

December 2018 Update from the Field: Respiratory Health

Knowledge, Attitudes, and Practices for Respiratory and Hearing Health among Midwestern Farmers. Cramer ME, Wendl MJ, Sayles H, Duysen E, Achutan C. *Public Health Nursing*. 2017;34(4):348-358.

Objective: The purpose of this study was to assess knowledge, attitudes, and practices for hearing and respiratory health/safety among farmers in seven Midwestern states served by a federally funded Agricultural Center. Findings provided a baseline to longitudinally track the Agricultural Center's program outcomes and to design community education to improve safety and health among farmers.

Design and Sample: This was a cross-sectional study using a 30 item mailed survey to describe farmers' operations, demographics, health conditions, related information sources, and knowledge/attitude/practices for personal protective equipment (PPE) (i.e., ear plugs/muffs and dust masks/respirators). **Measures:** Frequencies and percentages were calculated for each item and according to responses from younger versus older farmers. The unit of study was farm operators (N = 280) randomly selected from a publicly available database of corn/soybean and hog farmers in seven Midwestern states. **Results:** Findings revealed important knowledge gaps among respondents regarding (1) hazardous exposure sources; (2) long-term health consequences of noise/dust exposure; (3) proper selection/fitting of PPE. **Conclusions:** Public health nurses and primary care providers in rural communities should address specific knowledge gaps in order to enhance farmers' perceived understanding of their susceptibility to hazardous exposures. Increasing farmers' knowledge through preferred venues may help to improve PPE effectiveness.

Occupational Exposure to Vapor-Gas, Dust, and Fumes in a Cohort of Rural Adults in Iowa Compared with a Cohort of Urban Adults. Doney BC, Henneberger PK, Humann MJ, Liang X, Kelly KM, Cox-Ganser JM. *CDC Surveillance Summaries Morbidity and Mortality Weekly Report*. 2017;66(21).

Problem/Condition: Many rural residents work in the field of agriculture; however, employment in nonagricultural jobs also is common. Because previous studies in rural communities often have focused on agricultural workers, much less is known about the occupational exposures in other types of jobs in rural settings. Characterizing airborne occupational exposures that can contribute to respiratory diseases is important so that differences between rural and urban working populations can be assessed. **Reporting Period:** 1994–2011. **Description of System:** This investigation used data from the baseline questionnaire completed by adult rural residents participating in the Keokuk County Rural Health Study (KCRHS). The distribution of jobs and occupational exposures to vapor-gas, dust, and fumes (VGDF) among all participants was analyzed and stratified by farming status (current, former, and never) then compared with a cohort of urban workers from the Multi-Ethnic Study of Atherosclerosis (MESA). Occupational exposure in the last job was assessed with a job-exposure matrix (JEM) developed for chronic obstructive pulmonary disease (COPD). The COPD JEM assesses VGDF exposure at levels of none or low, medium, and high. **Results:** The 1,699 KCRHS (rural) participants were more likely to have medium or high occupational VGDF exposure (43.2%) at their last job than their urban MESA counterparts (15.0% of 3,667 participants). One fifth (20.8%) of the rural participants currently farmed, 43.1% were former farmers, and approximately one third (36.1%) had never farmed. These three farming groups differed in VGDF exposure at the last job, with the prevalence of medium or high exposure at 80.2% for current farmers, 38.7% for former farmers, and 27.4% for never farmers, and all three percentages were higher

than the 15.0% medium or high level of VGDF exposure for urban workers. **Interpretation:** Rural workers, including those who had never farmed, were more likely to experience occupational VGDF exposure than urban workers. **Public Health Action:** The occupational exposures of rural adults assessed using the COPD JEM will be used to investigate their potential association with obstructive respiratory health problems (e.g., airflow limitation and chronic bronchitis). This assessment might highlight occupations in need of preventive interventions.

Exposure to Field vs. Storage Wheat Dust: Different Consequences on Respiratory Symptoms and Immune Response Among Grain Workers. Barrera C, Wild P, Dorribo V, Savova-Bianchi D,

Laboissiere A, Pralong JA, Danuser B, Krief P, Millon L, Reboux G, Niculita-Hirzel H. . *International Archives of Occupational and Environmental Health*. 2018;91:745-757.

Purpose: The aim of this study was to understand the differential acute effects of two distinct wheat-related dusts, such as field or stored wheat dust handling, on workers' health and how those effects evolved at 6 month intervals. **Methods:** Exposure, work-related symptoms, changes in lung function, and blood samples of 81 workers handling wheat and 61 controls were collected during the high exposure season and 6 months after. Specific IgG, IgE, and precipitins against 12 fungi isolated from wheat dust were titrated by enzyme-linked immunosorbent assay, dissociation-enhanced lanthanide fluorescence immunoassay, and electrosynthesis. The level of fungi was determined in the workers' environment. Levels of exhaled fraction of nitrogen monoxide (FENO) and total IgE were obtained. Exposure response associations were investigated by mixed logistic and linear regression models. **Results:** The recent exposure to field wheat dust was associated with a higher prevalence for five of six self-reported airway symptoms and with a lower FENO than those in the control population. Exposure to stored wheat dust was only associated with cough. No acute impact of exposure on respiratory function was observed. Exposure to field wheat dust led to workers' sensitization against the three field fungi *Aureobasidium*, *Cryptococcus*, and *Phoma*, although exposure to storage wheat dust was associated with tolerance. The level of Ig remained stable 6 months after exposure. **Conclusion:** The clinical picture of workers exposed to field or storage wheat dust differed. The systematic characterization of the aerosol microbial profile may help to understand the reasons for those differences.