Executive Summary

On June 2nd, 2021, the California Initiative for Health Equity and Action brought faculty researchers and community leaders together to share their work surrounding environmental health and the impact of hazardous exposures on vulnerable populations across California. Their findings indicate that pregnant people, low-income communities of color, and indigenous migrants are especially impacted by hazardous environmental exposures, and the interaction of multiple vulnerabilities poses increased health risks. With wildfires and accompanying pollution projected to increase in the coming decade, panelists discussed the next steps for research and offered evidence-based policy recommendations to effectively minimize adverse health and social impacts on California’s most vulnerable communities.

Amy Padula, PhD (UC San Francisco), Camila Alvarez, PhD (UC Merced), Michael Mendez, PhD (UC Irvine), Omar Paz (North Bay Jobs with Justice), and Maria Salinas (Movimiento Cultural de la Unión Indígena) joined moderator Jay Graham, PhD (UC Berkeley) as panelists for this event.

View a recording of the event here.
Amy Padula

Air Pollution and Pre-term Birth

Dr. Amy Padula of the University of California, San Francisco School of Medicine presented her research investigating the impact of traffic-related air pollution, including PM$_{2.5}$ and PM$_{10}$, on preterm birth, or birth occurring at less than 37 weeks gestation. Pregnant individuals are particularly susceptible to air pollution due to physiological changes that occur during pregnancy, such as increased volume of air inhaled and increased oxygen consumption. Using data from birth certificates in the San Joaquin Valley, California, her team found that women who were exposed to the highest quartile of PM$_{2.5}$ and PM$_{10}$ during their 2nd trimester (weeks 14-26) had a 10% increased risk of late preterm birth; this risk increased to more than 20% for earlier preterm births. Then stratifying the data by neighborhood socioeconomic status (SES), her team found that the association between air pollutants was stronger within neighborhoods of low SES, illustrating the ‘double jeopardy’ of environmental and social stressors: communities which experience both face more adverse outcomes than those who experience either alone. Dr. Padula is continuing to look at this compound effect by studying how different types of biomass burning impact preterm birth while also considering neighborhood deprivation and privilege based on extremes of income and race/ethnicity by census tract as an effect modifier.

Figure 1. Odds ratio of birth at 20-27 weeks for exposures during the 2nd trimester of pregnancy.

*Low SES is defined as those living in a block group with over 10% unemployment, over 15% with income from public assistance, and over 20% families below poverty level.
Camila Alvarez
Intersectional Environmental Justice and Population Health: A Novel Approach

“Our approach reconceptualizes how environmental justice, intersectionality theory, and social determinants of health can inform each other and help us better understand social and environmental inequalities.”

Dr. Camila Alvarez of the University of California, Merced, presented her research focused on understanding environmental and population health inequities through an intersectional framework. To investigate whether there are compounded effects of multiple vulnerabilities for environmental health risks across census tracts in California. Instead of using the conventional multilevel regression models of census tracts within counties, Alvarez’s team developed an eco-intersectional multilevel model, wherein intersectional state of tracts were modeled. Each census tract is composed of five vulnerabilities (racial and ethnic composition, female headed household, educational attainment, median household income, and urbanicity). Using 2014 data on the annual estimated cancer risk from air toxins, Dr. Alvarez’s team found that tracts with multiple social vulnerabilities (higher stratum rank) had higher predicted cancer risks. A considerable amount of variation in the estimated cancer risk from air toxins can be explained by interaction effects across strata (15%). Dr. Alvarez also found that California has a higher minimum cancer risk than the country as a whole. Strata with the highest cancer risk in California also differed from the national analysis, such that there is higher vulnerability among high Latinx neighborhoods and within non-metro neighborhoods compared to the rest of the country. Together, her findings underscore the impact of intersecting vulnerabilities on exposure to environmental hazards, which increase cancer risk.

Figure 2. Expected values of total air pollution by stratum ranking.
Michael Mendez, Omar Paz, and Maria Salinas
Disparate Impacts of Wildfire on Undocumented Migrants: Lessons from Sonoma County

Dr. Michael Mendez of the University of California, Irvine, Omar Paz, Lead Organizer for North Bay Jobs with Justice, and Maria Salinas, a Chatina Indigenous activist, together presented their ethnographic research on the disparate impacts of wildfire on undocumented migrants in Sonoma County. In spite of the contributions of undocumented Latinx and indigenous migrant population to Sonoma County’s economy, disaster planning efforts of extreme wildfires have largely ignored their needs: language access, farmworkers health and safety, and disaster aid eligibility due to immigration status.

Mendez’s team found that there has been little communication in Spanish and indigenous languages, limiting their ability to access updates on approaching wildfires, air quality, and evacuation plans and leaving them unprepared. They also found that standards for safety regulations are not uniformly implemented, such that the air quality index (AQI) is not properly monitored, and workers often are not provided with appropriate personal protective equipment (PPE). Access verifications are issued to employers, which permits them to allow farmworkers into mandatory evacuation zones. There is no standard for this process, meaning that there is no guarantee that emergency plans or health concerns are being taken into consideration. After working in these conditions, there are no post-exposure health tests or monitoring processes in place. Many workers do not have unemployment or disability insurance due to their immigration status and wildfires often cause destruction and closures that lead to unemployment, leaving them in financial crisis. Furthermore, Mendez’s team found that the California Division of Occupational Safety and Health (Cal/OSHA) has limited staff capacity, with only 26 Spanish speaking field investigators, severely limiting their ability to communicate with and assess the needs of Spanish-speaking workers across the state. Current disaster policy fails to account for this complex web of impacts beyond the destruction of property within the perimeter of fire itself, and immigration status has received little attention in disaster vulnerability mapping research.

Read their full policy brief [here](#).
Evidence-Based Policy Recommendations

1 Increase worker protections for vulnerable populations during wildfire events.
CalOSHA should protect at-risk workers during periods of hazardous air quality by mandating employers provide paid leave and/or work from home accommodations for pregnant people, as well as provide hazard pay for outdoor workers laboring in mandatory evacuation zones. Additionally, the state should codify CalOSHA temporary regulations that grant protection from wildfire smoke into law, and extend these protections to service workers, regardless of immigration status.

2 Establish a reliable state-wide air quality monitoring system.
As an initiative of the Community Air Protection Program (CAPP), the California Air Resources Board (CARB) should integrate community air monitoring systems across the state into one state-wide monitoring system to ensure there are no gaps in frequently updated and accessible air quality data. This data may be used to inform hazardous working/hazard pay conditions.

3 Increase cultural and linguistic competency in community outreach.
Local public health departments should work with community-based organizations to convey important information regarding the health risks of hazardous environmental exposures, air quality monitoring, and emergency preparedness and evacuation information to non-English speaking communities. Movimiento Cultural de la Unión Indígena (MCUI) is one organization that has filled the linguistic gap in Sonoma County by broadcasting information in indigenous languages on the radio and doing outreach at food distribution and evacuation sites.

4 Fund and utilize intersectional research to inform program funding.
Intersectional analytical approaches, like those presented by Dr. Alvarez, are useful to understanding how social vulnerabilities interact to increase our susceptibility to environmentally-induced health risks. Similar approaches, including CARB’s Transportation Disparities Mapping Tool, can be used to identify communities most impacted by social and environmental stressors. This data should be used at the state and county level to inform program funding, environmental policies, community interventions.

5 Implement measures for disaster preparedness.
To prepare for the projected increase in climate-change induced wildfires, the state should establish a disaster relief fund for low-income Californians, regardless of immigration status. Additionally, the state should provide emergency funding for community-based organizations that provide basic needs and other necessary services to community members during wildfire and other disaster events.
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