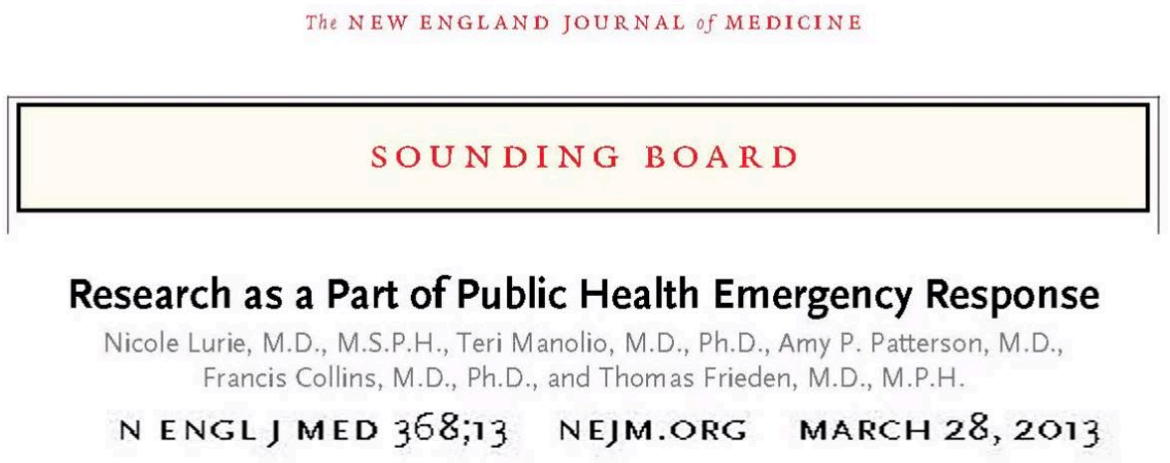
Acknowledgements: Drs. Maida Galvez and Sarah Evans, Mount Sinai

The Stakes are High



- The stakes are high:
  - As of 10/10/23, the U.S. has experienced 24 weather and climate disasters incurring losses that exceeded $1 billion
  - The 18 disasters >$1 billion in 2022 caused 474 direct or indirect fatalities
  - We know little about longitudinal health impacts

Research is action (Dr. Birnbaum)



The NEW ENGLAND JOURNAL of MEDICINE

SOUNDING BOARD

Research as a Part of Public Health Emergency Response

Nicole Lurie, M.D., M.S.P.H., Teri Manolio, M.D., Ph.D., Amy P. Patterson, M.D., Francis Collins, M.D., Ph.D., and Thomas Frieden, M.D., M.P.H.

N ENGL J MED 368;13 NEJM.ORG MARCH 28, 2013

"The knowledge that is generated through well-designed, effectively executed research in anticipation of, in the midst of, and after an emergency is critical to our future capacity to better achieve the overarching goals of preparedness and response: preventing injury, illness, disability, and death and supporting recovery."

Learning from Past Disasters Do Not Reinvent the Wheel

Notes from the Field

Self-Reported Health Symptoms Following Petroleum Contamination of a Drinking Water System — Oahu, Hawaii, November 2021–February 2022

Alyssa N. Troeschel, PhD[1]; Ben Gerhardstein, MPH [2]; Alex Poniatowski, MS[3]; Diana Felton, MD[4]; Amanda Smith, PhD[1]; Krishna Surasi, MD[1]; Alyson M. Cavanaugh, DPT, PhD[1]; Shanna Miko, DNP[1]; Michele Bolduc, PhD[1]; Vidisha Parasram, DrPH[1]; Charles Edge, MSN, MS[5]; Renée Funk, DVM[3]; Maureen Orr, MS[5]

Setting up a registry now…..
-this can be a multi-agency
-coordinated response

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TABLE. Occurrence of new or worsened symptoms, and symptoms persisting for ≥30 days after the contamination of a water system by a petroleum leak on November 20, 2021, self-reported by participants of the Hawaii Assessment of Chemical Exposures survey (N = 2,289) — Oahu, Hawaii, November 2021–February 2022

Self-reported symptom	No. (%) of survey participants: Experiencing new or worsened symptoms	Experiencing symptoms for ≥30 days*
Eyes	**967 (42)**	**514/967 (53)**
Increased tearing	498 (22)	303/498 (61)
Irritation/Pain/Burning of eyes	879 (38)	453/879 (52)
Ear, nose, and throat	1,078 (47)	553/1,078 (51)
Runny nose	715 (31)	388/715 (54)
Nose bleeds	191 (8)	86/191 (45)
Burning nose or throat	739 (32)	87/739 (12)
Ringing in ears	405 (18)	263/405 (65)
Nervous system	**1,428 (62)**	**959/1,428 (67)**
Headache	1,318 (58)	726/1,318 (55)
Dizziness/Lightheadedness	875 (38)	463/875 (53)
Seizures/Convulsions	23 (1)	18/23 (78)
Feeling fatigued	1,016 (44)	696/1,016 (69)
Loss of consciousness/Fainting	52 (2)	29/52 (56)
Confusion	424 (19)	271/424 (64)
Difficulty concentrating	738 (32)	530/738 (72)
Difficulty remembering things	644 (28)	483/644 (75)
Respiratory/Cardiovascular	**719 (31)**	**463/719 (64)**
Chest tightness or pain/Angina	362 (16)	206/362 (57)
Wheezing in chest	189 (8)	126/189 (67)
Difficulty breathing/Feeling out-of-breath	416 (18)	271/416 (65)
Coughing	522 (23)	303/522 (58)
Burning lungs	185 (8)	107/185 (58)
Gastrointestinal	**1,332 (58)**	**566/1,332 (43)**
Nausea	929 (41)	391/929 (42)
Vomiting	370 (16)	100/370 (27)
Diarrhea	1,121 (49)	397/1,121 (35)
Dermatologic	**1,322 (58)**	**880/1,322 (67)**
Irritation/Pain/Burning of skin	859 (38)	476/859 (55)
Skin rash	925 (40)	506/925 (55)
Skin blisters	169 (7)	101/169 (60)
Dry or itchy skin	1,144 (50)	771/1,144 (67)
Mental health	**1,049 (46)**	**865/1,049 (83)**
Anxiety	839 (37)	667/839 (80)
Agitation/Irritability	696 (30)	549/696 (79)
Difficulty sleeping	744 (33)	590/744 (79)
Feeling depressed	463 (20)	364/463 (79)
Paranoia	226 (10)	179/226 (79)
Tension/Nervousness	656 (29)	524/656 (80)
Other†	**360 (16)**	**236/360 (66)**

* Among those who reported experiencing symptom.
† Participants could report up to four additional symptoms not listed in the symptoms section of the survey.

Dr. Linda Birbaum

Going Forward

- Holistic approach
- Exposure – Acute vs. Chronic
  - Chronic Exposure leading to Ongoing Effects
  - Acute Exposure leading to Long Term Effects
- Health
  - Respiratory, Neurological, Immune, Reproductive/Developmental, Liver, K
  - Mental Health
- Establish Both Exposure & Disease Registries
  - Better late than never
  - Periodic Assessments
  - Involve special populations as appropriate
- Educate Clinicians
  - Establish Federally Funded Clinic
- *Listen* to Community

Day 1 Research Recommendations (Dr. Whelton)

1. Based on the complexity of disaster exposure pathways, number of people exposed, and limitations of existing information, additional work is needed to characterize exposures to inform the design of health studies
2. Conduct work to better understand outdoor and indoor chemical exposures
3. Conduct work to better understand where and the degree residual contamination remains in the environment and buildings (sheen, chemicals and their magnitudes, dioxins)
4. Use results to help design biomonitoring and short-term and long-term health studies

Day 1 Actions to address for the Next Disaster (Dr. Whelton)

1. Responders lack and need a formal check-down approach to identify the chemical exposure pathways
2. Chemical modeling tools should be developed to predict chemical exposures (and contaminant removal from water) when creeks are aerated and are naturally flowing
3. Responders lack a checklist of pros/cons of equipment and analytical methods
4. There's a need for responders receiving guidance and capabilities on analytical screening for “unknowns” in water/air/soil and on surfaces
5. Train decision makers about monitoring equipment limitations and PPE
6. **Setup mechanisms to rapidly engage academic institutions for advanced** analytical capabilities and decision-making which commercial laboratories and government labs often do not have

Future Research – Agenda identified during discussion

- Establish a registry – get there and get involved
- Start biobanking biological samples now - get there as quickly as possible
- Start with medical education and holistic provider education now
- Use the chemical lists already from the site so new methods can be rapidly developed to shape a future monitoring and evaluation report
- Start with high exposure, and vulnerable population, focus on specific epidemiologic studies (Melanie Pearson and Maureen Lichtveld, guided by communities)
  - Children and children exposures, informing health care providers, address hopelessness and mental health impacts
  - Above requires a multi-disciplinary approach
- Needs financial support

What are the most important gaps for advancing research now?

- Cumulative impacts – the disaster on top of previous environmental contamination (fracking, mining + disaster)
- Really important to get a baseline health assessment in the community and continue ongoing monitoring
- Understand low-level concentrations and mixtures
- Need multi-disciplinary teams- and diverse professionals
- Be on the ground –
- Be flexible in looking for funding- multiple agencies appropriate – NSF, NIH, CDC – “a good day in public health nothing bad happens”
- Build on health clinics- NOTE – access to health care and clinics important (form DAY One)

Centering the Community in Setting Up the Research Agenda (Erika Kinkead)

- Need for trust and validation – who will be the trusted messengers? Community experiences must be validated
- Provide ongoing response to community questions – many answered today but many remain
- Moving forward – be sure to close the loop on your research – bring it back to the community
- Address the fear and serve the community – in an accessible, useful way – translation is key

Centering the Community in Setting Up the Research Agenda (Dr. Breysse)

- As scientists be advocates for your research –
- Follow guiding principles for risk communication
- Transference of knowledge from one event to another is needed
- Every situation, affected community, and circumstances are unique
- Back and forth communication is critical
- Many resources are available through ATSDR……..
- Need to continue to advance and build the public health infrastructure at the state and local level to work with federal agencies**

Centering the Community in Setting up the Research Agenda- WTC lessons (Dr. Landrigan)

- In light of unknowns, track symptoms. This was then linked back to the chemical exposures

Focus on Vulnerable Populations (Dr. Lichtveld)

- Be sure to include first responders – broadly defined as highly exposed/sensitive

(note- heard this on Day 1)

- Children, family and residents
- Provide immediate health consultations
- *** a give back** with medical monitoring longer term
- Disseminate information – widely, meet the community where

They are

- Build rosters of exposed individuals
- Evidence based education

** Funding for public health infrastructure ---

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LESSONS FOR THE FUTURE

- Strengthen public health infrastructure – disease tracking, lab capacity
- Prepare for the next event by training people and pre-positioning supplies
- Clarify lines of authority
- Develop communication strategies and messages before the next event
- Build partnerships for prevention

Prevention and preparedness are essential

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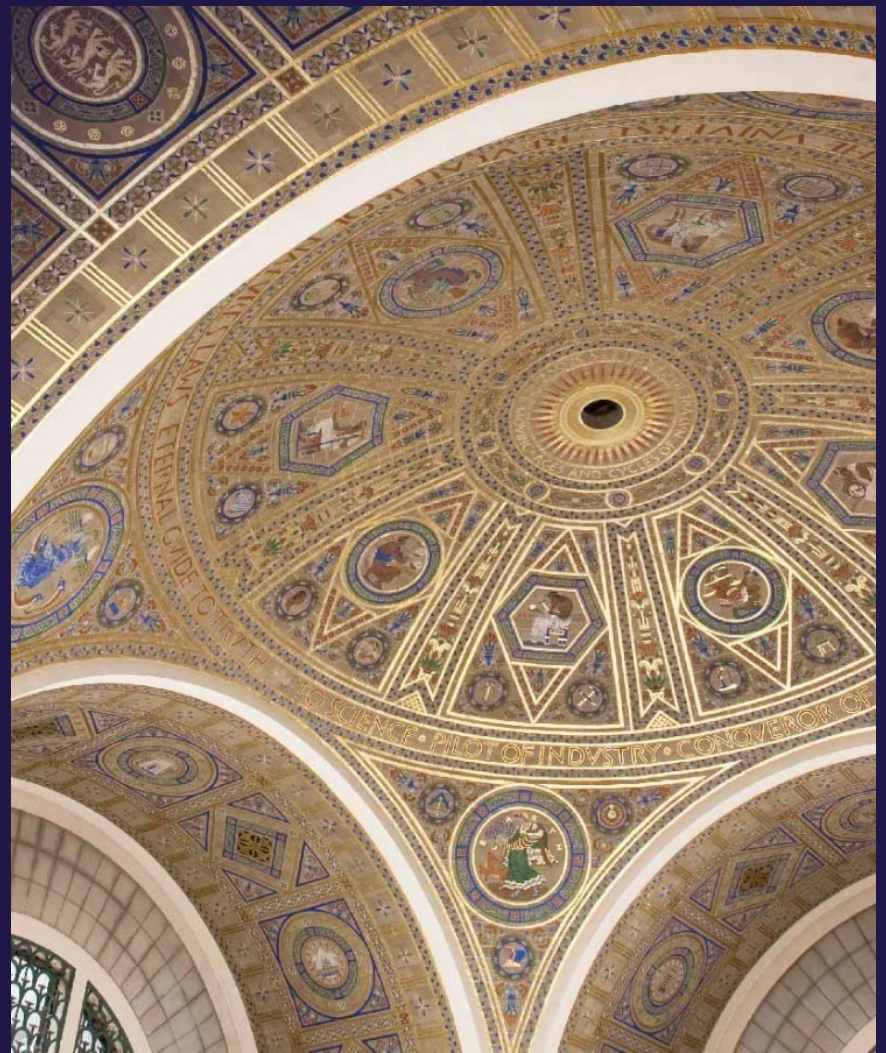
Moderators Roundtable



Closing Remarks

Kristen Malecki, *Workshop Chair*
University of Illinois – Chicago

Aubrey Miller
NIEHS