

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the National Institute for Occupational Safety and Health

The Case for Collecting Occupational Health Data Elements in Electronic Health Records

**Prepared by the Electronic Health Records Sub-Committee,
NIOSH Surveillance Coordination Group**

Committee Members:

NIOSH: CAPT. Margaret S. Filios, USPHS (Chair), Michael Attfield, Janet Graydon, Suzanne Marsh, Sue Nowlin, John Sestito, Jeffrey Shire, Philip Somervell, Eileen Storey

MA DPH: Letitia Davis

Fall, 2008

Executive Summary

NIOSH and its partners have a long history of conducting occupational disease and injury surveillance to identify and describe work-related disease and injury, with the aim of providing a basis for research and prevention. Although these efforts have been met with considerable success, this work has been hampered by limitations in the accessibility and scope of the available data, such as data from clinical care settings. National efforts are currently underway to implement health information technology, to monitor and enhance health care quality and patient safety. The Electronic Health Record (EHR) is a fundamental part of this process. The EHR provides a major opportunity to enhance occupational disease and injury recognition and prevention. However, this opportunity can only be realized if information reflecting the work experience of each patient is routinely included. This White Paper describes the rationale and need for national electronic health record standards to require the inclusion of information on the patient's work. If this can be achieved, our ability to track and prevent occupational disease and injury will be greatly improved. If this opportunity is missed, it may be immeasurably more difficult to add such provisions in the future.

Background

Extent and cost of occupational injuries and illnesses to the nation

The Bureau of Labor Statistics estimates that nearly 16 workers in the United States die each day from injuries sustained at work (1), and each day an estimated 11,200 private-sector workers have a nonfatal work-related injury or illness. As a result, more than half require a job transfer, work restrictions, or time away from their jobs (2). Annually, approximately 49,000 deaths in the U.S. are due to occupational diseases. Occupational illness and injury together are the 8th leading cause of death (3). Approximately 9,000 workers are treated in emergency departments each day because of occupational injuries, and approximately 200 of these workers are hospitalized (4). Work-related disease and injury account for a considerable fraction of total direct and indirect costs related to health outcomes. In 2005, workers' compensation costs for employers totaled an estimated \$89 billion (5). Comprehensive estimates of U.S. costs related to these burdens range between \$128 billion and \$155 billion per year (6).

Need for data to identify problems, direct research and guide prevention

Occupational mortality and morbidity is largely preventable yet workers continue to suffer from occupational illnesses and fatal or nonfatal injuries. There is good reason to consider the estimates above as gross underestimates of the numbers of work-related cases of injury and chronic disease, although they may be more reliable for fatal injuries than for other conditions. (7,8,9) There is wide recognition of the need to track work-related disease and injury, and to better assess risk factors which provide opportunities for prevention. This activity -- surveillance in the occupational arena -- provides the means to determine who is affected, where, and how, and to use that information to direct intervention efforts aimed at prevention.

There is a long history of successfully using industry and occupation (I/O) data to answer these questions. I/O data are relatively easy to acquire from workers or their next-of-kin. I/O information is present on death certificates, and is frequently collected on many surveys and databases such as the National Health Interview Survey (NHIS) and tumor and trauma registries. Although the I/O information can be imprecise or erroneous, its utility has been widely demonstrated. At the basic level, use of I/O information has revealed associations with health outcomes that are consistent with known occupational health problems. For instance, using death certificate information, insulation workers (with their known work with asbestos insulation) were found to have the highest proportionate mortality ratio for asbestosis from 1990-1999 (10).

To target effective interventions for work-related fatalities, injuries and illness, information on employment (industry and occupation) must be captured and available. Occupation not only may have a role in the causation of certain diseases, but the workplace may also provide a means for transmission of disease, for example tuberculosis (TB), SARS, or influenza. The ability to capture and monitor this information may prove critical during pandemic flu and emergency response scenarios, especially for workers in crucial services such as health care and power and water industries. Routine data collection could greatly improve the ability to anticipate problems, identify exposures and risk factors, and guide response. In the injury arena, information on nonfatal injuries in the work setting could lead to the prevention of a great deal of temporary and permanent disability, and the saving of considerable sums lost due to lost work days and health care expenses.

Existing data and data systems have limitations, preventing fully effective action

There is no comprehensive nationwide system to track work-related diseases and injuries. The most widely used data sources, generated outside of the public health infrastructure, may substantially and systematically undercount work-related diseases and injuries, certain types of workplaces and certain populations of workers (7,8,9). Occupation and industry as core data elements are not routinely collected in public health surveillance systems, which makes it impossible to associate cases with work exposures.

Only a limited number of data sources include industry and occupation (I/O) information. National mortality data include this information, due to special investigative systems; however, this is not true of nonfatal cases, even those seen in the clinical setting. Only a few national morbidity surveys have any I/O data. They typically cover a small minority of the population, and are not designed to detect potentially hazardous working environments. Moreover, some health outcomes are not amenable to enquiry via survey questionnaire, but require medical tests that are not feasible in the survey setting. Meanwhile, health care data (from clinical settings) do not consistently include I/O information. These limitations of the available morbidity information severely restrict the ability of the occupational health community to identify and prevent work-related disease and injury.

Electronic Health Records (EHRs) and Occupational Disease and Injury Surveillance

History

Health (or medical) records are maintained by health care providers and institutions in order to document health status, medical and surgical conditions, and treatment of patients over their tenure with the provider. In recent years there has been a move to convert such records to electronic format, thereby facilitating transfer between providers and providing more ready access to the information. In 2004, the President of the United States set as a goal an electronic health record for every U.S. citizen by 2014. The movement towards implementation of a "network of networks" across the U.S. for information gathering is accelerating. In 2005 the Office of the National Coordinator for Health Information Technology established the Health Information Technology Standards Panel (HITSP) to harmonize and integrate health information standards to facilitate sharing information among organizations and systems.

(www.HITSP.orgwww.HITSP.org) Implementation testing of an initial set of standards began in January, 2008.

Potential uses of EHRs in regard to occupational disease and injury

EHRs could potentially provide a major source of information on occupational disease and injury morbidity since all data from visits to health care providers and subsequent diagnoses will be documented in the record. When coupled with I/O information, such clinical data would permit an analysis of patterns of illness and injury in relationship to work. It would also permit rapid assessment of emerging threats by designated authorities such as state health departments.

Benefit of including I/O information in EHRs

EHRs are potentially superior to existing surveillance approaches for two reasons: they involve morbidity information; and they are comprehensive. In contrast, existing surveillance systems are either comprehensive but include only mortality data, or involve morbidity outcomes but are

not fully comprehensive. In addition, since EHRs are collected and updated as each case presents itself, the data are completely up to date and current.

Routine collection of information regarding industry and occupation will also improve patient care. Recognition of potential occupational illness or the cause of an injury provides an immediate opportunity for prevention. Early recognition of the relationship between work and asthma or hand/arm pain can prevent the development of a chronic condition that results in significant morbidity, lost work time, and even long term disability. Recognition of work-relatedness also may assist health care providers in apportionment in the costs of health care of occupationally-caused disease and injury.

Consequences of taking no action to include I/O information in EHRs

The movement to EHRs appears inexorable; many organizations are converting their hard-copy, paper-based systems to digital format. Given that a harmonized system will probably become a reality in the near future, it behooves the public health community to advocate for inclusion of I/O variables now. The ability to link an individual's work history with adverse outcomes is vitally important for the current and future health of the workforce. The inability to capture I/O information from EHRs would be a critical loss and missed opportunity to greatly enhance the realm of occupational disease and injury surveillance. Failure to recognize this need could mean that work-related disease and injury prevention efforts will be severely handicapped for many years to come.

Recommended actions

NIOSH should work with the public and private organizations engaged in developing standards and processes for electronic health records to develop efficient methods of recording information on occupation, employment status, and industry in those records. The level of detail and specific methods of recording and coding this information need careful consideration in the very near future.

Summary

The inclusion of employment-specific data elements (e.g., industry and occupation) within an electronic health record is strategically important for CDC and NIOSH to fulfill their obligation to anticipate, identify, and respond with prevention efforts. The workplace is a key location for health promotion activities. Knowledge about the incidence of disease and injury by industry and occupation can assist in designing health and safety promotion and prevention activities. The benefit of information on industry and occupation would extend to all who are working to provide and manage health care, determine appropriate prevention strategies, and preserve the health and safety of the workforce. In summary, provision for regular collection and maintenance of employment information in the EHR, especially work history information at the time of each clinical encounter (for longitudinal analysis), provides a unique opportunity to identify exposures and risk factors, and reduce the burden of work-related disease, injury, and death.

References

1. Bureau of Labor Statistics. National Census of Fatal Occupational Injuries in 2006. Washington, DC: US Department of Labor; 2007. Available at <http://www.bls.gov/news.release/pdf/cfoi.pdf>.
2. Bureau of Labor Statistics. Workplace Injuries and Illnesses in 2006. Washington, DC: US Department of Labor; 2007. Available at <http://www.bls.gov/news.release/pdf/osh.pdf>.
3. Steenland K, Burnett C, Lalich N, Ward E, Hurrell J. Dying for Work: the Magnitude of U.S. Mortality from Selected Causes of Death Associated with Occupation. *Am J Ind Med* 2003;43:461–82.
4. CDC. Nonfatal Occupational Injuries and Illnesses—United States, 2004. *MMWR* 2007;56:393-397. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5616a3.htm>.
5. Sengupta I, Reno V, Burton JF Jr. Workers' Compensation: Benefits, Coverage, and Costs, 2005. Washington, DC: National Academy of Social Insurance; 2007. Available at http://www.nasi.org/usr_doc/NASI_Workers_Comp_2005_Full_Report.pdf.
6. Schulte PA. Characterizing the Burden of Occupational Injury and Disease. *J Occup Environ Med*. 2005 47:607-22.
7. Rosenman KD, Kalush A, Reilly MJ, Gardiner JC, Reeves M, Luo Z. How much work-related injury and illness is missed by the current national surveillance system? *J Occup Environ Med*. 2006 48:357-65.
8. Leigh JP, Marcin JP, Miller TR. An Estimate of the U.S. Government's Undercount of Nonfatal Occupational Injuries. *J Occup Environ Med*. 2004;46:10-18.
9. Azaroff LS, Levenstein C, Wegman DH. Occupational Injury and Illness Surveillance: Conceptual Filters Explain Underreporting. *Am J Public Health*. 2002 92:1421-1429.
10. Work-Related Lung Disease Surveillance Report 2002. USDHHS (NIOSH) No. 2003-111.

“The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the National Institute for Occupational Safety and Health.”