Lifetime risk of injury and death in the construction industry: Chronic Disease

Risks of a lifetime in construction Part II: Chronic occupational diseases

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Overview

Using data collected between 1997 and 2010 from the Building Trades Medical Screening Program, researchers estimated lifetime risk of dust-related occupational lung disease, Chronic Obstructive Pulmonary Disease (COPD), and hearing loss. Researchers analyzed results from 12,742 chest x-rays, 12,679 breathing tests (spirometry), and 11,793 hearing tests to estimate the cumulative risk of occupational injury or fatality for a construction worker in the course of a 45-year career.

Key Findings

- Assuming a 45-year working life, the construction trades workers in the sample had a 16% probability of suffering COPD – double the risk suffered by their counterparts employed in the administrative/scientific/security control group. For some trades the risk was considerably higher: one-third of roofers who survived to age 85 could expect to develop COPD.
- Chest x-rays indicated that a construction worker has an 11% lifetime probability of parenchymal abnormalities associated with dust-related occupational lung diseases (pneumoconioses). This was nearly three times the risk experienced by the administrative/scientific/security control group (3.7%).
- Hearing tests with this group suggested that a construction worker with a 45-year career has a 73.8%% probability of material hearing loss. The administrative/scientific/security control group had a significantly lower probability of hearing loss (43.4%).

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See abstract:
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Risks of a Lifetime in Construction. Part II: Chronic Occupational Diseases

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Background *We developed working-life estimates of risk for dust-related occupational lung disease, COPD, and hearing loss based on the experience of the Building Trades National Medical Screening Program in order to (1) demonstrate the value of estimates of lifetime risk, and (2) make lifetime risk estimates for common conditions among construction workers.*

Methods *Estimates of lifetime risk were performed based on 12,742 radiographic evaluations, 12,679 spirometry tests, and 11,793 audiograms.*

Results *Over a 45-year working life, 16% of construction workers developed COPD, 11% developed parenchymal radiological abnormality, and 73.8% developed hearing loss. The risk for occupationally related disease over a lifetime in a construction trade was 2–6 times greater than the risk in non-construction workers.*

Conclusions *When compared with estimates from annualized cross-sectional data, lifetime risk estimates are highly useful for risk expression, and should help to inform stakeholders in the construction industry as well as policy-makers about magnitudes of risk.* Am. J. Ind. Med. 57:1235–1245, 2014. © *2014 Wiley Periodicals, Inc.*

KEY WORDS: diseases; occupation; lifetime risk; construction industry; lung disease; COPD; hearing loss; surveillance; radiographic; audiometry; spirometry

INTRODUCTION

Lifetime estimates of risk have been used with great effectiveness to influence individuals' perceptions of risk and policy priorities in other fields of public health [Arndt et al., 2004], but this has not been done in occupational safety and health. Instead, the magnitude of occupational risk has generally been described as odds ratios, population attributable risks or relative risk based on cross-sectional data or short time periods [Fosbroke et al., 1997]. While such studies are useful, they tend to understate risks [Robinson et al., 1995]. Longitudinal cohort studies can improve on these deficiencies [Schubauer-Berigan et al., 2009; Neitzel et al., 2011], but such studies are difficult to maintain due to reasons such as investigators losing interest/funding or participants leaving the cohort. Consequently, there have been very few longitudinal studies of occupational risks [Arndt et al., 2005]. This study is based on results from a medical surveillance program with 16 years of experience to assess risk of chronic obstructive pulmonary disease (COPD), occupational lung disease, and hearing loss over a working lifetime.

Construction workers are at an elevated risk for several chronic medical conditions, including COPD, pneumoconiosis consisting primarily of asbestosis and silicosis, and noise-induced hearing loss [Dement et al., 2003, 2005, 2009, 2010]. Occupational exposure to the general category of "vapors, gases, dusts, and fumes" (VGDF) has been associated with increased COPD risk [Becklake, 1989; National Institute for Occupational Safety and Health, 2002;

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