



Project Information?

5R01ES022583-03

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Abstract Text:

DESCRIPTION (provided by applicant): A critical need exists for efficient community-based interventions aimed at reduction of environmental exposures relevant to health. Biomass smoke exposures due to residential wood heating are common among rural Native American communities, and such exposures have been associated with **respiratory** disease in susceptible populations. In many of these communities wood stoves are the most economic and traditionally preferred method of residential heating, but resource scarcity can result in burning of improper wood fuels and corresponding high levels of indoor particulate matter. In response to the funding announcement "Interventions for **Health Promotion** and Disease Prevention in Native American Populations" (PAR-11-346), we propose a two-level intervention strategy to reduce exposure to indoor biomass smoke among elderly tribal members in two reservation communities: Nez Perce and Navajo Nation. Community-based participatory **research** techniques will be used to adapt intervention approaches to meet the cultural context of each participating community. At the community level, we will facilitate local development of a tribal agency-led wood bank program ensuring that elderly and/or persons with need have access to dry wood for heating. At the household level, we will use a three arm randomized placebo-controlled intervention trial to implement and assess education/outreach on best burn practices (Tx1). The content and delivery strategies of the education intervention will be adapted to each community according to stakeholder input. This educational intervention will be evaluated against an indoor air filtration unit arm (Tx2), as well as a placebo arm (Tx3, sham air filters). Tx3 will be used in comparison with the other two treatment arms to evaluate the penetration and efficacy of the community-level wood bank program. Outcomes will be evaluated with respect to changes in **pulmonary** function measures and **respiratory** symptoms and conditions among household elders. We hypothesize that locally-designed education-based interventions at the community and household levels will result in efficacious and sustainable strategies for reducing personal exposures to indoor particulate matter, and lead to **respiratory** health improvements in elderly Native populations. This study will advance knowledge of cost-effective environmental interventions within two unique Native American communities, and inform sustainable multi-level strategies in similar communities throughout the US to improve **respiratory** health among at-risk populations.

Public Health Relevance Statement:

PUBLIC HEALTH RELEVANCE: **Lung** function is an important determinant of long-term health, and exposure to particular matter is known to adversely impact **Lung** function. This study will test community-based exposure reduction strategies in tribal households that use wood stoves for home heating and evaluate the corresponding impact on **respiratory** function among elderly residents.

Project Terms:

Acute; Adult; Air; air filter; air filtration; arm; base; biomass smoke; **burden of illness**; Burn injury; Child; Childhood; Chronic; Chronic Obstructive Airway Disease; Clinical; Collaborations; Communities; community based participatory **research**; comparative efficacy; **Cookstove**; cost; cost effective; Data; design; Developing Countries; Development; disorder prevention; Economically Deprived Population; Economics; Education; **Education and Outreach**; Educational Background; Educational Intervention; Elderly; Ensure; Environmental Exposure; Environmental Health; environmental intervention; **Epidemiologic Studies**; Evaluation; experience; Exposure to; Funding; Goals; Health; **Health Promotion**; Heating; Home environment; Home heating; Household; improved; Indian reservation; Indoor Air Quality; Indoor environment; innovation; **Interdisciplinary Study**; Intervention; Intervention Trial; Knowledge; Lead; **Lung**; **Lung** diseases; Measures; meetings; Methods; Morbidity - disease rate; mortality; Native Americans; Navaho; Nez Perce Tribe of Idaho; Outcome; Participant; Particulate Matter; Penetration; Persons; Placebo Control; Placebos; Population; Populations at Risk; programs; **pulmonary** function; **pulmonary** function decline; Randomized; randomized placebo controlled trial; randomized trial; **research**; **research** Technics; **Resources**; **respiratory**; **respiratory** health; **respiratory** physiology; **respiratory** Signs and Symptoms; **respiratory** Tract Infections; response; Risk; Rural; Rural Population; smoking intervention; Technology; Testing; translational approach; tribal college; tribal community; tribal member; Tribes; Underserved Population; Wood material; wood smoke; **Wood stove**

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