

Respiratory Diseases in the Construction Industry

In 2010, the U.S. Bureau of Labor Statistics (BLS) reported 500 nonfatal work-related “respiratory conditions” among the nation’s 5.7 million wage-and-salary construction workers in the private sector.¹ This figure is believed to be underestimated, as data from the Building Trades National Medical Screening Program (BTMed, *see* page 49) showed that among former construction workers at U.S. Department of Energy (DOE) nuclear sites, nearly one in five (18.7%) had an abnormal chest x-ray (chart 50a). For asbestos workers, the rate was more than double (39.3%). A medical screening program for veteran sheet metal workers also found that the duration of sheet metal work significantly increased the risk of parenchymal disease.² In addition, a study in California found that construction workers, especially roofers, had a significantly elevated risk for all types of lung cancer, and had a lower survival rate than non-construction workers (14.2% vs. 16.2%).³

The BTMed respiratory examination found that 41% of construction workers in the program had an abnormal pulmonary function test; the percentage was close to 50% among roofers, brickmasons and concrete workers, and truck drivers (chart 50b). For both chest x-rays and pulmonary function tests, workers in *production* (blue-collar; *see* Glossary) occupations had a noticeably higher prevalence of abnormalities than those employed in administrative or support positions, which was consistent with their exposure levels to workplace hazards (*see* page 35).

Construction workers from DOE sites were also at risk of developing chronic beryllium disease (CBD), a disease that causes difficulty breathing and scarring of lung tissue. An indicator of CBD is beryllium sensitivity (BeS), which is defined as one

abnormal plus one borderline or two abnormal beryllium lymphocyte proliferation tests, a test to diagnose CBD.⁴ About 1.4% of all construction workers had BeS; and the percentage doubled among boilermakers (2.9%) and roofers (2.8%; chart 50c). BeS can almost always be attributed to workplace exposures, given that beryllium is typically found only at atomic energy and defense sites.⁵

The prevalence of lung diseases increases steadily with age.⁶ Using data from the Health and Retirement Study, a large longitudinal survey on the U.S. population aged 50 years and older, it was estimated that the prevalence of lung disease more than doubled among the older construction worker cohort, from 6.9% to 15.2% in a 10-year period (chart 50d). The prevalence of lung diseases among workers in construction trades was significantly higher than those in white-collar occupations in the follow-up period, suggesting that lung diseases due to construction exposures may not emerge until later in life.

Dual exposure to both smoking and occupational hazards markedly increases the risk of respiratory diseases.⁷ In 2010, the annual cost to the nation for chronic obstructive pulmonary disease (COPD) alone was expected to reach almost \$50 billion.⁸ The best way to protect workers from respiratory hazards is to have simultaneous prevention efforts against occupational exposures and smoking. To that end, the National Institute for Occupational Safety and Health has initiated the Total Worker Health™ program, promoting a “synergism of prevention” by integrating occupational safety and health and worksite health promotion.⁹

1. U.S. Bureau of Labor Statistics. Survey of Occupational Injuries and Illnesses. (Table SNR10. Number of nonfatal occupational illnesses by industry and category of illness, 2010).

2. Welch L, Haile E, Myers D, Dement J, & Michaels D. 2007. Change in prevalence of asbestos-related disease among sheet metal workers, 1986 to 2004. *Chest*, 131:863-869.

3. Calvert GM, Luckhaupt S, Lee SJ, Cress R, Schumacher P, Shen R, Tak S, & Deapen D. 2012. Lung cancer risk among construction workers in California, 1988-2007. *American Journal of Industrial Medicine*, 55:412-422.

4. Welch L, Ringen K, Dement J, Bingham E, Quinn P, Shorter J, & Fisher M. Unpublished data from the BTMed database.

5. Beryllium Network. *Exposure risks: Industries and occupations*. Brayton Purcell LLP. http://www.chronicberylliumdisease.com/exposure/ex_industries.htm (Accessed June 2012).

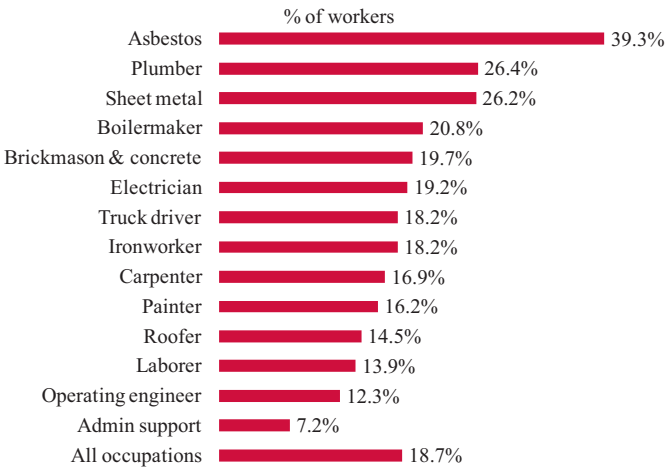
6. Dong X, Wang X, & Daw C. 2011. Chronic diseases and functional limitations among older construction workers in the United States: A 10-year follow-up study. *Journal of Occupational and Environmental Medicine*, 53(4):372-380.

7. Blanc PD, Iribarren C, Trupin L, Earnest G, Katz PP, Balmes J, Sidney S, & Eisner MD. 2009. Occupational exposures and the risk of COPD: Dusty trades revisited. *Thorax*, 64(1):6-12.

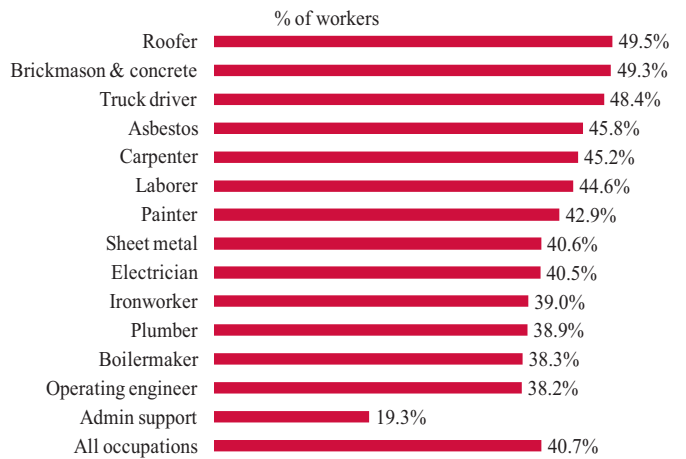
8. U.S. Department of Health and Human Services, National Institutes of Health, National Heart Lung and Blood Institute. Morbidity and mortality: 2009 chart book on cardiovascular, lung and blood diseases. http://www.nhlbi.nih.gov/resources/docs/2009_ChartBook.pdf (Accessed March 2013).

9. National Institute for Occupational Safety and Health (NIOSH). May 2012. Research Compendium: The NIOSH Total Worker Health™ Program, Seminal Research Papers, 2012. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS Publication No. 2012-146.

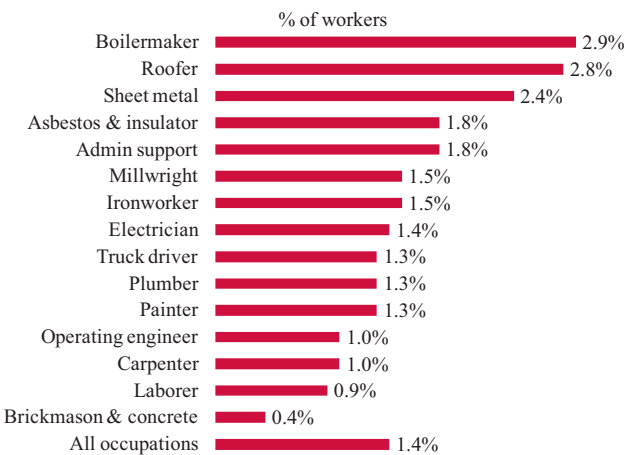
50a. Prevalence of abnormal chest x-ray, selected construction occupations at U.S. Department of Energy sites, 1996-2010



50b. Prevalence of abnormal pulmonary function test, selected construction occupations at U.S. Department of Energy sites, 1996-2010



50c. Prevalence of beryllium sensitivity, selected construction occupations at U.S. Department of Energy sites, 1998-2010



50d. Lung diseases among older construction workers in 10-year follow-up, construction trades vs. white-collar occupations, 1998 vs. 2008 (All employment)



Source: Charts 50a and 50b – BTMed disease prevalence: Exams completed through 2010. Contact: John Dement, Duke University Medical Center. Chart 50c – Welch L, Ringen K, Dement J, Bingham E, Quinn P, Shorter J, & Fisher M. Unpublished data from the BTMed database. Chart 50d – Dong X, Wang X, & Daw C. 2011. Chronic diseases and functional limitations among older construction workers in the United States: A 10-year follow-up study. *Journal of Occupational and Environmental Medicine*, 53(4):372-380.