TITLE: Assessment of Diesel Exhaust Exposures and Work-Related Stress among Farmworkers using Off-Road Diesel Equipment

ABSTRACT:
This study will describe previously uncharacterized worker exposures to constituents of diesel exhaust from off-road diesel equipment and work-related stress through a mixed methods approach. Farmworkers are uniquely vulnerable to job insecurity, which can be described as the temporary nature of jobs, including seasonal work and risk of layoffs. They also experience high rates of other psychosocial stressors related to lack of health insurance coverage and documentation status. Work-related stress has been associated with increased rates of mental health impacts and injuries among farm and agricultural workers in particular. Increased risk of coronary heart disease has also been associated with work-related stress among various occupational groups. Diesel exhaust is a known carcinogen, and is linked with respiratory and cardiovascular impacts. Stress may potentiate effects of exposure to air pollutants, a finding among the general population, which has not been investigated in agricultural work settings. This pilot study addresses data gaps among work-related stress and airborne exposures to diesel exhaust among farmworkers in this vulnerable population in the San Joaquin Valley. Full-shift personal air samples will characterize three components of diesel exhaust: elemental carbon, nitrogen dioxide, and naphthalene exposures. Work-related stress will be investigated by conducting semi-structured qualitative interviews using items from the validated Perceived Occupational Stress Scale. Interviews will also ask farmworkers about their work tasks, awareness of workplace hazards, perceptions of exposure mitigation strategies, and what they would like to learn from study results. Guided by a Community Engaged Research framework, qualitative interviews will inform how study results are reported back to employees. This mixed methods investigation prioritizes the assessment of both qualitative and quantitative exposures using a Total Work Health approach. Results of this investigation may be generalizable to workers in similar settings working with off-road diesel equipment in other communities, thus these data can inform future epidemiological and industrial hygiene investigations as well as policy initiatives among individual employers and government agencies.