

## Letters to the Editor

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### Characterizing the Burden of Occupational Injury and Disease

*To the Editor:* The article by Schulte promises to review the literature and provide a comprehensive characterization of the burden of occupational injury and disease. A thorough read would suggest that the first half of the objective has been accomplished, but instead of a comprehensive documentation, he has only succeeded in highlighting, in stark fashion, some of the many obstacles to achieving a true characterization.

I would submit that there are key contributors to the issue that have not been identified. Furthermore, the basis of this paper is the published literature. Unfortunately, the published literature is not diverse enough and is skewed in favor of a few large, private companies such as Dow, GM, or Johnson and Johnson, and relies on data that is limited and flawed. Table 2 of the document<sup>1</sup> raises questions about the reliability of the methods used in deriving data. Depending on the study, there are several age groups lumped together, and it is not clear what criteria are used to attribute risk to each category under health effects. Another flaw is the result of the lack of uniformity and standardization in methods of data collection and analysis.

The source of information for government statistics are inconsistent and lack uniformity. There is no central database or standard method of data collection, analysis, or reporting. For example, much of government workers compensation data relies on documentation from employees' primary care physicians.

These doctors may be operating under managed care/cost guidelines that provide no time or opportunity to focus on assessing workers' issues. The doctor may wrongly attribute an injury or illness to work or not consider work as a causative factor. Often, there is no true occupational history taken, and the provider has no objective knowledge of the workplace and a limited knowledge of occupational medicine.

I do not disagree with the conclusions of the author. There is no doubt a significant magnitude of burden that is greatly underestimated. In addition to the authors' suggestion of an integrated approach to address issues, I offer the following suggestions: 1) we need to educate general primary care physicians to assure more reliable assessments and medical documentation; 2) we must engage workers in a discussion to get accurate reporting, commitment to following workplace injury prevention guidelines, and a willingness on the part of the worker to assume personal responsibility for his or her own health and safety; and 3) emphasize the need for the development and affordability of software to address data collection, storage, and retrieval. This should have a standardized platform with interoperability between systems for easy sharing of electronic medical records within legal limits and HIPAA guidelines.

The author has raised an issue that merits the focus of employers, policymakers and, most importantly, workers. The workplace is where many spend a significant portion of their day. In today's environment, the workplace can be dangerous to

one's health secondary to acts of violence or terror. Accurate categorizing of the burden should translate into benefits to all constituents. The benefits would be in the form of greater emphasis being placed on worksite health and safety with adequate funding, education, and safeguards.

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### Reference

1. Schulte PA. Characterizing the burden of occupational injury and disease. *J Occup Environ Med*. 2005;47:607–622.

DOI: 10.1097/01.jom.0000190321.55457.64

### Reply: Characterizing the Burden of Occupational Injury and Disease

*Author's Response:* I welcome Dr Charles' comments because they highlight a major point made in the paper, namely that occupational disease and injury are underestimated. Dr Charles points out that there is a limitation in using only the published literature, which is peer-reviewed, as was done in this paper. However, most journals only consider papers that use the published literature. Indeed, a much fuller picture might be developed if gray literature and internal reports of insurance companies and corporations were available for review. The question is one of what journals will accept and also of what is available to researchers. The gray literature is often not peer-reviewed or easily accessible.

It may not be appropriate to characterize the "sources" of burden information as inconsistent; they are just different. Different tools are used to measure morbidity and mortality on the population-level as opposed to the company level. Ideally, it would be helpful if every employer used the same methods to track (in census terms) their working populations, and monitor and characterize their health, illness, injury, and disability status. However, from the perspective of public health surveil-

lance, a central database and standardized methods of data collection, analysis, and reporting may be difficult to achieve.

Among the additional steps that Dr Charles suggests for improving estimation of the burden is the statement to engage workers in accurate reporting and for them to be willing to assume personal responsibility for their safety. Such a recommendation, in the absence of any discussion of employers' responsibilities regarding workplace safety and health, is incomplete.

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 DOI: 10.1097/01.jom.0000204045.95809.56

### **Erratum: Career Risk of Hepatitis C Virus Infection Among U.S. Emergency Medical and Public Safety Workers**

*To the Editor:* While continuing our work on the risk of occupational transmission of bloodborne pathogens, we encountered a recent publication by Boal et al<sup>1</sup> reviewing the risks of bloodborne pathogen transmission for firefighters and emergency medical technicians. Because of discrepancies in the reported rates of percutaneous injuries between our two publications, we reanalyzed the extracted data from the original publications used to calculate needlestick incidence rates for public safety and emergency medical personnel and discovered some errors in Table 1 of our recent publication.<sup>2</sup> During the process, we identified several errors and unexplained discrepancies in some of the original publications that we reviewed. Therefore, the corrected data that we provide here is based on our best calculations and may still vary from some of the original publications and the review of Boal et al. We are currently in the

process of contacting the authors of several of the original papers in an effort to clarify these issues and obtain the original data when possible. In addition to correcting these errors, we have also chosen to present the data in a manner that more clearly articulates the population and the range of reported values. The revised Table 1 is presented here.

Because we used a Monte Carlo approach based on the range of reported data and the corrected data fall within the range estimates that we used, they do not appreciably alter the risk estimates presented in Table 2 for firefighters and emergency medical services (EMS) personnel. In fact, it appears that we may have significantly overestimated the rate of needlestick injury, and hence risk of infection, among non-EMS firefighters. Woodruff<sup>3</sup> reported no needlestick injuries during a 6-month period among 611 non-EMS firefighters. Averoff<sup>4</sup> reports an annual incidence of 12 needlestick injuries per 1000 employees per year among non-EMS firefighters. Therefore, a range of zero to 12 needlestick injuries per 1000 employees per year would have been more appropriate than the 10 to 20 needlestick injuries per 1000 employees per year that we used in our model. Because our model essentially doubled the reported incidence of needlestick injuries, it can be considered a conservative model of the risk for non-EMS fire personnel.

With regard to firefighter-EMS personnel, although Reed et al<sup>5</sup> report an incidence rate of 104 needlestick injuries per 1000 employees per year in their publication, their data describe only 14 needlestick injuries among this population of 650 firefighter-EMTs over the 2-year study period, leading to a calculated rate of 10.8 needlestick injuries per 1000 employees per year. A table footnote reveals that 55 (9%) of the firefighters were paramedics (EMT-4), whereas 595 of the 650 participants were nonparamedics (EMT 1-3). Among paramedics, there were 10

reported needlestick injuries during the 2-year study period representing a rate of 90.9 needlestick injuries per 1000 employees per year, whereas among nonparamedic firefighters, only four needlestick injuries were reported representing a rate of 3.4 needlestick injuries per 1000 employees per year.

Averoff<sup>5</sup> reports additional information on needlestick injury rates among law enforcement and correctional personnel that we regrettably did not identify and include in our manuscript. Assuming that no law enforcement worker in Averoff's study had more than one needlestick (not specified in the original publication), we calculated rates of 18 needlestick injuries per 1000 workers per year for police officers, 13 needlestick injuries per 1000 workers per year for sheriff officers, and 46 needlestick injuries per 1000 workers per year for corrections officers. These data suggest that we may have underestimated the risk for law enforcement and correctional personnel. We are currently preparing a follow-up manuscript using refined methodology that includes additional published data to refine our input variable estimates, as well as introducing a alternative analytic tool that may have more practical application for occupational and public health practitioners who do not have access to statistical programming or personnel.

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2. Rischitelli DG, Lasarev M, McCauley L.

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DOI: 10.1097/01.jom.0000203983.18388.9c

**TABLE 1**

Parenteral Exposures Per 1000 Employees Per Year

Population	Parenteral Exposures Per 1000 Employees Per Year		Study Author	Year
Firefighters and emergency medical services	0	Firefighter (non-EMS)	Woodruff	1993
	3.4	EMT	Reed	1993
	10.8	EMT and paramedic	Reed	1993
	30	EMT	Carillo	1996
	87	EMT	Hochreiter	1988
	111	EMS (unspecified)	Woodruff	1993
	145	EMT and paramedic	Hochreiter	1988
	200	EMT and paramedic	Marcus	1995
	90.9	Paramedic	Reed	1993
	180	Paramedic	Carillo	1996
	181	Paramedic	Hochreiter	1988
	367	Paramedic	Klontz	1991
Police officers	3		Hoffman	1994
Emergency department personnel	247 (NSI)	70 (all percutaneous injuries)	Marcus	1993
Registered nurses	176		Stotka	1991
	180		McCormick	1991
	123.8		Neuberger	1984
	277		Ruben	1983
	92.6		McCormick	1981
Other nursing personnel	57		Neuberger	1984
	44.1		McCormick	1981
Physicians	558		Stotka	1991
	2000		Melzer	1989
	52		Ruben	1983
Hospital housekeeping personnel	113.5		Neuberger	1984
	179		Ruben	1983
	420		Jacobson	1983
	127		McCormick	1981
Hospital laboratory personnel	75.9		Neuberger	1984
	121		Ruben	1983
	104.7		McCormick	1981
Radiology personnel	65		Ruben	1983
Miscellaneous healthcare workers	26.2		McCormick	1981
All healthcare workers	81.2		Goob	1999
	101.9		Neuberger	1984
	165		Ruben	1983
	81.8		McCormick	1981

EMS indicates emergency medical services; EMT, emergency medical technician; NSI, needlestick injury.