Grant: AFC618-63

Title: Explore the Integration of Distributed Lag Models for Diesel Exhaust with Methods to Control Healthy Worker Survivor Bias to Assess Benefits of Exposure Interventions in Non-metal Miners

Organization: University of California, Berkeley

Principal Investigator: Ellen A. Eisen

Focus Area: Lung Health and Heart Disease

Project summary: This proposal describes the application of a nonlinear distributed lag model for teasing apart the relative importance of the intensity, duration and timing of diesel exhaust exposure in relation to risk of nonmalignant lung and heart disease mortality in a cohort of non-metal miners. It also describes the exploration of a novel approach to combine the distributed lag exposure model with g-computation to address both the key temporal aspects of exposure as well as the healthy worker survivor effect in the Diesel Exhaust in Miners Study (DEMS).

The specific goals of this exploratory project are to:

Aim 1: Estimate the relative contributions of intensity, duration and timing of diesel exhaust exposure, measured as respirable elemental carbon (REC), to NMRD and IHD mortality using distributed lag, nonlinear models (DLNM) in the DEMS study of miners at eight non-metal mines.

Aim 2: Explore how to incorporate the distributed lag models into the counterfactual framework needed to address HWSE in the analysis of REC exposure, NMRD and IHD mortality by applying a g-method (parametric g-formula), to handle time-varying confounding by employment status (leaving work) that is affected by past exposure, a signature characteristic of healthy worker survivor bias in longitudinal studies.