

**Project Number:** 9277416

**Title:** Respiratory Health and Hazards in Agriculture Report

**Division:** DRDS

**Project Officer:** Mark Greskevitch

**PO Degree:** Bachelor of Science – Engineering of Mines

**PO Area of Expertise:** Industrial Hygiene

**Start Date:** 10/1/2000

**End Date:** 9/30/2005

**Total Budget:** \$496,321

**Program Area:** Surveillance of ALL Respiratory Diseases

**Goal:** Surveillance

**Ag Sector:** Not Specific

**Target Audience:** Public Health Agencies; All agricultural occupations with elevated risks to respiratory diseases, particularly those identified in the report as Crop farm workers and Livestock farm workers who had elevated PMRs and PRs caused by several respiratory diseases.

**Collaborators:**

Marc Schenker at University of California-Davis; Micheal Koontz and Laura Niang of Geomet Technologies, Inc.; NIOSH staff: Robert Castellan, Michael Attfield, Jacek Mazuerk, Greg Kullman, Teri Palermo, Stephen Olenchock, Ki Moon Bang, Cathy Rotunda, and Bret Jackson.

**Stakeholders:**

(Agricultural Centers (other than own): Steven Kirkhorn, MD, MPH, FACOEM Chair, North American Agromedicine Consortium, Robert Petrea, PhD President National Institute for Farm Safety, Inc.; Jane Hoppin, ScD, Epidemiologist National Institutes of Environmental Health Sciences (NIEHS); Wayne Sanderson Director, Great Plains Center for Agricultural Health; Robert H. McKnight, MPH, ScD, Associate Professor and Director, Southeast Center for Agricultural Health & Injury Prevention College of Public Health University of Kentucky.

**Challenge / Issue:**

There is a lack of surveillance to identify and analyze recurring-systematic databases for high risk occupations of occupational respiratory diseases and related hazards for the agricultural industry. Sources of information are the National Center for Health Statistics multiple-cause-of-death data (1988-1998), the Third National Health and Nutrition Examination Survey (NHANES III) data (1988-1994), and the National Health Interview Survey (NHIS) data (1994-1997). A gap of recurring-systematic databases for occupational exposure-related data for the agricultural industry was identified by this project. The gap of systematically-recurring exposure-related information identified for the agriculture industry by this project has spurred NIOSH to collect, analyze, and disseminate information regarding agricultural respiratory hazards through a new project. The new project will augment the current agricultural surveillance report which is concerned only with health outcomes with a state-of-the-art review of respiratory hazards in agriculture. The new project will also ascertain and publish information on the

economic costs of occupational respiratory disease (ORD) in agriculture, explore ways to enhance ORD surveillance information so as to fill gaps and improve dissemination, develop ways to assess how ORD surveillance information is used for education and prevention, and develop indicators of relevance to measure progress in disease prevention.

Through this project, NIOSH funded a contract to develop a DRDS-approved surveillance report which identifies agricultural groups (occupations) with significantly elevated Proportional Mortality Ratios (PMRs) and significantly elevated Prevalence Ratios (PRs) of respiratory disease categories. Selected data sources used were the National Center for Health Statistics multiple-cause-of-death data (1988-1998), the Third National Health and Nutrition Examination Survey (NHANES III) data (1988-1994), and the National Health Interview Survey (NHIS) data (1994-1997). Expected values for the PMRs and PRs are based on the non-agricultural populations in their respective databases, and are adjusted for age, sex, race/ethnicity (and, for PRs, smoking status). This project provides important information for prioritizing research and intervention programs needed to reduce mortality and morbidity of high-risk agricultural groups (occupations). The contractor identified a gap of recurring-systematic databases for occupational exposure-related data for the agricultural industry.

**Organizations that were engaged in the program activities:**

North American Agromedicine Consortium and National Institute for Farm Safety, Inc.

**Findings:**

Crop workers had significantly elevated mortality for a number of respiratory conditions, including hypersensitivity pneumonitis (proportionate mortality more than 10 times higher than expected), asthma, bronchitis, histoplasmosis, tuberculosis, pneumonia, and influenza). Livestock farm workers had significantly elevated mortality for several respiratory conditions, including hypersensitivity pneumonitis (proportionate mortality more than 50 times higher than expected), asthma, tuberculosis, and influenza. Landscape or horticultural workers had significantly elevated mortality for chronic obstructive pulmonary diseases (COPD), including chronic airways obstruction, and for abscesses of the lung and mediastinum. Forestry workers had significantly elevated mortality for tuberculosis, COPD, including chronic airways obstruction, and for pneumonia. Fishery workers had significantly elevated mortality for COPD, including chronic airways obstruction. Farm workers had elevated prevalence of phlegm production compared to all non-agricultural workers. Prevalence of wheeze was elevated for female farm workers and shortness of breath was elevated for farm workers who had 'ever smoked.' Farm workers had a prevalence ratio (PR) of 173 for obstructive abnormality.

**Outputs:**

One platform and two poster presentations at the 2006 Conference of State and Territorial Epidemiologists (CSTE) and 2005 National Institute of Farm Safety, Inc. (NIFS) and North American Agromedicine Consortium (NAAC) annual conferences. DRDS-approved manuscript for NIOSH-numbered surveillance report (awaiting NIOSH-OD approval).

**Intermediate Outcomes:**

- 1) This project and ensuing presentations and journal publications should serve to motivate and target effective activities to prevent adverse respiratory health effects occupationally associated with the agriculture industry.
- 2) Some of the surveillance research gaps identified through this project have resulted in the development of new research projects targeting surveillance for hazards / exposures in agriculture - moved NIOSH to action in new research areas

**End Outcomes:**

None yet.

**External Factors:**

A gap of recurring-systematic databases for occupational exposure-related data for the agricultural industry was identified by this project.

**Future Directions:**

The gap of systematically-recurring exposure-related information identified for the agriculture industry by this project has spurred NIOSH to collect, analyze, and disseminate information regarding agricultural respiratory hazards through a new project. The new project will augment the current agricultural surveillance report which is concerned only with health outcomes with a state-of-the-art review of respiratory hazards in agriculture. The new project will also ascertain and publish information on the economic costs of occupational respiratory disease (ORD) in agriculture, explore ways to enhance ORD surveillance information so as to fill gaps and improve dissemination, develop ways to assess how ORD surveillance information is used for education and prevention, and develop indicators of relevance to measure progress in disease prevention.