reporting and fixing hazards and other safety practices were gathered via survey questionnaires.

Results: Responses to several survey items differed between hourly workers and managers. Themes that varied significantly (chi-square p-value < 0.05) include hazard identification, reporting, and correction, injury and illness reporting, and actions towards injured workers. While some perceptions were similar between workers and managers, overall, workers were often less enthusiastic about the efforts to identify and remedy hazards than were managers. Some results differed across mines, but often the associations held across all four locations.

Discussion: If culture is defined as a shared set of attitudes, beliefs, and norms, then a single "safety culture" does not appear to exist in these workplaces. It may be difficult to implement an effective and widely supported safety program when such differences exist in what is perceived to be needed to improve workplace safety and health. This study has implications for current efforts to promote a better "safety culture" as a fix for workplaces with safety and health problems.

D2.2
Title: Influence of Work Organization and Environment on Health and Productivity Outcomes among Construction Apprentices: A Total Worker Health Approach

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Background: Construction is among the most dangerous industries, with well-recognized risks of traumatic injury and high physical demands. In addition to traditional hazards for workplace injury and illness, other threats to construction workers' health and well-being occur from work organization and work environment factors, including irregular employment, multiple job sites, long commutes, long work hours, and employer policies regarding health and safety. These non-traditional hazards have been associated with injury and illness, psychosocial stress, and unhealthy behaviors including poor diet and smoking. The cumulative impacts of both traditional and non-traditional hazards on the health and well-being of construction workers are largely unknown.

Methods: We are conducting annual surveys among apprentice construction workers to identify relationships between work organization, environmental factors, health behaviors, and health outcomes.

Results: 963 surveys were completed and returned by apprentice construction workers (90% response rate). Respondents (mean age 28) reported high levels of job satisfaction, job security, and social support, but also reported high rates of musculoskeletal symptoms and various work organizational factors potentially affecting health outcomes and behaviors. Average commuting distance to work was 45 miles, and 63% reported no limits on daily working hours. Workers reported high smoking rates (28% were current smokers), and only 55% reported any restrictions on smoking at their worksites. Only 10% reported regularly using sunscreen when in the sun for >15 minutes; only 4% of worksites provided sunscreen. We examined associations between work organization and environmental factors and four self-reported outcomes: lower work ability, lower productivity, higher rates of missed days of work due to injury, and use of prescription pain medication. Preliminary analyses show that all four outcomes were associated with high job demands, low supervisor support, and low job security. Other factors were associated with one or more outcomes, including low job security, mandatory overtime, low coworker support, and low foreman supervision of safety. Compared to commercial construction workers, those in residential construction reported higher job demands and job strain, and had higher rates of missed days due to work injuries, bodily pain, and use of pain medication. One year follow-up surveys are now being conducted; we will report both cross-sectional and longitudinal associations between work organizational factors and health and productivity outcomes. Other ongoing analyses examine associations between work factors and health behaviors that may mediate health and productivity outcomes.

Discussion: These preliminary cross-sectional results highlight non-traditional worksite health risks, and suggest potential interventions that may improve heath behaviors and outcomes among construction workers. As our study progresses, we plan to evaluate the longitudinal impact of work organization on health and health behaviors in construction trades, identify workplace programs, policies, and practices affecting worker health and well-being, and determine readiness for adoption of integrated interventions to improve worker health.

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