2023 NIEHS EHSCC MEETING: Disaster Research Response & Climate Change & Health

We are inviting members of the NIEHS P30 Centers to present their disaster research response-themed or climate change-themed work at the October 2023 NIEHS EHSCC MEETING in Houston, Texas.

The leadership of each P30 Center is encouraged to nominate a member of their center to present at the October meeting. To participate, the nominated member should send an abstract of their work to the 2023 NIEHS EHSCC MEETING planning committee by completing this online questionnaire.

Up to four abstract authors will be invited as plenary speakers. Others will be invited to share their work during poster sessions.

Please submit your abstract by July 24, 2023. Plenary speakers will be notified by August 7, 2023.

Thank you - 2023 NIEHS EHSCC MEETING planning committee.

Response was added on 07/24/2023 3:36pm.

ABSTRACT AUTHOR'S CONTACT INFORMATION

Author's name (first name last name):	Irva Hertz-Picciotto (The abstract author is the prospective presenter)
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Author's title	Professor
Author's primary department & institution	Department of Public Health Sciences, University of California at Davis
P30 Center where the author is a member:	UC Davis Environmental Health Sciences Center
The project PI/Lead	⊗ Same as abstract author ◯ Different from abstract author, if so, specify

PROJECT FOCUS

The primary focus of the project (you may select more than one option, if applicable)

☐ Disaster Research Response (DR2)
☒ Climate Change and Health (CCH)
☐ Other, please specify

The climate change and health issues (being) studied

☒ Exposure pathways (extreme heat, air quality, water quality/quantity, vector ecology, etc.)
☒ Vulnerability factors (demographic, biological, social determinants, geographic, etc.)
☐ Health system capacity & resilience - (governance, EHS workforce, health information systems, etc.)
☒ Stress response (pathways, psychosocial stress, eco-anxiety)
☐ Climate and geospatial modeling
☐ Other, please specify

PROJECT DETAILS - DR2/CCH AND HEALTH GAPS, PROJECT OBJECTIVES, FINDINGS, & LESSONS LEARNED

Study Title

Effects of Northern California wildfires on mental health of adults and children

DR2- or CCH-specific research gaps that the project addressed/is addressing

Deterioration of mental health in response to climate change can occur through varied pathways. The dramatic increase in frequency, intensity and destructiveness of wildfires in California, other western states, and countries around the globe have brought an array of both physical and mental health impacts in the aftermath of such events. Both the exposures to high concentrations of PM2.5 and traumatic experiences during and after the fires may play a role, along with underlying vulnerabilities. To date, few large studies have examined wildfire-related mental health changes, the factors contributing to them including experiences resulting directly from the fires, and the heterogeneity across different population groups defined by social, economic, demographic, disability, and medical conditions. Understanding what factors contribute to greater versus less resilience can highlight where and what types of interventions are needed to reduce mental health morbidity in the wake of wildfires.

Project goals and objectives

The overall goals of this project are: first, to develop cohorts for long term studies of health impacts from wildfires; second, to begin to fill major gaps in understanding the factors that contribute to mild and serious mental health changes and lay a foundation for interventions.
Specific Objectives are:
1) To determine the impacts from wildfire- related experiences such as evacuations, major losses (home, job, neighborhood, deaths of friends or close relatives), or other trauma, and whether more experiences incur greater severity of mental health deterioration. Additionally, to determine whether PM2.5 in wildfire smoke has an impact on mental health changes, independently or in combination with traumatic experiences.
2) To examine the role of socioeconomic factors at the neighborhood level; size of household, e.g., living alone or not; and individual characteristics such as age (children, adults 18-64, adults 65 years and above), sex, racial or ethnic identification, and pre-existing disabilities or health conditions. To additionally consider independent or combined effects among these variables; and similarly, in combination with wildfire-related exposures described in 2).
3) To develop understanding of medium to long-term impacts, in relation to the wildfire-related and non-related factors, and what circumstances or wildfire experiences favor resilience.

Research methods/approaches used

☐ Community-engaged research methods
☐ Communications research methods
☒ Field epidemiological methods
☐ Fundamental/basic science methods
☒ Other, please specify

Study Title

Quantitative and qualitative methods

Project stage/status:

◯ Project is ongoing - process findings available to present; no primary outcomes findings available yet
◯ Project is ongoing - process findings and/or primary outcomes findings available to present
⊗ Project completed - process findings and/or primary outcomes findings available to present
◯ No stage/status to report
◯ Other, please specify

Describe the process/primary outcomes findings from the project.

In response to fierce fires throughout northern California that caused evacuations of 100,000 people, 44 deaths, and >9000 structures destroyed, UC Davis Environmental Health Sciences Center launched a longitudinal study in collaboration with two county health departments, and administered an online survey in both English and Spanish in communities throughout the region. Adults 17+ years reported for themselves and other household members. The survey was publicized through traditional and social media.

Questions included wildfires experiences (see goals, above), pre-fire factors (above), prior psychiatric diagnosis, and changes in mental or behavioral variables compared to the pre-fire period: depressive mood, anxiety or stress, difficulty concentrating, loss of appetite, loss of appetite, agitated behavior, trouble sleeping/nightmares, withdrawing from daily life, alcohol or drug use, tobacco or vaping, or witnessed violence. For children, questions on drugs or alcohol were dropped, difficulties at school was added. The primary outcome was the number of symptoms that changed, relative to pre-fire, categorized as zero, 1-3, and 4 or more.

Nearly half of 4430 adults experienced anxiety/stress, 1/3 had trouble sleeping, and about 22% experienced changes in four or more symptoms. Multivariable hierarchical multinomial regression analysis modeled the three level mental health changes, with robust standard errors and adjustment for clustering within households. Overall, in adults, post-fire variables carried higher risk for changes to mental health symptoms than sociodemographic or other pre-fire variables, with total incineration of the home, prior psychiatric diagnosis, an injury during the fire, and number of evacuations each having precise RRâ€™s above 3.3 for four or more symptoms. A trend from mild/moderately elevated risks at 1-3 symptoms, to larger risks for 4+ symptoms was observed for nearly all post-fire experiences. Results for children indicated that the strongest risk factor was an adult in the household with four or more symptoms.

Describe key challenges or lessons learned.

This project documented widespread mental and behavioral health disturbances brought by major mega-fires. Timing of the survey was a challenge, and people were sensitive about research as they were living (and re-living) the disaster. By four months post-fire, many people were ready to respond. Developing our survey with county health officers and epidemiologists added to the relevance of the survey. Creative solutions are needed for the mental health crises created by these disasters: to mitigate the mental health crises from climate change will require building out the workforce in mental/behavioral health, training para-professionals at scale, generating an evidence base for treatments tailored to specific populations and addressing the inequitable suffering after disasters. Broader upstream population health protection from wildfires is also needed, e.g., hardening of physical structures, redesigning cities to withstand large conflagrations, abandoning fallacious forest/wildland management practices and replacing with traditional Native peoples' knowledge of fire.

PROJECT SPONSORSHIP/SUPPORT

Project sponsorship (choose all that apply)?

- ☐ P30 inter-center collaborative pilot funding (via NIEHS)
- ☒ Other NIEHS - (NOT inter-center collaborative funding)
- ☐ NIH - other institutes (NOT NIEHS)
- ☐ Any other federal agency (NOT NIH)
- ☐ Non-federal government agency (state, local, etc.)
- ☐ Non-government, non-profit entity
- ☐ For-profit entity
- ☐ Insitutional (intramural) funding
- ☐ Project not sponsored
- ☐ Other, please specify