

**CSTE Occupational Health Workgroup Meeting
Alexandria, Virginia, March 1 – 2, 2006**

Taking a Closer look at the Survey of Occupational Injury and Illness

Meeting Summary

The Council of State and Territorial Epidemiologists (CSTE), in conjunction with the National Institute for Occupational Safety and Health (NIOSH), has recently developed a set of occupational health indicators for use by states. Five of the recommended occupational health indicators rely on data from the Bureau of Labor Statistics (BLS) Survey of Occupational Injury and Illness (SOII). On March 1, 2006 the CSTE Occupational Health Workgroup held a meeting to discuss the strengths and limitations of the SOII. Representatives from 16 states, the BLS, the Occupational Safety and Health Administration (OSHA), NIOSH, Liberty Mutual Research Institute for Safety and four academic centers attended. A copy of the agenda and recommended background reading is attached in Appendix I. A list of the attendees is attached in Appendix II.

The meeting had three objectives:

- (1) To review data collection methods and approaches to data quality control used in conducting the BLS Survey of Occupational Injury and Illness (SOII).
- (2) To review recent research findings regarding underreporting/underestimation of occupational injury and illness in national and state SOII estimates.
- (3) To identify ways that state surveillance programs can work with BLS to improve the estimates of non-fatal occupational injury and illness in the United States.

The morning session was devoted to a presentation by OSHA on OSHA's record keeping requirements, their record keeping audits and the OSHA Data Initiative, and a presentation by BLS on the SOII "What's In, What's Out, and How Does BLS Collect, Estimate, and Control Quality." (Slides from these presentations are included in Appendix III.) These were followed by presentations of two NIOSH funded surveillance research studies matching the companies and persons reported in SOII to information in workers' compensation records and other state data systems. (A copy of the paper with the results from one of the two studies presented, which was published subsequent to the meeting, is in Appendix IV).

The afternoon consisted of a panel discussion of the morning presentations followed by a brainstorming session regarding increased state and federal collaboration in developing complementary and supplementary systems to address the SOII's limitations, and research needed to increase understanding of the omissions in SOII. Conceptual filters to documenting work-related injury and illness as discussed by Azaroff et al. (2002) were used as a framework for this discussion. Steps to improve the usefulness of existing SOII data and the need for new surveillance tools were also discussed.

This document is the CSTE Occupational Health Workgroup's summary of the meeting and includes recommendations discussed at the meeting for future activities to improve surveillance of non-fatal occupational injuries and illnesses at the state and national levels.

The SOII provides national estimates of both counts and rates of broad spectrum of occupational injuries and illnesses. State estimates are also generated for those states that elect to participate. SOII data collection is based on administrative records required by OSHA recordkeeping. The data are collected by BLS and its state partners in a uniform manner across all states and territories allowing for comparison across time and locale. Data are collected on total recordable cases and cases with days away from work, job transfer or restriction. In the early 1990's the survey was redesigned to collect more extensive case and demographic details for those cases that involve days away from work and a new system for acute traumatic work-related fatalities was developed. Data are published annually.

However, the SOII has a number of limitations. It has well defined gaps in scope; it does not include information about work-related injuries and illness among self-employed workers, public sector workers, and individuals employed on farms with less than 10 employees, who together comprise approximately 22 % of the US workforce (Leigh et al, 2004). It is also widely recognized that SOII does not provide useful estimates of occupational illness, particularly chronic occupational illness. The two research studies presented in the morning session focused on SOII's capture of in scope OSHA recordable injuries and illnesses. The findings showed that the BLS SOII failed to capture a substantial proportion of occupational injuries and illnesses with days away from work in the establishments participating in the survey sample. The estimates of undercounting in the SOII based on capture-recapture methods used in these studies ranged widely across the six states studied from 20 – 66%. These findings contrasted with results presented by an OSHA representative at the meeting that annual audits of OSHA logs from approximately 250 companies find that 90% of establishments record the correct number of occupational injuries and illnesses.

The research findings presented, coupled with the well recognized gaps in SOII, indicate that the current national estimates for non-fatal injuries markedly undercount the burden of occupational injuries and illness in the U.S. Underestimating this burden can influence public awareness of workplace health and safety as a public health concern and the level of resources and policy activity directed to address the problems. An outstanding and critical question is whether SOII, albeit with limitations, offers a reliable method for documenting trends and elucidating the most important occupational health problems. More specifically, to what extent does the observed decline in work-related injuries and illnesses in the last decade reported by SOII reflect change in underlying incidence? To what extent are the omissions in the data collected on the working population covered by SOII systematic (non-random)? Is there differential underreporting among certain categories of workers, by certain types of events, by types or sizes of establishments or by nature of health and safety programs in the workplace?

The OSHA Act charged the Secretary of Labor with developing and maintaining a comprehensive program of health and safety statistics. The responsibility for collecting statistics on occupational injuries and illnesses was delegated to the BLS. The responsibility of enforcing the provisions of the 1970 act, including record-keeping was charged to OSHA. There is nothing

in the OSHA Act that stipulates the method in which health and safety statistics should be collected. In the early 1990's BLS set up a separate multi-source based system for acute traumatic workplace fatalities (Census for Fatal Occupational Injuries - CFOI). The number of acute traumatic fatalities recorded doubled with the introduction of CFOI in comparison to data previously collected through SOII. To date, BLS efforts at SOII data quality control for non-fatal work-related injuries and occupational illnesses have focused on assuring the validity of the statistical sampling, statistical analysis and the availability of the data they generate. BLS has also worked to reduce non-sampling errors due to survey operations; the agency has completed a review of survey operations to identify and address procedures that might introduce bias and has provided training and manuals to ensure consistency in data collection and coding across states. However, the BLS has considered the issues that precede recording by the employer of injuries and illnesses on the OSHA log to be OSHA's responsibility.

Future activities.

Both expanded surveillance to address well recognized gaps in the SOII and surveillance research to better understand omissions in SOII and factors leading to those omissions are needed. The meeting participants identified a number of specific needs and recommended activities. These are briefly summarized below.

Increased collaboration between BLS and state public health agencies

Surveillance planning. Increased collaboration between state public health agencies, which have epidemiologic capacity and access to a variety of state health data sources, BLS, OSHA and NIOSH is needed to develop a coordinated and comprehensive approach to surveillance of work-related injuries and illnesses in the United States. In 1986, BLS set up the BLS-State Health Department Committee on Occupational Injuries and Illnesses. The committee consisted of BLS and representatives from the California, New Jersey, New York, Texas and Wisconsin Health Departments. The committee was in existence through 1989. It conducted one project funded by BLS comparing the reporting of pneumoconiosis in the SOII survey versus hospital discharge data available to the state health departments. The results were published in 1991 in the Journal of Occupational and Environmental Medicine. Because of budgetary restraints the committee ceased to function in 1989.

Recommendation:

- The CSTE Occupational Health Workgroup previously has provided input to NIOSH on a vision of a comprehensive nationwide occupational health surveillance system in which States and federal agencies play essential complementary roles. This plan needs to be updated. The Work Group should proceed with this effort, and work in collaboration with BLS and OSHA as well as NIOSH to specifically address the interface between SOII and other data sources to address data gaps in the current national surveillance system. The Workgroup should also develop specific suggestions for surveillance research to further explore potential biases in SOII and collaborative approaches to address identified problems. (Several specific research activities suggested at the meeting are summarized below.)

Coordination at state level: Currently, in many states there is little interaction between state agency staff responsible for conducting the SOII and occupational health surveillance program staff in state health agencies. The confidential nature of BLS data is often interpreted as a barrier to collaboration, therefore BLS leadership is needed to encourage increased collaboration on the state level.

Recommendations:

- CSTE and BLS should collaborate to organize a conference that brings together the State BLS survey personnel and state occupational epidemiology personnel to foster ongoing working relationships at the state level. The possibility of holding such a conference in conjunction with the BLS annual meeting of state survey staff should be explored.
- State SOII programs have the option of developing an SOII sample to address state specific needs. State public health agencies should work with state SOII staff to develop state specific data collection.

Addressing out of scope worker populations

Self-employed workers. The Census of Fatal Occupational Injuries (CFOI), also conducted by BLS, includes data on fatalities among the self-employed, and CFOI findings indicate that self-employed are at high risk of fatal occupational injury. However, the self-employed are excluded from SOII and information about non-fatal occupational injuries and illnesses among the self-employed is sparse.

Recommendations:

- Develop methods to generate national estimates of non-fatal occupational injuries and illnesses among the self-employed. This would include use of data available to the states as well as SOII data.

Public sector workers. Public sector workers, who are not covered under the federal OSH Act are excluded from the national SOII estimates. Although data on public state and municipal workers are collected as part of SOII in state plan states, public sector data are not routinely aggregated and made available across these states.

Recommendations:

- Explore use of SOII data on public sector workers in state plan states to generate national estimates of non-fatal occupational injuries and illnesses among public employees.
- Expand use of the Behavioral Risk Factor Surveillance System (BRFSS) and other public health surveys to generate surveillance data on out of scope worker populations and to generate independent estimates of the overall burden of occupational injury and illnesses.

Vulnerable populations. CFOI findings of high fatality rates among Hispanic workers have raised awareness of the need for better data on non-fatal occupational injuries and illnesses among racial and ethnic groups. However, race and ethnicity information is an optional data element in the OSHA record-keeping requirements and is missing in a high percentage of the cases in SOII.

Recommendations:

- Explore possibility of improving race and ethnicity data in SOII.
- Expand use of state public health data sources and national health surveys to document the occupational health outcomes among racial and ethnic groups.

Developing a surveillance research agenda.

Differential underreporting. While research presented at this meeting adds to existing evidence that the SOII underestimates the burden of occupational injuries and illness among the worker population under surveillance, there is relatively little information on differential under-reporting by employer and establishment characteristics. Differential reporting and specific barriers to reporting at the individual and establishment level need to be examined using both qualitative and quantitative methods.

Recommendations:

- Investigate the differential effect on undercount of facility size, workforce demographics (age, gender, race and ethnicity), industry sector and geography.
- Explore use of worker follow-back surveys in establishments participating in the surveys.
- Explore opportunities for states that have access to data sources outside of the workplace to work with OSHA in completing the record-keeping audits.
- Investigate the impact of behavioral safety programs on reporting and recording illnesses and injuries on OSHA logs.
- Investigate the potential relationship between state workers' compensation laws and reporting practices.
- Incorporate questions regarding worker reporting of injury or illness to employers in follow-back surveys of workers conducted by state-based surveillance programs.
- Investigate employer and employee understanding of record-keeping requirements.
- Investigate incentives and disincentives for physicians to report cases to workers' compensation.

- Conduct key informant interviews with SOII data collectors.
- Explore whether barriers to reporting at both the employee and employer level could be investigated using the BRFSS or economic development type surveys conducted in the states.

Use of data for enforcement. Use of data from surveillance systems in which there is an unknown degree of underreporting to target enforcement activities can have the unwanted impact of penalizing the best reporters. This is an issue that has not been adequately addressed by the surveillance and enforcement community. There is also concern that use of OSHA log data to target OSHA enforcement activities creates an incentive for employers to outsource the most dangerous jobs, resulting in a shift of the burden of occupational injury and illness to the contract or contingent workforce.

Recommendations:

- Investigate strategies for mitigating the unwanted impact of penalizing the best reporters when surveillance data are used to target enforcement activities. This might include for example, OSHA's routinely targeting a sample of low rate as well as high rate establishments.
- Investigate the effect of outsourcing jobs on establishment injury and illness statistics.

Changes in OSHA record-keeping. In 2002, OSHA introduced a number of changes in the record-keeping requirements. (See OSHA presentation in attachment III.) Since that time there have been a marked decline in some injury and illnesses categories. For example, there was a 7% decrease in the number of MSDs reported nationwide from 2003-2004. This decline was over 20% in some states.

Recommendations:

- Investigate the potential impact of changes in the record-keeping requirements on the reported decline of musculoskeletal disorders over the last several years.
- Investigate the potential role of commercially available software for maintaining OSHA required injury and illness logs on this decline.

Improving usefulness of the current SOII data.

SOII findings are the most widely cited statistics on non-fatal occupational injury and illness in the US. There is concern on the part of state and academic partners present at the meeting that the limitations of the SOII are not widely recognized in the public arena. While limitations of the SOII are included in the BLS documentation, the limitations often appear to be overlooked.

Recommendations:

- Develop consensus language to accompany presentations of SOII data that will adequately present the limitations of the current SOII.
- Explore development of standard adjustments to the estimates of occupational injury and illnesses to account for out of scope worker populations and underreporting.

State SOII sample size. The sizes of the SOII samples in the individual states that participate are too small to allow analysis of data at some of the detailed occupation, industry or injury levels needed by the states. Increases in sample size are unlikely in light of available resources.

Recommendation:

- Develop methods for aggregating state data over time to allow for periodic in-depth analysis of data at the state level.

Break in series. In 2003, BLS changed from using the Standard Industrial Classification system to the North American Industry Classification system in both SOII and CFOI. Since these two industry classification systems are not directly comparable, there is a break in series in both the SOII and CFOI data.

Recommendation:

- Develop detailed guidance for states on how to handle breaks in series.

The Occupational Illness and Injury Classification Manual (OIIC). The OIIC system developed by BLS provides an important tool for standardizing occupational health surveillance data across a variety of surveillance systems. However, the OIIC manual has been neither updated nor revised for use by external researchers since it was first published in 1992.

Recommendations:

- Develop and publish an updated OIIC manual to improve standardization of surveillance data. (BLS reported at the meeting that it is working on a revised manual that should be available in 2007.)
- Provide OIIC training materials to state staff involved in other occupational injury and illness surveillance activities and to external researchers.

Automated coding. The use of multiple coding systems and large data sets poses substantial challenges for states and others conducting occupational health surveillance.

Recommendation:

- Develop new software for better automated coding and cross walks between different data systems, including the development of tools for coding complex narrative text fields.

References

Azaroff LS, Levenstein C, Wegman DH. Occupational injury and illness surveillance: conceptual filters explain underreporting. *Am J Pub Health*. 2002;92: 1421–1429.

Leigh JP, Marcin JP, Miller TR. An estimate of the US Government's undercount of non fatal occupational injuries. *J Occup Environ Med*. 2004;46:10 –18.