

Limitations and Observations on the Data

This chart book relies mainly on data collected by a large number of public and private agencies in the United States and several international organizations. Occupational safety and health surveillance systems nationwide have been enhanced and improved significantly in recent years. However, the pace of improvement lags far behind the rapidly changing construction industry. Many new and emerging issues are not yet addressed by the existing data collections, and information that has been needed urgently for a long time remains unavailable. The limitations identified by compiling this chart book are listed and briefly discussed below. It is hoped that this edition will draw attention to many unanswered questions that exist in the construction industry and will point out important gaps in government and private-sector data collection systems. In addition, it is hoped that the book will inspire decision makers to improve conditions in the construction industry and lead to more research on this industry and its workers.

■ *Incomplete Data*

The Census of Fatal Occupational Injuries (CFOI) data on deaths from injuries are believed to be relatively complete and can be tabulated in detail. However, the nonfatal injury data derived from the U.S. Bureau of Labor Statistics' (BLS) Survey of Occupational Injuries and Illnesses (SOII) are questionable. The SOII covers only the private industry, and the self-employed are not required to report injuries and illnesses. This is a problem for the construction industry in particular, because about one-fourth of the construction workforce is self-employed. Safety and health performance and outcomes among this population remains unknown.

Also, BLS survey data are based on the Occupational Safety and Health Administration (OSHA) logs maintained by employers. The accuracy of the logs depends largely on employers' understanding of which cases are work-related and the truthfulness of reporting. Based on the data presented in the chart book, nonfatal injuries are probably underreported, particularly by small firms and for Hispanic workers. It is difficult to estimate the magnitude of underreporting, and the existing estimates are therefore unreliable. An improved national injury surveillance system is needed for the whole industry, especially for small construction establishments and the residential construction sector.

■ *Lack of Reliable Denominators*

To measure risk, hours worked are needed as the denominator to calculate injury rates across different occupations and industries. However, none of the available data sources can provide precise estimates. The Current Population Survey (CPS), used to estimate the size of the workforce and hours worked in this chart book, is a household survey conducted by telephone. Undercounting is likely among all construction workers, but especially among migrant and mobile workers and those who rent rooms or lack permanent U.S. addresses. This potential undercounting may be of particular concern when attempting to find data on subgroups such as recent immigrants, Hispanics, and very low-income workers.

Although undercounting is a problem, survey respondents may be more likely to overestimate the hours they worked. When injury and illness rates based on work hours from CPS were compared with rates based on work hours reported by employers as part of SOII, the rates from SOII were higher. This difference suggests that the fatality rates reported in this chart book – which used the CPS data – overestimated the hours worked and thus may have underestimated the fatality rates by about 10%.

■ *Lack of Data on Occupational Illnesses*

According to available BLS data, occupational illnesses count for about 2.5% of the overall number of nonfatal occupational injuries and illnesses in the construction industry. Clearly, these illness data are grossly underreported. The underreporting largely reflects the difficulty of identifying illnesses as work-related. Part of the problem is that many work-related illnesses can be latent for a decade or longer between initial exposures to a job hazard, such as toxic substances, noise, and musculoskeletal disorders, and the appearance of symptoms. While this is true for all occupational illnesses, it is particularly difficult for a construction worker to establish the connection between diseases and employment, since a construction worker may have a series of employers, varying tasks, and changing workplaces, each of which could involve different exposures to health hazards. Also, a construction worker may be exposed directly to toxins and may be a bystander to other workers' hazardous tasks, resulting in second-hand exposures. Furthermore, the *healthy worker effect*¹ can skew results of

health studies on construction workers due to the high physical demands of this industry. Intensive research is needed to develop new approaches to accurately collect data on the scope of occupational illnesses and identify associations between illnesses and exposures.

■ ***Lack of Detailed Industry Data***

The U.S. Census Bureau and the Bureau of Labor Statistics provide various types of cross-sectional information about employment in the construction industry. However, none of the data sources has information on exactly how many construction workers are involved in residential construction. All construction sub-sectors are grouped together in the household surveys, which are used as data sources to measure employment in the chart book. The establishment surveys, such as the County Business Patterns (CBP), provide employment data by detailed construction sectors, but self-employed workers are excluded. This is particularly a problem when estimating employment for the residential construction industry because workers in this sector are more likely to be self-employed. Although the Census Bureau collects a series of construction statistics by type of construction work (e.g., office buildings, residential, maintenance, etc.), employment information is not included in this series. All of this significantly hampers researchers' abilities to understand occupational variables in specific industrial environments and limits the efforts in developing appropriate intervention strategies.

There is also a need to collect project-level data and make such data accessible to the public and researchers. Adding industry identifiers to several existing data collections, such as the National Electronic Injury Surveillance System and National Ambulatory Medical Care Survey, would be a cost-effective way to acquire data.

■ ***Lack of Data Access and Data Linkage***

Due to the strict confidentiality rules adopted by many government and private agencies, detailed information on safety and health is difficult to obtain for research. Although most of the fatal and nonfatal injury data used in this edition are tabulated by the authors using the BLS confidential research files, the authors still had difficulty acquiring information at state and local levels, as well as information for detailed occupational and demographic sub-groups.

Data obtained from current safety and health surveillance systems cannot be linked to information on work environments and work organization. Therefore, researchers are unable to accurately estimate differ-

ences in safety and health outcomes caused by probable confounders, such as workload, work schedules, and unionization. This limitation has greatly reduced the value of existing surveillance systems.

Methods should be established to better measure safety and health performance at the company level. Coding each company name with a unique identifier would protect confidentiality while maintaining major indicators related to safety and health for research purposes.

■ ***Lack of Uniformity***

No federal system exists for tracking insurance benefits paid and related costs of injuries and illnesses in construction. Private estimates are available, but subscription costs are prohibitively expensive for most researchers. As a result, researchers must follow complicated procedures to acquire data from individual states, which differ in definitions and inclusiveness. Additionally, workers' compensation systems catch only a fraction of all occupational injuries and illnesses. Not only are most self-employed workers excluded, but wage-and-salary workers legally covered by this system may not submit claims or receive compensation. As a result, workers' compensation data are unreliable for estimating the injury and illness risks in the construction industry and their associated costs.

■ ***Lack of Comparison***

The data sources used for this book are collected from workers or employers separately. Often, these data sources do not match, and there is little accounting for the differences. Information from household surveys (such as CPS) rely on self-reporting and are thus dependent on the workers' perceptions of the questions being asked and their memory. Also, household surveys may sample a relatively small portion of the construction population. Therefore, analyses of subgroups included in this book may not be statistically reliable in some cases. Information from employers (or construction firms with payroll) is collected through establishment surveys, such as the Current Employment Statistics and the National Compensation Survey. While these surveys have much larger sample sizes in general, they provide little information on worker demographics. Therefore, estimates such as racial disparities and union differentials in wages and benefits cannot be obtained from establishment surveys.

■ ***Lack of Consistency***

The data sources used for estimating injury and illness rates for this chart book have undergone several important changes in recent years, including changes

in industrial and occupational coding systems, OSHA reporting criteria, and sampling methods used in CPS (the source of denominators to calculate rates) – all of which affect the data comparability over time. However, the BLS does not provide guidance or interpretations of the impact caused by the data systems changes. Thus, in this edition the injury and illness data before 2003 cannot be compared to the data after 2003, which prevents researchers from knowing if the decline in nonfatal injuries in construction is a net result of safety and health improvements or merely a consequence of system transitions.

■ ***Lack of Productivity Measures***

None of the U.S. government agencies provide productivity measures for the construction industry. As a result, it is difficult to measure economic losses due to occupational injuries and illnesses, or measure improvements that are the result of safety and health interventions, technological changes, better planning, or changes in work processes. Development of productivity measures in construction should be a high priority.

■ ***Lack of Reliable Data to Measure Consequences***

The available injury and illness data systems, (i.e., SOII and CFOI), only collect information directly related to the cases, such as cause and nature, and not on the consequences of such injuries. Most of the demographic and employment datasets used for the chart book (i.e., CPS and ACS) do not collect information on injury or job history. The authors of this book attempted to piece together information from several existing longitudinal datasets (i.e., National Longitudinal Survey of Youth, Health and Retirement Survey). However, such efforts have been limited because the sub-sample sizes are too small to conduct reliable analyses for construction. As a result, information on basic issues, such as causes of disabilities and return to work after injuries, remains unknown.

No uniform national data are available to estimate the costs of work-related injuries and illnesses – or savings resulting from improved safety and health. Many costs are not compensated, partly because they are difficult to connect to specific work exposures. Therefore, cost estimates presented by this chart book are only rough estimates. Health examination and financing surveys should add questions concerning the job-relatedness of health conditions or increase sample sizes so that industry and occupational differences in health status can be measured reliably. This information should also be made available for public use.

■ ***Lack of Data on Intervention and Evaluation***

It was not possible for this edition to include useful information on the processes and effects of safety and health interventions, including information on safety and health training, occupational training, engineering controls, and policy enforcement, except for the limited data from OSHA inspections. Quantitative measures of the efficacy, effectiveness, and efficiency of safety and health interventions are extremely important to determine the value of safety and health programs that influence future directions and investments.

■ ***Lack of Data on Undocumented Workers***

As presented in this edition, the number of immigrants, both documented or undocumented, and especially those of Hispanic origin, has increased dramatically in the construction industry. It is predicted that this trend will continue in the next few decades. Emerging issues in employment, immigration policies, and workplace security, as well as safety and health, have been debated on a national scale. However, data in this edition on safety and health among this vulnerable population are extremely limited. Given the large number of undocumented workers employed in construction and the hazards they face on the job, there is an urgent need to collect information on this population.

■ ***Worker Misclassification***

The North American Industrial Classification System (NAICS) appears to have greatly reduced past problems with “misclassification” of some construction workers in other industries. Construction management, landscaping, and real estate establishments, which were not counted as part of construction under the 1987 Standard Industrial Classification (SIC) system, are considered construction establishments under the 2002 and 2007 NAICS. However, temporary agencies that hire day laborers for construction sites are still counted in the service industry rather than in construction. Therefore, construction employment presented in this edition may be underestimated. In some cases, employers may misclassify employees as independent contractors (or self-employed workers) to avoid paying Social Security, workers’ compensation, and other taxes. Worker misclassification creates challenges for workers, employers, and insurers, as well as for policy enforcement. This critical issue requires more precise documentation throughout the industry.

Because of the limitations addressed above, the data presented in this chart book are far from complete.

Readers of the chart book are strongly encouraged to not only study the charts, but also read the accompanying text and notes carefully while using this book.

Notes: 1. Healthy worker effect - The results of epidemiological studies depend on the comparisons made between different groups. If the groups are not well matched, the results will not be meaningful.

Workers who have severe injuries or illnesses may leave the construction industry because of the high physical demands. Therefore, construction workers are likely to be healthier than the population as a whole as the latter includes people unable to work due to illness or disability.