**FINAL PROGRESS REPORT – TECHNICAL SUMMARY**

Grant Number: 7 R01 OH04020
Principal Investigator: David J. Tollerud, MD, MPH
Project Title: "Claims-Based Surveillance to Identify Injury Precursors"

Project Period: 09/30/1999 – 09/29/2003

**Specific Aims**

The specific aims of this project were to:

1. Develop the procedures and protocols to transform workers' compensation medical claims data into a surveillance system for work-related injuries and illnesses
2. Determine the degree to which the claims-based surveillance system under-reports workplace injuries and illnesses
3. Explore methods to identify patterns that predict precursor events that could be identified through primary prevention
4. Develop employer guidelines for using their workers' compensation medical claims databases for surveillance activities

**Study Results**

Specific Aim 1:

We successfully converted workers' compensation medical claims files that cover injuries to City of Philadelphia municipal workers from 1994-2000 to an analytical file format that can be used to study trends in injury rates and severity. Using these data, we have constructed and examined several proxies for injury severity and explored the feasibility of using workers' compensation claims data to create a surveillance system. Variables developed for the proposed surveillance system included medical data on the length of medical supervision, and the number and the intensity of medical services use. We were able to successfully carry out a number of informative analyses that have formed the basis for several national presentations and manuscripts in preparation. In addition, we provided regular injury reports to the City and were able to provide data support for a number of occupational health and safety initiatives among city departments during the period of this grant

Specific Aim 2:

To determine the degree to which the claims-based surveillance system under-reports workplace injuries and illnesses requires collecting data on injuries from the City and then comparing these data to the workers' compensation medical claims data. The undercounting exercise was originally focused on three City of Philadelphia departments (Streets, Water, and Fire) and two years worth of injury data (1998 and 1999). These three departments were selected based upon two criteria: They are three of the top four departments with respect to the number of injuries that occur each year and they have long-standing, effective safety programs with good record-keeping. In the final analysis,

data from the Fire Department were not available, and the analysis was performed on the Streets and Water departments. In the Streets Department, the City kept track of injuries using a paper form referred to as the Injury Checklist form. We obtained copies of all Injury Checklist forms for injuries that occurred in the Streets Department in 1998 and 1999, created a Microsoft Access database and entered all Streets data with appropriate QA/QC procedures to assure accuracy. The Water Department keeps a computerized database on injuries which captures nearly 100% of injuries, therefore, no data entry was needed.

In the Water Department, we found that relying solely on workers' compensation medical claims data resulted in an undercount of 8.4% of the injuries in 1998 and 4.5% in 1999. For five of the twenty four months in the analysis, use of claims data would result in more injuries being counted than would be counted using departmental data.

The data collected from the Streets Department permitted a more in-depth undercount analysis and a one-to-one matching of injuries recorded on departmental forms to injuries represented by new medical claims. In 1998 and 1999, the Streets Department collected information on 2,296 new injuries. In this same time period, there were 2,577 new claims filed by employees of the Streets Department. In detailed discussions with the safety officer of the Water Department, it appeared that departmental procedures related to filling out and filing the paper Injury Checklist form accounted for the substantial undercount of injuries on the departmental forms. The analysis results resulting from this project stimulated a review of these departmental procedures.

Specific Aim 3:

We found two difficulties in using the surveillance database as a meaningful predictor for workplace injuries. First, the nature and timing of the reporting and filing of charges for service preclude the use of these data for a timely surveillance program, even if we had real-time access to the claims data. For example, the mean lag between date of medical service for a work-related injury and the time a medical bill for that service is entered into the workers' compensation claims database is 71 days for treatment received at outpatient clinics, 107 days for treatment received within a hospital, and 51 days for prescriptions. Second, we performed numerous analyses, using both regression models and graphical displays of injury data over time within departments and other aggregation of worksites and found no consistent ability to predict the number or severity of injuries that will occur at some point in the future, either on a departmental or city-wide basis. The regression analyses demonstrated that the number of injuries that occur on a weekly basis appears to be a random walk. That is, there is no statistically significant relationship between the number of injuries in week t and the number of injuries in weeks prior to t. We have therefore concluded that claims data, as reported by the City, can not be used to create an effective surveillance system. It is possible that claims data from other employers with more rapid claims filing and different workplace management might be more usable in this regard. However, after discussions with several large and small employers, it appears unlikely that the City differs significantly from other large employers.

Specific Aim 4:

This aim was contingent upon our finding that it is feasible to use workers' compensation medical claims data to develop an injury surveillance system. Because we determined that it is not feasible for the data we have from the City, this aim was not completed.

**Publications/Abstracts/Presentations**

Peele, P. B., Stockman, C., and D.J. Tollerud. "Using Existing Workers' Compensation Medical Claims Data to Improve Workplace Safety," Association for Health Services Research, Los Angeles, on program for June 2000.

Tollerud, D.J., Peele, P.B., and C.K. Stockman. "A Low Cost Approach to Evaluating Workplace Safety Programs," American College of Preventive Medicine, Atlanta, Georgia, March 2000.

Peele, P. B., Stockman, C., and D.J. Tollerud. "Injury Surveillance Using Existing Workers' Compensation Medical Claims Data," National Occupational Injury Research Symposium 2000.