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HIT Policy Committee
Meaningful Use Workgroup
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Panel 3: Potential areas for HIT Policy Committee consideration: Where should the committee focus its attention to support MU measures and criteria that complement the public health mission?

Biography

Eileen Storey, MD, MPH is Chief of the Surveillance Branch, Division of Respiratory Disease Studies at the National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention. Dr. Storey is leading an effort across NIOSH to ensure the integration of information regarding the work history of patients in the electronic clinical record to improve patient care and to support public health surveillance efforts. She is Vice-President for Federal Agencies of the Public Health Data Standards Consortium. Prior to joining NIOSH, Dr. Storey was on the faculty at the University of Connecticut School of Medicine where she was Chief of the Division of Public Health and Population Sciences in the Department of Medicine and co-Director of the Center for Public Health and Health Policy of the University of Connecticut. She practiced occupational medicine, taught students and public health students, and conducted research focused on indoor environments and respiratory disease. She completed her Medical Degree and an MPH at Harvard University in 1978, Internal Medicine training at West Virginia University in 1981, and is board certified in Internal Medicine and Occupational Medicine.

Written testimony

Thank you for the opportunity to speak to the Meaningful Use Workgroup. This written document will provide background on the importance of work in the health of U.S.

citizens, the potential that is offered by the emergence of systems of electronic health records, and the challenges before us that could prevent realization of a rare opportunity to significantly reduce illness and injury in the population. The specific questions asked by the workgroup are addressed and will be the focus of my verbal presentation.

The National Institute for Occupational Safety and Health (NIOSH) is the federal agency established to help assure safe and healthful working conditions for working men and women by providing research, information, education, and training in the field of occupational safety and health, and making recommendations for the prevention of work-related injury and illness. NIOSH was created by the Occupational Safety and Health Act of 1970, and is part of the Centers for Disease Control and Prevention.

NIOSH is working 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 ability to link an individual's work history with adverse health outcomes is vitally important for the current and future health of the workforce.

While the level of detail and specific methods of recording and coding occupational information are under careful consideration in several states, NIOSH is pursuing this effort at the national level in a number of ways. CDC/NIOSH is a member of the Public Health Data Standards Consortium (PHDSC) and serve as liaison to federal agencies on the Board of Directors, and actively participate with others in the joint Council of State and Territorial (CSTE)- CDC Public Health Case Report Standardization Workgroup, assisting with standardization of work-related data elements for all Nationally-Notifiable Conditions (NNC). NIOSH is working collaboratively with those involved in the process of capturing clinical data, its content, structured format and collaborative messaging exchange to ensure collection of occupational information. In addition, NIOSH is developing a strategy to clarify the goals for incorporating occupational information into EHR's, to develop use cases for particular conditions, to estimate the impact on health care utilization and cost of effective use of occupational information in the care of patients, and to work with the Office of the National Coordinator's committees to move forward.

NIOSH is also developing a software system to effectively and efficiently code narrative or text information on industry and occupation (I/O). This project was initiated in FY2008. In a prototype stage, this system has already increased the productivity of manual coding of I/O within NIOSH. When completed, the Web-based system will permit computerized auto coding of the majority of I/O data presented in narrative form. This program will be useful for many of the NIOSH projects that analyze I/O. NIOSH is

partnering with the Bureau of Labor Statistics, the Census Bureau and Internal Revenue Service – all of which are interested in a more streamlined I/O coding process. The anticipated Web-based system will be available to many organizations that rely on I/O coding, including state vital registrars, cancer registries, including CDC's National Center for Health Statistics (NCHS) and others.

Background

The urgent need for prevention in the context of clinical care

Building in capacity to promote prevention and public health in the context of medical care is an urgent need. Occupational mortality and morbidity is largely preventable yet workers continue to suffer from occupational illnesses and fatal and nonfatal injuries. The BLS estimates that nearly 16 workers in the United States die each day from injuries sustained at work (BLS, 2007). Every day an estimated 11,200 private-sector workers have a nonfatal injury or illness at work. As a result, more than half require a job transfer, work restrictions, or time away from their jobs (BLS, 2007). 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 (Steenland, 2003). Approximately 9,000 workers are treated in emergency departments each day because of occupational injuries, and approximately 200 of these workers are hospitalized (CDC, 2007). Failure to recognize this at the point of care with a clinician leads to poor outcomes and no prevention. The individual patient is not afforded appropriate treatment and the opportunity for intervention to reduce risks for the patient at hand as well as co-workers is lost.

In 2007, employers spent nearly $85 billion on workers' compensation. (Sengupta, 2009) These expenditures are only a portion of the costs borne by employers, workers, and society overall, including costs paid by other insurance systems (CDC, 2010). Work-related disease and injury account for a considerable fraction of total direct and indirect costs related to health outcomes. Recognition of work-relatedness may assist health care providers in apportionment of the costs of health care related to occupational conditions. For work-related adult asthma, the direct and indirect costs may be upwards of over three billion dollars when the assumption that 15% of all adult asthma is attributable to occupational exposures is applied to general estimates (Leigh, 2002; Balmes, 2003). According to the Liberty Mutual Research Institute for Safety, repetitive motion injuries, which are those injuries due to repeated stress or strain, cost $2.8 billion dollars and represent 3.8% of the entire cost burden of the 10 most disabling workplace injuries that occurred in 2007 - $53 billion (Liberty Mutual Workplace Safety Index, 2009) .

The Urgent Need for Surveillance of Occupational Illness and Injury

There is good reason to consider the estimates above as gross underestimates of the numbers of work-related cases of injury and chronic disease. (Rosenman, 2006; Leigh, 2004; Azaroff, 2002) There is not a single dataset or survey that systematically captures information on occupational injuries, illnesses and exposures. The most widely used data sources, generated outside of the public health infrastructure, substantially and systematically undercount work-related diseases and injuries, certain types of workplaces and certain populations of workers (Rosenman, 2006; Leigh, 2004; Azaroff, 2002). Occupation and industry as data elements are not routinely collected in public health surveillance systems, which makes it impossible to associate cases with work exposures.

The Workplace as a Location of Disease Transmission

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.

The Workplace as a Location of Health Promotion

The workplace can be an important venue for delivery of prevention-focused services and messages. Worksite health promotion is more likely to be successful if occupational safety and health is considered. In fact, a growing body of evidence indicates that workplace-based interventions that take coordinated or integrated approaches to reducing health threats to workers both in and out of work are more effective than traditional isolated programs (Sorensen et al., 2002, 2005; Hunt et al.,2005; LaMontagne, 2004;Meas et al., 1998). The need for this coordinated approach was noted in *Healthy People 2010* (*HP 2010*) (US Department of Health and Human Services, [US HHS] 2000). Thus, knowledge of risk factors, disease burdens, and behaviors in various industries and occupation can assist efforts to target prevention efforts effectively. For example, the age-adjusted prevalence rate of current smoking is most common in Construction and Extraction occupation (29%), and highest in the Construction industry (29%) (unpublished data, NIOSH).

To target effective interventions for work-related fatalities, injuries and illness, information on employment (industry and occupation) must be captured and available.

Summary

With Americans spending 50% of their waking hours at work, the workplace has an enormous impact on the health of the U.S. population. Beyond income, it provides a context for human creativity, application of skills and talents, social networks, and growth of the national economy. It also poses substantial risks – physical, biological, chemical, and psychological – which can result in injury or illness that significantly interferes with productivity and quality of life. It's a key location and effective venue for health promotion activities. 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 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 , provides a unique opportunity to identify exposures and risk factors, and reduce the burden of work-related disease, injury, and death.

1. **What policy, legal and/or technical issue do you perceive as barriers to getting to improved population health outcomes?**

Improved population health outcomes will require

- Collection of data regarding risk factors for illness and injury
- Decision support mechanisms that transform these data into actionable information
- Assessment of clinician behavior and documentation (quality assurance)
- Reporting of conditions to appropriate public health authorities
- Notification of reportable conditions to appropriate federal authorities

These will provide opportunities to

- Promote primary prevention through patient education and environmental intervention
- Promote secondary prevention through early recognition of evidence of exposure or health outcome that can be reversed or ameliorated
- Support community-based efforts to reduce risks

Barriers:

I. Failure to capture the data in the clinical record or to provide the data at the point of care for the clinician

Successful capture of information requires that the EHR be structured to require, or at a minimum permit, that the information about employment be recorded.

CDC recommended during the comment periods. Unfortunately, current and usual occupation was not added to the demographic factors as a requirement for capturing in Complete EHR and EHR Module at Stage 1.

Although federal agencies, such as the Bureau of Census and the National Center for Health Statistics, are successful in obtaining industry and occupation through national surveys, the health care setting has little experience in this regard; possibly due the lack of understanding of the importance of this information in clinical care.

The Occupational Health Surveillance Program at the Massachusetts Department of Public Health collaborated with three community health centers (CHCs) to collect data on work-related conditions affecting their patients. Each of the three health centers used a different EHR software package. The following barriers were identified in their electronic data systems:

- No system included a field for patient occupation in the main sections of the EHRs that are typically used by providers.
- No system included a field for patient occupation or for work-relatedness of diagnosed conditions that could be easily searched or queried.
- One system did not permit the addition of new, searchable fields, so was not able to add a field for work-relatedness of diagnosed conditions.
- Technical difficulties at one health center prevented linking a work-relatedness field (added to the health center's system for the DPH collaboration) to the corresponding diagnosis.

In short, three of the EHRs used by health centers in Massachusetts did not permit the systematic capture and reporting of patient occupation or of work-related diagnoses. (Personal communication: Lenore Azaroff).

Information about employer and to a much lesser extent, occupation, is often captured in administrative data collected at intake, but may not be integrated or linked with clinical data.

A review of medical charts for working age patients with injuries treated in Massachusetts emergency departments found that for cases where there was indication that the injury was work-related, 89% of the records had employer name, 77% had employer address, 34% had occupation and 13% had industry. This information was nearly always on FACE sheets, and not in the clinical history. Notably employer name was available for 42% of the other injury – related emergency department visits. This figure increased to 62% excluding visits by persons reported "not working." (Personal Communication: Letitia Davis.)

II. Absence of well developed systems to capture and use the data

What is needed are pilot projects to (a) demonstrate efficient capture of industry and occupation information in the clinical setting (b) demonstrate decision support that provides useful information to the clinician with that information (c) document impact on clinical outcomes and (4) link this to public health reporting systems already functioning in many states.

Policy (OH)

Failure to link clinical guidelines to quality measures of clinical care

The American College of Occupational and Environmental Medicine has issued clinical professional guidelines for the diagnosis and treatment of many occupational illnesses and injuries. More broadly, guidelines for conditions with common occupational or environmental contributors require that these be assessed and managed. For example, the National Asthma Education and Prevention Program (NAEPP) of the National Heart Lung and Blood Institute/NIH issued guidelines in 2008 specifically addressing the need to assess environmental and workplace factors that could contribute to the severity and persistence of asthma in adults and children. The American Thoracic Society outlines a very explicit algorithm to diagnose possible occupational asthma in any adult with asthma.

As a matter of policy, incorporating the NAEPP or ATS guidelines into the practice of medicine is important to reducing the burden of asthma in the population. The electronic health record provides a means to assist clinicians in this process, provides an opportunity to give information to clinicians to guide further assessment, and could be used to measure rates at which appropriate care is provided.

Legal (OH)

Inadequate protection of patients from third-party use of information in medical records

Recording occupational data and pursuing a discussion with a patient regarding the possible role of work in a condition cannot be used to deny health benefits or to undermine job security. Confidentiality and appropriate use of data is essential to providing care.

Workers' compensation laws are specific to each state. Statutes of limitations impede frank discussion of concerns about workplace risks by patients with physicians if they perceive that their access to workers' compensation benefits may be compromised. On the other hand, efforts by group health insurance to shift costs to workers' compensation may also inhibit exploration of possible work-relatedness by both patient and physician, particularly for conditions poorly covered by workers' compensation.

Technical (OH)

Challenges include the efficient recording of occupation and industry and the ability to link administrative data with clinical data.

Industry and occupation are inextricably linked and both are necessary to adequately characterize a patient's work. For example a maintenance worker can be employed in the manufacturing or health care industry sector. While standard code sets for industry and occupation exist and are well established, due to the complexity of the coding process, current practices require trained coders for quality data. NIOSH provides training for industry and occupation coding. NIOSH is developing an automated coding system to assist in this process which will be useful for coding vital statistics, for cancer registries, and other public health data sources as well as for occupational health research. It remains a challenge to develop approaches to coding in the clinical arena; however, new technologies applied to EHRs including automated coding of industry and occupation may reduce the challenges. Experience in Massachusetts at CHC's is mixed. One center preferred to use a drop-down menu of common occupations in the patient population. Another found using free text after training of staff was easier.

2. Are there any specific approaches to data standards, aggregation and/or infrastructure that would help achieve better population health outcomes?

To help achieve better population health outcomes we must be able to deliver necessary data to those who need to know in real-time. Under Meaningful Use, for public health this means the ability to participate in electronic health information exchanges with clinical EHR-S and across public health information systems.

As a member of the Public Health Data Standards Consortium (PHDSC), NIOSH has worked collaboratively with NCHS and other federal, state, and local health authorities as well as non-governmental public health agencies, academic institutions, and private sector entities engaged in the development of health informatics systems to consider carefully the relationship between the emerging electronic health record in U.S. clinical care and public health. The Consortium has developed a Business Case that describes and quantifies the approach for data standards development, data aggregation and deployment of the service-oriented, standard-based infrastructure.

This approach is focused on the adoption of interoperable standards-based HIT products in public health. In order to make this happen, representatives from every local, state and federal public health agencies must participate in the national HIT standardization activities as follows:

- developing and harmonizing HIT standards that will serve public health needs by working with standards development organizations,
- developing tools and methods for testing developed standards by working with testing laboratories,
- developing certification criteria for standards-based HIT products,
- deploying interoperable standard-based HIT products in public health agencies or upgrading current non-standardized public health information systems to assure interoperability, building informatics-savvy public health workforce by participation in the ONC-funded informatics training, so public health professionals will be able to represent public health interests in the national Hit standardization activities.(PHDSC, 2009)

3. How should PH contribute to the concept of a learning health system?

Public health can contribute to a learning health system in profound ways: recognition of constellations of symptoms, and detection of pertinent environments where exposures have occurred can lead to public health alerts in the electronic record – providing clinicians with instant new knowledge regarding detected threats. Other contributions include the ability to evaluate the effectiveness of various interventions using a “systems approach” to problems.

4. What future state might we envision as public health agencies gain access to population health information to drive improved health outcomes?

We envision a state where sentinel events and emerging illness and injury trends lead to clinician recognition, intervention, and prevention. Sentinel surveillance tied to systematic interventions has been successful in the past, starting with substantial reductions in maternal mortality in New York City and in Massachusetts (Rutstein, 1983). The concept has been applied to occupational illness and injury in very focused, resource-limited ways in a number of states since the 1980's. Success can be measured in the identification of new risks, in the recognition of known risks in new settings, and in the development of effective tools for intervention. However, there is no systematic surveillance of occupational illness and injury that would provide adequate measures of morbidity and mortality linked to occupation that allows for consistent measures of the impact of these sentinel event systems. The electronic health record provides an enormous opportunity to apply this concept consistently in the care of patients in the United States.

We envision a state in which we could measure the burden of occupational illness and injury in a community, in populations at excess risk for these conditions, in states, and nationally. We would be able to analyze patterns of illness and injury in relationship to work and recognize disparities in populations. We could conduct rapid assessment of emerging threats and mitigate those threats and meet the respective needs of local, state, and federal public health agencies.

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