

No. 13-0224

UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

SECRETARY OF LABOR,

Complainant,

v.

A.H. STURGILL ROOFING, INC.,

Respondent.

**BRIEF FOR *AMICUS CURIAE*
NORTH AMERICA'S BUILDING TRADES UNIONS**

VICTORIA L. BOR
SUE D. GUNTER
Sherman Dunn, P.C.
900 Seventh Street, N.W., Suite 1000
Washington, DC 20001
(202) 785-9300

Counsel for North America's
Building Trades Unions

May 14, 2018

TABLE OF CONTENTS

	Page(s)
Introduction and Interest of the <i>Amicus</i>	1
Argument	4
I. The Commission Should Not Use this Case to Decide Whether the Employer’s Knowledge is an Element of the Secretary’s Proof in a General Duty Clause Case.....	4
A. The Secretary’s Proof in this Case did not Turn on the “Underlying Health Conditions or Ages” of Sturgill’s Employees	4
B. The Legal and Policy Implications of the Commission’s Briefing Question Counsel Against Deciding an Issue the Case Does not Present	7
1. <i>Policy Considerations: OSHA</i>	9
2. <i>Legal Considerations: The Americans with Disabilities Act</i>	11
a. <i>Restrictions on securing health information</i>	11
b. <i>Employment protections for individuals with disabilities</i>	14
c. <i>The lack of protection for employees whose underlying health conditions do not qualify as “disabilities.”</i>	17
II. The Importance of Ensuring Employers Comply with § 1926.21(b)(2)	17
A. Construction Workers are Typically “Temporary” Workers	17
B. This Case Illustrates the Importance of Training “Temporary” Workers	21
Conclusion	23

TABLE OF AUTHORITIES

Cases	Page(s)
<i>Compass Env’l, Inc.</i> , 23 BNA OSHC 1132 (No. 06-1036, 2010), <i>aff’d</i> , 663 F.3d 1164 (10th Cir. 2011)	22
<i>Conroy v. NY State Dep’t of Corr. Servs.</i> , 333 F.3d 88 (2d Cir. 2003).....	13
<i>Cossette v. Minnesota Power & Light</i> , 188 F.3d 964 (8th Cir. 1999)	12
<i>Echazabal v. Chevron USA, Inc.</i> , 536 U.S. 73 (2002).....	15
<i>EEOC v. Murray, Inc.</i> , 175 F.Supp. 2d 1053 (M.D. Tenn. 2001).....	15
<i>Fredenburg v. Contra Costa County Dep’t of Health Servs.</i> , 172 F.3d 1176 (9th Cir. 1999)	12
* <i>Kansas City Power & Light Co.</i> , 10 BNA OSHC 1417 (No. 76-5255, 1982)	6
<i>Lee v. City of Columbus</i> , 636 F.3d 245 (6th Cir. 2011)	12
<i>Estate of Mauro v. Borgess Medical Center</i> , 137 F.3d 398 (6th Cir.1998)	16
<i>Miller v. Whirlpool Corp.</i> , 807 F.Supp. 2d 684 (N.D. Ohio 2011).....	13, 14, 16
<i>O’Brien Concrete Pumping, Inc.</i> , 18 BNA OSHC 2059 (No. 98-0471, 2000)	22, 23
<i>Phoenix Roofing, Inc.</i> , 17 BNA OSHC 1076 (No. 90-2148, 1995), <i>aff’d</i> , 79 F.3d 1146 (5th Cir. 1996).....	6, 7
<i>Rohr v. Salt River Project Agric. Improvement and Power Dist.</i> , 555 F.3d 850 (9th Cir. 2009), <i>abrogated in part on other grounds in Univ. of Tex. SW Med. Ctr. v. Nassar</i> , 133 S.Ct. 2517 (2013)	16
* <i>Sec’y v. DeKalb Forge Co.</i> , 13 BNA OSHC Cases 1146, 1151, OSHRC Doc. No. 83-0299 (Comm’n 1987)	8

*Cases principally relied upon.

<i>Sec’y v. Equitable Shipyards</i> , 12 BNA OSHC 1288, 1293, OSHRC Doc. No. 81-1685 (Comm’n 1985)	8
<i>Sullivan v. River Valley Sch. Dist.</i> , 197 F.3d 804 (6th Cir. 1999)	13
<i>Wurzel v. Whirlpool Corp.</i> , 482 Fed. Appx. 1 (6th Cir. 2012).....	15
Statutes and Regulations	
Americans with Disabilities Act	<i>passim</i>
42 U.S.C. § 12102(1)	14
42 U.S.C. § 12112(d)(2)(A).....	12
29 C.F.R. Part 1630, App. 1630.14(c)	13
29 C.F.R. § 1630.2(r).....	15, 16
29 C.F.R. § 1630.15(e).....	16
Occupational Safety and Health Act	
29 U.S.C. § 651(b)	3, 5
29 U.S.C. § 655(a)(1).....	6
29 C.F.R. § 1910.1053(i)	11
29 C.F.R. § 1926.1101(m)(2)(ii).....	10
Health Insurance Portability and Accountability Act	10
Other Authorities	
AFL-CIO, <i>Death on the Job: The Toll of Neglect</i> (2018) available at https://aflcio.org/sites/default/files/2018-04/DOTJ2018nb.pdf	2
American College of Occupational and Environmental Medicine, <i>Confidentiality of Medical Information in the Workplace; Additional Guidance on Medical Confidentiality in the Workplace #9</i> (Nov. 6, 2012), available at http://acoem.org/Confidentiality_Medical_Information.aspx (last visited May 10, 2018)	10

Galassi, Thomas, <i>Policy Background on the Temporary Worker Initiative</i> (July 15, 2014), available at https://www.osha.gov/temp_workers/Policy_Background_on_the_Temporary_Worker_Initiative.html (last visited May 7, 2018)	18
Occupational Safety and Health Administration, U.S. Dept. of Labor, <i>Occupational Exposure to Respirable Crystalline Silica; Final Rule</i> , 81 Fed.Reg.16285 (Mar. 25, 2016).....	9, 11
OSHA, <i>Protecting Temporary Workers</i> , available at https://www.osha.gov/temp_workers/ (last visited May 7, 2018)	17, 18
OSHA, <i>Using the Heat Index: A Guide for Employers</i> , available at https://www.osha.gov/SLTC/heatillness/heat_index/pdfs/all_in_one.pdf (last visited May 7, 2018)	20
OSHA/NIOSH, <i>Recommended Practices: Protecting Temporary Workers</i> (OSHA Publication OSHA-3735-2014; DHHS (NIOSH) Publication Number 2014-139), available at https://www.osha.gov/Publications/OSHA3735.pdf (last visited May 7, 2018).	21
Sheila Arbury, et al., <i>Heat Illness and Death Among Workers – United States 2012-2013</i> , 63 Morbidity and Mortality Weekly Report 661 (DCDCP, Aug. 8, 2014), available at https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6331a1.htm (last visited May 11, 2018)	19
Xiuwen Sue Dong, Julie A. Largay, Sang D. Choi, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, <i>Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports</i> , 102 Accident Analysis and Prevention 102 (2017).....	19
Xiuwen Sue Dong, Julie A. Largay, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, <i>The Construction FACE Database – Codifying the NIOSH FACE Reports</i> , 62 Journal of Safety Research 217 (2017)	1, 19, 20, 21
Xiuwen Sue Dong, Sang D. Choi, James G. Borchart, Xuanwen Wang & Julie A. Largay, <i>Fatal falls from roofs among U.S. construction workers</i> , 44 Journal of Safety Research 17 (2013) (copyrighted material; available from authors upon request)	2
Xiuwen Sue Dong, Xuanwen Wang, and Julie A. Largay, <i>CPWR Quarterly Data Report: Temporary Workers in the Construction Industry</i> at 12 (Second Quarter 2015), available at https://www.cpwr.com/sites/default/files/publications/Second%20Quarter%202015.pdf (last visited May 7, 2018).	20

INTRODUCTION AND INTEREST OF THE *AMICUS*

North America's Building Trades Unions (NABTU) is filing this *amicus curiae* brief on behalf of itself, its fourteen affiliated national and international construction unions and the three million workers they represent. These workers routinely labor in the extreme heat, whether they are outside, exposed to the elements, or inside structures that lack proper ventilation or other climate controls. Moreover, regardless of their tenure in the industry or with a particular employer, these workers are constantly assigned to new worksites and therefore, to new conditions to which they must be oriented and acclimated.

In the instant case, OSHA cited Sturgill Roofing for assigning its employees to work in excessive heat, without implementing proper measures to protect them from heat stress. In addition, Sturgill had an inadequate training program for its permanent employees, and failed to provide even that training to a temporary employee. The results of these failures were catastrophic: The employee newly assigned to Sturgill's workforce suffered heat stroke and died.

The events in this case illustrate a major problem in the construction industry. As a general matter, construction workers in the United States experience a disproportionate number of workplace fatalities. In fact:

[t]he construction industry has the highest number of work-related fatal injuries in the United States. In 2015, 985 construction workers died at worksites, accounting for 20.4% of the overall work-related fatal injuries in the country. These numbers are disproportionately high given that construction workers made up less than 7% of the overall total employment in 2015.¹

¹ Xiuwen Sue Dong, Julie A. Largay, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, *The Construction FACE Database – Codifying the NIOSH FACE Reports*, 62 *Journal of Safety Research* 217, 217 (2017) (internal citations omitted).

In 2016, 991 construction workers were killed, once again the highest number in any sector.²

The numbers are even more disproportionate when it comes to heat-related fatalities: One study showed that in 2002, 40% of occupational deaths related to heat strain occurred in the construction industry. And it is likely that heat strain and associated conditions are not the only work-related fatalities linked to working in excessive heat. For example, a study of fatal falls from roofs – a major source of work-related deaths in the construction industry – revealed that almost half of all roof fall fatalities occurred in the South,³ and although the authors acknowledged that further study is needed to understand why, they suggested that “environmental factors such as heat, humidity, and related fatigue” could be factors.⁴

Ensuring that construction industry employers appropriately protect their employees from the effects of working in hot environments is therefore critically important to NABTU and its affiliates. In this case, to its credit, Sturgill Roofing does not appear to be challenging OSHA’s contention that excessive heat is a recognized hazard. Instead, the company is challenging OSHA’s contention, and the Administrative Law Judge’s (ALJ’s) finding, that the heat on the day in question was sufficiently high to require it to take protective measures. NABTU does not intend to address the question whether the ALJ properly calculated the heat index on the worksite on the day in which M.R., the temporary employee, died, but will instead address two

² AFL-CIO, *Death on the Job: The Toll of Neglect*, at 7 (2018), citing U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 2016; available at <https://aflcio.org/sites/default/files/2018-04/DOTJ2018nb.pdf>

³ Xiuwen Sue Dong, Sang D. Choi, James G. Borchart, Xuanwen Wang & Julie A. Largay, *Fatal falls from roofs among U.S. construction workers*, 44 *Journal of Safety Research* 17, 18 – 19 (2013) (copyrighted material; available from authors upon request) (one-third of all construction fatalities between 1992 and 2009 were fall fatalities; one-third of those falls were from roofs; and one-half of roof fall fatalities occurred in the South).

⁴ *Id.* at 23.

issues this case raises that are critically important to NABTU, its affiliates and the workers they represent.

NABTU will first address issues raised by the Commission's first briefing question, regarding whether employer knowledge of an employee's underlying health issues is relevant to the Secretary's case under the general duty clause. This question implicates a host of issues that extend far beyond this particular case. In particular, NABTU is concerned about the need to carefully protect employees' privacy rights, while at the same time ensuring them a safe workplace. Construction contractors are increasingly attempting to subject prospective employees to extensive medical screening, purporting to want to ensure they assign employees only to positions they are physically able to handle. At worst, the notion of fitting the employee to the workplace runs directly counter to the statutory goal of providing, "so far as possible, every working man and woman in the Nation safe and healthful working conditions." 29 U.S.C. § 651(b). At best, these "fitness for duty" programs reveal a serious tension between legitimate concerns about ensuring employees can work safely, and excessive and irrelevant intrusions into privacy, which invite opportunities for discrimination. The extent to which an employer knows or should know about its employees' underlying health conditions, the actions the employer should take based on its knowledge, or lack of knowledge, and whether these questions have any bearing on the Secretary's burden in proving a general duty clause violation are serious and complex issues. Yet, as we will explain, they are not issues presented by the facts in this case and, we submit, are therefore not properly before the Commission for resolution.

NABTU is also filing this brief to stress the importance of the second citation, the failure to provide training, particularly to new employees. As noted, regardless of their tenure in the industry, construction workers are constantly assigned to new projects at new worksites, and

therefore, to new conditions to which they must be oriented. As so painfully illustrated in this case, the consequences of failing to properly train newly-assigned workers can be dire.

ARGUMENT

I. The Commission Should Not Use this Case to Decide Whether the Employer’s Knowledge is an Element of the Secretary’s Proof in a General Duty Clause Case.

The Commission’s first briefing question is:

Whether an employer’s knowledge or lack of knowledge of its employees’ underlying health conditions or ages, and any legal restrictions upon the employer in obtaining such information, are relevant to the Secretary’s burden to establish a violation of the general duty clause in this case.

As explained below, in this case, the Secretary established that the conditions on the worksite presented a recognized hazard, which Sturgill failed to mitigate, without regard to how the hazard affected any particular employee. Accordingly, Sturgill’s “knowledge or lack of knowledge of its employees’ underlying health conditions or ages,” was not an issue in this case. As we further explain, because of the complex legal and policy concerns the question raises, NABTU submits that the Commission should follow its own established precedent and refrain from deciding an issue that is not before it.

A. The Secretary’s Proof in this Case did not Turn on the “Underlying Health Conditions or Ages” of Sturgill’s Employees.

The Secretary cited Sturgill for exposing its employees to the hazard of “excessive heat,” and in particular, “the hazard of excessive heat from working on a commercial roof in the direct sun.” Decision of the Administrative Law Judge (“ALJD”) at 9.

To establish a violation of the general duty clause, the Secretary must demonstrate, *inter alia*, that “a condition or activity in the workplace presented a hazard” which was “likely to cause death or serious physical harm.” ALJD at 9, *citing Arcadian Corp.*, 20 BNA OSHC 2001, 2007 (No. 93-0628, 2004). In this case, the Secretary cited Sturgill for the “condition or activity”

of “excessive heat,” which exposed employees “to the development of serious heat-related illnesses such as heat exhaustion and heat stroke.” ALJD at 9. The ALJ found that the Secretary satisfied his burden in both regards.

To establish the existence of the hazard, the Secretary began with the National Weather Service’s (NWS’s) heat index, which “measure[s] how hot it really feels when relative humidity is factored with the actual air temperature,” in “shady, light wind conditions.” *Id.* (internal citations omitted). At the time of the incident, the unadjusted heat index measured 85 degrees, putting it in the NWS’s “‘caution’ category . . . ‘for the likelihood of heat disorders with prolonged exposure or strenuous activity.’” *Id.* The Secretary then adjusted the index to reflect the conditions on the roof: occasional scattered clouds and, as the morning progressed, little available shade. *Id.* at 10-11. The NWS cautions that “exposure to full sunshine can increase the heat index values up to 15,” and Sturgill’s foreman confirmed that it was about 10 degrees hotter on the roof than on the ground. *Id.* at 10, 11. The Secretary accordingly adjusted the applicable heat index, bringing it into the “danger” category, *id.* at 10 – clearly a hazardous condition.

As for whether the hazardous condition was likely to cause serious physical harm, the ALJ credited the testimony of the Secretary’s expert, Dr. Theodore Yee, that the conditions on the roof could cause a range of physical problems, from “heat exhaustion for a younger person up to heat stroke for an older person,” *id.* at 11, all of which, as “Sturgill’s own training documents highlight . . . are serious conditions which require medical attention.” *Id.* at 13; *see also id.* at 14 (crediting Dr. Yee’s opinion that the working conditions on the jobsite were likely to result in a range of serious illnesses). And the ALJ found the evidence that the conditions on the roof were likely to cause serious physical harm bolstered by the “contemporaneous

diagnos[es] of M.R.’s treating physicians” that he ultimately died from the excessive heat to which he was exposed on Sturgill’s worksite. *Id.* at 13-14.

The Secretary did not contend, nor did the ALJ find, that M.R.’s underlying health condition had any relevance to whether a hazard existed or whether the hazard was likely to cause serious harm. In fact, the ALJ was careful to state that “[t]he hazard was *not* M.R.’s particular medical condition that day. It was the jobsite heat-related illness hazard to which Sturgill’s employees were exposed.” *Id.* at 13 n. 20 (emphasis added).

The ALJ’s conclusion in this regard was completely consistent with longstanding Commission precedent that, for purposes of the general duty clause, 29 U.S.C. § 655(a)(1), “a recognized hazard is a *condition or practice* in a workplace that is known to be hazardous by either the industry in general or the employer in particular. The hazard, *not the specific incident resulting in injury*, is the relevant consideration in determining the existence of a recognized hazard.” *Kansas City Power & Light Co.*, 10 BNA OSHC 1417, 1422 (No. 76-5255, 1982) (internal citations omitted; emphasis added). By the same token, to demonstrate exposure, the Secretary need not show that an employee was actually exposed to the cited condition or practice; it is sufficient that access to the cited condition was reasonably predictable. *Phoenix Roofing, Inc.*, 17 BNA OSHC 1076, 1079 (No. 90-2148, 1995), *aff’d*, 79 F.3d 1146 (5th Cir. 1996). The evidence in this case was clear that employees were working on the roof and therefore their access to the elevated heat was “predictable.”

The one respect in which Sturgill’s awareness – or lack of awareness – of its employees’ health conditions is relevant is with respect to abatement. But the relevant issue is not what Sturgill knew – or did not know – about its employees’ *underlying* health conditions. Instead, what is relevant is whether, in abating the heat hazard, Sturgill was monitoring the condition of

its employees while they were *on the worksite*, working in hazardous heat, and especially observing any employee who, because he had not recently worked in these conditions, needed to be slowly acclimated.

The ALJ found that the Secretary presented a number of reasonable means of abating the hazard of excessive heat, including “[d]evelop[ing] an acclimatization program and provid[ing] training of heat related illness.” ALJD at 16. An effective acclimatization program would include “a practice of monitoring employees for signs and symptoms of heat-related illness.” *Id.* at 19. Yet, Sturgill’s foreman failed to recognize “[t]he initial signs that M.R. displayed of heat related illness, [including] odd behavior, sweating, and not drinking water,” *id.*, indications that an employee – any employee – was not becoming properly acclimated to the conditions on the roof. That M.R., or any of the other employees exposed to excessive heat on that day, may have had underlying health conditions, and what Sturgill knew or did not know about those conditions were irrelevant to the Secretary’s demonstration that reasonable means existed to abate the recognized hazard in this case.

In short, the ALJ found that the Secretary established that Sturgill violated the general duty clause, without regard to Sturgill’s knowledge, or lack of knowledge, about M.R.’s underlying health condition.

B. The Legal and Policy Implications of the Commission’s Briefing Question Counsel Against Deciding an Issue the Case Does not Present.

The answer to the Commission’s question – *i.e.*, whether Sturgill’s knowledge or lack of knowledge of [M.R.’s] underlying health conditions or age[]” – was relevant to any of the issues “in this case,” *Invitation to File Amicus Briefs*, is therefore simple: It is “no.”⁵

⁵ Indeed, although they have differing views on the facts in this case, both the Secretary and Sturgill agree that neither the employee’s age nor his underlying health condition were relevant

And that, we submit, should be the end of the Commission's inquiry in this case: The Commission should not go farther and attempt to decide whether, in another purely hypothetical case, the answer might be different. As a general matter, the Commission "do[es] not sit to pass upon abstract arguments." *Sec'y v. DeKalb Forge Co.*, 13 BNA OSHC Cases 1146, 1151, OSHRC Doc. No. 83-0299 (Comm'n 1987), *citing Sec'y v. Equitable Shipyards*, 12 BNA OSHC 1288, 1293, OSHRC Doc. No. 81-1685 (Comm'n 1985). In this context in particular, NABTU respectfully submits that the Commission should be particularly wary of unnecessarily wading into areas that raise serious and complex legal and policy questions that cannot, and should not, be addressed untethered to specific facts.

NABTU's overriding concern, and its reason for participating in this case, is that OSHA and the Commission keep their primary focus on ensuring that conditions in the workplace are safe, and not on encouraging or permitting employers to exclude employees from the workplace as a means of achieving that goal. In this regard, we consider it critical that employers not get more information about employee health than is necessary to respond appropriately to their safety and health obligations. And that is precisely the issue the Commission is raising: how much information may, or should, an employer have to fulfill its OSHA obligations.

There may be situations in which employers need information in order to make special accommodations for individual employees, and there may be circumstances in which a failure to do so will constitute a violation of the general duty clause. But that is not this case, and without a factual basis on which test it, the Commission should not develop a legal theory that may have the unintended consequence of creating an incentive for employers to seek out and act on their

to either the existence of a hazard or the adequacy of Sturgill's heat-related illness prevention program. *See Secretary's Brief to the Commission at 20; Sturgill's Brief to the Commission at 22; Sturgill's Reply Brief at 8.*

employees private medical information, as a means of creating a workplace “free from recognized hazards.”

Law and policy are increasingly moving in the direction of shielding personal health information and protecting employees from adverse employment actions based on their health status. But these protections are not universal, and as documented in the hearings leading to the silica standard, construction workers tend to hide their injuries and illnesses out of fear of being laid off from their jobs.⁶ In the sections below, we will highlight aspects of policy and law that reflect the tensions between the privacy rights of employees, the limited circumstances in which it is appropriate for employers to have access to personal medical information, and the imperfect protections for employees against employers that act on medical information. Our point is not to provide an exhaustive review of possibly relevant policy and legal principles, nor to attempt to resolve the underlying tensions, but instead to provide the Commission with a sense of the context in which their question must be resolved, and the importance of not attempting to do so in the absence of a concrete controversy.

1. Policy Considerations: OSHA

OSHA’s view on employee privacy has changed dramatically in recent years. From the agency’s inception, its health standards required employers to offer their employees medical surveillance to identify and/or monitor either medical conditions that interfere with the employees’ ability to work safely in an environment with potential exposures to the regulated substance or conditions that employees risk developing as a result of exposure to the regulated substance. For example, the asbestos standard requires employers to offer medical surveillance

⁶ See Occupational Safety and Health Administration, U.S. Dep’t of Labor, *Respirable Crystalline Silica; Final Rule*, 81 Fed.Reg.16285, 16831-32 (Mar. 25, 2016) (preamble, summarizing testimony from workers).

aimed at determining whether employees working in environments covered by the standard can safely wear respirators and to monitor any signs of developing asbestos-related disease. 29 C.F.R. § 1926.1101(m)(2)(ii) (specifying the content of the medical exams under the asbestos standard). Until recently, as part of these medical surveillance programs, OSHA routinely required the physician or other health care professional to provide the results of the medical exams directly to the employer. *See, e.g., id.* § 1926.1101(m)(4) (requiring the employer covered by the asbestos standard to obtain a written opinion from the examining physician, including the results of the medical exam).

This approach is completely at odds with prevailing views about the confidentiality of medical information, as evidenced by the privacy provisions in the Health Insurance Portability and Accountability Act and, as discussed below, the ADA. It is also inconsistent with the American College of Occupational and Environmental Medicine’s guidance on Confidentiality of Medical Information in the Workplace, which specifies that while physicians asked to assess an employee’s fitness to perform a specific job should give their opinions, they “should not provide the employer with specific medical details of the diagnoses” without the employee’s consent.⁷

These issues were brought to the fore during the rulemaking proceedings for OSHA’s silica standards. The agency’s proposed standard would have followed its traditional approach towards medical surveillance. However,

in response to the weight of opinion in th[e] rulemaking record and to evolving notions about where the balance between preventive health policy and patient privacy is properly struck, OSHA [took] a more privacy- and consent-based approach regarding the contents of the [physician or other licensed health care

⁷ ACOEM Confidentiality of Medical Information in the Workplace; Additional Guidance on Medical Confidentiality in the Workplace #9 (Nov. 6, 2012), available at http://acoem.org/Confidentiality_Medical_Information.aspx (last visited May 10, 2018).

professional's ("PLHCP's") written medical opinion for the employer compared to the proposed requirements and earlier OSHA standards.

81 Fed.Reg. at 16831.

OSHA carefully considered what information about an employee's health would be relevant to the employer in making decisions about its obligations under the standard, and determined that there was, in fact, very little. As a result, the silica standards require the employer to make medical exams available to its employees, and PLHCP to perform various tests to determine whether the employee has a silica-related disease and can use a respirator. The PLHCP is to disclose the results of those tests to the employee, but is only authorized to disclose to the employer any recommended limitations on the employee's use of respirators and, solely with the employee's consent, any recommendations that the employee limit his exposure to silica or have a follow-up exam with a specialist. 29 C.F.R. § 1910.1053(i) (general industry silica standard); id. § 1926.1153(h) (construction silica standard).

As discussed in the next section, OSHA's new recognition of the need to protect employee privacy and separate most medical information from decisions about how best to make the workplace safe is somewhat reflected in provisions in the ADA.

2. Legal Considerations: The Americans with Disabilities Act

The ADA is the primary law that explicitly restricts the health-related information employers may secure from their workforce and the actions employers can take in response to that information. These protections are important, but they neither completely shield all information nor protect all employees with underlying health conditions.

a. Restrictions on securing health information.

As Sturgill points out in its brief, the ADA regulates the information employers may obtain about the medical condition of applicants and employees. These protections apply to all

employees and prospective employees of covered employers, regardless whether they would be considered “person[s] with a disability” under the Act. *Cossette v. Minnesota Power & Light*, 188 F.3d 964 (8th Cir. 1999); *Fredenburg v. Contra Costa County Dep't of Health Servs.*, 172 F.3d 1176, 1181-82 (9th Cir. 1999); *Griffin v. Steeltek*, 160 F.3d 591, 593-94 (10th Cir. 1998).

The statute breaks the employment relationship into three phases, each with different rules and restrictions. At each phase, employers are clearly entitled to ask whether employees can perform the essential functions of the job. There are no barriers to asking employees about their prior experience and, in the current context, how long since they last worked under similar circumstances.

At the initial phase of the interview process, an employer may not conduct *any* “medical examination or make inquiries . . . as to whether the applicant is an individual with a disability.” 42 U.S.C. § 12112(d)(2)(A). Because any sort of medical screening could potentially reveal whether someone is “an individual with a disability,” the restriction on inquiries extends to all sorts of medical screens. As the court explained in *Lee v. City of Columbus*, 636 F.3d 245, 253 (6th Cir. 2011), “[o]bviously, asking an employee whether he is taking prescription drugs or medication or questions seeking information about illnesses, mental conditions, or other impairments an employee has or had in the past trigger the ADA’s . . . protections.”

These restrictions completely disappear at the second phase: An employer may extend an offer to an applicant conditioned on the applicant submitting to medical inquiries, as long as all entering employees are subject to the same exam. *Id.* § 12112(d)(3)(A). At this point, the ADA places no restrictions whatsoever on the scope of the inquiries or the content of the medical exam.

Once an applicant becomes an employee, the ADA strictly limits what an employer can ask. While the employer remains free to “make inquiries into the ability of an employee to perform job-related functions,” *id.* § 12112(d)(4)(B), it may only require employees to submit to medical exams or respond to medical inquiries “shown to be job-related and consistent with business necessity,” *id.* § 12112(d)(4)(A).

“An examination ordered by the employer must be restricted to discovering whether the employee can continue to fulfill the essential functions of the job.” 29 C.F.R. Part 1630, App. 1630.14(c) “Thus, for an employer’s requirements for an exam to be upheld, there must be significant evidence that could cause a reasonable person to inquire as to whether an employee is still capable of performing his job.” *Sullivan v. River Valley Sch. Dist.*, 197 F.3d 804 (6th Cir. 1999). Moreover, these provisions are not “an excuse for every wide-ranging assessment of mental or physical debilitation that could conceivably affect the quality of an employee’s job performance.” *Id.* 811-12. They instead only permit exams that are “no broader or more intrusive than necessary,” and that are a “reasonably effective method of achieving a business necessity.” *Conroy v. N.Y. State Dep’t of Corr. Servs.*, 333 F.3d 88, 97-98 (2d Cir. 2003).

Workplace safety is a “well-recognized business necessity,” *id.* at 97, which may, in appropriate circumstances, justify certain medical inquiries. However, whether an employer can subject an employee or group of employees to particular medical inquiries is a fact-intensive question that cannot be resolved in a vacuum. Thus, for example, in *Miller v. Whirlpool Corp.*, 807 F.Supp. 2d 684 (N.D. Ohio 2011), the employer responded to a serious accident and resulting OSHA citation by instituting a mandatory certification process, which required its employees to respond to detailed questions regarding past accidents and illnesses, all prescription medications, and specific physical conditions. While agreeing that workplace safety was a

business necessity, the court found it needed to resolve whether, in that workplace and with respect to the employer's particular safety concern, each question was a "reasonably effective and necessary method of achieving workplace safety," and therefore, a lawful means to that end. *Id.* at 687.

The ADA thus limits the medical information employers can obtain at various points in the employment process. But these limits are not absolute. There are times when employers can ask targeted questions of their *employees*, to seek information with a nexus to their ability to perform their jobs. And since there are no limits on the information employers can seek from applicants with conditional offers, the reality is that employers can amass significant amounts of private information about the members of their workforce. As explained below, the ADA limits the actions employers can take in response to this information, but only regarding persons with disabilities.

b. Employment protections for individuals with disabilities.

All employees of covered employers are protected by the ADA's restrictions on securing medical information. When it comes to adverse employment actions based on that information, however, the ADA protects a more limited group of employees: those who either have, have a record of having, or are "regarded as having" "a physical or mental impairment that substantially limits one or more major life activities of such individual," 42 U.S.C. § 12102(1), and are "qualified" to perform the essential functions of the job, with or without reasonable accommodation, *id.* § 12111(8). Without attempting to provide an exhaustive review, we simply note there are a number areas in which, in dealing with employees with disabilities, the ADA speaks to how employers may respond to employees with known disabilities in an effort to make their workplaces safe.

For example, the ADA does not permit an employer to assume that because an individual has insulin-dependent diabetes, she necessarily is unable safely to operate a forklift. *See, e.g., EEOC v. Murray, Inc.*, 175 F.Supp. 2d 1053 (M.D. Tenn. 2001). Instead, the employer must engage in an interactive process to determine whether there is a reasonable accommodation that would permit the employee to perform the essential functions of the job. Nor could an employer assume that an employee with type-2 diabetes, who is otherwise qualified to perform the essential functions of the job, is unable to perform roofing work on a hot day, without determining whether there are reasonable accommodations – like a slower acclimatization process – that would enable the employee to perform the essential functions of the job.

An employee will not be considered “qualified” if her disability poses a threat to her own health or safety or that of other employees in the workplace, which cannot be eliminated or reduced through a reasonable accommodation. *Id.* § 12113(b) (providing a defense if the individual poses a threat to others); 29 C.F.R. § 1630.2(r); *Echazabal v. Chevron U.S.A., Inc.*, 536 U.S. 73 (2002) (endorsing EEOC regulation’s extending the “direct threat” defense to threats to the employee him or herself). But employers may not simply remove employees with disabilities out of fear their disabilities make them vulnerable to injuries on the job. Employers instead must make an individualized assessment of the employee’s condition, “based on medical or other objective evidence.” *Wurzel v. Whirlpool Corp.*, 482 Fed. Appx. 1, *12 (6th Cir. 2012), quoting *Bragdon v. Abbott*, 524 U.S. 624, 649 (1998) (internal quotations omitted). And the risk must be substantial: “An employer . . . is not permitted to deny an employment opportunity to an individual with a disability merely because of a slightly increased risk. The risk can only be considered when it poses a significant risk, *i.e.*, high probability, of substantial harm; a

speculative or remote risk is insufficient." *Estate of Mauro v. Borgess Medical Center*, 137 F.3d 398, 403 (6th Cir.1998).⁸

These are all considerations employers must weigh in dealing with employees with disabilities, and of which the Commission must be mindful in considering whether employer knowledge about an employee's underlying health is a factor in a general duty case. Another area where the ADA and OSHA potentially cross paths is found in EEOC regulations providing that "[i]t may be a defense to a charge of discrimination . . . that a challenged action is required or necessitated by another Federal law or regulation." 29 C.F.R. § 1630.15(e). In the few cases in which they have raised the defense, employers have thus far been unsuccessful in pointing to OSHA regulations or the general duty clause to justify wide-ranging medical inquiries. *See, e.g., Miller v. Whirlpool Corp.*, 807 F.Supp. 2d at 688 (court rejects employer's argument that the general duty clause required it to implement a certification process that OSHA approved, noting that "approving certain medical questions is not the same as requiring them"); *Rohr v. Salt River Project Agric. Improvement and Power Dist.*, 555 F.3d 850, 862 (9th Cir. 2009), *abrogated in part on other grounds in Univ. of Tex. SW Med. Ctr. v. Nassar*, 133 S.Ct. 2517 (2013) (rejecting employer's argument that OSHA required it to implement certain respirator certification procedures that screened out employees with high blood pressure, writing that "OSHA's requirements are sufficiently broad to allow Salt River the discretion to determine how, and how often, it would evaluate its employees' ability to use respirators."). This defense, and these

⁸ Whether an employee's presence in the workplace constitutes a such a "direct threat" depends on four factors: "(i) the duration of the risk, (ii) the nature and severity of the potential harm, (iii) the likelihood that the potential harm will occur, and (iv) the imminence of the potential harm." 29 C.F.R. § 1630.2(r); *Estate of Mauro*, 137 F.3d at 402.

cases, are yet another cautionary note that the Commission must be careful not to put down a marker in this area absent a live and fully developed controversy.

c. The lack of protection for employees whose underlying health conditions do not qualify as “disabilities.”

While the ADA provides a framework for ensuring employers do not arbitrarily take adverse employment actions against persons with disabilities in the guise of creating a safe workplace, the Act provides no protections for other employees, whose underlying health conditions do not qualify as “disabilities.” When employers obtain the medical records of these employees, there is little that bars the employers from removing them from the workplace out of concern – warranted or not – that they are vulnerable to illness or injury; nothing that requires employers to evaluate and make decisions based on their ability to perform the essential functions of the job; nothing that requires the employers to consider reasonable accommodations or alternatives to just laying them off or sending them back to the referral hall. This lack of protection therefore potentially poses even more vexing issues as the Commission considers whether to make employer knowledge a factor in a general duty clause case.

In sum, the Commission’s first question raises a host of important and vexing questions, and implicates a number of different policy and legal concerns – none of which are issues in this case. NABTU therefore respectfully urges the Commission not to use this case as a vehicle for resolving this question.

II. The Importance of Ensuring Employers Comply with § 1926.21(b)(2)

A. Construction Workers are Typically “Temporary” Workers

OSHA launched its temporary worker initiative in 2013, to help protect workers whom the agency had determined were “more vulnerable to workplace safety and health hazards and

retaliation than workers in traditional employment relationships”⁹ In its policy background for this initiative, OSHA explained that “numerous studies have shown that new workers are at greatly increased risk for work-related injury, and most temporary workers will be ‘new’ workers multiple times a year.”¹⁰ In other words, temporary workers are at greater risk *not* because they are necessarily new to the *workforce*, but rather, because they are new to the *workplace*, where they are facing unfamiliar environments, expectations and/or responsibilities. In these situations, they tend to be “more vulnerable to workplace safety and health hazards and retaliation than workers in traditional employment relationship,”¹¹ and, as described below, less likely to be adequately trained about the hazards they may encounter on the worksite.

OSHA’s temporary worker initiative focused on “workers hired and paid by a staffing agency and supplied to a host employer to perform work on a temporary basis.”¹² There are construction workers who, like M.R., are supplied to construction contractors by staffing agencies. However, in reality, *most* construction workers share the characteristics and attendant workplace vulnerabilities of such temps: They typically move from project to project, and from contractor to contractor, and are therefore “‘new’ workers multiple times a year.”¹³

⁹ OSHA, *Protecting Temporary Workers*, available at https://www.osha.gov/temp_workers/ (last visited May 7, 2018).

¹⁰ Galassi, Thomas, *Policy Background on the Temporary Worker Initiative* (July 15, 2014), available at https://www.osha.gov/temp_workers/Policy_Background_on_the_Temporary_Worker_Initiative.html (last visited May 7, 2018).

¹¹ OSHA, *Protecting Temporary Workers*.

¹² *Galassi, supra.*

¹³ *Id.*

Statistics confirm that construction workers employed on a short-term basis – like other “temps” – are at particular risk of illness or injury, regardless their tenure in the industry. Data collected during NIOSH Fatality Assessment and Control Evaluation (FACE) investigations of construction industry fatalities from 1982 to 2015 “indicate[] that a large number of decedents died when they had just started a new job.”¹⁴ In fact, “one in five was killed *within the first two months on the job.*”¹⁵ Statistics from a review of the twenty general duty clause citations OSHA issued for heat hazards in 2012 and 2013 are even more stunning: Workers died in thirteen of those cases, with nine dying within their first three days on the job. “Four of the 13 deaths occurred on the first day at work in a new job or after returning from time away from the job, three on the second day, and two on the third day.”¹⁶

An analysis of workplace fatalities resulting from falls similarly showed “[d]ecedents having a short job tenure with the employer at the time of the incident more likely to die from falls. Among decedents who had been on the job for just one week, 54% of all fatalities were from falls, while the proportion was 42% for decedents having five or more years with their employer when the incident occurred.”¹⁷ Similarly, among construction workers who answered

¹⁴ Xiuwen Sue Dong, *et al.*, *The Construction FACE Database – Codifying the NIOSH FACE Reports*, 62 *Journal of Safety Research* at 221. The statistics come from NIOSH’s Fatality Assessment and Control Evaluation (FACE) program, established in 1982, and the State FACE program, added in 1989, which together collect information from work-related fatality investigations. *Id.* at 217.

¹⁵ *Id.* at 221 (emphasis added).

¹⁶ Sheila Arbury, *et al.*, *Heat Illness and Death Among Workers – United States 2012-2013*, 63 *Morbidity and Mortality Weekly Report* 661 (DCDCP, Aug. 8, 2014), available at <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6331a1.htm> (last visited May 11, 2018).

¹⁷ Xiuwen Sue Dong, Julie A. Largay, Sang D. Choi, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, *Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports*, 102 *Accident Analysis and Prevention* 102, 138 (2017).

“yes” when asked whether their jobs “lasted only for a limited time or until the completion of a project,” 84.4% reported working outdoors twice week or more (as compared to 70.3% of other construction workers), while 57.2% reported being exposed to vapors, gases, dust or fumes twice a week or more, as compared to 49.4% of their counterparts with longer term jobs.¹⁸

With particular resonance to this case, workers new to the job are most at risk for heat-related illnesses. For example, an investigation by California OSHA of 25 incidents of heat-related illness in 2005 revealed that “[i]n almost half of the cases, the worker involved was on their first day of work and in 80% of the cases the worker involved had only been on the job for four or fewer days.”¹⁹

Given research showing that temporary construction workers and construction workers new to a jobsite are more vulnerable to fatalities, training before beginning work on a construction jobsite is key to preventing serious injuries and fatalities. Analysis of NIOSH’s FACE database shows that only 42% of construction decedents were found to have received job-related training before their work-related deaths.²⁰ Among the reports prepared as a result of the investigations, “roughly three-quarters . . . included a recommendation for employers to provide

¹⁸ Xiuwen Sue Dong, Xuanwen Wang, and Julie A. Largay, *CPWR Quarterly Data Report: Temporary Workers in the Construction Industry* at 12 (Second Quarter 2015), available at <https://www.cpwr.com/sites/default/files/publications/Second%20Quarter%202015.pdf> (last visited May 7, 2018).

¹⁹ OSHA, *Using the Heat Index: A Guide for Employers*, available at https://www.osha.gov/SLTC/heatillness/heat_index/pdfs/all_in_one.pdf (last visited May 7, 2018).

²⁰ Xiuwen Sue Dong, *et al.*, *The Construction FACE Database – Codifying the NIOSH FACE Reports*, 62 *Journal of Safety Research* at 221.

safety training,” leading researchers to conclude that “implementing [safety training] recommendations prior to beginning work may mitigate the risk of [fatalities] in the future.”²¹

As part of its temporary worker initiative, OSHA similarly stresses the importance of training workers before they begin work at a new location. Whether provided by the staffing agency or the host employer, it is critical that “all temporary workers on new projects or newly-placed on existing projects” receive “safety and health orientations.” Moreover, OSHA counsels that the “host employers should provide temporary workers with safety training that is identical or equivalent to that provided to the host employers’ own employees performing the same or similar work.”²²

B. This Case Illustrates the Importance of Training “Temporary” Workers.

Sturgill’s Superintendent Gould provided safety orientation to the company’s permanent employees by showing two videos, providing the employees with a pocket guide published by the National Roofing Contractors Association, and reviewing the pocket guide with them. Although the videos dealt with heat, they did not address acclimatization. CX-13 at 3 (Foreman Brown’s testimony to CSHO Wallace, that while the videos “talk about the cold elements, liquids, . . . the heat, electrical cords and all that,” they do not cover “how to get used to being on the roof where it is hot.”) Similarly, although the pocket guide stressed the “importan[ce] of understand[ing] the precautions you need to avoid heat related illness,” it did not explicitly address the steps employees need to take when they first begin work in a hot environment. RX-9 at 6.

²¹ *Id.* at 222.

²² OSHA/NIOSH, *Recommended Practices: Protecting Temporary Workers* 4 (OSHA Publication OSHA-3735-2014; DHHS (NIOSH) Publication Number 2014-139), available at <https://www.osha.gov/Publications/OSHA3735.pdf> (last visited May 7, 2018).

In addition to their initial orientation, permanent Sturgill employees periodically took the OSHA 10-hour training. The course included a segment on heat stress, but there was no evidence introduced that it covered acclimatization. *See* Tr. 433; RX-13. Finally, the company regularly conducted tool box talks, including two that dealt with heat-related issues. These talks were presented in a 52-week cycle. The heat-related topics were not necessarily presented during the summer, and were not presented on this job. ALJD at 7.

The ALJ correctly found that Sturgill's training for its permanent employees fell short of § 1926.21(b)(2)'s command that the company "instruct each employee in the recognition and avoidance of unsafe conditions" by providing "reasonable and necessary instruction specific to the recognition and avoidance of risk factors related to the development of health-related illnesses." ALJD at 24. That Sturgill "failed to provide the instructions that a reasonably prudent employer would have given in the same circumstances," *Compass Env'l, Inc.*, 23 BNA OSHC 1132, 1134 (No. 06-1036, 2010), *aff'd*, 663 F.3d 1164 (10th Cir. 2011), on how "to avoid the unsafe conditions which they may encounter on the job," *O'Brien Concrete Pumping, Inc.*, 18 BNA OSHC 2059, 2061 (No. 98-0471, 2000), was abundantly clear in the manner in which Sturgill's foreman treated M.R. when he came to the site. He failed to conduct systematic acclimatization and to carefully monitor behavior on the jobsite, which were necessary to ensure M.R.'s safety.

Whatever the limitations in the instruction Sturgill provided its permanent employees, Sturgill provided *none* of that training to M.R. When M.R. reported to the PNC job on August 1, Foreman Brown gave him *no* training on heat-related hazards or on recognizing the signs and symptoms of heat-related illness. ALJD at 4. The foreman pointed out the water coolers and the break area on the roof and told M.R. to let him know if he got hot and needed a break. *Id.* But

telling someone he can drink, seek shade and take breaks is very different from training someone in the importance of taking those steps to acclimate to the heat and protect himself from serious injury or even – as in this case – death.

The contrast between the manner in which Sturgill treated its permanent and temporary employees, and the complete lack of training Sturgill provided to its temporary employee before sending him to work, is symptomatic of a serious problem in the construction industry. Whether they are traditional “temps,” supplied by staffing agencies, or long-term workers, whose jobs take them from one worksite and contractor to another, construction workers are constantly “new” to their worksite, facing new challenges and hazards. It is critically important to hold employers accountable for providing adequate training to these workers, as the ALJ did in this case.

CONCLUSION

Underlying this case is a significant proposition on which all of the parties appear to agree: heat stress is a recognized hazard, and in the absence of a standard, OSHA can address it through the general duty clause. What separates the parties is not this legal issue, but is instead the narrow factual question whether the heat on the particular day on which Sturgill was cited rose to a level at which the employer should have recognized it posed a hazard.

Through its briefing order, the Commission appears to be using this case to raise a far more complex issue: the extent to which an employer’s knowledge about its employees’ health should be an element in a general duty clause case. As discussed, for construction workers, whether employers can or should seek out information about their underlying health conditions, and what actions, if any, employers can or should take based on that information are serious questions that have important implications about both their privacy rights and their rights to

expect workplace conditions to be safe. They are not, however, issues presented by this case. Given the vexing legal and policy issues the Commission's question raises, NABTU respectfully urges the Commission not to wade into this area of the law in the absence of a concrete controversy.

Finally, NABTU urges the Commission to take seriously the importance of ensuring that construction employers recognize that the employees commonly share the characteristics of "temps" and need to be provided training whenever they are new to their worksite.

Respectfully submitted,

Victoria L. Bor
Sue D. Gunter
Sherman Dunn, P.C.
900 Seventh Street, N.W. Suite 1000
Washington, D.C. 20001
202/785-9300
bor@shermardunn.com
gunter@shermardunn.com

Counsel for North America's Building Trades Unions

APPENDIX

1. AFL-CIO, *Death on the Job: The Toll of Neglect* (2018) (excerpts)
2. American College of Occupational and Environmental Medicine, *Confidentiality of Medical Information in the Workplace; Additional Guidance on Medical Confidentiality in the Workplace* 9 (Nov. 6, 2012)
3. Galassi, Thomas, *Policy Background on the Temporary Worker Initiative* (July 15, 2014)
4. Occupational Safety and Health Administration, U.S. Dept. of Labor, *Occupational Exposure to Respirable Crystalline Silica; Final Rule*, 81 Fed.Reg.16285 (Mar. 25, 2016) (excerpts)
5. OSHA, *Protecting Temporary Workers*
6. OSHA, *Using the Heat Index: A Guide for Employers* (excerpts)
7. OSHA/NIOSH, *Recommended Practices: Protecting Temporary Workers* (OSHA Publication OSHA-3735-2014; DHHS (NIOSH) Publication Number 2014-139)
8. Sheila Arbury, *et al.*, *Heat Illness and Death Among Workers – United States 2012-2013*, 63 Morbidity and Mortality Weekly Report 661 (DCDCP, Aug. 8, 2014)
9. Xiuwen Sue Dong, Julie A. Largay, Sang D. Choi, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, *Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports*, 102 Accident Analysis and Prevention 102 (2017)
10. Xiuwen Sue Dong, Julie A. Largay, Xuanwen Wang, Chris Trahan Cain, & Nancy Romano, *The Construction FACE Database – Codifying the NIOSH FACE Reports*, 62 Journal of Safety Research 217 (2017)
11. Xiuwen Sue Dong, Xuanwen Wang, and Julie A. Largay, *CPWR Quarterly Data Report: Temporary Workers in the Construction Industry* at 12 (Second Quarter 2015)



DEATH ON THE JOB

The Toll of Neglect

**A NATIONAL AND
STATE-BY-STATE PROFILE OF
WORKER SAFETY AND HEALTH
IN THE UNITED STATES**

JOB FATALITIES, INJURIES AND ILLNESSES

On average, 14 workers were fatally injured and more than 10,000 workers were injured or made ill each day of 2016. These statistics do not include deaths from chronic occupational diseases, which claim the lives of an estimated 50,000–60,000 workers each year.

Job Fatalities

In 2016, there were 5,190 workplace deaths due to traumatic injuries, a significant increase over the 4,836 deaths reported in 2015.² The rate of fatal job injuries in 2016 also increased to 3.6 per 100,000 workers from 3.4 per 100,000 workers in 2015.

The biggest increase in job fatalities was in the service-providing industries, where the number of job fatalities increased by 13% (from 2,399 to 2,702 deaths). The job fatality rate declined in mining and manufacturing and was unchanged in construction, all industries that receive the greatest oversight from OSHA and MSHA. But in all other sectors, the fatality rate increased.

Deaths from workplace violence increased by 23% (from 703 to 866 deaths) and are now the second-leading cause of job death. Asian and black workers also saw a significant increase in job deaths in 2016, as did older workers (ages 55 and older).

Fatalities by State

Wyoming had the highest job fatality rate in 2016, at 12.3 per 100,000 workers, followed by Alaska (10.6), Montana (7.9), South Dakota (7.5) and North Dakota (7.0). Connecticut had the lowest state fatality rate (1.6 per 100,000 workers), followed by Rhode Island (1.8), California (2.2), Maine (2.4), New Jersey (2.4) and Washington (2.4).

From 2015 to 2016, fatality rates increased in 31 states. Alaska experienced a 159% increase, followed by Massachusetts (57%), South Dakota (53%), Oregon (50%) and Rhode Island (50%).

Industry, Occupation, Event and Demographic Highlights

In 2016, the construction sector had the largest number of fatal work injuries (991), followed by transportation and warehousing (825) and agriculture, forestry, fishing and hunting (593). Industry sectors with the highest fatality rates were agriculture, forestry, fishing and hunting (23.2 per 100,000); transportation and warehousing (14.3), mining, quarrying, and oil and gas extraction (10.1) and construction (10.1).

Within the mining and extractive industries in 2016, BLS reported 63 deaths in oil and gas extraction—the lowest since BLS has been reporting this data. According to separate statistics reported by the Mine Safety and Health Administration, in 2016 there were eight deaths in coal mining and 17 deaths in metal and nonmetal mining, the safest year in mining history. Preliminary data for 2017 show a significant increase in coal mine fatalities, with 15 deaths, and a decline in metal and nonmetal fatalities, with 13 deaths.

²U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 2016. Released Dec.19, 2017.



Public Affairs



PUBLIC AFFAIRS

- [Press Releases](#)
- [Policies & Position Statements](#)
- [Guidance Statements](#)
- [Public Comments](#)
- [Reference Material](#)
- [Press Room](#)
- [Advocacy](#)
- [Healthy Workforce Now](#)

Confidentiality of Medical Information in the Workplace

11/6/2012

ACOEM Committee on Ethical Practice in Occupational and Environmental Medicine

As do all physicians, occupational and environmental medicine (OEM) practitioners rely on the patient to completely and truthfully disclose private information before rendering a professional opinion. In order to facilitate the disclosure of private personal information, employees must feel that their private disclosures will be treated in a dignified and confidential manner. Because a physician must first of all do no harm, information received in confidence should be disclosed only when it is in the best interests of the patient or society, or required by applicable law or valid governmental rule or regulation.

When considering requests for job accommodation, addressing threats to health or safety, or reviewing claims for workers' compensation benefits, employers may require access to personal information. Additionally, employers shoulder an increasing responsibility for providing other types of benefits such as health and disability insurance, family medical leave, and employee assistance programs. As a result, the employer becomes inextricably and unavoidably involved in employees' personal and medical affairs. Thus, competing interests between the employee's right to privacy and the employer's legitimate interest in the health of the employee creates sensitive ethical and legal dilemmas for physicians who practice occupational medicine. Other parties, such as insurers, state and federal agencies, and accrediting organizations may also have a right to patient records, and this right must be considered and managed carefully.

The laws governing the confidentiality of employee medical information are complex and vary depending on the relationship between parties and by jurisdiction.¹ Difficult ethical problems arise when the physician must attempt to balance the importance of the employee's need and legal right to keep information confidential versus the employer's need and legal right to know or the interests of other parties.

ACOEM Position

The American College of Occupational and Environmental Medicine (ACOEM) acknowledged the importance of medical confidentiality with publication of its first Code of Ethical Conduct in 1976. This Code was later revised in 1993 to reflect changes in the character of the modern workplace,² and subsequently updated in 2010.³ The 2010 Code of Ethics states that physicians should:

"5. Protect Patient Confidentiality. Keep confidential all individual medical, health promotion, and health screening information, only releasing such information with proper authorization. Recognize that employers may be entitled to counsel about an individual's medical work fitness."³

Additional Guidance on Medical Confidentiality in the Workplace

While the ACOEM Code of Ethics provides direction, the ACOEM Committee on Ethical Practice in Occupational and Environmental Medicine believes that additional guidance on the issue of confidentiality is necessary. Therefore, in addition to Point 5 of the ACOEM Code of Ethics, the College is providing the following guidance regarding medical record confidentiality:

1. Legislation and local practice may treat medical records created in the context of occupational health, independent medical evaluations, and workers' compensation cases differently from medical records created by personal health care providers. However, the physician practicing occupational medicine is advised not to make such distinctions in practice without clear legal guidance or permission from the proper parties. Confidential medical information should be treated the same as in situations where there is a clear physician-patient relationship unless there is a valid legal reason or consent to do otherwise, a health and safety risk to the client or others, or evidence of a criminal act.⁴
2. Physicians should make all reasonable efforts to obtain the patient's consent before disclosing all or any portion of his or her medical record. If disclosure is legally required or consent is not legally required, the patient should be notified of the impending disclosure unless such notification is impossible or there are overriding patient or public health concerns.
3. Physicians should recognize a patient's consent-for-disclosure only if said consent is both informed and voluntary. The consent should specify the nature of the information to be released, the purposes for its release, the person or persons to whom it may be released, the time period for which the consent remains in effect, and acknowledgement statement that the patient may rescind consent at anytime. The consent must be signed by the employee or his or her legal guardian, or

- if the employee is deceased, by his or her personal representative.
4. Whenever physicians are aware that the results of an examination or records of a visit may be shared with a third party (e.g., in the case of an independent medical examination the information will be shared with an insurer and/or attorneys representing the insurer and the claimant), it is incumbent upon the physician to properly notify the examinee prior to gathering historical or clinical data as to the nature of the evaluation, what information will be collected, and to whom it will be transmitted. The physician should not state or imply that any records will be kept confidential if this cannot be assured. The physician performing independent medical examinations should be knowledgeable of statutes and/or regulations controlling the distribution of their reports. It is appropriate that the insurer and physician share with the claimant the nature of information to be included and the distribution of the report. Sensitive confidential medical information that is not relevant to the claim should not be included in the report.
 5. Although all personal health information should be presumed to be confidential, physicians should recognize that certain types of health information are particularly sensitive such as sexual orientation, HIV/AIDS status,⁵ drug and alcohol treatment, past history of physical or sexual abuse, treatment for sexually transmitted diseases, and genetic information.⁶ Physicians should be aware that a general consent for disclosure of medical records cannot be presumed to be sufficient in these situations and that specific written consent for release of such information must be obtained. This information should only be disclosed in compliance with U.S. federal and state law and similar laws of other countries where occupational physicians work. Because it is often possible to infer sensitive information from other parts of the medical record, such as the medication history, the physician should treat such information in the same manner as explicitly sensitive information.
 6. Physicians should release only the portion of a record covered by a release and not disclose the entire medical record unless indicated and permitted by the patient. Forwarding records that have been obtained from other medical providers is appropriate when that information is relevant to the specific problem in question and permitted.
 7. Physicians should develop a written policy for the treatment of medical records in their offices, clinics, or workplaces. The policy should address such issues as where, and for how long the records are stored; the security of medical records including computer databases; what happens in the event of employee resignation, layoff, termination, job transfer, or closure and/or merger of employer; and the mechanisms of employee access and consent for disclosure.⁷
 8. Physicians should make reasonable efforts to ensure that those under their supervision act with due care regarding the confidentiality of medical records, and act to educate fellow health care providers and office support staff regarding the confidentiality of medical information. Physicians should encourage the confidential treatment of medical information by their clients and in their organization by colleagues in other departments such as human resources or benefits who may have access to such data.
 9. Physicians should disclose their professional opinion to both the employer and the employee when the employee has undergone a medical assessment for fitness to perform a specific job. However, the physician should not provide the employer with specific medical details or diagnoses unless the employee has given his or her permission. Additionally, physicians should not disclose without permission any "non-medical" information gained in the context of a physician/patient relationship that could adversely affect the employee. Exceptions include health and safety concerns or knowledge of unlawful activity.
 10. Physicians should notify employees of their right to obtain access to their medical records and to request correction of any inaccuracies therein.⁸
 11. Supervisors and managers may be informed regarding necessary restrictions on the work or duties of the employee and recommended accommodations. First aid and safety personnel may be informed, when appropriate, if a condition might require emergency treatment, in which case the employee should be informed.
 12. Physicians should be a source of professional, unbiased, and expert opinion in the workers' compensation or court systems and should only disclose medical information that is relevant and necessary to the claim or suit. When release of medical information is authorized or required by specific regulation, only the necessary and relevant information should be released.
 13. Physicians should exercise caution whenever presented with a request or subpoena for medical records that does not include a written authorization for release by the employee, or when the records requested contain information about HIV status, drug and alcohol treatment, or genetic information. It may be appropriate to seek legal advice in these situations.
 14. Physicians should withdraw or decline services when faced with an irresolvable ethical conflict or an unethical request by a client or employer. In many instances, the medical record will be the property of an employer. This ownership does not abrogate any of these principles. Each employer that owns medical records should designate a custodian of the records. Access by employer officials (e.g., employee relations, legal counsel) should proceed via the same process as requests by those outside the employer through the custodian. Physicians should consider inquiring about the employer's practices regarding medical records prior to employment or contractual services.

Because OEM physicians work in a wide variety of practice situations and must respect the laws and customs of many countries, physicians have an ethical duty to become familiar with laws and regulation applicable to their practice. The College believes that all employee health and medical records should be treated as confidential by the employer and provider; however, occupational medicine physicians are in a unique position and must carefully balance the interests of all parties and society as a whole. These recommendations are intended to serve as guidance for OEM physicians in their relationships with their patients and the other individuals that they serve including employers.

References

1. Rischitelli DG. The confidentiality of medical information in the workplace. *J Occup Environ Med.* 1995;37(5):583-93.
2. Teichman R, Wester MS. Code of ethical conduct. *J Occup Med.* 1994;29(1):27-30.
3. ACOEM Code of Ethics. 2010. Available at www.acoem.org/codeofconduct.aspx.
4. American Medical Association Council on Ethical and Judicial Affairs. *Code of Medical Ethics. Current Opinions with Annotations.* Chicago, Ill: AMA, 2006.
5. Americans with Disabilities Act, 42 USC §12112(D)(3)(B) (1990).
6. ACOEM Task Force on Genetic Screening in the Workplace. Position statement. Genetic screening in the workplace. *J Occup Environ Med.* 2010;52(7):763. Available at www.acoem.org/GeneticScreening.aspx.
7. Health Insurance Portability and Accountability Act of 1996 (HIPAA). *Federal Register.* 65 FR 82462. December 28, 2000. Available at www.hhs.gov/ocr/hipaa/finalreg.html.
8. OSHA. Access to Employee Exposure and Medical Records Standard. 19 CFR § 1910.20.

This statement was reviewed and revised by the ACOEM Committee on Ethical Practice in Occupational and Environmental Medicine. Committee members are Drs. David Lukcso, chair, Paul Brandt-Rauf, and William W. Greaves. This statement was peer-reviewed by Dr. Robert Orford, and approved by the ACOEM Board of Directors on July 28, 2012. This statement updates ACOEM's 2008 statement.

[Return to Previous Page](#)

SHOW FEATURED CONTENT LINKS



Founded in 1916, ACOEM is the nation's largest medical society dedicated to promoting the health of workers through preventive medicine, clinical care, research, and education. A dynamic group of physicians encompassing specialists in a variety of medical practices is united via the College to develop positions and policies on vital issues relevant to the practice of preventive medicine both within and outside of the workplace.

Copyright © 2017 | American College of Occupational and Environmental Medicine (ACOEM), All Rights Reserved | [Home](#) | [Privacy Policy](#) | [Join Today](#) | [Contact Us](#) | [Site Map](#)

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210



Reply to the attention of:

July 15, 2014

MEMORANDUM FOR: REGIONAL ADMINISTRATORS

THROUGH: DOROTHY DOUGHERTY
Deputy Assistant Secretary

FROM: THOMAS GALASSI, DIRECTOR
DIRECTORATE OF ENFORCEMENT PROGRAMS

SUBJECT: Policy Background on the Temporary Worker Initiative

On April 29, 2013, OSHA launched the Temporary Worker Initiative (TWI) in order to help prevent work-related injuries and illnesses among temporary workers.¹ The purpose of this initiative is to increase OSHA's focus on temporary workers in order to highlight employers' responsibilities to ensure these workers are protected from workplace hazards.

As detailed in the documents posted on our website (www.osha.gov/temp_workers), temporary workers are at increased risk of work-related injury and illness. In recent months, OSHA has received and investigated many reports of temporary workers suffering serious or fatal injuries, some in their first days on the job. Numerous studies have shown that new workers are at greatly increased risk for work-related injury, and most temporary workers will be "new" workers multiple times a year. Furthermore, as the American economy and workforce are changing, the use of temporary workers is increasing in many sectors of the economy.

OSHA compliance officers regularly encounter worksites with temporary workers. This memorandum is being sent to remind OSHA field staff of the Agency's long standing general enforcement policy regarding temporary workers. Additional enforcement and compliance guidance will be issued in the near future.

For the purposes of the TWI, "temporary workers" are workers hired and paid by a staffing agency and supplied to a host employer to perform work on a temporary basis. In general, OSHA will consider the staffing agency and host employer to be "joint employers" of the worker in this situation. Joint employment is a legal concept recognizing that, in some situations, the key attributes of the traditional employer-employee relationship are shared by two or more employers in such a manner that they each bear responsibility for compliance with statutory and regulatory requirements. For example, the staffing agency often controls a worker's paycheck and selects the host employer location where the worker will be sent. The host employer, in turn, assigns the particular work to be done each day and controls operations in the physical workplace.

As joint employers, both the host employer and the staffing agency have responsibilities for protecting the safety and health of the temporary worker under the OSH Act. In assessing compliance in any inspection where temporary workers are encountered, compliance officers must consider whether each employer has met its responsibility.

Identifying Employer Responsibilities. It is a fundamental principle that temporary workers are entitled to the same protections under the OSH Act as all other covered workers. The staffing agency and host employer must work together to ensure that OSH Act requirements are fully met and that the temporary worker is provided a safe workplace. This requires effective initial and follow-up communication and a common understanding of the division of responsibilities for safety and health. OSHA compliance officers should review any written contract(s) between the staffing agency and the host employer and determine if it addresses responsibilities for employee safety and health. It should be understood, however, that the contract's allocation of responsibilities may not discharge either party's obligations under the Act.

The extent of the obligations each employer has will vary depending on workplace conditions and may be clarified by their agreement or contract. Their duties will sometimes overlap. The staffing agency or the host may be particularly well suited to ensure compliance with a particular requirement, and may assume primary responsibility for it. For example, staffing agencies might provide general safety and health training applicable to many different occupational settings, while host employers provide specific training tailored to the particular hazards at their workplaces. If the staffing agency has a long-term, continuing relationship with the temporary worker, it may be best positioned to comply with requirements such as audiometric testing or medical surveillance. The host employer, in turn, would be the primary party responsible for complying with workplace-specific standards relating to machine guarding, exposure to noise or toxic substances, and other workplace-specific safety and health requirements.

As noted above, although the host employer typically has primary responsibility for determining the hazards in their workplace and complying with worksite-specific requirements, the staffing agency also has a duty. Staffing agencies must ensure they are not sending workers to workplaces with hazards from which they are not protected or on which they have not been trained. Agencies need not become experts on all potential hazards at the host's workplace, but nevertheless have a duty to diligently inquire and determine what, if any, safety and health hazards are present at their client's workplaces. For example, if a staffing agency is

supplying workers to a host where they will be working in a manufacturing setting using potentially hazardous equipment, the agency should take reasonable steps to identify any hazards present, to ensure that workers will receive the required training, protective equipment, and other safeguards, and then later verify that the protections are in place.

Prior to accepting a new host employer as a client, or a new project from a current client, both parties should jointly review the task assignments and any job hazard analyses in order to identify and eliminate potential safety and health dangers and provide the necessary protections and training for workers. If information becomes available that questions the adequacy of the host employer's job hazard analyses, such as injury and illness reports, safety and health complaints or OSHA enforcement history, the staffing agency should make efforts to address those issues with the host employer to ensure that existing hazards are properly assessed and abated to protect the workers. In assessing worksite hazards, host employers typically have the safety and health knowledge and control of worksite operations. However, the staffing agency may itself perform, if feasible, an inspection of the workplace to conduct its own hazard assessment or to ensure implementation of the host employer's safety and health obligations.

It is incumbent on both employers to communicate with each other when a worker is injured, and to determine what measures are to be implemented to prevent future injuries from occurring. Communication between the host employer and staffing agency is of fundamental importance in this regard. For example, if a temporary worker is injured at a host employer worksite, the host employer should inform the staffing agency of the injury, and the staffing agency, in turn, should follow-up about preventive actions taken. Similarly, if a staffing agency learns of a temporary worker's injury (through, for example, the filing of a workers' compensation claim), the staffing agency should inform the host employer to help ensure that preventive measures are taken before additional workers are injured.

When investigations reveal a temporary worker exposed to a violative condition, and the worker is considered to be employed by both a staffing agency and a host employer, OSHA will consider issuing citations to either or both of the employers, depending on the specific facts of the case. This will require Area Offices to make a careful assessment of whether both employers have fulfilled their respective compliance responsibilities in each individual case. These inspections are considered high priority and early consultation between OSHA and SOL is essential to facilitate case development.

Temporary workers have the same rights and protections against retaliation as all other covered workers. Given the importance of communication between employers about the presence of hazards, it is also incumbent on both employers to take necessary steps to ensure that temporary workers are aware of their rights and responsibilities under the OSH Act. Section 11(c) of the OSH Act protects temporary workers who report injuries and illnesses or complain to their employer, OSHA, or other government agencies about unsafe or unhealthful working conditions in the workplace. Temporary workers have the right to report injuries or illnesses or complain to both the host employer and the staffing agency without fear of retribution. Both the staffing agency and the host employer should inform temporary employees how to report injuries and illnesses and include training on the employee's right to report workplace safety concerns. If the CSHO finds evidence of retaliation by either the host employer or the staffing agency for reporting an injury or illness, the CSHO will inform the worker of his/her right to file a retaliation complaint with OSHA.

When to Open an Inspection with the Staffing Agency. When a temporary worker is exposed to a violation, the CSHO should make inquiries into the staffing agency's actual or constructive knowledge of the worksite's hazards - whether the staffing agency knew, or with the exercise of reasonable diligence, could have known about the hazards. The CSHO should review such factors as the terms of the staffing agency-host employer contract, the interaction and communication between the staffing agency and the host employer, the staffing agency's contact with its temporary workers, whether those workers have had any complaints or concerns and whether they have made those concerns known to the employers (and if not, why not).

As noted above, the staffing agency has a basic duty to inquire into the conditions at the host worksite. The decision to open an inspection with the staffing agency is not dependent upon whether or not a staffing agency management representative is on-site. If a temporary worker is or could be exposed to a serious hazard or if the staffing agency does not appear to have taken any actions to learn of the conditions at the host's worksite, then the CSHO should initiate an inspection with the staffing agency. In all other instances, Area Directors may decide, based upon the evidence found during the inquiries, whether to open an inspection with the staffing agency.

Resources. Determining the responsibilities of host employers and staffing agencies will be highly fact-specific. To assist the field in such cases, the Directorate of Enforcement Programs is preparing a series of bulletins on various aspects of the TWI. The first bulletin addresses recordkeeping requirements and can be found on our Temporary Worker webpage. The second bulletin will address whistleblower protection rights. Other topics may include personal protective equipment, training, hazard communication, duty-to-inquire, hearing conservation programs, exposures to heat, and powered industrial trucks. A compliance directive is also planned.

In addition, a large number of resources devoted to the TWI have been assembled on OSHA's internal website. These include existing interpretive guidance and compliance directives related to temporary worker issues on recordkeeping, hazard communication, bloodborne pathogens, and other standards. More resources will be added in the future.

Conclusion. Too often in recent months, it has been OSHA's sad duty to investigate fatalities and injuries involving temporary workers who were not given the necessary safety and health protections required under the Act. In the TWI, we are attempting to ensure that all employers, whether host or staffing agency, individually and collaboratively, fulfill their duties to their workers, so that at the end of the shift of every work day, all temporary workers in the United States can return home safely.

As noted above, further guidance in the form of bulletins and a compliance directive will be forthcoming. Should you have any further questions, please contact Mary Lynn in the Office of Chemical Process Safety and Enforcement Initiatives, at lynn.mary@dol.gov.

cc: Jim Maddux, Director, DOC
Doug Kalinowski, DCSP

1 See OSHA New Release 13-800-NAT, OSHA launches initiative to protect temporary workers, April 29, 2013

Occupational Safety and Health Administration
200 Constitution Ave., NW,
Washington, DC 20210
☎ 800-321-6742 (OSHA)
TTY
www.OSHA.gov

FEDERAL GOVERNMENT

[White House](#)
[Affordable Care Act](#)
[Disaster Recovery Assistance](#)
[USA.gov](#)
[Plain Writing Act](#)
[Recovery Act](#)
[No Fear Act](#)
[U.S. Office of Special Counsel](#)

OCCUPATIONAL SAFETY AND HEALTH

[Frequently Asked Questions](#)
[A - Z Index](#)
[Freedom of Information Act](#)
[Read the OSHA Newsletter](#)
[Subscribe to the OSHA Newsletter](#)
[OSHA Publications](#)
[Office of Inspector General](#)

ABOUT THE SITE

[Freedom of Information Act](#)
[Privacy & Security Statement](#)
[Disclaimers](#)
[Important Web Site Notices](#)
[Plug-ins Used by DOL](#)
[RSS Feeds from DOL](#)
[Accessibility Statement](#)



FEDERAL REGISTER

Vol. 81 Friday,
No. 58 March 25, 2016

Book 2 of 3 Books

Pages 16285–16890

Part II

Department of Labor

Occupational Safety and Health Administration

29 CFR Parts 1910, 1915, and 1926

Occupational Exposure to Respirable Crystalline Silica; Final Rule

to respirable crystalline silica, and any referral for specialist examination directly to the employee; and (2) an opinion focused primarily on any recommended limitations on respirator use, and with the employee's consent, recommended limitations on the employee's exposure to respirable crystalline silica and referral to a specialist. The ensuing two subsections will then discuss the specific requirements and the record comments and testimony relating to those specific requirements.

OSHA proposed that the employer obtain from the PLHCP a written medical opinion containing: (1) A description of the employee's health condition as it relates to exposure to respirable crystalline silica, including any conditions that would put the employee at increased risk of material impairment of health from further exposure to respirable crystalline silica; (2) recommended limitations on the employee's exposure to respirable crystalline silica or use of PPE, such as respirators; (3) a statement that the employee should be examined by a pulmonary disease specialist if the X-ray is classified as 1/0 or higher by the B reader, or if referral to a pulmonary disease specialist is otherwise deemed appropriate by the PLHCP; and (4) a statement that the PLHCP explained to the employee the medical examination results, including conditions related to respirable crystalline silica exposure that require further evaluation or treatment and any recommendations related to use of protective clothing or equipment. The proposed rule would also have required the employer to ensure that the PLHCP did not include findings unrelated to respirable crystalline silica exposure in the written medical opinion provided to the employer or otherwise reveal such findings to the employer. OSHA raised the contents of the PLHCP's written medical opinion, including privacy concerns, as an issue in the preamble of the NPRM in Question 71 in the "Issues" section (78 FR at 56290).

OSHA received a number of comments on these provisions. The majority of these comments related to the proposed contents of the PLHCP's written medical opinion and its transmission to the employer. For example, Dr. Laura Welch expressed concern that the provision that would have required the PLHCP to disclose "a medical condition that puts him or her at risk of material impairment to health from exposure to silica" could be read to require disclosure of the employee's medical diagnosis (Document ID 3581, Tr. 1580). Dr. Steven Markowitz,

physician and director of the Center for Biology of Natural Systems at Queens College, representing USW, explained:

So, for example, if I were the examining healthcare provider and I saw an employee, and he had what I identified as idiopathic pulmonary fibrosis, which is diffuse scarring of the lungs with an unknown cause, in this case, not silica, is that information that I would need to turn over to the employer because further exposure to silica might impair that person's health or not? Or what if the worker has emphysema, which is a silica-related condition, and the provider believes that that emphysema is not due to silica exposure but to the employee's long-time smoking history. Is that information that the healthcare provider is supposed to turn over to the employer? It isn't at all clear (Document ID 3584, Tr. 2518–2519).

Some commenters offered suggestions to address privacy concerns regarding the content of the proposed PLHCP's written medical opinion for the employer and the proposed requirement that the opinion be given to the employer instead of the employee. One suggestion advocated by UAW, LHSFNA, AFSCME, AFL-CIO, and BCTD was for OSHA to use a model based on the black lung rule for coal miners (Document ID 2282, Attachment 3, pp. 20–21; 3589, Tr. 4207; 4203, p. 6; 4204, p. 88; 4223, p. 134). Under the coal miner regulations, miners receive the medical information and employers are prohibited from requiring that information from miners (30 CFR 90.3). Commenters including BlueGreen Alliance, CWA, USW, and Collegium Ramazzini also urged OSHA to require that findings from medical surveillance only be given to employers upon authorization by the employee (Document ID 2176, p. 2; 2240, pp. 3–4; 2336, p. 12; 3541, p. 13). UAW, AFL-CIO, and BCTD referred OSHA to ACOEM's recommendations for workplace confidentiality of medical information (Document ID 2282, Attachment 3, p. 20; 3578, Tr. 929; 3581, Tr. 1579–1580). The ACOEM guidelines state:

Physicians should disclose their professional opinion to both the employer and the employee when the employee has undergone a medical assessment for fitness to perform a specific job. However, the physician should not provide the employer with specific medical details or diagnoses unless the employee has given his or her permission (Document ID 3622, p. 2).

Exceptions to this recommendation listed under the ACOEM guidelines include health and safety concerns. Collegium Ramazzini, BCTD, USW, and BAC argued that providing an employer with information about an employee's health status violates an employee's privacy and is not consistent with

societal views reflected in laws, such as the Health Insurance Portability and Accountability Act (HIPAA) (Document ID 3541, p. 13; 3581, Tr. 1578–1579; 3584, Tr. 2519; 4219, p. 31).

Although HIPAA regulations allow medical providers to provide medical information to employers for the purpose of complying with OSHA standards (Document ID 4214, p. 7), OSHA has accounted for stakeholder privacy concerns in devising the medical disclosure requirements in the rule. OSHA understands that the need to inform employers about a PLHCP's recommendations on work limitations associated with an employee's exposure to respirable crystalline silica must be balanced against the employee's privacy interests. As discussed in further detail below, OSHA finds it appropriate to distinguish between the PLHCP's recommendations and the underlying medical reasons for those recommendations. In doing so, OSHA intends for the PLHCP to limit disclosure to the employer to what the employer needs to know to protect the employee, which does not include an employee's diagnosis. Contrary to some of the comments, it was not OSHA's intent, either in the proposed rule or in earlier standards that require information on an employee's medical or health condition, to transmit diagnostic information to the employer; OSHA intended for the PLHCP merely to convey whether or not the employee is at increased risk from exposure to respirable crystalline silica (or other workplace hazards in other standards) based on any medical condition, whether caused by such exposure or not. In re-evaluating how to express this intent, however, OSHA concludes that the employer primarily needs to know about any recommended limitations without conveying the medical reasons for the limitations. Thus, in response to the weight of opinion in this rulemaking record and to evolving notions about where the balance between preventive health policy and patient privacy is properly struck, OSHA is taking a more privacy- and consent-based approach regarding the contents of the PLHCP's written medical opinion for the employer compared to the proposed requirements and earlier OSHA standards. These changes, which are reflected in paragraph (i)(6) of the standard for general industry and maritime (paragraph (h)(6) of the standard for construction), and the comments that led to these changes, are more fully discussed below.

Reinforcing the privacy concerns, various stakeholders, including labor unions, physicians, and employees,

were also concerned that employees' current or future employment might be jeopardized if medical information is reported to employers (e.g., Document ID 2282, Attachment 3, p. 20; 3581, Tr. 1582; 3583, Tr. 2470–2471; 3585, Tr. 3053–3054; 3586, Tr. 3245; 3589, Tr. 4227–4228, 4294–4295; 4203, pp. 6–7; 4214, pp. 7–8). The same concerns were expressed by Sarah Coyne, a painter and Health and Safety Director from the International Union of Painters and Allied Trades, who testified that many of her fellow union members who have silicosis refused to testify at the silica hearings because they feared they would lose their jobs if their employers found out they were ill (Document ID 3581, Tr. 1613–14). Dr. L. Christine Oliver testified that her patients do not want medical information reported to employers, and Dr. James Melius stated that LHSFNA members are leery of medical surveillance because they fear losing their jobs (Document ID 3588, Tr. 3881–3882; 3589, Tr. 4228). Deven Johnson, cement mason, described employees hiding injuries from supervisors on jobsites for fear of being blacklisted, and said that:

The same is true with occupational illnesses, that the last thing that a worker wants is to have any information that he's somehow compromised because, even though we want to think the best of the employer, that somebody wouldn't take action against that individual, we know for a fact that it happens. It's happened to our membership (Document ID 3581, Tr. 1656).

Industry representatives indirectly confirmed that discrimination based on medical results was possible. For example, CISC noted that some employers might refuse to hire an employee with silicosis because they might have to offer workers' compensation or be held liable if the disease progresses (Document ID 4217, pp. 22–23).

Evidence in the record demonstrates that a likely outcome of employees' reluctance to let employers know about their health status is refusal to participate in medical surveillance. For example, Dr. Rosemary Sokas stated that employees who lack job security would likely avoid medical surveillance if the employer receives the results (Document ID 3577, Tr. 819–820). In discussing the Coal Workers' Health Surveillance Program, Dr. David Weissman stated that maintaining confidentiality is critical because:

One of the biggest reasons in focus groups that miners have given for not participating in surveillance is fear of their medical information being shared without their permission (Document ID 3579, Tr. 169).

When asked if employees would participate in medical surveillance that lacked both employee confidentiality and anti-retaliation and discrimination protection, employees Sarah Coyne, Deven Johnson, and Dale McNabb stated that they would not (Document ID 3581, Tr. 1657; 3585, Tr. 3053–3054). BAC and BCTD emphasized that employees must choose to participate in medical surveillance in order for it to be successful (Document ID 4219, p. 31; 4223, p. 131).

Industry groups, such as OSCO Industries and NAHB, commented that they or employers from their member companies are reluctant to handle or maintain confidential medical information (Document ID 1992, p. 12; 2296, p. 32). NAHB indicated:

Members have expressed strong concerns that much of [the medical information], if not all, would be covered by privacy laws and should be between a doctor and patient. . . . Moreover, the PLHCP should provide a copy of the written medical opinion to the employee directly, not the employer, once it is written (Document ID 2296, pp. 31–32).

However, other industry groups asserted that employers should receive detailed information from medical surveillance. In particular, NISA argued that reporting medical surveillance findings to employers would facilitate epidemiological studies to better understand hazards and the effectiveness of a new standard (Document ID 4208, p. 14).

OSHA agrees that epidemiology studies are important; indeed its health effects and significant risk findings in this rule are overwhelmingly based on epidemiological studies. However, as noted above, it was never OSHA's intent for the PLHCP's written medical opinion on respirable crystalline silica to contain specific diagnoses or detailed findings that might be useful for an epidemiology study. As noted in the summary and explanation of *Recordkeeping*, OSHA's access to employee exposure and medical records standard (29 CFR 1910.1020) requires employers to ensure that most employee medical records are retained for the duration of employment plus 30 years for employees employed more than one year. Such records obtained through appropriate legal means, and with personal identifying information omitted or masked, would be a possible avenue for conducting epidemiology studies.

CISC also noted that in past standards, the purpose of medical surveillance was to improve health practices by allowing employers to understand effects of hazards and, therefore, make changes to the worksite,

such as implementing controls or removing employees from exposure (Document ID 4217, p. 24). Attorney Brad Hammock, representing CISC at the public hearing, stated that if OSHA expects employers to make placement decisions based on health outcomes and exposure, then there would be some value in an employer receiving the PLHCP's opinion. However, Mr. Hammock further explained that if the purpose of surveillance is simply to educate employees about their health situation, then there would be arguably little value in the employer receiving the opinion (Document ID 3580, Tr. 1466–1467). Other commenters, including ACOEM, AOEC, and NISA, also noted the importance of medical surveillance for identifying adverse health effects among employees in order to make workplace changes or evaluate the effectiveness of regulations or workplace programs (Document ID 2080, pp. 9–10; 3577, Tr. 784; 4208, pp. 13, 16–17). Andrew O'Brien testified that if employers are not allowed to see medical findings, the first time they are made aware of a problem is when they receive a letter from the compensation system. Mr. O'Brien stated:

Without access to that data, you can't . . . potentially see disease beginning and take preventative action to prevent it from actually having a negative health effect (Document ID 3577, Tr. 614).

In contrast to those views, USW questioned the value in providing employers with the PLHCP's medical opinion. It stated:

Exactly what corrections in the workplace will the employer make based on newfound knowledge that one of his workers has a silica-related condition? Silicosis occurs 15 or more years following onset of exposure, so that today's silicosis is due to exposure that likely occurred decades ago. (Exceptions are acute and accelerated silicosis, which are rare and are not expected to occur at the recommended PEL.) What inference is the employer supposed to make about the magnitude or effect of current exposures under these circumstances? Indeed, to make sense of the issue, the employer would have to know about the worker's prior silica exposures, quite often at different workplaces. But the employer and, quite likely, even the worker are unlikely to have high quality data on exposures to silica that occurred decades ago. In the absence of such information, it is unclear how an employer can properly interpret current exposures as causing silicosis. By contrast, the best information on current exposures derives from current exposure monitoring, and the notion that documenting silicosis can somehow provide useful information about current exposures above and beyond what proper exposure monitoring is ill-conceived (Document ID 4214, p. 8).

Protecting Temporary Workers

Employer Responsibilities to Protect Temporary Workers*

To ensure that there is a clear understanding of each employer's role in protecting employees, OSHA recommends that the temporary staffing agency and the host employer set out their respective responsibilities for compliance with applicable OSHA standards in their contract. Including such terms in a contract will ensure that each employer complies with all relevant regulatory requirements, thereby avoiding confusion as to the employer's obligations.

Joint Responsibility

While the extent of responsibility under the law of staffing agencies and host employers is dependent on the specific facts of each case, staffing agencies and host employers are *jointly responsible* for maintaining a safe work environment for temporary workers - including, for example, ensuring that OSHA's training, hazard communication, and recordkeeping requirements are fulfilled.

OSHA could hold both the host and temporary employers responsible for the violative condition(s) - and that can include lack of adequate training regarding workplace hazards. Temporary staffing agencies and host employers share control over the worker, and are therefore jointly responsible for temporary workers' safety and health.

OSHA has concerns that some employers may use temporary workers as a way to avoid meeting all their compliance obligations under the OSH Act and other worker protection laws; that temporary workers get placed in a variety of jobs, including the most hazardous jobs; that temporary workers are more vulnerable to workplace safety and health hazards and retaliation than workers in traditional employment relationships; that temporary workers are often not given adequate safety and health training or explanations of their duties by either the temporary staffing agency or the host employer. Therefore, it is essential that *both* employers comply with all relevant OSHA requirements.

Both Host Employers and Staffing Agencies Have Roles

Both host employers and staffing agencies have roles in complying with workplace health and safety requirements and they *share* responsibility for ensuring worker safety and health.

A key concept is that each employer should consider the hazards it is in a *position to prevent and correct*, and in a position to *comply* with OSHA standards. For example: staffing agencies might provide general safety and health training, and host employers provide specific training tailored to the particular workplace equipment/hazards.

- The key is *communication* between the agency and the host to ensure that the necessary protections are provided.
- Staffing agencies have a duty to inquire into the conditions of their workers' assigned workplaces. They must ensure that they are sending workers to a safe workplace.
- Ignorance of hazards is not an excuse.
- Staffing agencies need not become experts on specific workplace hazards, but they should determine what conditions exist at their client (host) agencies, what hazards may be encountered, and how best to ensure protection for the temporary workers.

Worker Rights

Highlights

- Recommended Practices: Protecting Temporary Workers
- Policy Background on the Temporary Worker Initiative
- Temporary Worker Initiative (TWI) Bulletin No. 1 - Injury and Illness Recordkeeping Requirements
- Temporary Worker Initiative (TWI) Bulletin No. 2 – Personal Protective Equipment
- Temporary Worker Initiative (TWI) Bulletin No. 3 – Whistleblower Protection Rights
- Temporary Worker Initiative (TWI) Bulletin No. 4 - Safety and Health Training
- Temporary Worker Initiative (TWI) Bulletin No. 5 - Hazard Communication
- Temporary Worker Initiative Bulletin No. 6 – Bloodborne Pathogens
- Temporary Worker Initiative Bulletin No. 7 - Powered Industrial Truck Training
- Temporary Workers' Rights Pamphlet

News Releases

November 9, 2017 [Region 1 News Release] U.S. Department of Labor Cites Lynnway Auto Auction For Exposing Employees to Numerous Hazards

- The staffing agency has the duty to inquire and *verify* that the host has fulfilled its responsibilities for a safe workplace.
- And, just as important: Host employers *must treat temporary workers like any other workers* in terms of training and safety and health protections.

October 24, 2017 [Region 1 News Release] U.S. Department of Labor and Massachusetts Packaging Company and Staffing Agencies Reach Agreements to Enhance Workplace Safeguards

[Read More....](#)

How can OSHA help?

Workers have a right to a safe workplace. If you think your job is unsafe or you have questions, contact OSHA at 1-800-321-OSHA (6742). It's confidential. We can help. For other valuable worker protection information, such as Workers' Rights, Employer Responsibilities and other services OSHA offers, visit OSHA's Workers' page.

OSHA also provides help to employers. OSHA's On-site Consultation Program offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. For more information or for additional compliance assistance, contact OSHA at 1-800-321-OSHA (6742).

* From OSHA's webinar with the American Staffing Association

UNITED STATES DEPARTMENT OF LABOR

Occupational Safety and Health Administration
200 Constitution Ave., NW,
Washington, DC 20210
☎ 800-321-6742 (OSHA)
TTY
www.OSHA.gov

FEDERAL GOVERNMENT

White House
Affordable Care Act
Disaster Recovery Assistance
USA.gov
Plain Writing Act
Recovery Act
No Fear Act
U.S. Office of Special Counsel

OCCUPATIONAL SAFETY AND HEALTH

Frequently Asked Questions
A - Z Index
Freedom of Information Act
Read the OSHA Newsletter
Subscribe to the OSHA Newsletter
OSHA Publications
Office of Inspector General

ABOUT THE SITE

Freedom of Information Act
Privacy & Security Statement
Disclaimers
Important Web Site Notices
Plug-ins Used by DOL
RSS Feeds from DOL
Accessibility Statement

Using the Heat Index: A Guide for Employers

Introduction

Outdoor workers who are exposed to hot and humid conditions are at risk of heat-related illness. The risk of heat-related illness becomes greater as the weather gets hotter and more humid. This situation is particularly serious when hot weather arrives suddenly early in the season, before workers have had a chance to adapt to warm weather.

For people working outdoors in hot weather, both air temperature and humidity affect how hot they feel. The "**heat index**" is a single value that takes both temperature and humidity into account. The higher the heat index, the hotter the weather feels, since sweat does not readily evaporate and cool the skin. The heat index is a better measure than air temperature alone for estimating the risk to workers from environmental heat sources.

Heat-related illness can be prevented.

OSHA does not have a specific standard that covers working in hot environments. Nonetheless, under the OSH Act, employers have a duty to protect workers from recognized serious hazards in the workplace, including heat-related hazards. This guide helps employers and worksite supervisors prepare and implement hot weather plans. It explains how to use the

heat index to determine when extra precautions are needed at a worksite to protect workers from environmental contributions to heat-related illness. Workers performing strenuous activity, workers using heavy or non-breathable protective clothing, and workers who are new to an outdoor job need additional precautions beyond those warranted by heat index alone.

Workers new to outdoor jobs are generally most at risk for heat-related illnesses. For example, Cal/OSHA investigated 25 incidents of heat-related illness in 2005. In almost half of the cases, the worker involved was on their first day of work and in 80% of the cases the worker involved had only been on the job for four or fewer days. That's why it's important to gradually increase the workload or allow more frequent breaks to help new workers and those returning to a job after time away build up a tolerance for hot conditions. Make sure that workers understand the risks and are "acclimatized".

Heat Index	Risk Level	3URWHFWLYH 0HDVXUHV
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91° to 103°F	Moderate	Implement precautions and heighten awareness
103° to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

Two primary sources of heat for workers: Workers become overheated from two primary sources: (1) the environmental conditions in which they work and (2) the internal heat generated by physical labor. Heat-related illnesses occur when the body is not able to lose enough heat to balance the heat generated by physical work and external heat sources. Weather conditions are the primary external heat sources for outdoor workers.

Outdoor workers include any workers who spend a substantial portion of the shift outdoors. Examples include construction workers, agricultural workers, baggage handlers, electrical power transmission and control workers, and landscaping and yard maintenance workers. These workers are at risk of heat-related illness when the heat index is high. Additional risk factors are listed below. *These must be taken into consideration even when the heat index is lower.*

- Work in direct sunlight-adds up to 15 degrees to the heat index.
- Perform prolonged or strenuous work
- Wear heavy protective clothing or impermeable suits

*This guidance is advisory in nature and informational in content. It is not a standard or regulation, and it neither creates new legal obligations nor alters existing obligations created by OSHA standards or the Occupational Safety and Health Act. Pursuant to the OSH Act, employers must comply with safety and health standards and regulations issued and enforced either by OSHA or by an OSHA-approved State Plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.

Recommended Practices



Protecting Temporary Workers

The Occupational Safety and Health Administration (OSHA) and the National Institute for Occupational Safety and Health (NIOSH) are aware of numerous preventable deaths and disabling injuries of temporary workers. One example is the death of a 27-year-old employed through a staffing agency to work as an equipment cleaner at a food manufacturing plant. While cleaning a piece of machinery, he came into contact with rotating parts and was pulled into the machine, sustaining fatal injuries. The manufacturing plant's procedures for cleaning the equipment were unsafe, including steps in which cleaners worked near the machine while it was energized and parts were moving. Additionally, while the company's permanent maintenance employees were provided with training on procedures to ensure workers were not exposed to energized equipment during maintenance or cleaning, this training was not provided to cleaners employed through the staffing agency. Source: Massachusetts Fatality Assessment and Control Evaluation (FACE) Program, 11MA050.

Workers employed through staffing agencies are generally called *temporary* or *supplied* workers. For the purposes of these recommended practices, "temporary workers" are those supplied to a host employer and paid by a staffing agency, whether or not the job is actually temporary. Whether temporary or permanent, **all workers always have a right to a safe and healthy workplace.** The staffing agency and the staffing agency's client (the *host employer*) are joint employers of temporary workers and, therefore, both are responsible for providing and maintaining a safe work environment for those workers. The staffing agency and the host employer must work together to ensure that the *Occupational Safety and Health Act of 1970* (the OSH Act) requirements are fully met. See [29 U.S.C. § 651](#). The extent of the obligations of each employer will vary depending on workplace conditions

and should therefore be described in the agreement or contract between the employers. Their safety and health responsibilities will sometimes overlap. Either the staffing agency or the host employer may be better suited to ensure compliance with a particular requirement, and may assume primary responsibility for it. The joint employment structure requires effective communication and a common understanding of the division of responsibilities for safety and health. Ideally, these will be set forth in a written contract.

OSHA and NIOSH recommend the following practices to staffing agencies and host employers so that they may better protect temporary workers through mutual cooperation and collaboration. *Unless otherwise legally required, these recommendations are for the purpose of guidance and in some cases represent best practices.*

- ▶ **Evaluate the Host Employer’s Worksite.** Prior to accepting a new host employer as a client, or a new project from a current client host employer, the staffing agency and the host employer should jointly review all worksites to which the worker might foreseeably be sent, the task assignments and job hazard analyses in order to identify and eliminate potential safety and health hazards and identify necessary training and protections for each worker. The staffing agency should provide a document to the host employer that specifies each temporary worker’s specific training and competencies related to the tasks to be performed.

Staffing agencies need not become experts on specific workplace hazards, but should determine what conditions exist at the worksite, what hazards may be encountered, and how to best ensure protection for the temporary workers. Staffing agencies, particularly those without dedicated safety and health professionals on staff, should consider utilizing a third-party safety and health consultant. For example, staffing agencies may be able to utilize the safety and health consultation services provided by their workers’ compensation insurance providers. These consultation services are often offered to policyholders at little to no charge. Employers (staffing agencies and host employers) should inquire with their insurance providers about these services. Small and medium-sized businesses may request assistance from OSHA’s free on-site consultation service. On-site consultation services are separate from enforcement and do not result in penalties or citations.

If information becomes available that shows an inadequacy in the host employer’s job hazard analyses, such as injury and illness reports, safety and health complaints or OSHA enforcement history, the staffing agency should make efforts to discuss and resolve those issues with the host employer to ensure that existing hazards

are properly assessed and abated to protect the workers. In assessing worksite hazards, host employers typically have the safety and health knowledge and control of worksite operations. However, the staffing agency may itself perform an inspection of the workplace, if feasible, to conduct their own hazard assessment or to ensure implementation of the host employer’s safety and health obligations for temporary workers.

- ▶ **Train Agency Staff to Recognize Safety and Health Hazards.** Many staffing agencies do not have dedicated safety and health professionals and, even when they do, these experts cannot be everywhere at once. By teaching agency representatives about basic safety principles and the hazards commonly faced by its temporary workers, the agency will be better equipped to discover hazards and work with the host employer to eliminate or lessen identified workplace hazards before an injury or illness occurs.
- ▶ **Ensure the Employer Meets or Exceeds the Other Employer’s Standards.** When feasible, the host employer and staffing agency should exchange and review each other’s injury and illness prevention program. Host employers should also request and review the safety training and any certification records of the temporary workers who will be assigned to the job. Host employers in certain industries, for example, will only accept bids from and hire staffing agencies that the host has previously verified as meeting the host employer’s safety standards. Similarly, some staffing agencies work only with clients that have robust safety programs.
- ▶ **Assign Occupational Safety and Health Responsibilities and Define the Scope of Work in the Contract.** The extent of the responsibilities the staffing agency and the host employer have will vary depending on the workplace conditions and should be described in their agreement. Either the staffing agency or the host employer may be better suited to ensure compliance with

a particular requirement, and may assume primary responsibility for it. When feasible, the agency-host contract should clearly state which employer is responsible for specific safety and health duties. The contract should clearly document the responsibilities to encourage proper implementation of all pertinent safety and health protections for workers. This division of responsibilities should be reviewed regularly.

The tasks that the temporary worker is expected to perform, and the safety and health responsibilities of each employer, should be stated in the agency-host contract and should be communicated to the worker before that worker begins work at the job site. For example, should the job tasks require personal protective equipment, the contract should state what equipment will be needed and which employer will supply it. The worker should be informed of these details before beginning the job. Clearly defining the scope of the temporary worker's tasks in the agency-host contract discourages the host employer from asking the worker to perform tasks that the worker is not qualified or trained to perform or which carry a higher risk of injury. Defining, clarifying, and communicating the employers' and worker's responsibilities protects the workers of both the staffing agency and of the host employer. The contract should specify who is responsible for all such communications with the temporary worker.

- ▶ **Injury and Illness Tracking.** Employer knowledge of workplace injuries and investigation of these injuries are vital to preventing future injuries from occurring. Information about injuries should flow between the host employer and staffing agency. If a temporary worker is injured and the host employer knows about it, the staffing agency should be informed promptly, so the staffing agency knows about the hazards facing its workers. Equally, if a staffing agency learns of an injury, it should inform the host employer promptly so that future injuries

might be prevented, and the case is recorded appropriately. The parties should therefore also discuss a procedure to share injury and illness information between the employers, ideally specifying that procedure contractually.

NOTE on Injury and Illness Recordkeeping Requirements: Both the host employer and staffing agency should track and where possible, investigate the cause of workplace injuries. However, for statistical purposes, OSHA requires that injury and illness records (often called OSHA Injury and Illness Logs) be kept by the employer who is providing day-to-day supervision, i.e., controlling the means and manner of the temporary employees' work (the host employer, generally). See [29 CFR 1904.31\(b\)\(2\)](#). The agency-host contract should therefore identify the supervising employer and state that this employer is responsible for maintaining the temporary workers' injury and illness records. Employers cannot discharge or contract away responsibilities that pertain to them under law. Further, the contract should specify which employer will make the records available upon request of an employee or an employee representative.

The supervising employer is required to set up a method for employees to report work-related injuries and illnesses promptly and must inform each employee how to report work-related injuries and illnesses. However, both the staffing agency and the host employer should inform the temporary employee on this process and how to report a work-related injury or illness. See [29 CFR 1904.35\(b\)](#).

No policies or programs should be in place that discourage the reporting of injuries, illnesses or hazards. The OSH Act prohibits employers from retaliating against a worker for reporting an injury or illness, including for filing a workers' compensation claim for a work-related condition.

- ▶ **Conduct Safety and Health Training and New Project Orientation.** OSHA standards require site- and task-specific safety and health training. The training must be in a language the workers understand. Training helps to protect the workers of both the staffing agency and the host employer.

The training of temporary workers is a responsibility that is shared between the staffing agency and the host employer. Staffing agencies should provide general safety and health training applicable to different occupational settings, and host employers provide specific training tailored to the particular hazards at their workplaces. The host employer and the staffing agency should each provide — separately or jointly — safety and health orientations for all temporary workers on new projects or newly-placed on existing projects. The orientation should include information on general worker-protection rights and workplace safety and health. At least one of the joint employers, generally the host employer, must provide worksite-specific training and protective equipment to temporary workers, and identify and communicate worksite-specific hazards. The temporary workers' tasks, as defined by the agency-host contract, should also be clearly communicated to the workers and reviewed with the host employer's supervisor(s). **Host employers should provide temporary workers with safety training that is identical or equivalent to that provided to the host employers' own employees performing the same or similar work.** Host employers should inform staffing agencies when such site-specific training for temporary workers has been completed. Informing workers and supervisors of their respective responsibilities agreed upon by the joint employers protects the workers of both the staffing agency and the host employer.

- **First Aid, Medical Treatment, and Emergencies.** Procedures should be in place for both reporting and obtaining treatment for on-the-job injuries and illnesses. Temporary employees should be provided with information on how to report an injury and obtain treatment on every job assignment. Host employers should train temporary employees on emergency procedures including exit routes.

- ▶ **Injury and Illness Prevention Program.** It is recommended that staffing agencies and host employers each have a safety and health program to reduce the number and severity of workplace injuries and illnesses and ensure that their temporary workers understand it and participate in it. The employers' safety programs should be communicated at the start of each new project, whenever new temporary workers are brought onto an existing project, or whenever new hazards are introduced into the workplace.

NOTE: Employers are required to have hazard-specific programs when workers are exposed to certain hazards. Such programs include bloodborne pathogens, hearing conservation, hazard communication, respiratory protection, and control of hazardous energy (lock-out/tag-out).

Contractors and employers who do construction work must comply with standards in 29 CFR 1926, Subpart C, General Safety and Health Provisions. These include the responsibilities for each contractor/employer to initiate and maintain accident prevention programs, provide for a competent person to conduct frequent and regular inspections, and instruct each employee to recognize and avoid unsafe conditions and know what regulations are applicable to the work environment.

- **Injury and Illness Prevention Program Assessments.** The employers should identify and track performance measures key to evaluating the program's effectiveness. For both staffing agencies and host employers, a quality program will stipulate how there will be ongoing assessments to evaluate the consistency, timeliness, quality and adequacy of the program. Leading indicators, such as training and number of hazards identified and corrected, should be included in the assessments. Generally speaking, these assessments should take place at least on an annual basis with a competent internal team or a combined internal and external team. The value of these assessments is the resulting prioritized recommendations for program improvement.
- **Incidents, Injury and Illness Investigation.** In addition to reporting responsibilities, employers should conduct thorough investigations of injuries and illnesses, including incidents of close-calls, in order to determine what the root causes were, what immediate corrective actions are necessary, and what opportunities exist to improve the injury and illness prevention programs. It is critical that both the staffing agency and host employer are engaged in partnership when conducting these investigations.
- ▶ **Maintain Contact with Workers.** The staffing agency should establish methods to maintain contact with temporary workers. This can be as simple as the agency representatives touching base with the workers throughout the temporary assignment, such as when the representatives are at the site to meet with the host employer or to drop off paychecks, or by phone or email. The staffing agency has the duty to inquire and, to the extent feasible, verify that the host has fulfilled its responsibilities for a safe workplace.

The staffing agency should have a written procedure for workers to report any hazards and instances when a worker's tasks are altered by the host employer from those previously agreed upon. The staffing agency and host employer should inform workers how to report hazards and/or changes to job tasks. For example, some staffing agencies have a hotline for their workers to call to report problems at the host employer's worksite. The staffing agency distributes this phone number during the orientation.

The staffing agency should follow up on a worker's safety and health concerns and any complaints with the host employer, as well as investigate any injuries, illnesses and incidents of close calls.

How Can OSHA Help?

OSHA has a great deal of information to assist employers in complying with their responsibilities under the law. Information on OSHA requirements and additional health and safety information is available on the OSHA website (www.osha.gov). Further information on protecting temporary workers is available at the [OSHA Temporary Worker webpage \(www.osha.gov/temp_workers\)](http://www.osha.gov/temp_workers).

Workers have a [right to a safe workplace \(www.osha.gov/workers.html#2\)](http://www.osha.gov/workers.html#2). For other valuable worker protection information, such as Workers' Rights, Employer Responsibilities and other services OSHA offers, visit [OSHA's Workers' page](#).

The OSH Act prohibits employers from retaliating against their employees for exercising their rights under the OSH Act. These rights include raising a workplace health and safety concern with the employer, reporting an injury or illness, filing an OSHA complaint, and participating in an inspection or talking to an inspector. If workers have been retaliated

against for exercising their rights, they must file a complaint with OSHA within 30 days of the alleged adverse action. For more information, please visit www.whistleblowers.gov.

OSHA can help answer questions or concerns from employers and workers. To reach your regional or area OSHA office, go to OSHA's [Regional and Area Offices webpage](http://www.osha.gov/html/RAmap.html) (www.osha.gov/html/RAmap.html) or call 1-800-321-OSHA (6742). OSHA also provides help to small and medium-sized employers. OSHA's [On-site Consultation Program](#) offers free and confidential advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site consultation services are separate from enforcement activities and do not result in penalties or citations. To contact OSHA's free consultation program, or for additional compliance assistance, call OSHA at 1-800-321-OSHA (6742).

Workers may [file a complaint](#) to have OSHA inspect their workplace if they believe that their employer is not following OSHA standards or that there are serious hazards. Employees can file a complaint with OSHA by calling 1-800-321-OSHA (6742) or by printing the complaint form and mailing or faxing it to your local OSHA area office. Complaints that are signed by an employee are more likely to result in an inspection.

If you think your job is unsafe or you have questions, contact OSHA at 1-800-321-OSHA (6742). It's confidential. We can help.

How Can NIOSH Help?

The National Institute for Occupational Safety and Health (NIOSH) is the federal agency that conducts research and makes recommendations to prevent worker injury and illness. Recommendations for preventing worker injuries and illnesses across all industries and for a wide variety of hazards are available on the NIOSH website (www.cdc.gov/niosh). To receive documents or more information about occupational safety and health topics, please contact NIOSH at 1-800-CDC-INFO (1-800-232-4636), TTY 1-888-232-6348.

The NIOSH Fatality Assessment and Control Evaluation (FACE) program investigates selected work-related fatalities to identify high-risk work injury situations and to make recommendations for preventing future similar deaths. Investigations are conducted by NIOSH and state partners. For more information and links to reports of temporary worker deaths, please visit www.cdc.gov/niosh/face. The Michigan and Massachusetts FACE programs have developed 1-2 page Hazard Alerts on temporary worker deaths that are available on their websites (www.oem.msu.edu/userfiles/file/MiFACE/TemporaryWorkerHA17.pdf and www.mass.gov/eohhs/docs/dph/occupational-health/temp-workers.pdf).

The NIOSH Health Hazard Evaluation (HHE) Program provides advice and assistance regarding work-related health hazards. NIOSH may provide assistance and information by phone, in writing, or may visit the workplace. The HHE Program can be reached at www.cdc.gov/NIOSH/HHE or 513-841-4382.

Disclaimer: This document is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace. The *Occupational Safety and Health Act* requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.



Heat Illness and Death Among Workers — United States, 2012–2013

Weekly

August 8, 2014 / 63(31);661-665

Sheila Arbury, MPH¹, Brenda Jacklitsch, MS², Opeyemi Farquah³, Michael Hodgson, MD⁴, Glenn Lamson, MS⁵, Heather Martin, MSPH³, Audrey Proffitt, MPH⁶ (Author affiliations at end of text)

Exposure to heat and hot environments puts workers at risk for heat stress, which can result in heat illnesses and death. This report describes findings from a review of 2012–2013 Occupational Safety and Health Administration (OSHA) federal enforcement cases (i.e., inspections) resulting in citations under paragraph 5(a)(1), the "general duty clause" of the Occupational Safety and Health Act of 1970. That clause requires that each employer "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees" (1). Because OSHA has not issued a heat standard, it must use 5(a)(1) citations in cases of heat illness or death to enforce employers' obligations to provide a safe and healthy workplace. During the 2-year period reviewed, 20 cases of heat illness or death were cited for federal enforcement under paragraph 5(a)(1) among 18 private employers and two federal agencies. In 13 cases, a worker died from heat exposure, and in seven cases, two or more employees experienced symptoms of heat illness. Most of the affected employees worked outdoors, and all performed heavy or moderate work, as defined by the American Conference of Governmental Industrial Hygienists (2). Nine of the deaths occurred in the first 3 days of working on the job, four of them occurring on the worker's first day. Heat illness prevention programs at these workplaces were found to be incomplete or absent, and no provision was made for the acclimatization of new workers. Acclimatization is the result of beneficial physiologic adaptations (e.g., increased sweating efficiency and stabilization of circulation) that occur after gradually increased exposure to heat or a hot environment (3). Whenever a potential exists for workers to be exposed to heat or hot environments, employers should implement heat illness prevention programs (including acclimatization requirements) at their workplaces.

To understand the effectiveness of existing heat illness prevention campaigns and tools, OSHA convened the Heat Illness Workgroup* to conduct a systematic review of cases of occupational heat illness or death cited for federal enforcement under paragraph 5(a)(1) during 2012–2013. Cases were identified by OSHA's Directorate of Enforcement Programs. For all cases reviewed, the workgroup established a list of program elements it considered important based on published literature and members' professional experience (Table). These included information on local weather conditions, work processes and workload, employer heat illness prevention program elements, health outcomes, numbers of persons affected, and individual risk factors. When needed, OSHA Compliance Safety and Health Officers were consulted for case clarification.

During 2012–2013, a total of 20 cases were cited for federal enforcement under paragraph 5(a)(1). Thirteen cases involved a worker death attributed to heat exposure, and seven involved two or more workers with symptoms of heat illness. Thirteen worksites were outdoors. In eight cases, workers performed heavy work, and in 12 cases they performed moderate work per American Conference of Governmental Industrial Hygienists workload definitions (2). Seven cases occurred in indoor facilities with a local heat source, such as laundry equipment or combustion engines. The cases occurred in various workplaces, including two in solid waste collection, two in mail delivery, nine in outdoor worksites (e.g., ship repair, landscaping, roofing, and oil servicing), two in laundries, and five in indoor worksites with machinery or other heat sources. All heat illnesses and deaths occurred on days with a heat index in the range of 84.0°F–105.7°F (29.0°C–41.0°C), although those working in direct sunlight might have experienced a heat index that was up to 15.0°F (8.3°C) higher than reported (3).

Thirteen employers had not incorporated an approach to identifying heat illness risk (e.g., heat index), as described by the National Oceanic and Atmospheric Administration, into their heat illness prevention program (4). None of the employer heat illness prevention programs were complete. Twelve had no program at all, seven provided inadequate water management, and 13 failed to provide shaded rest areas. Only one of the employers used work-rest cycles (i.e., scheduled periods of rest between periods of work based on temperature, humidity, and the intensity of the work activity), and none had an acclimatization program (Table). Four of the 13 deaths occurred on the first day at work in a new job or after returning from time away from the job, three on the second day, and two on the third day; four deaths occurred among long-time employees. In the cases that involved heat illness but not a death, the number of days on the job did not appear to contribute to any of the heat-related incidents.

Discussion

Heat-related deaths often occur in occupations in which workers are performing tasks in hot environments, causing them to build metabolic heat faster than their bodies can release heat and cool down. In North Carolina, during 2008–2010, work-related heat illnesses resulting in emergency department visits were more common than work-related emergency department visits with any other cause among persons aged 19–45 years (5). In Maricopa County, Arizona, during 2002–2009, outdoor work in construction and agriculture accounted for 35% of heat-related deaths in men (6). A total of 68 crop production worker deaths were reported in the United States during 1992–2006, resulting in an annual average death rate of 0.39 deaths per 100,000 crop workers (7). Particularly in agriculture, estimates of heat illness cases are likely to be undercounts because some surveys exclude workers on small farms (8).

Although OSHA's Heat Illness Prevention Campaign's core message "Water. Rest. Shade." has been widely disseminated and reflects many similar public health messages (9), this review shows that some employers have not developed complete heat illness prevention programs. Strikingly, in the cases reviewed, the failure to support acclimatization appears to be the most common deficiency and the factor most clearly associated with death. Employers need to provide time to acclimatize for workers absent from the job for more than a few days, new employees, and those working outdoors during an extreme heat event or heat wave. Employers must ensure that all workers acclimatize to hot environments by gradually increasing duration of work in the hot environment. In addition, health care providers should be aware of the loss of acclimatization in their patients who have been out of work for a week or more and counsel them that they will need time to regain acclimatization once they return to their job. New workers and all workers returning from an absence of more than a week should begin with 20% of the usual duration of work in the hot environment on the first day, increasing incrementally by no more than 20% each subsequent day (3). During a rapid change leading to excessively hot weather or conditions such as a heat wave, even experienced workers should begin on the first day of work in excessive heat with 50% of the usual duration of work, 60% on the second day, 80% on the third, and 100% on the fourth day (9). Full acclimatization might take up to 14 days or longer to attain, depending on individual or environmental factors.

Employers should be aware of the importance of all elements, including acclimatization, in their heat illness prevention programs. They should be diligent about 1) designating a person to develop, implement, and manage the program, 2) monitoring the temperature (e.g., heat index and wet bulb globe temperature†) of their worksite, 3) providing water and rest breaks in a shaded, cool area, 4) acclimatizing workers by gradually increasing the exposure to heat or a hot environment, 5) modifying work schedules as necessary to reduce workers' exposure to heat, 6) training workers on the signs and symptoms of heat illness, 7) monitoring workers for signs of heat stress, and 8) planning for emergencies and response. Guidance provided by CDC's National Institute for

Occupational Safety and Health includes information on acclimatization, work-rest schedules, adequate hydration, indices for monitoring environmental heat stress (including wet bulb globe temperature), and other recommendations that can be used for developing a heat illness prevention program (9,10).

The findings in this report are subject to at least three limitations. First, information collected retrospectively might fail to identify important elements such as individual prior acclimatization that might have been missed by OSHA Compliance Safety and Health Officers. Second, information from weather websites regarding past weather conditions relatively close to the worksite under consideration might not accurately represent conditions at the worksite itself (especially because at least one of the weather stations was more than 100 miles from the worksite) and thus might fail to identify the actual impact of weather. Finally, OSHA Compliance Safety and Health Officers performing workplace inspections might have missed program elements identified by the Heat Illness Workgroup because these elements were not part of routine information collection.

Additional information and resources regarding heat stress are available from CDC at <http://www.cdc.gov/niosh/topics/heatstress> and from OSHA at <https://www.osha.gov/SLTC/heatillness/edresources.html>.

1Office of Occupational Health Nursing, Occupational Safety and Health Administration (OSHA); 2Education and Information Division, National Institute for Occupational Safety and Health, CDC; 3Office of Science and Technology Assessment, OSHA; 4Office of Occupational Medicine, OSHA; 5Salt Lake Technical Center, Directorate of Technical Support and Emergency Management, OSHA; 6Office of Health Enforcement, OSHA (Corresponding author: Michael J. Hodgson, hodgson.michael@dol.gov, 202-693-1768)

References

1. Section 5(a)(1) of the Occupational Safety and Health Act of 1970 (29 U.S.C.654) and 29 CFR 1960.8(a) for federal agencies. Available at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=3359&p_table=oshact.
2. American Conference of Governmental Industrial Hygienists. TLVs and BEIs: threshold limit values for chemical substances and physical agents of biological exposure indices. Heat stress and strain. Cincinnati, OH: American Conference of Governmental Industrial Hygienists; 2007.
3. Occupational Safety and Health Administration. Campaign to prevent heat illness in outdoor workers. Washington, DC: US Department of Labor, Occupational Safety and Health Administration; 2014. Available at <https://www.osha.gov/SLTC/heatillness>.
4. National Oceanic and Atmospheric Administration. Heat: a major killer. Silver Spring, MD: National Oceanic and Atmospheric Administration; 2014. Available at <http://www.nws.noaa.gov/os/heat/index.shtml>.
5. Rhea S, Ising A, Fleischauer AT, Deyneka L, Vaughan-Batten H, Waller A. Using near real-time morbidity data to identify heat-related illness prevention strategies in North Carolina. *J Community Health* 2012;37:495–500.
6. Petitti DB, Harlan SL, Chowell-Puente G, Ruddell D. Occupation and environmental heat-associated deaths in Maricopa County, Arizona: a case-control study. *PLoS One* 2013;8(5).
7. CDC. Heat-related deaths among crop workers—United States, 1992–2006. *MMWR* 2008;57:649–53.
8. Leigh JP, Du J, McCurdy SA. An estimate of the U.S. government's undercount of nonfatal occupational injuries and illnesses in agriculture. *Ann Epidemiol* 2014;24:254–9.
9. CDC. Criteria for a recommended standard: occupational exposure to hot environments (revised criteria 1986). Cincinnati, OH: US Department of Health and Human Services, CDC, National Institute for Occupational Safety and Health; 1986. DHHS (NIOSH) publication no. 86-113. Available at <http://www.cdc.gov/niosh/docs/86-113>.
10. CDC. OSHA-NIOSH infosheet: protecting workers from heat illness. Cincinnati, OH: US Department of Health and Human Services, CDC, National Institute for Occupational Safety and Health; 2011. DHHS (NIOSH) publication no. 2011-174. Available at <http://www.cdc.gov/niosh/docs/2011-174>.

* The Heat Illness Workgroup was created in 2014 after an informal internal review of OSHA's Heat Illness Campaign and consisted of representatives from the various offices (all listed as coauthors in this report) involved in campaign materials development. The group invited a representative from CDC's National Institute for Occupational Safety and Health when they became aware of the CDC/NIOSH document revision, *Criteria for a Recommended Standard: Occupational Exposure to Heat and Hot Environments* that was underway.

† Wet bulb globe temperature is the measure of heat stress in direct sunlight that takes into account temperature, humidity, wind speed, sun angle, and cloud cover. This differs from the heat index, which takes into account temperature and humidity and is calculated for shady areas. Additional information available at <http://www.srh.noaa.gov/tsa/?n=wbgt>.

What is already known on this topic?

Exposure to heat and hot environments puts workers at risk for heat stress, which can result in heat illness and death. Guidance for prevention exists, but heat illness prevention programs are not formally implemented by most employers.

What is added by this report?

A review of 2012–2013 Occupational Safety and Health Administration federal enforcement cases (i.e., inspections) resulting in citations under paragraph 5(a)(1), the "general duty clause" of the Occupational Safety and Health Act of 1970, indicated a total of 20 cases involving heat illness and death among workers (13 cases of worker deaths and seven cases in which two or more employees experienced symptoms of heat illness). Most of the affected workers were outdoors and performing heavy or moderate work. In addition, most deaths occurred in the first 3 days of working, with four of them occurring on the worker's first day. Many employers had no heat illness prevention program. Among those with such programs, many lacked basic program elements, such as water management, shaded rest areas, work-rest cycles, and acclimatization protocols. Employers' failure to support acclimatization appears to be the most common deficiency and the factor most clearly associated with death.

What are the implications for public health practice?

Heat illness prevention recommendations include the provision of water and rest breaks in a shaded, cool area to employees. Guidance from regulatory and public/occupational health agencies should include acclimatization of workers as an essential element of employer heat illness prevention programs.

TABLE. Summary of heat illness and fatality cases cited by the Occupational Safety and Health Administration (OSHA)* — United States

Case no.	Age (yrs)	Fatality	Type of employment	Temperature (heat index) at time of incident	Time employed	Overall employer program present	Employer provided water and supported use	Employer provided rest opportunities	Employer provided cool or shaded area	Work-rest cycle	Acclimatization program	Local heat source (indoor)
1	47	Yes	Waste collection	91.0°F, 32.8°C (93.8°F)	1 day	No	No	Only on scheduled	No	No	No	None

				34.3°C)				breaks				
2	Unknown (multiple workers)	No	HVAC systems manufacturing	98.6°F, 37.0°C (105.5°F, 40.8°C)	Unknown	No	No	Limited breaks	No	No	No	Plant machinery in operation
3	47	Yes	Asphalt paving	97.0°F, 36.1°C (99.9°F, 37.7°C)	3 days	No	Yes	Scheduled and water breaks	No	No	No	Asphalt machinery asphalt
4	39	Yes	Synthetic turf installation	91.9°F, 33.3°C (92.5°F, 33.6°C)	2 days	Yes	Yes	Scheduled breaks	No	No	No	Synthetic materials
5	Unknown	No	Commercial laundry	93.9°F, 34.4°C (102.1°F, 38.4°C)	Unknown	No	Yes	Scheduled breaks	Yes	Yes†	No	Irons, venders, or fans
6	55	Yes	Mail delivery	102.0°F, 38.9°C (104.6°F, 40.3°C)	2 days	Yes	No	No	No§	No	No	None
7	3 workers: 53; mid-30's; 31	No	Oil field servicing	96.1°F, 35.6°C (102.0°F, 38.8°C)	Unknown	Yes	No	Minimal breaks	No	No	No	Rig equipment black steel pipe
8	60	Yes	Roofing	82.9°F, 28.3°C (84.0°F, 28.9°C)	1 day	No	Yes	Scheduled breaks	Yes	No	No	Reflective surface
9	Unknown (multiple workers)	No	Laundry	92°F, 33.3°C (100.0°F, 37.8°C)	Unknown	No	No	Scheduled breaks	No	No	No	Irons, venders,
10	30	Yes	Oil and gas drilling	101.0°F, 38.3°C (101.7°F, 38.7°C)	2 days	No	Yes	Scheduled breaks	Yes	No	No	None
11	31	Yes	Waste collection	91.0°F, 32.8°C (97.0°F, 36.1°C)	3 days	No	Yes	Minimal breaks	No	No	No	None
12	36	Yes	Laying pipe	84.0°F, 28.9°C (88.0°F, 31.1°C)	1 day	Yes	Yes	Scheduled breaks	Yes	No	No	None
13	Unknown (multiple workers)	No	Printing services	93.9°F, 34.4°C (98.6°F, 37.0°C)	Unknown	No	No	Limited breaks	No	No	No	Machinery
14	59	Yes	Ship repair	87.1°F, 30.6°C (94.5°F, 34.7°C)	1 day	No	No	Breaks as needed	No	No	No	None
15	45	Yes	Mail delivery	93.9°F, 34.4°C (98.6°F, 37.0°C)	>1 year	Yes	Yes	No	No	No	No	None
16	20's (2 workers); 35 (1 worker)	No	Roofing	97.0°F, 36.1°C (105.5°F, 40.8°C)	2 weeks (1 worker); 2–3 days (2 workers)	No	Yes	Scheduled breaks	Yes	No	No	Hot tar
17	Unknown (2 workers)	No	Military post exchange	90.0°F, 32.2°C (97.9°F, 36.6°C)	>1 year	Yes	Yes	No	No	No	No	Not furnished A/C, military trailer, parking
18	64	Yes	Waste handling and recycling	93.9°F, 34.4°C (100.8°F, 38.2°C)	1 year	Yes	Yes	One 45-minute break in 12-hour shift	No	No	No	Radiant from metal aluminum walls
19	68	Yes	Sauna	82.4°F, 28.0°C (82.9°F,	Unknown	No	Yes	Scheduled breaks	Yes	No	No	Sauna temperature

28.3°C)

200.0–
250.0°] (93.3–1
radiant
from st
walls

20	64	Yes	Park	113.0°F, 45.0°C (105.7°F, 40.9°C)¶	>1 year	Yes	Yes	Breaks as needed	Yes	No	No	None
----	----	-----	------	---	---------	-----	-----	---------------------	-----	----	----	------

Sources: OSHA's Directorate of Enforcement Programs database for heat case inspections. OSHA Compliance Safety and Health Officers' inspection records interviews with Compliance Safety and Health Officers about the inspections.

Abbreviations: HVAC = heating, ventilation, and air conditioning; A/C = air conditioning.

* OSHA convened the Heat Illness Workgroup to conduct a systematic review of cases of occupational heat illness or death cited for federal enforcement (i.e., paragraph 5(a)(1), the "general duty clause" of the Occupational Safety and Health Act of 1970, for the period 2012–2013. Cases were identified by OSHA's Di Enforcement Programs. For all cases reviewed, the workgroup established a list of program elements it considered important based on published literature ar professional experience.

† 75% laundry sorting and 25% rest.

§ A/C unavailable in mail delivery vehicles.

¶ Humidity was very low (7%), making the heat index lower than the temperature.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

References to non-CDC sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of pages found at these sites. URL addresses listed in *MMWR* were current as of the date of publication.

All *MMWR* HTML versions of articles are electronic conversions from typeset documents. This conversion might result in character translation or format errors in the HTML version. Users are referred to the electronic PDF version (<http://www.cdc.gov/mmwr>) and/or the original *MMWR* paper copy for printable versions of official text, figures, and tables. An original paper copy of this issue can be obtained from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, DC 20402-9371; telephone: (202) 512-1800. Contact GPO for current prices.

**Questions or messages regarding errors in formatting should be addressed to mmwrq@cdc.gov.

Page last reviewed: August 08, 2014
 Page last updated: August 08, 2014
 Content source: [Centers for Disease Control and Prevention](#)

Centers for Disease Control and Prevention 1600 Clifton Road Atlanta, GA 30329-4027, USA
 800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - [Contact CDC-INFO](#)





Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports

Xiuwen Sue Dong^{a,*}, Julie A. Largay^a, Sang D. Choi^b, Xuanwen Wang^a, Chris Trahan Cain^a, Nancy Romano^c

^a CPWR – The Center for Construction Research and Training, 8484 Georgia Ave, Suite 1000, Silver Spring, MD 20910, United States

^b University of Wisconsin-Whitewater, Department of Occupational & Environmental Safety & Health, Hyland Hall 3509, 800 West Main St., Whitewater, WI 53190, United States

^c National Institute for Occupational Safety and Health, Division of Safety Research, 1095 Willowdale Rd., Room 1714, Morgantown, WV 26505, United States

ARTICLE INFO

Article history:

Received 28 October 2016

Received in revised form 17 February 2017

Accepted 28 February 2017

Keywords:

Construction industry

Fatality Assessment and Control Evaluation

Fall hazards

Fall height

Fall protection

Personal fall arrest systems

ABSTRACT

This study analyzed the Construction FACE Database (CFD), a quantitative database developed from reports of the Fatality Assessment and Control Evaluation (FACE) program conducted by the National Institute for Occupational Safety and Health (NIOSH). The CFD contains detailed data on 768 fatalities in the construction industry reported by NIOSH and individual states from 1982 through June 30, 2015. The results show that falls accounted for 42% (325) of the 768 fatalities included in the CFD. Personal fall arrest systems (PFAS) were not available to more than half of the fall decedents (54%); nearly one in four fall decedents (23%) had access to PFAS, but were not using it at the time of the fall. Lack of access to PFAS was particularly high among residential building contractors as well as roofing, siding, and sheet metal industry sectors (~70%). Although the findings may not represent the entire construction industry today, they do provide strong evidence in favor of fall protection requirements by the Occupational Safety and Health Administration (OSHA). In addition to stronger enforcement, educating employers and workers about the importance and effectiveness of fall protection is crucial for compliance and fall prevention.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction

Occupational fatality statistics in the U.S. construction industry continue to highlight the risks and hazards associated with construction work. Data for 2014 show there were more fatalities in construction than in any other major industry in the U.S., and the annual number of construction fatalities has increased since 2011, which coincides with the recent economic recovery (U.S. Bureau of Labor Statistics, 2016). Moreover, fatal injuries caused by falls have remained the leading cause of fatalities in construction since 1992 (CPWR, 2013; U.S. Bureau of Labor Statistics, 2016).

Fall protection is an essential part of preventing fall injuries. The Occupational Safety and Health Administration (OSHA), which sets and enforces standards to ensure safe work conditions in the United States, requires that each employee on a walking or working

surface (horizontal and vertical) with an unprotected side or edge that is 6 feet (1.8 m) or more above a lower level must be protected from falling by the use of guardrail systems, safety net systems, or a personal fall arrest system (PFAS) (OSHA, 2010). However, until 2010, these requirements did not apply to the residential construction industry. According to OSHA case reports of fatalities between 2005 and 2010 (prior to the change in requirements), there was little or no appropriate fall protection used in residential roofing (Moore and Wagner, 2014). Earlier studies found that more than 40% of fall injuries from scaffolding, staging, or floor openings could be attributed to non-compliant scaffolds and unguarded openings (Chi et al., 2005). Falls from ladders also account for a large proportion of workplace injuries related to falls from heights (DiDomenico et al., 2013), although fall protection is not required on portable ladders (29 CFR 1926.1053). In addition, a 1997 study found a significant relationship between injury severity and height of fall (Gillen et al., 1997). Despite improvements in OSHA standards, lack of fall protection remained at the top of OSHA's most frequently cited construction standards in 2014 (OSHA, 2015b).

Although a comprehensive understanding of the causal factors in fatal falls is important for injury intervention, the existing litera-

* Corresponding author at: Data Center Director, CPWR – The Center for Construction Research and Training, 8484 Georgia Ave, Silver Spring, MD 20910, United States.

E-mail address: sdong@cpwr.com (X.S. Dong).

ture appears to lack a scientific review of falls from height (Nadhim et al., 2016). Data collection on the height of falls was just initiated in 2011 by the Census of Fatal Occupational Injuries (CFOI), which is the primary data source for occupational safety and health surveillance of fatalities. Information on usage of PFAS is even scarcer in the existing databases and literature.

To improve understanding of fatal incidents and provide recommendations for avoiding similar events in the future, NIOSH has maintained the Fatality Assessment and Control Evaluation (FACE) program since 1982. In addition to the demographic and employment data collected on decedents, FACE has reported information on height of falls since inception of the program. Information on fall protection status was also collected, including whether the decedent was wearing fall protection when the incident occurred; had access to fall protection (such as the equipment was provided to the decedent prior to the incident or was available on site), but did not use it; or no fall protection was provided. FACE investigators also made recommendations on how the incident may have been prevented based on the incident circumstances. These detailed incident descriptions and recommendations can be critical for designing injury prevention measures, including safety policies and procedures, engineering controls, and other aspects of the safety climate (Higgins et al., 2001; Menendez et al., 2012).

The Construction FACE Database (CFD), a numeric database covering all FACE reports in the construction industry published from 1982 to June 30, 2015, facilitates the use of the rich data included in

the FACE reports (more information on the CFD creation and contents is reported separately). This study examined characteristics of fall fatalities and fall protection use in the construction industry by analyzing the CFD. The study attempts to fill certain research gaps, given the shortage of information on the height of falls and use of PFAS in the construction industry in the existing literature.

2. Materials and methods

The fatal cases involving falls were identified from the CFD. Height of these fatal falls, and access to and use of PFAS when the fall occurred, were examined and compared among the decedents with different demographic and employment characteristics. Heights of falls were grouped into four major categories: (1) less than 6 feet, (2) 6–15 feet, (3) 16–30 feet, and (4) more than 30 feet. These categories were based on OSHA's regulations and requirements (OSHA, 2014). To identify whether the decedent was wearing fall protection, or if not, whether fall protection was present at the incident site, PFAS status was categorized as: (1) present, in use; (2) present, not in use; (3) not present; and (4) unknown. Construction industry subsectors were coded according to the Standard Industrial Classification (SIC) system. Occupations were classified based on the 1990 Census Occupational Classification System. Only major construction occupations were reported in this study due to too few cases among smaller occupations and those with a lower risk of falls.

Table 1
Characteristics of FACE fatalities, all fatalities vs. fatal falls.

Characteristics	All Fatalities	Fatal Falls	
	Number	Number	% of all Fatalities
Age			
Less than 25 years	126	45	35.7%
25–44 years	375	169	45.1%
45–64 years	189	88	46.6%
65+ years	25	15	60.0%
Not reported	53	8	15.1%
Employment Status			
Wage-and-salary	666	278	41.7%
Self-employed	71	31	43.7%
Other/Not reported	31	16	51.6%
Occupation			
Construction laborers, helpers	186	60	32.3%
Structural metal workers	61	42	68.9%
Supervisors, construction	98	40	40.8%
Carpenters	55	34	61.8%
Roofers	40	31	77.5%
Other, n.e.c.	328	118	36.0%
Job Tenure			
Up to 1 week	67	36	53.7%
>1 week to 2 months	82	42	51.2%
>2 months to 6 months	71	33	46.5%
>6 months to 2 years	105	47	44.8%
>2 years to 5 years	82	36	43.9%
>5 years	163	69	42.3%
Unknown/Not reported	198	62	31.3%
Industry			
General Building Contractors – Residential	53	32	60.4%
General Building Contractors – Nonresidential	70	35	50.0%
Roofing, Siding, & Sheet Metal Work	76	58	76.3%
Structural Steel Erection	53	38	71.7%
Special Trade Contractors, n.e.c.	288	118	41.0%
Other, n.e.c.	228	44	19.3%
Employer Size			
Up to 20 employees	338	172	50.9%
21 to 200 employees	212	83	39.2%
More than 200 employees	89	33	37.1%
Unknown/Not reported	93	37	39.8%
Total	768	325	42.3%

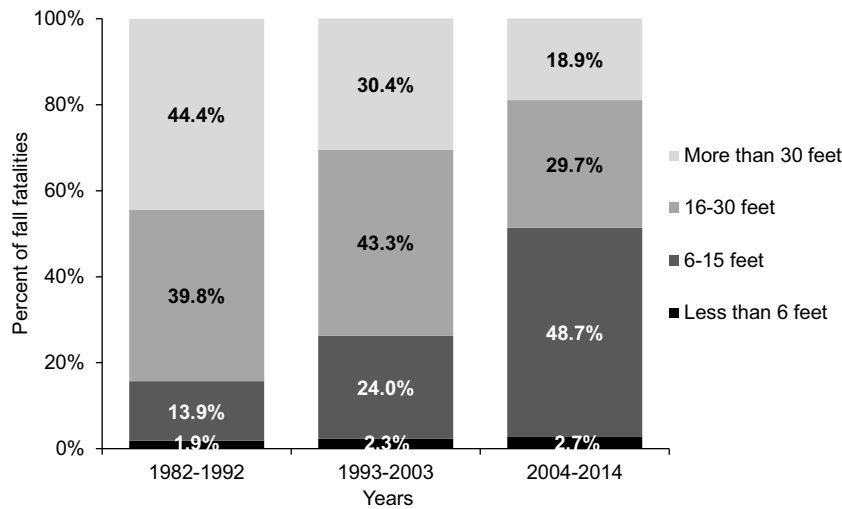


Fig. 1. NIOSH FACE reports: fatal falls in construction, by height of fall, 1982–2014. Height of fall is missing for 9 of 325 cases.

Source: NIOSH and State FACE Reports for Construction.

Trend analysis was conducted to examine changes in FACE fall investigations and the use of PFAS over a 33-year period (1982–2015). The characteristics of fall decedents, including age, employment status (i.e., wage-and-salary, self-employed, and other), occupation, and job tenure (i.e., tenure with the employer when the fatal incident occurred) were examined by height of falls and PFAS status. Information on the decedent's employer, such as industry sector and size of the employer, were stratified by height of fall and PFAS status. Fall height and PFAS status were also explored by type of fall (e.g., fall through surface, fall from ladder) and incident location (e.g., residential construction site, nonresidential construction site). Information on race and ethnicity was missing for the majority of cases, and was therefore not included in this study. Descriptive statistics, including number of deaths and percent distributions among subcategories, were tabulated and reported. The CFD was analyzed using SAS version 9.4.

3. Results

3.1. General trends

Overall, falls accounted for 325 (42%) of the 768 construction fatalities included in the CFD (Table 1). There was a higher incidence of total fatalities and fatalities from falls among decedents aged 25–44 years than any other age group. Older decedents had a smaller share of overall fatalities, but a higher proportion of fatalities from falls, than younger ones. For those aged 65 and older, 60% of the fatalities were due to falling, compared to 36% of workers younger than 25. By occupation, about 78% of roofer fatalities were caused by falls, compared to 32% for construction laborers and helpers. Decedents having a short job tenure with the employer at the time of the incident were more likely to die from falls. Among decedents who had been on the job for just one week, 54% of all fatalities were from falls, while the proportion was 42% for decedents having five or more years with their employer when the incident occurred. When industry was examined, more than three out of four fatalities that occurred among the roofing, siding, and sheet metal industries were found to be from falls. Additionally, more than half of all the fatalities among employers with 20 or fewer employees were from falls, compared to 37% among those with more than 200 employees.

3.2. Height of falls

Over the study period, fatal falls reported by FACE shifted from falls from higher levels to falls from lower levels. The proportion of fatal falls from more than 30 feet dropped significantly—from 44.4% between 1982 and 1992 to 18.9% between 2004 and 2014 (Fig. 1). In contrast, the proportion of fatal falls from 15 feet or less more than tripled during the same time period (15.8% to 51.4%).

More than one-third (107) of fall fatalities were from heights of more than 30 feet (9 cases without height information were excluded), and seven falls from less than six feet were identified (Table 2). Older decedents had a higher proportion of fatal falls from lower heights, and few fell from over 30 feet. Nearly half of falls among self-employed decedents were from 15 feet or below, double the proportion among wage-and-salary decedents (46.5% vs. 22.7%). Decedents employed as structural metal workers had the highest proportion of falls from more than 30 feet (52.4%), while roofers had the highest proportion of falls from 16 to 30 feet (63.3%). However, no association between the height of falls and job tenure was observed. Among construction subsectors, more than half of falls in the roofing, siding, and sheet metal industry were from 16 to 30 feet, and 97% of falls among residential contractors were below 30 feet. Smaller employers had a larger proportion of falls from lower levels.

In terms of source of falls, almost half of falls from ladders occurred below 15 feet, while the proportion of falls from more than 30 feet was higher among those working on scaffolding, staging, building girders, or other structural steel (Table 3). Some jobsites were more likely to experience falls from specific heights. For example, falls from 6 to 15 feet were more than twice as likely at residential construction sites when compared to all locations (48% vs. 23%).

3.3. Usage of personal fall arrest systems (PFAS)

Fall protection use was examined despite missing data for 17% of cases. Neither the proportion of workers without access to fall protection (i.e., PFAS not present), nor that of workers using fall protection (i.e., PFAS present, in use), had any noteworthy changes over the time period (Fig. 2). Nevertheless, the proportion of workers with PFAS available but not in use dropped from 22% to 15% during this period.

Table 2
Height of falls, selected characteristics.

Characteristics	Height of Falls				Total Falls ¹ (Number) %
	Less than 6 Feet	6–15 Feet	16–30 Feet	More than 30 Feet	
	Percent	Percent	Percent	Percent	
Total	(7) 2.2%	(74) 23.4%	(128) 40.5%	(107) 33.9%	(316) 100%
Age					
Less than 25 years	2.3%	23.3%	37.2%	37.2%	(43) 100%
25–44 years	0.6%	18.9%	43.3%	37.2%	(164) 100%
45–64 years	3.4%	28.7%	39.1%	28.7%	(87) 100%
65+ years	13.3%	53.3%	33.3%	0.0%	(15) 100%
Not reported	0.0%	0.0%	28.6%	71.4%	(7) 100%
Employment Status					
Wage-and-salary	1.5%	21.2%	41.0%	36.3%	(273) 100%
Self-employed	3.6%	42.9%	39.3%	14.3%	(28) 100%
Other/Not reported	13.3%	26.7%	33.3%	26.7%	(15) 100%
Occupation					
Construction laborers, helpers	1.7%	29.3%	51.7%	17.2%	(58) 100%
Structural metal workers	0.0%	9.5%	38.1%	52.4%	(42) 100%
Supervisors, construction	5.1%	17.9%	43.6%	33.3%	(39) 100%
Carpenters	0.0%	54.5%	39.4%	6.1%	(33) 100%
Roofers	0.0%	23.3%	63.3%	13.3%	(30) 100%
Other, n.e.c.	3.5%	18.4%	28.9%	49.1%	(114) 100%
Job Tenure					
Up to 1 week	0.0%	30.6%	38.9%	30.6%	(36) 100%
>1 week to 2 months	0.0%	17.1%	48.8%	34.1%	(41) 100%
>2 months to 6 months	6.3%	18.8%	40.6%	34.4%	(32) 100%
>6 months to 2 years	2.2%	22.2%	35.6%	40.0%	(45) 100%
>2 years to 5 years	0.0%	26.5%	29.4%	44.1%	(34) 100%
>5 years	1.5%	30.9%	45.6%	22.1%	(68) 100%
Unknown/Not reported	5.0%	16.7%	40.0%	38.3%	(60) 100%
Industry					
General Building Contractors – Residential	0.0%	48.4%	48.4%	3.2%	(31) 100%
General Building Contractors – Nonresidential	2.9%	28.6%	42.9%	25.7%	(35) 100%
Roofing, Siding, & Sheet Metal Work	0.0%	26.3%	54.4%	19.3%	(57) 100%
Structural Steel Erection	0.0%	8.3%	47.2%	44.4%	(36) 100%
Special Trade Contractors, n.e.c.	3.5%	21.1%	32.5%	43.0%	(114) 100%
Other, n.e.c.	4.7%	16.3%	30.2%	48.8%	(43) 100%
Employer Size					
Up to 20 employees	1.2%	27.5%	44.3%	26.9%	(167) 100%
21 to 200 employees	2.4%	18.1%	38.6%	41.0%	(83) 100%
More than 200 employees	3.0%	24.2%	21.2%	51.5%	(33) 100%
Unknown/Not reported	6.1%	15.2%	45.5%	33.3%	(33) 100%

¹ Height of fall is missing for 9 of 325 cases.**Table 3**
Case characteristics by height of fall.

Characteristics	Height of Fall				Total Falls ¹ (Number) %
	Less than 6 Feet	6–15 Feet	16–30 Feet	More than 30 Feet	
	Percent	Percent	Percent	Percent	
Total	(7) 2.2%	(74) 23.4%	(128) 40.5%	(107) 33.9%	(316) 100%
Type of Fall					
Fall through floor opening/surface	0.0%	21.7%	43.5%	34.8%	(23) 100%
Fall through roof surface, existing opening, or skylight	0.0%	7.5%	67.9%	24.5%	(53) 100%
Fall from roof edge	0.0%	22.9%	52.1%	25.0%	(48) 100%
Fall from scaffold, staging, building girders, or other structural steel	2.2%	22.5%	24.7%	50.6%	(89) 100%
Fall from ladder	7.7%	41.0%	46.2%	5.1%	(39) 100%
Fall to lower level, n.e.c.	3.1%	28.1%	26.6%	42.2%	(64) 100%
Location					
Nonresidential construction site	3.8%	16.8%	42.7%	36.6%	(131) 100%
Residential construction site	2.0%	48.0%	40.0%	10.0%	(50) 100%
Industrial places & premises	0.0%	20.0%	45.7%	34.3%	(35) 100%
Residential home	0.0%	26.5%	61.8%	11.8%	(34) 100%
Public building	3.6%	32.1%	21.4%	42.9%	(28) 100%
Other, n.e.c.	0.0%	7.9%	23.7%	68.4%	(38) 100%

¹ Height of fall is missing for 9 of 325 cases.

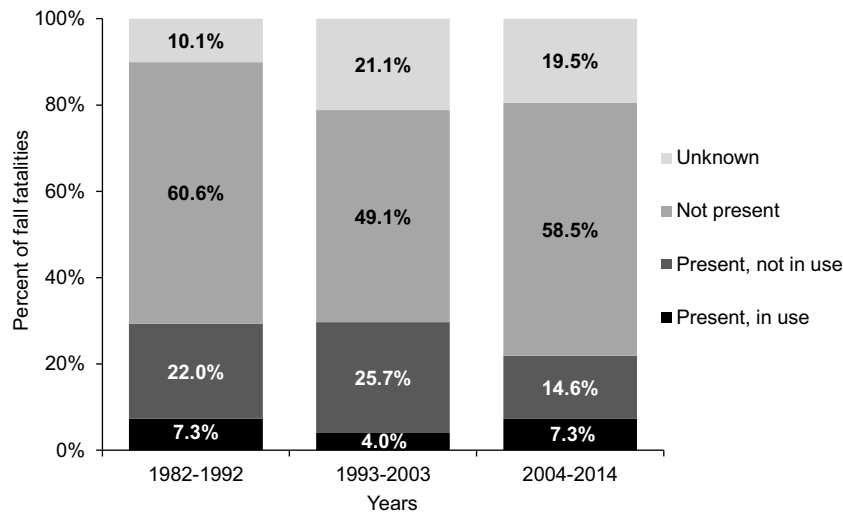


Fig. 2. NIOSH FACE reports: fatal falls in construction, by Personal Fall Arrest System (PFAS) status, 1982–2014.

Source: NIOSH and State FACE Reports for Construction.

Only 28.6% of decedents had access to PFAS (Table 4). More than half (54.2%) did not have access to PFAS, and records were incomplete for an additional 17.2%. Among those who had access to PFAS, 81% were not using it when the incident occurred. In general, decedents under age 45 had better access to PFAS than older decedents. However, the percentage not using PFAS (when present) or experiencing a PFAS failure was also higher among younger decedents. In addition, the majority of self-employed decedents did not have access to PFAS (68%) or their PFAS status was unknown (29%). As a result, none of the self-employed decedents in the CFD were using PFAS at the time of the fall. By construction subsector, about 70% of decedents in the residential construction industry and roofing, siding, and sheet metal industries had no access to PFAS. However, PFAS status was unknown for 28% of decedents in residential construction. In terms of occupation, about 70% of decedent roofers and laborers and helpers did not have access to PFAS. More than half (54.8%) of decedent structural metal workers had PFAS present but not in use; the proportion of PFAS used but failed was also higher in this occupation than for all fall decedents (66.7% vs. 28.6%). No significant association between job tenure and PFAS use was found from the analysis.

By construction subsector, about 70% of decedents in the residential construction industry and roofing, siding, and sheet metal industries had no access to PFAS (Table 4). However, PFAS status was unknown for 28% of decedents in residential construction. Decedents in small establishments with 20 or fewer employees were less likely to have access to PFAS (59%). Decedents in large establishments (i.e., more than 200 employees) were more likely to have access to PFAS; however, nearly 40% of those decedents had access, but did not use it.

Examined by source of falls, PFAS was found to be unavailable for 73.5% of decedents who fell from a roof edge, and for 66% who fell through a roof surface, existing opening, or skylight (Table 5). PFAS was not present or the status was unknown for 95% of ladder falls. Just 4.7% of ladder falls were reported having PFAS present and not in use compared to 23.1% for all falls combined. By location, fewer decedents at residential construction sites or residential homes (i.e., not new construction) had access to fall protection compared to those at nonresidential construction sites. On residential construction sites, none of the decedents were using PFAS when the incident occurred. Some fall decedents at public buildings and nonresidential construction sites were using PFAS, but PFAS was either damaged, misused, or did not provide adequate protection.

When PFAS use was stratified by fall height, less than 16% of decedents who fell from more than 30 feet used PFAS (17 of 107), 41% of those who fell from that height had access to PFAS but did not use it, and another 37% did not even have access to PFAS. Among decedents who were working at the height <30 feet, only one worker was using PFAS when the incident occurred. In fact, just 5.5% (18 cases) of fall fatalities occurred while wearing PFAS; 13 cases wore PFAS but did not tie-off, and the rest of the cases were due to the failure of PFAS (see footnote of Table 5).

4. Discussion

By analyzing the CFD, this study found that falls from over 30 feet accounted for more than one-third of fatal falls. Falls from lower heights were also a fatality risk for workers—25% of fall fatalities were from heights of 15 feet or less. The data showed a higher proportion of fatal falls from heights of 15 feet or less between 2004 and 2014 than in previous years, which may be related to changes in OSHA regulations and NIOSH targets for FACE over time (OSHA, 2010; NIOSH, 2016). Even though this study was unable to assess effectiveness of the OSHA fall protection standard established in 1995, the considerable number of fall fatalities from lower heights provides strong evidence of the need for the OSHA requirement that fall protection be provided at elevations of six feet or more in the construction industry (OSHA, 1995b; 2010). Although the triggering height of fall protection is six feet above walking/working surface, PFAS requires a minimum clearance of 17.5 feet from anchor (i.e., 6-foot lanyard, 3.5-foot shock absorber, 5-foot surface to dorsal D-ring, 1-foot harness stretch, and 2-foot safety factor). Therefore, a PFAS anchor point that is less than 15 feet from the lower level is not effective (Epp, 2007). One alternative for low height fall arrest is the self-retracting lifeline (SRL). Allowing for stretch and the safety factor, the total fall distance to allow for is between 5 and 7.5 feet. While fall fatalities from higher heights frequently occurred among younger decedents, wage-and-salary workers, larger employers, and commercial construction sites, deaths caused by falls from lower heights were more common among older decedents, self-employed workers, smaller employers, and residential construction sites. While the information on decedents' job tenure is incomplete, among decedents who had been on the job for just one week, 54% of all fatalities were from falls. This suggests that providing adequate job and safety train-

Table 4
Personal Fall Arrest System (PFAS) status, selected characteristics.

Characteristics	PFAS Status				Total Falls (Number) %
	Present, in Use Percent	Present, not in Use Percent	Not Present Percent	Unknown Percent	
Total	(18) 5.5%	(75) 23.1%	(176) 54.2%	(56) 17.2%	(325) 100%
Age					
Less than 25 years	8.9%	22.2%	53.3%	15.6%	(45) 100%
25–44 years	4.1%	26.0%	52.1%	17.8%	(169) 100%
45–64 years	4.6%	21.6%	58.0%	15.9%	(88) 100%
65+ years	0.0%	6.7%	66.7%	26.7%	(15) 100%
Not reported	37.5%	12.5%	37.5%	12.5%	(8) 100%
Employment Status					
Wage-and-salary	6.5%	24.8%	52.5%	16.2%	(278) 100%
Self-employed	0.0%	3.2%	67.7%	29.0%	(31) 100%
Other	0.0%	31.3%	56.3%	12.5%	(16) 100%
Occupation					
Construction laborers, helpers	1.7%	13.3%	70.0%	15.0%	(60) 100%
Structural metal workers	11.9%	54.8%	26.2%	7.1%	(42) 100%
Supervisors, construction	0.0%	25.0%	55.0%	20.0%	(40) 100%
Carpenters	2.9%	8.8%	55.9%	32.4%	(34) 100%
Roofers	3.2%	12.9%	71.0%	12.9%	(31) 100%
Other, n.e.c.	8.5%	22.9%	50.9%	17.8%	(118) 100%
Job Tenure					
Up to 1 week	8.3%	16.7%	52.8%	22.2%	(36) 100%
> 1 week to 2 months	2.4%	26.2%	59.5%	11.9%	(42) 100%
>2 months to 6 months	0.0%	24.2%	45.5%	30.3%	(33) 100%
>6 months to 2 years	10.6%	25.5%	46.8%	17.0%	(47) 100%
>2 years to 5 years	11.1%	25.0%	61.1%	2.8%	(36) 100%
>5 years	0.0%	20.3%	56.5%	23.2%	(69) 100%
Unknown/Not reported	8.1%	24.2%	54.8%	12.9%	(62) 100%
Industry					
General Building Contractors – Residential	0.0%	3.1%	68.8%	28.1%	(32) 100%
General Building Contractors – Nonresidential	2.9%	25.7%	51.4%	20.0%	(35) 100%
Roofing, Siding, & Sheet Metal Work	3.5%	12.1%	70.7%	13.8%	(58) 100%
Structural Steel Erection	13.2%	44.7%	36.8%	5.3%	(38) 100%
Special Trade Contractors, n.e.c.	3.4%	26.3%	47.5%	22.9%	(118) 100%
Other, n.e.c.	13.6%	22.7%	56.8%	6.8%	(44) 100%
Employer Size					
Up to 20 employees	2.9%	18.6%	58.7%	19.8%	(172) 100%
21 to 200 employees	6.0%	27.7%	47.0%	19.3%	(83) 100%
More than 200 employees	9.1%	39.4%	51.5%	0.0%	(33) 100%
Unknown/Not reported	13.5%	18.9%	51.4%	16.2%	(37) 100%

ing is extremely important for construction workers, especially for new workers.

While PFAS is not required when climbing portable ladders under current standards (OSHA, 2014), this study revealed that PFAS was not available or not in use for many fall decedents who worked from heights of 16–30 feet, as well as for some of the decedents who fell from more than 30 feet. More than 70% (see Table 2) of decedents in small establishments (i.e., 20 or fewer employees) were working at heights of 16 feet or above when the incident occurred, but PFAS was present or in use for just 22% (see Table 4) of fall decedents in those establishments. In residential construction as well as the roofing, siding, and sheet metal industries, more than two-thirds of the decedents had no access to PFAS (see Table 4), despite the fact that the majority were working at heights of 16 feet or above when the incident occurred (see Table 2). The small number of incidents that occurred while wearing PFAS suggests that fall protection was effective, confirming the results from a recent case study in residential construction (Bethancourt and Cannon, 2015) and supporting OSHA fall protection requirements.

This study also found that PFAS was present but not in use for about 23% of the falls. Nevertheless, the proportion of workers who had access to, but did not use, fall protection has decreased in recent years, indicating a growing awareness of fall hazards and effective ways to prevent them, as well as increases in positive safety cul-

ture or leadership in construction. Previous research has shown an association between a better safety climate and the use of fall protection (Dutra et al., 2014; Kaskutas et al., 2013). Although PFAS is effective, details from the FACE reports show that PFAS did not provide adequate protection when used improperly. For example, some workers had only one connection point and fell while disconnecting to relocate on a structure (Missouri FACE Investigation #99MO138). PFAS should have “Y” or double lanyards to allow for 100% tie-off fall protection, so that workers who must move from one anchorage point to another anchorage point connect to the new anchorage prior to disconnecting from the old. In other cases, workers tie-off to other suspended objects instead of a proper anchorage point (NIOSH FACE Investigation #9820; Colorado FACE Investigation #92CO001) as required by OSHA Regulation 1926.502(d)(15). Finally, some PFAS were damaged or not properly engaged, and were not adequately inspected prior to use (California FACE Investigation #95CA016). These cases confirm that adhering to OSHA requirements would have saved lives. PFAS should not only be provided to workers exposed to fall hazards, but must be inspected before use, and workers must be trained on how to use them correctly (OSHA Regulations 29 CFR 1926.502(d)(21) and 29 CFR 1926.503(a)(2)(iii)).

Workers in residential construction typically work on projects below 30 feet, but the findings show that considerable risk of

Table 5
Case characteristics by Personal Fall Arrest System (PFAS) status.

Characteristics	Personal Fall Arrest System				Total Falls (Number) %
	Present, in Use Percent	Present, not in Use Percent	Not Present Percent	Unknown Percent	
Total	(18 ¹) 5.5%	(75) 23.1%	(176) 54.2%	(56) 17.2%	(325) 100%
Type of Fall					
Fall through floor opening/surface	0.0%	25.0%	58.3%	16.7%	(24) 100%
Fall through roof surface, existing opening, or skylight	0.0%	22.6%	66.0%	11.3%	(53) 100%
Fall from roof edge	6.1%	18.4%	73.5%	2.0%	(49) 100%
Fall from scaffold, staging, building girders, or other structural steel	11.1%	34.4%	43.3%	11.1%	(90) 100%
Fall from ladder	0.0%	4.7%	41.9%	53.5%	(43) 100%
Fall to lower level, n.e.c.	7.6%	22.7%	51.5%	18.2%	(66) 100%
Location					
Nonresidential construction site	8.2%	25.4%	52.2%	14.2%	(134) 100%
Residential construction site	0.0%	11.3%	64.2%	24.5%	(53) 100%
Industrial places & premises	0.0%	25.0%	52.8%	22.2%	(36) 100%
Residential home	2.9%	8.8%	76.5%	11.8%	(34) 100%
Public building	10.7%	21.4%	46.4%	21.4%	(28) 100%
Other, n.e.c.	7.5%	42.5%	35.0%	15.0%	(40) 100%
Height of Fall					
Less than 6 feet	0.0%	0.0%	57.1%	42.9%	(7) 100%
6–15 feet	1.4%	5.4%	63.5%	29.7%	(74) 100%
16–30 feet	0.0%	20.3%	60.9%	18.8%	(128) 100%
More than 30 feet	15.9%	41.1%	37.4%	5.6%	(107) 100%

¹ About 13 decedents wore PFAS but did not tie-off.

fatality is possible at lower heights. None of the fall decedents in the residential construction industry were using PFAS when the incident occurred. This could be because workers on residential construction sites often use portable ladders to access heights and PFAS is not required in such cases. Many ladder falls could be prevented if contractors and owners planned ahead for the job; inspected and maintained ladders before use; verified proper set up and use; and considered alternatives to ladders such as aerial lifts and stairways. Additionally, employers should ensure that each employee is properly trained and fully understands the nature of fall hazards in the work area and the correct procedures for using ladders and fall protection systems (Dong et al., 2014). Furthermore, Teran et al. (2015) found that small contractors perceive financial disincentives for implementing fall protection. A survey study by Choi and Carlson (2014) showed that about one-third of residential building contractors did not have any form of safety programs. OSHA developed a series of resources with strategies to improve adherence to fall protection in residential construction, which address the special needs of smaller businesses (OSHA, 2015a). OSHA encourages small employers to contact its On-site Consultation Program for free and confidential occupational health and safety advice (OSHA, 2015c). Other efforts, such as the National Safety Stand-Down, which is part of a broader construction falls prevention campaign sponsored by OSHA, NIOSH, and CPWR – The Center for Construction Research and Training, was initiated in part to reach small employers, providing a wealth of information on fall prevention, and available on websites hosted by OSHA, NIOSH, and CPWR (<https://www.osha.gov/SLTC/fallprotection/standards.html>; www.cdc.gov/niosh/topics/falls/; www.stopconstructionfalls.com).

The widely accepted hierarchy of fall prevention controls emphasizes engineering controls as more effective than PFAS. Studies have shown that safety practices of construction workers cannot mitigate all occupational hazards. Although PFAS is an important element of fall protection, the first goal on construction sites should be to eliminate fall hazards altogether. For example, guardrails and toeboards to protect openings, skylights, and edges have been proven effective for fall risk mitigation (Fullen and Savage, 2015; Bobick et al., 2010). However, guardrails were not installed at most of the fall incident sites in the FACE reports, and guardrail instal-

lation has been frequently recommended by FACE investigators based on the event circumstances. According to OSHA construction industry regulation 29 CFR 1926.502 (Subpart M), one of the conventional fall protection systems is guardrail systems comprising top edge, midrails, and toeboards (OSHA, 1995b). OSHA also requires that “Each employee on walking or working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes” and that “Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers” (OSHA, 1995a; 29 CFR 1926.501(b)(4)(i)). These OSHA regulations are important to follow for effective fall prevention.

More and more safety and health professionals have become aware that Prevention through Design (PtD) can be one of the keys to making construction projects safer (Rajendran and Gambatese, 2013). NIOSH’s PtD strategy intends to prevent or reduce falls in construction through the inclusion of safety considerations in the initial design. For example, identifying and mitigating hazards by incorporating safety features (e.g., guardrails, PFAS anchor points) into the worksite or designing the permanent structure can promote a safe work environment (NIOSH, 2014; Rajendran and Gambatese, 2013; Dewlaney and Hallowell, 2012; Lingard et al., 2013).

This study has several limitations. First, it should be noted that the FACE program is not nationally representative since only selected states participated. Also, individual states conduct fatality investigations according to self-identified state-level targets in addition to the NIOSH targets. Therefore, the FACE investigation targets do not necessarily represent all occupational fatalities covered by occupational injury surveillance systems (e.g., CFOL). In addition, many cases occurred decades ago, and the reporting states and number of cases also vary from year to year, as do the types of fatalities targeted, and PFAS requirements over time. Therefore, this study only provides characteristics from a subset of fall fatalities in construction, and may not represent current worksite conditions. Moreover, several important data points are not included in the analysis due to missing data. For example, information on Hispanic and foreign-born workers was only available in recent years.

Thus, no such demographic analysis could be conducted for this study. Finally, the numeric format of the CFD is convenient for statistical analyses, but the contents of the CFD cannot completely cover the rich information provided in each original, unique, and detailed FACE report. Even if existing coding systems were used where possible in the CFD, misclassifications may be present.

Despite the limitations, the information found in the FACE reports describes the risk of fall fatalities under various circumstances, and sheds light on underutilized PFAS practices in the U.S. construction industry, which can be used to inform further research and targeted interventions. Future studies are needed to verify these findings, including analyses of the recently available CFOI data on heights of falls, and fall inspections in the OSHA inspection databases.

References

- Bethancourt, J., Cannon, M., 2015. Fall protection structural efficacy of residential structures for fall protection systems. *Prof. Saf.* 60 (5), 58–64.
- Bobick, T.G., McKenzie Jr., E.A., Kau, T.Y., 2010. Evaluation of guardrail systems for preventing falls through roof and floor holes. *J. Saf. Res.* 41 (3), 203–211.
- CPWR – The Center for Construction Research and Training, 2013. The Construction Chart Book: The U.S. Construction Industry and Its Workers, fifth edition. Silver Spring, MD : CPWR <http://www.cpwr.com/>.
- Chi, C.F., Chang, T.C., Ting, H.L., 2005. Accident patterns and prevention measures for fatal occupational falls in the construction industry. *Appl. Ergon.* 36 (4), 391–400.
- Choi, S.D., Carlson, K., 2014. Occupational safety issues of residential construction surveyed in Wisconsin, United States. *Ind. Health* 52 (6), 541–547.
- Dewlaney, K.S., Hallowell, M.R., 2012. Prevention through design and construction safety management strategies for high performance sustainable building construction. *Constr. Manage. Econ.* 30 (2), 165–177.
- DiDomenico, A.T., Lesch, M.F., Blair, M.F., Huang, Y.-H., 2013. Reaching on ladders: do motivation & acclimation affect risk taking? *Prof. Saf.* 58 (2), 50–53.
- Dong, X.S., Wang, X., Largay, J.A., Platner, J.W., Stafford, E., Cain, C.T., Choi, S.D., 2014. Fatal falls in the U.S. residential construction industry. *Am. J. Ind. Med.* 57 (9), 992–1000.
- Dutra, L.M., Kim, S.S., Williams, D.R., Kawachi, I., Okechukwu, C.A., 2014. Worksite safety climate, smoking, and the use of protective equipment by blue-collar building workers enrolled in the MassBUILT smoking cessation trial. *J. Occup. Environ. Med.* 56 (10), 1082–1087.
- Epp, R.J., 2007. Fall protection misconceptions and myths: working within the OSHA system. *Prof. Saf.* 52 (9), 26–34.
- Fullen, M., Savage, K., 2015. Guardrails. *Construction Solutions* (Accessed October 24, 2016 from: <http://www.cpwrconstructionsolutions.org/residential-construction/solution/718/guardrails.html>).
- Gillen, M., Faucett, J.A., Beaumont, J.J., McLoughlin, E., 1997. Injury severity associated with nonfatal construction falls. *Am. J. Ind. Med.* 32 (6), 647–655.
- Higgins, D.N., Casini, V.J., Bost, P., Johnson, W., Rautiainen, R., 2001. The Fatality Assessment and Control Evaluation program's role in the prevention of occupational fatalities. *Inj. Prev.* 7 (Suppl. 1), i2–i33.
- Kaskutas, V., Dale, A.M., Lipscomb, H., Evanoff, B., 2013. Fall prevention and safety communication training for foremen: report of a pilot project designed to improve residential construction safety. *J. Saf. Res.* 44, 111–118.
- Lingard, H., Cooke, T., Blismas, N., Wakefield, R., 2013. Prevention through design: trade-offs in reducing occupational health and safety risk for the construction and operation of a facility. *Built Environ. Proj. Asset Manage.* 3 (1), 7–23.
- Menendez, C.C., Castillo, D., Rosenman, K., Harrison, R., Hendricks, S., 2012. Evaluation of a nationally funded state-based programme to reduce fatal occupational injuries. *Occup. Environ. Med.* 69 (11), 810–814.
- Moore, J.R., Wagner, J.P., 2014. Fatal events in residential roofing. *Saf. Sci.* 70, 262–269.
- NIOSH, 2014. Campaign to Prevent Falls in Construction (Accessed October 24, 2016 from: <http://www.cdc.gov/niosh/construction/stopfalls.html>).
- NIOSH, 2016. NIOSH Fatality Assessment and Control Evaluation Program Brochure (Accessed October 24, 2016 from: <http://www.cdc.gov/niosh/docs/2016-113/pdfs/2016-113.pdf>).
- Nadhim, E.A., Hon, C., Xia, B., Stewart, I., Fang, D., 2016. Falls from height in the construction industry: a critical review of the scientific literature. *Int. J. Environ. Res. Public Health* 13 (7), 638–658.
- OSHA, 1995a. Subpart M – Fall Protection: Duty to Have Fall Protection (Accessed January 7, 2017 from https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10757).
- OSHA, 1995b. Subpart M – Fall Protection: Fall Protection Systems Criteria and Practices (Accessed January 7, 2017 from https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10758).
- OSHA, 2010. Compliance Guidance for Residential Construction. Directive STD 03-11-002 (Accessed October 24, 2016 from: https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=DIRECTIVES&p_id=4755).
- OSHA, 2014. Safety and Health Regulations for Construction: Fall Protection (Standard 29 CFR 1926, Subpart M) (Accessed October 24, 2016 from: https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10922).
- OSHA, 2015a. Fall Protection in Residential Construction: Compliance Assistance (Accessed October 24, 2016 from: <https://www.osha.gov/doc/topics/residentialprotection/index.html#compliance>).
- OSHA, 2015b. Fall Protection Tops Preliminary List of Alleged OSHA Violations in Fiscal '15. InsideOSHAOnline.com, September 29 (Accessed October 24, 2016 from <http://insideoshaonline.com/osha-daily/fall-protection-tops-preliminary-list-alleged-osha-violations-fiscal-15>).
- OSHA, 2015c. On-site Consultation (Accessed October 24, 2016 from <https://www.osha.gov/dcsp/smallbusiness/consult.html>).
- Rajendran, S., Gambatese, J., 2013. Risk and financial impacts of prevention through design solutions. *Pract. Period. Struct. Des. Constr.* 18 (1), 67–72.
- Teran, S., Blecker, H., Scruggs, K., Garcia Hernandez, J., Rahke, B., 2015. Promoting adoption of fall prevention measures among Latino workers and residential contractors: formative research findings. *Am. J. Ind. Med.* 58 (8), 870–879.
- U.S. Bureau of Labor Statistics, 2016. Census of Fatal Occupational Injuries (Accessed October 24, 2016 from: <http://www.bls.gov/data/#injuries>).



The construction FACE database – Codifying the NIOSH FACE reports[☆]



Xiuwen Sue Dong,^{a,*} Julie A. Largay,^a Xuanwen Wang,^a Chris Trahan Cain,^a Nancy Romano^b

^a CPWR – The Center for Construction Research and Training, 8484 Georgia Ave, Suite 1000, Silver Spring, MD 20910, USA

^b National Institute for Occupational Safety and Health, Division of Safety Research, 1095 Willowdale Rd, Room 1714, Morgantown, WV 26505, USA

ARTICLE INFO

Article history:

Received 9 November 2016

Received in revised form 24 March 2017

Accepted 21 June 2017

Available online 04 July 2017

Keywords:

Construction industry

Fatality assessment and control evaluation

Injury prevention and intervention

Occupational fatality

Workplace safety

ABSTRACT

Introduction: The National Institute for Occupational Safety and Health (NIOSH) has published reports detailing the results of investigations on selected work-related fatalities through the Fatality Assessment and Control Evaluation (FACE) program since 1982. **Method:** Information from construction-related FACE reports was coded into the Construction FACE Database (CFD). Use of the CFD was illustrated by analyzing major CFD variables. **Results:** A total of 768 construction fatalities were included in the CFD. Information on decedents, safety training, use of PPE, and FACE recommendations were coded. Analysis shows that one in five decedents in the CFD died within the first two months on the job; 75% and 43% of reports recommended having safety training or installing protection equipment, respectively. **Conclusion:** Comprehensive research using FACE reports may improve understanding of work-related fatalities and provide much-needed information on injury prevention. **Practical Application:** The CFD allows researchers to analyze the FACE reports quantitatively and efficiently.

© 2017 National Safety Council and Elsevier Ltd. All rights reserved.

1. Introduction

The construction industry has the highest number of work-related fatal injuries in the United States. In 2015, 985 construction workers died at worksites, accounting for 20.4% of the overall work-related fatal injuries in the country (U.S. Bureau of Labor Statistics [BLS], 2016). These numbers are disproportionately high given that construction workers made up less than 7% of the overall total employment in 2015 (CPWR, 2017). Accurate surveillance and examination of contributing factors are necessary for effective injury prevention (Bunn, Costich, & Slavova, 2006). However, few data sources contain information on detailed circumstances and situations leading up to and surrounding fatal injuries (Higgins, Casini, Bost, Johnson, & Rautiainen, 2001). Although the Census of Fatal Occupational Injuries (CFOI) provides a substantial amount of information on occupational fatalities, it does not collect information on safety training, use of personal protective equipment (PPE), whether a malfunction or unsafe design of machinery or tools were involved in an incident, and how to avoid similar incidents in the future.

To provide insight into work-related fatal injuries, the National Institute for Occupational Safety and Health (NIOSH) started the NIOSH Fatality Assessment and Control Evaluation (FACE) program in 1982, and added the State FACE program in 1989 (<https://www.cdc.gov/niosh/docs/2017-145/>). These programs have targeted varying types of events for investigation over the years. For example, NIOSH is currently focusing FACE resources on investigating falls in construction, as well as deaths involving machinery, and foreign-born workers, particularly among states that do not have funding for the State FACE program. In addition to investigating NIOSH targets, individual states conduct a limited number of investigations of fatalities related to state-level targets. The FACE reports are the result of these extensive fatal injury investigations, combining information collected from the employer, coworkers, safety personnel, emergency response crews, and other witnesses. In addition to the decedents' demographic and employment information, FACE collects information on the decedents' employers, such as whether the employer had a safety program, provided safety training, PPE, and much more. Such information is crucial for understanding the mechanisms by which fatalities occur (Bunn, Slavova, & Hall, 2008). FACE reports also provide detailed recommendations on how to avoid such incidents based on information obtained during the investigations (Higgins et al., 2001). These recommendations and detailed incident descriptions can be critical for injury prevention and interventions, including safety policies and procedures, engineering controls, and other aspects of the safety climate (Menendez, Castillo, Rosenman, Harrison, & Hendricks, 2012).

Since the FACE program was established, a number of case studies have been generated from the FACE reports to highlight specific risks

[☆] Disclaimers: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the views of the National Institute for Occupational Safety and Health. In addition, citations to websites external to NIOSH do not constitute NIOSH endorsement of the sponsoring organizations or their programs or products. Furthermore, NIOSH is not responsible for the content of these websites. All web addresses referenced in this document were accessible as of the publication date.

* Corresponding author.

E-mail address: sdong@cpwr.com (X.S. Dong).

or policy implications (Hallman, Gelberg, & Hallisey, 2005; *Morbidity and Mortality Weekly Report* (MMWR), 2001, 2004, 2012; NIOSH, 1990, 2006, 2007, 2010, 2011a, 2014). For example, a FACE report about a fall from a “catch” platform in New Jersey led to an Occupational Safety and Health Administration (OSHA) *Letter of Interpretation*, stating that “catch” platforms must comply with OSHA’s Scaffold Standard (OSHA, 2009). Findings based on FACE reports also contributed to a Massachusetts law protecting the safety and health of floor finishing workers (NIOSH, 2011b). Several reports covered various aspects of the Minnesota agriculture industry as well (Brown, Parker, Seeland, Boyle, & Wahl, 1997; MMWR, 1993, 1996, 1998, 1999). In addition, a few studies have applied FACE findings more broadly. These topics include tractors (Bunn et al., 2008), motor vehicle collisions (Bunn & Struttman, 2003), electrocutions in construction (Zhao, Thabet, McCoy, & Kleiner, 2014), tree care operations (MMWR, 2009), younger workers (Higgins, Tierney, & Hanrahan, 2002), and homicides (Harrison & Gillen, 1996).

FACE reports are categorized by major industry on the NIOSH website. Since 1982, the NIOSH and State FACE programs have investigated hundreds of work-related fatal injuries in the construction industry, providing detailed information on the circumstances and recommendations to protect construction workers from similar incidents occurring again. In order to efficiently explore specific information in the FACE reports for the construction industry, the Construction FACE Database (CFD) was developed using all NIOSH and State FACE reports in construction posted to the NIOSH FACE website as of June 30, 2015. Since FACE programs are ongoing and the annual counts are subject to change, reports posted on the NIOSH FACE website after the cutoff date are not covered by the CFD. To assist safety and health professionals who may use the CFD, this study describes the development and major contents of the CFD, and provides examples of how to employ the CFD for construction safety and health research. Considerations of the CFD and future research applications are also discussed.

2. Materials and methods

Selected data from each construction-related FACE report were manually entered into the CFD, including information on decedents, their employers, type of injury, environment, and recommendations (Appendix A). Information on safety equipment, safety programs, and training was also included. The selected data items were coded using coding systems available in 2000 when the CFD was first created. Occupation and industry were coded using the 1990 Census Occupational Classification System (U.S. Department of Commerce, 1999) and the

1987 Standard Industrial Classification System (Office of Management and Budget (OMB), 1987), respectively. The fatal incident details were classified according to the BLS’ Occupational Injury and Illness Classification System (BLS, 2007). While these classification systems have been updated in recent years, changes related to the construction industry have been relatively minor. In order to maintain consistency and ease usage of the CFD, the coding systems have remained the same since inception.

A key element of the CFD is the compilation of FACE recommendations. Since a corresponding classification system is not available, codes were created to categorize the narrative recommendations included in FACE reports (Appendix B). A two-digit classification schema was developed to capture major categories as well as finer details for each recommendation. The first digit designates the main categories: Personal Protective Equipment (PPE; coded 1×), Equipment (2×), Training (3×), Organizational (4×), and Violations (5×). The second digit classifies more specific recommendations within each of the major categories (e.g., 14 – Provide functional Personal Fall Arrest System (PFAS); or 42 – Conduct Job Safety/Hazard Analysis). Detailed recommendation codes are displayed in Appendix B.

The CFD was created in Microsoft Excel, and can be easily imported to other statistical packages, such as SAS. Examples of analyzing the CFD using SAS (version 9.4) and descriptive statistics from the analyses are reported below.

3. Results

3.1. Trend analysis

The CFD includes 768 construction-related fatal injuries reported by FACE, covering the fatalities that occurred from 1982 through 2014 (Fig. 1). While some investigations involved multiple fatalities, for analysis purposes, the CFD uses an individual death as the unit. According to the CFD, about one-third (270) of the fatalities were reported by the NIOSH internal FACE program and the remainder (498) by the State FACE programs. The NIOSH FACE program peaked in 1988 with 38 fatalities. The highest number (53) reported by State FACE programs was in 1998; making that year the highest reported total (64) for all FACE programs.

State FACE programs were reduced shortly after 1998, leading to fewer active State FACE programs. Since then, the number of annual FACE reports has decreased. In June 2015, nine states were conducting FACE programs – California, Iowa, Kentucky, Massachusetts, Michigan,

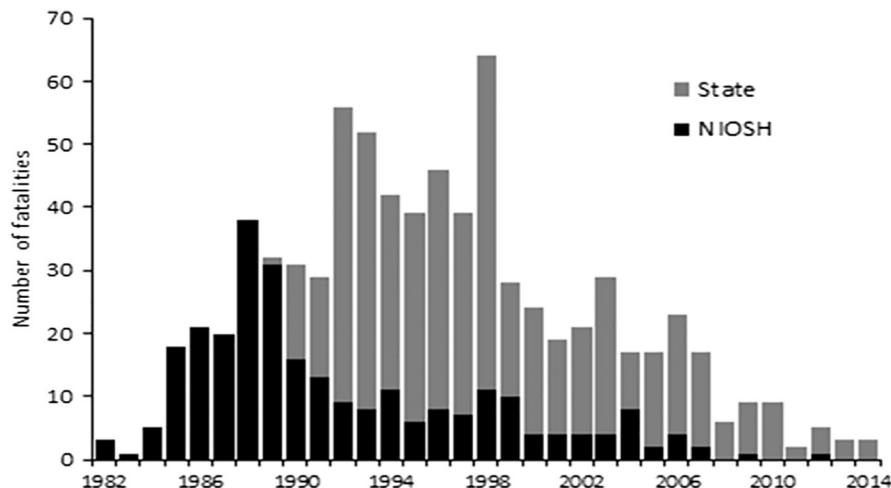


Fig. 1. NIOSH and State FACE reports in construction, by year. (Source: NIOSH and State FACE Reports for Construction.)

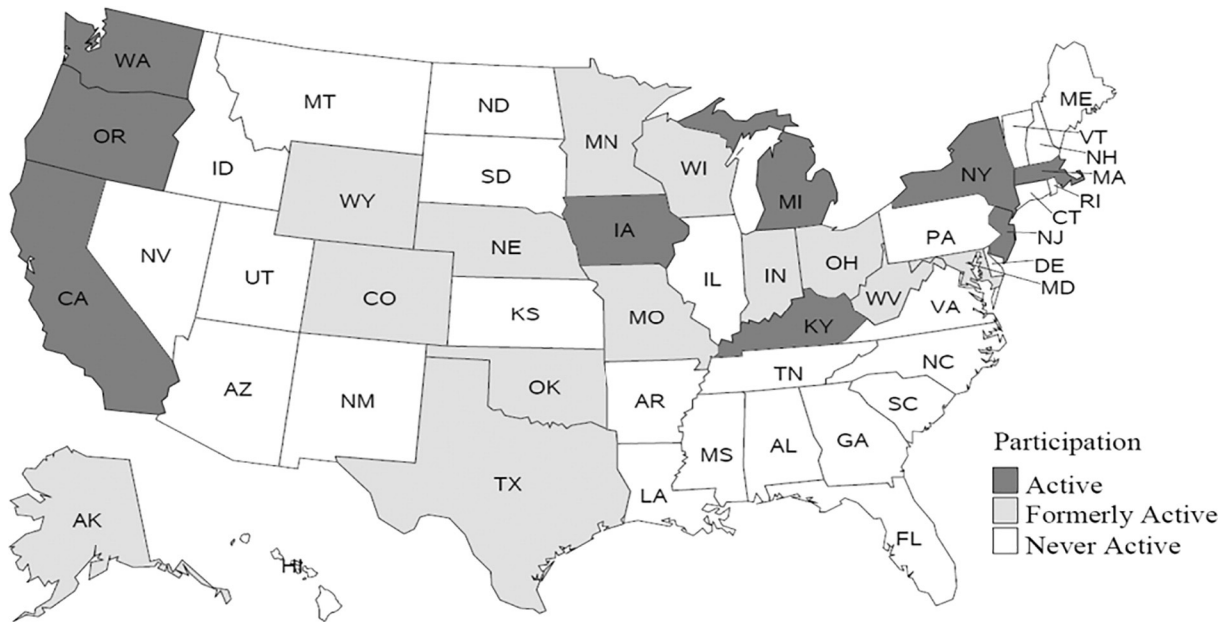


Fig. 2. Active and formerly active State FACE programs.
 Note: These are reflective of the FACE States in June 2015.
 (Source: State FACE website.)

New Jersey, New York, Oregon, and Washington, and 13 other states previously participated in the FACE program (Fig. 2).

FACE data collection has improved significantly in many respects over the years. For example, while age was only collected in 44% of cases from 1982 to 1987, it was collected in 95% of cases in the most recent period (2008–2014; Table 1). Similarly, the collection of race and foreign-born status jumped from 1.5% to more than 40% during the same time period. Moreover, job tenure collection increased from 22% to 89%, as did employer time in business (from 28% to 73%).

3.2. Descriptive analysis of decedents

Based on demographic information available in the CFD, nearly all decedents were male (759). The mean age of construction decedents involved in a FACE investigation was 38 years, with 20 fatalities occurring among minors under the age of 18 (Table 2). The youngest decedent was only 13 years old. About half of all investigations involved fatalities among those between the ages of 25 and 44 years. Geographically, about 35% of all investigated fatalities occurred in the South, compared to just 17% in the West. At least one fatality was investigated in 34 states; Massachusetts had the highest number of construction-

related fatalities investigated (74), and California ranked the second highest (69).

Employment information of the decedents is reported in Table 3. Nearly one-quarter of the decedents were construction laborers or helpers. Construction foremen accounted for the next largest occupational group of decedents. The majority of the decedents were wage-and-salary workers (87%), and the rest were self-employed (9%) or worked for a family business (4%). Job tenure information was available for 570 (74%) of the decedents. The average job tenure was nearly five years, but one in five decedents died during the first two months of employment.

3.3. Analyzing decedents' employers

This analysis shows that the majority of employers (97%) were in the private sector, and 45% were employers with 20 or fewer employees (Table 4). By industry sector, 16% were general building contractors, with 9% in nonresidential and 7% in residential, respectively. About 22% were in heavy construction, including 8% in highway and street construction. More than half (53%) of the employers were in specialty trades, such as the roofing, siding, or sheet metal industry (10%), electrical work (7%), and painting and paper hanging (5%). Additionally,

Table 1
 FACE reports in construction, number and percent of data completeness by time period, 1982–2014.

Characteristic	1982–1987 (N ^a = 68)		1988–1992 (N = 186)		1993–1997 (N = 218)		1998–2002 (N = 156)		2003–2007 (N = 103)		2008–2014 (N = 37)		Total (N = 768)	
	n	%	n	%	n	%	n	%	N	%	n	%	n	%
Age	30	44.1%	180	96.8%	217	99.5%	156	100.0%	97	94.2%	35	94.6%	715	93.1%
Race	1	1.5%	11	5.9%	16	7.3%	12	7.7%	35	34.0%	15	40.5%	90	11.7%
Foreign-born	1	1.5%	4	2.2%	9	4.1%	11	7.1%	31	30.1%	16	43.2%	72	9.4%
Employer time in business	19	27.9%	136	73.1%	170	78.0%	133	85.3%	82	79.6%	27	73.0%	567	73.8%
Job tenure	15	22.1%	130	69.9%	177	81.2%	133	85.3%	82	79.6%	33	89.2%	570	74.2%
Employer size	49	72.1%	163	87.6%	187	85.8%	139	89.1%	87	84.5%	34	91.9%	659	85.8%
Number of workers on injury site	54	79.4%	162	87.1%	192	88.1%	138	88.5%	86	83.5%	33	89.2%	665	86.6%
Using safety equipment	60	88.2%	129	69.4%	133	61.0%	93	59.6%	68	66.0%	29	78.4%	512	66.7%
Written safety plan	55	80.9%	158	85.0%	146	67.0%	122	78.2%	79	76.7%	29	78.4%	589	76.7%
Employer-provided job training	26	38.2%	106	57.0%	136	62.4%	113	72.4%	74	71.8%	33	89.2%	488	63.5%

^a N represents the number of fatalities.

Table 2
FACE reports in construction, by demographic characteristics of decedents, 1982–2014.

Characteristic	Number	Percent
Age (Mean = 38 years)		
<18 years	20	2.6%
18–24 years	106	13.8%
25–34 years	188	24.5%
35–44 years	187	24.4%
45–54 years	123	16.0%
55–64 years	66	8.6%
65+ years	25	3.3%
Unknown/not reported	53	6.9%
Sex		
Male	759	98.8%
Female	8	1.0%
Not reported	1	0.1%
Race/ethnicity		
White, non-Hispanic	17	2.2%
Hispanic	66	8.6%
Asian	7	0.9%
Unknown/not reported	678	88.3%
Foreign-born		
Foreign-born	70	9.1%
Native-born	2	0.3%
Unknown/Not reported	696	90.6%
Geographic region		
Midwest	204	26.6%
Northeast	165	21.5%
South	267	34.8%
West	129	16.8%
Not reported	3	0.4%
Total fatalities	768	100.0%

nearly 8% of the decedents were working on construction sites when the injury occurred but were employed in a non-construction industry (e.g., an electrician could be employed by a telephone company).

Table 3
FACE reports in construction, by employment characteristics of decedents, 1982–2014.

Characteristic	Number	Percent
Occupation		
Construction laborers, helpers	186	24.2%
Foremen, construction	98	12.8%
Structural metal workers	61	7.9%
Equipment & machine operators	59	7.7%
Carpenters	55	7.2%
Electricians, power/phone line installers	51	6.6%
Roofers	40	5.2%
Painters	38	5.0%
Plumbers, pipefitters, & steamfitters	26	3.4%
Miscellaneous mechanics & repairers	18	2.3%
Truck drivers	18	2.3%
Construction, n.e.c.	100	13.0%
Other, n.e.c.	18	2.3%
Employment status		
Wage-and-salary	666	86.7%
Self-employed	71	9.2%
Family business	29	3.8%
Volunteer	2	0.3%
Job tenure (Mean = 4 years, 10 months)		
1 day	18	2.3%
2 days	17	2.2%
3–14 days	55	7.2%
>2 weeks to 1 month	26	3.4%
>1 month to 2 months	33	4.3%
>2 months to 6 months	71	9.2%
>6 months to 1 year	50	6.5%
>1 year to 2 years	55	7.2%
>2 years to 5 years	82	10.7%
>5 years to 10 years	72	9.4%
>10 years to 20 years	66	8.6%
>20 years	25	3.3%
Unknown/not reported	198	25.8%
Total fatalities	768	100.0%

Table 4
FACE reports in construction, by decedents' employer characteristics, 1982–2014.

Characteristic	Number	Percent
Employer ownership		
Private ownership	744	97.1%
Federal, state, or local government	22	2.9%
Unknown/not reported	2	0.3%
Industry		
Construction employer	698	90.9%
General building contractors	123	16.0%
General building contractors – nonresidential	70	9.1%
General Building Contractors – residential	53	6.9%
Heavy construction	167	21.8%
Highway & street construction, except elevated highways	62	8.1%
Water, sewer, pipeline, & communications & power line construction	51	6.6%
Heavy construction, n.e.c.	25	3.3%
Bridge, tunnel, & elevated highway construction	20	2.6%
Water well drilling	9	1.2%
Special trade contractors	408	53.1%
Roofing, siding, & sheet metal work	76	9.9%
Electrical work	54	7.0%
Structural steel erection	53	6.9%
Painting & paper hanging	41	5.3%
Special trade contractors, n.e.c.	37	4.8%
Carpentry & floor work	30	3.9%
Masonry, stonework, tile setting, & plastering	29	3.8%
Plumbing, heating & air-conditioning	27	3.5%
Excavation work	23	3.0%
Concrete work	22	2.9%
Wrecking & demolition work	9	1.2%
Installation or erection of building equipment, n.e.c.	7	0.9%
Non-construction employer	58	7.6%
Non-classifiable/not reported	12	1.6%
Employer size		
1–10 employees	249	32.4%
11–20 employees	99	12.9%
21–50 employees	110	14.3%
51–200 employees	108	14.1%
More than 200 employees	93	12.1%
Unknown/not reported	109	14.2%
Employer time in business		
≤1 year	23	3.0%
>1 year to 5 years	75	9.8%
>5 years to 10 years	83	10.8%
>10 years to 20 years	140	18.2%
>20 years to 30 years	101	13.2%
>30 years	145	18.9%
Unknown/not reported	201	26.2%
Written safety plan		
Yes	331	43.1%
No	258	33.6%
Unknown/not reported	179	23.3%
Employer-provided job training		
Yes	323	42.1%
No	165	21.5%
Unknown/not reported	280	36.5%
Total fatalities	768	100.0%

Employers had a written safety plan in 43% of cases, and provided job training in 42% of cases. Such information was missing for many cases; 23% of cases did not have information about a written safety plan, and 37% did not have information regarding training.

3.4. Analyzing events, locations, and other circumstances of incidents

In terms of events, falls accounted for 42% (325) of all investigated fatalities in construction (Table 5), of which nearly 17% were falls from scaffolding or staging. Contact with electricity resulted in almost 18% of the total deaths, with nearly two-thirds of those from overhead power lines. By location, more than one-third of the investigated fatalities occurred at nonresidential construction sites. Another 14% occurred at new residential construction sites, and 11% at residential remodeling,

Table 5
FACE reports in construction, by case event circumstances, 1982–2014.

Characteristic	Number	Percent
Event or exposure		
Contact with objects and equipment	150	19.5%
Struck by/against object or equipment	74	9.6%
Caught in/compressed by equipment or objects	47	6.1%
Excavation or trenching cave-in	29	3.8%
Falls	325	42.3%
Fall through floor opening/surface	24	3.1%
Fall from ladder	43	5.6%
Fall through existing roof opening	22	2.9%
Fall through roof surface	13	1.7%
Fall through skylight	18	2.3%
Fall from roof edge	49	6.4%
Fall from scaffold, staging	54	7.0%
Fall from building girders, other structural steel	36	4.7%
Fall to lower level, n.e.c.	66	8.6%
Exposure to harmful substances or environments	161	21.0%
Contact with electric current or wiring, etc.	50	6.5%
Contact with overhead power lines	86	11.2%
Inhalation/depletion of oxygen in confined space	18	2.3%
Drowning, submersion	7	0.9%
Transportation accidents	105	13.7%
Collision accident	7	0.9%
Non-collision accident	39	5.1%
Pedestrian accident	59	7.7%
Fires and explosions	10	1.3%
Other, n.e.c.	17	2.2%
Location		
Nonresidential construction site	262	34.1%
Residential construction site	106	13.8%
Home (home/apartment/farmhouse/n.e.c.)	83	10.8%
Industrial places & premises	77	10.0%
Road construction site	66	8.6%
Public building	51	6.6%
Street & highway	42	5.5%
Parking lot, garage	17	2.2%
Other, n.e.c.	56	7.3%
Unknown/not reported	8	1.0%
Number of workers on injury site		
Working alone	42	5.5%
2 workers	164	21.4%
3 workers	119	15.5%
4 workers	97	12.6%
5 workers	73	9.5%
6–9 workers	99	12.9%
10–19 workers	42	5.5%
20–99 workers	24	3.1%
100+ workers	5	0.7%
Unknown/not reported	103	13.4%
Using safety equipment		
Yes	119	15.5%
No	393	51.2%
Unknown/not reported	256	33.3%
Total fatalities	768	100.0%

renovation, and demolition sites. Nearly 80% of the investigated fatalities transpired on jobsites with fewer than 10 workers. Safety equipment was used in less than 16% of cases. However, such information was only available for two-thirds of cases.

3.5. Analyzing recommendations

FACE reports provide recommendations on a variety of issues. The most common recommendations were related to Equipment (81%), followed by Organizational matters (80%), Training (79%), and PPE (35%; Table 6). Among the Equipment-related recommendations, 43% of reports suggested the installation of safety protection—more than double the number of recommendations to provide functional PFAS (21%; PPE major category). Within the Training category, three in four cases recommended that employers provide safety training (e.g., CPR, how to handle an emergency, hazard recognition). For recommendations addressing Organizational issues, 40% suggested that employers

Table 6
FACE report recommendations for construction, 1982–2014.

Recommendations	Number ^a (n = 768)	Percent
Personal protective equipment		
Provide functional PPE	272	35.4%
Inspect PPE for functionality	33	4.3%
Enforce use of PPE	2	0.3%
Provide functional PFAS	54	7.0%
Inspect PFAS for functionality	158	20.6%
Enforce use of PFAS	9	1.2%
Equipment		
Provide proper equipment for the task	130	16.9%
Inspect equipment for functionality/condition	618	80.5%
Enforce proper use of equipment	151	19.7%
Install safety protection	111	14.5%
Prevention through design	158	20.6%
Other, n.e.c.	327	42.6%
Training		
Provide job training	122	15.9%
Provide safety training	95	12.4%
CPR training	604	78.7%
Provide training in a language the employee can understand	94	12.2%
Train local emergency medical services on worksite safety	574	74.7%
Other, n.e.c.	19	2.5%
Organizational		
Develop safety checklist	44	5.7%
Conduct job safety (hazard) analysis	28	3.7%
Ensure safe worksite conditions	3	0.4%
Improve employer awareness	613	79.8%
Verify employee qualifications for the job	17	2.2%
Designate competent worksite safety monitor	307	40.0%
Establish clear communication system	186	24.2%
Enforce safety requirements of subcontractors	74	9.6%
Other, n.e.c.	55	7.2%
Violations		
Enforce child labor laws	153	19.9%
Heavier/successive penalties for violations	101	13.2%
Other, n.e.c.	41	5.3%
Other, n.e.c.	148	19.3%
Other, n.e.c.	31	4.0%
Other, n.e.c.	21	2.7%
Other, n.e.c.	7	0.9%
Other, n.e.c.	3	0.4%
Other, n.e.c.	1	0.1%

Note: Investigators could provide multiple recommendations per report, therefore, totals do not add to 100%.

^a Number refers to the number of fatalities.

conduct a job safety/hazard analysis prior to beginning work, and 24% recommended that employers should ensure safe worksite conditions (e.g., assessing if weather conditions are too dangerous to proceed with work).

4. Discussion

This study describes the CFD development by codifying the NIOSH and State FACE reports on construction fatalities spanning more than 30 years. Analyses using the CFD provide findings that may not exist in the current literature. For example, demographic data from the CFD shows that 20 construction deaths were identified among minors under the age of 18. Because minors under the age of 18 are prohibited from working in hazardous occupations such as roofing and trenching (U.S. Department of Labor, 2010), this information may help to understand the issue of child labor at construction jobsites and highlights the need to enforce federal and state child labor laws to protect this vulnerable group. While the information on decedents' job tenure is incomplete, the results indicate that a large number of decedents died when they had just started a new job; one in five was killed within the first two months on the job. Despite missing data on training, only 42% of decedents were found to have received job-related training (including formal and informal safety training). Factors related to safety training could be further explored using the CFD.

Information on PPE or PFAS use is particularly valuable since such information is not collected in most data sources. The findings suggest that just 16% of decedents were using safety equipment at the time of the incident. Some FACE reports provide a detailed list of what the decedent was using or wearing when the incident occurred (e.g., hard hat, work gloves, work boots, reflective vest), and some describe whether the available PPE or PFAS was actually in use during the incident (e.g., the employer had PFAS in the truck, but the decedent was not wearing it). However, the current CFD only includes whether safety protection was used or not, and does not classify protection in detail (original FACE reports may be referenced if more information is needed).

The CFD can also be used to examine a specific event for fatalities. The largest proportion of investigated fatalities in construction was fall-related, accounting for 42% of the decedents, reflecting that falls are a priority of construction safety for NIOSH targets (NIOSH, 2008). A study addressing fall fatalities (including PFAS use and availability) using the CFD has been published (Dong et al., 2017). Other common events in construction, such as Exposure to Harmful Substances or Environments, or Contact with Objects and Equipment, could be examined in future research using the CFD.

Perhaps the most important element of the CFD is the FACE recommendations. The findings show that roughly three-quarters of reports included a recommendation for employers to provide safety training, and 43% recommended installing safety protection equipment. Conducting a job safety/hazard analysis (40%) and ensuring safe worksite conditions (24%) were also frequently recommended. Although the findings may not be representative of the entire construction industry, implementing these recommendations prior to beginning work may mitigate the risk of similar incidents in the future. Further detailed analysis of the recommendations captured in CFD could also be conducted to assess the impact of implementation.

While the CFD provides an easy way to analyze FACE reports, it only contains selected information within the construction industry. FACE reports are also not nationally representative because they are related to pre-selected targets and are voluntarily reported by participating states. In addition, the FACE program started more than 30 years ago, thus findings generated from the CFD may not reflect the conditions on current construction sites. Moreover, a large number of cases in the CFD have some missing data. For example, some demographic data points were only available in recent reports. Therefore, a detailed analysis on Hispanic or foreign-born workers is not suggested based on the current CFD version. Moreover, despite significant improvements in FACE reports, some information is still incomplete, such as safety training and use of safety equipment. A more detailed checklist for future FACE investigations could be helpful in evaluating and interpreting incidents. The CFD can be updated as more information is available.

Given the above considerations, the CFD may allow researchers to analyze the FACE reports quantitatively and efficiently. The CFD in Excel and its codebook in PDF format will be available on the NIOSH FACE website in the near future as a free download for interested parties. Comprehensive research using FACE reports may improve our understanding of work-related fatalities and provide much needed information on strategies for the prevention of future incidents.

Funding source

This study was funded by the U.S. National Institute for Occupational Safety and Health (NIOSH) grant U60OH009762.

Acknowledgements

The authors are grateful to Michael A. Fiore, Mark Fullen, Paul Moore, John Myers, Audrey Reichard, and Christine Schuler for their review and valuable comments on this manuscript.

References

- Brown, M., Parker, D., Seeland, E., Boyle, D., & Wahl, G. (1997). Five years of work-related injuries and fatalities in Minnesota. Agriculture: A high-risk industry. *Minnesota Medicine*, 80(8), 29–32.
- Bunn, T., Costich, J., & Slavova, S. (2006). Identification and characterization of Kentucky self-employed occupational injury fatalities using multiple sources, 1995–2004. *American Journal of Industrial Medicine*, 49(12), 1005–1012.
- Bunn, T. L., Slavova, S., & Hall, L. (2008). Narrative text analysis of Kentucky tractor fatality reports. *Accident: Analysis and Prevention*, 40(2), 419–425.
- Bunn, T. L., & Struttman, T. W. (2003). Characterization of fatal occupational versus non-occupational motor vehicle collisions in Kentucky (1998–2000). *Traffic Injury Prevention*, 4(3), 270–275.
- CPWR – The Center for Construction Research and Training (2017). *The construction chart book: The U.S. construction industry and its workers* (Sixth ed.). Silver Spring, MD: CPWR (in press).
- Dong, X., Largay, J. A., Choi, S. D., Wang, X., Cain, C. T., & Romano, N. (2017). Fatal falls and PFAS use in the construction industry: Findings from the NIOSH FACE reports. *Accident Analysis and Prevention*, 102, 136–143 (Epub ahead of print).
- Hallman, E. M., Gelberg, K. H., & Hallisey, J. L. (2005). The NIOSH fatality assessment and control evaluation (FACE) program: A New York case study illustrating the impact of a farm manure pump PTO entanglement. *Journal of Agromedicine*, 10(3), 57–64.
- Harrison, R., & Gillen, M. (1996). Surveillance and investigation of homicides at work: California fatality assessment and control evaluation program. *Occupational Medicine*, 11(2), 243–255.
- Higgins, D. N., Casini, V. J., Bost, P., Johnson, W., & Rautiainen, R. (2001). The fatality assessment and control evaluation program's role in the prevention of occupational fatalities. *Injury Prevention*, 7(Suppl 1), i2–i33.
- Higgins, D. N., Tierney, J., & Hanrahan, L. (2002). Preventing young worker fatalities. The Fatality Assessment and Control Evaluation (FACE) program. *AAOHN Journal*, 50(11), 508–514.
- Menendez, C. C., Castillo, D., Rosenman, K., Harrison, R., & Hendricks, S. (2012). Evaluation of a nationally funded state-based program to reduce fatal occupational injuries. *Occupational and Environmental Medicine*, 69, 810–814.
- Morbidity and Mortality Weekly Report (MMWR) (1993). Fatalities attributed to entering manure waste pits – Minnesota, 1992. *Centers for Disease Control and Prevention*, 42(17), 325–329.
- Morbidity and Mortality Weekly Report (MMWR) (1996). Suffocations in grain bins – Minnesota, 1992–1995. *Centers for Disease Control and Prevention*, 45(39), 837–841.
- Morbidity and Mortality Weekly Report (MMWR) (1998). Fatalities associated with large round hay bales – Minnesota, 1994–1996. *Centers for Disease Control and Prevention*, 47(2), 27–30.
- Morbidity and Mortality Weekly Report (MMWR) (1999). Childhood work-related agricultural fatalities – Minnesota, 1994–1997. *Centers for Disease Control and Prevention*, 48(16), 332–335.
- Morbidity and Mortality Weekly Report (MMWR) (2001). Baler and compactor-related deaths in the workplace – United States, 1992–2000. *Centers for Disease Control and Prevention*, 27(50), 309–313.
- Morbidity and Mortality Weekly Report (MMWR) (2004). Occupational fatalities during trenching and excavation work – United States, 1992–2001. *Centers for Disease Control and Prevention*, 53(15), 311–314.
- Morbidity and Mortality Weekly Report (MMWR) (2009). Work-related fatalities associated with tree care operations – United States, 1992–2007. *Centers for Disease Control and Prevention*, 58(15), 389–393.
- Morbidity and Mortality Weekly Report (MMWR) (2012). Fatal exposure to methylene chloride among bathtub refinishers – United States, 2000–2011. *Centers for Disease Control and Prevention*, 61(07), 119–122.
- National Institute for Occupational Safety and Health (NIOSH) (1990). *Preventing worker deaths and injuries from falls through skylights and roof openings*. NIOSH Alert. DHHS (NIOSH) publication number 90–100. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/90-100/>).
- National Institute for Occupational Safety and Health (NIOSH) (2006). *Preventing worker injuries and deaths from mobile crane tip-over, boom collapse, and uncontrolled hoisted loads*. NIOSH Alert. DHHS (NIOSH) publication number 2006–142. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/2006-142/pdfs/2006-142.pdf>).
- National Institute for Occupational Safety and Health (NIOSH) (2007). *Preventing worker deaths and injuries from contacting overhead power lines with metal ladders*. Workplace solutions. DHHS (NIOSH) publication number 2007–155. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/wp-solutions/2007-155/pdfs/2007-155.pdf>).
- National Institute for Occupational Safety and Health (NIOSH) (2008). National Occupational Research Agenda (NORA), National Construction Agenda. Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/nora/comment/agendas/construction/pdfs/ConstOct2008.pdf>.
- National Institute for Occupational Safety and Health (NIOSH) (2010). *Preventing injuries and deaths from skid-steer loaders*. NIOSH Alert. DHHS (NIOSH) publication number 2011–128. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/2011-128/pdfs/2011-128.pdf>).
- National Institute for Occupational Safety and Health (NIOSH) (2011a). *Preventing worker deaths from trench cave-ins*. Workplace solutions. DHHS (NIOSH) publication number 2011–208. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/wp-solutions/2011-208/pdfs/2011-208.pdf>).

National Institute for Occupational Safety and Health (NIOSH) (2011b). *A story of impact: NIOSH-funded program contributes to a new Massachusetts law to protect the health and safety of floor finishing workers*. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/2011-181/pdfs/2011-181.pdf>).

National Institute for Occupational Safety and Health (NIOSH) (2014). *Workplace design solutions: Preventing falls from heights through the design of embedded safety features. Publication number 2014–124*. Atlanta, GA: Centers for Disease Control and Prevention (CDC) (Retrieved October 11, 2016 from: <http://www.cdc.gov/niosh/docs/wpsolutions/2014-124/>).

Occupational Safety & Health Administration (OSHA) (2009). Standard interpretations. Retrieved October 11, 2016 from: https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27373.

Office of Management and Budget (OMB), Executive Office of the President (1987). *Standard Industrial classification manual*. Springfield, VA: National Technical Information Service.

U.S. Bureau of Labor Statistics (BLS) (2007, September). Occupational injury and illness classification manual. Retrieved October 11, 2016 from: http://www.bls.gov/iif/oiics_manual_2007.pdf.

U.S. Bureau of Labor Statistics (BLS) (2016). Census of fatal occupational injuries. *Injuries, Illnesses, and Fatalities Database* (<http://www.bls.gov/data/#injuries>) (Retrieved March 15, 2017)).

U.S. Department of Commerce (1999). *1990 Census occupational classification system*. Washington, DC: Bureau of the Census.

U.S. Department of Labor (2010, July). *Fact sheet #43: Youth employment provisions of the Fair Labor Standards Act (FLSA) for nonagricultural occupations*. U.S. Wage and Hour Division (Retrieved October 11, 2016 from: <http://www.dol.gov/whd/regs/compliance/whdfs43.pdf>).

Zhao, D., Thabet, W., McCoy, A., & Kleiner, B. (2014). Electrical deaths in the US construction: An analysis of fatality. *International Journal of Injury Control and Safety Promotion*, 21(3), 278–288.

Appendix A. FACE database variables (Appendix A)

#	Variable	Information
<i>Decedent characteristics</i>		
1	Case Type (NIOSH or State)	N = NIOSH S = State
2	Record ID	
3	State	Two letter abbreviation
4	Age	In years
5	Gender	1. Male 2. Female
6	Race/ethnicity	1. White, non-Hispanic 2. Black, non-Hispanic 3. Hispanic 4. Asian 5. Native American 6. Other 7. Unknown/not reported
7	Foreign-born (FB)	1. Yes 2. No 3. Unknown/not reported
8	Occupation (OCCUP)	1990 Census Code
9	Employee status (ES)	1. Wage-and-salary 2. Self-employed 3. Family business 4. Volunteer 5. Not reported
10	Time with employer (TWEY)	Years Months Days
<i>Employer characteristics</i>		
11	Industry (SIC)	SIC
12	Ownership (OWNER)	1. Federal government 2. State government 3. Local government 4. Foreign government 5. Other government 6. Private ownership
13	Time: employer has been in business (TEIB)	In years
14	Establishment size (SIZE)	Number of employees
15	Written safety plan/program/procedure (WSP)	1. Yes 2. No 3. Unknown/not reported
16	Provide job training (PJT)	1. Yes 2. No 3. Unknown/not reported
<i>Injury/incident</i>		
17	Injury date	Month (IM) Day (ID) Year (IY)
18	Nature of injury (NOI)	OIICS 2007
19	Part of body (POB)	OIICS 2007
20	Source of injury (SOI)	OIICS 2007
21	Event or exposure (EOE)	OIICS 2007

(continued on next page)

Appendix A (continued)

#	Variable	Information
22	Activity	1. Vehicular & transportation operations 2. Using/operating tools, machinery 3. Constructing, repairing, cleaning 4. Materials handling 5. Physical activities, n.e.c. 6. Unknown/Not reported
23	Height of fall (Fall_feet)	In feet
<i>Environment</i>		
24	Location	1. Nonresidential construction site 2. Residential construction site 3. Home (home/apartment/farmhouse/n.e.c.) 4. Industrial places & premises 5. Road construction site 6. Public building 7. Street & highway 8. Parking lot, garage 9. Other, n.e.c. 10. Unknown/not reported
25	Number of workers injured in the event (excluding decedent) (NOWIIE)	Number of employees
26	With SAFETY EQUIPMENT (WSE)	1. Yes 2. No 3. Unknown/not reported
27	What protection (e.g., fall protection) (WP)	Protection type
28	Fall protection (PFAS)	1. Present and in use 2. Present but not in use 3. Not present 4. Unknown/not reported
<i>FACE report recommendations</i>		
29	Report recommendations	See Appendix B
30	PFAS recommended (PFAS_Rec)	1. Yes 2. No

Appendix B. FACE recommendation categories (Appendix B)*B.1. Personal protective equipment (PPE – e.g., hard hat, gloves, PFAS or harness/lanyard)*

11. Provide functional PPE (e.g., the employer did not provide, or provided inadequate or faulty PPE, NOT PFAS)
12. Inspect PPE for functionality (e.g., when PPE failed)
13. Enforce use of PPE
14. Provide functional PFAS (e.g., the employer did not provide, or provided inadequate or faulty PFAS)
15. Inspect PFAS functionality (e.g., when PFAS failed)
16. Enforce use of PFAS
19. Other

B.2. Equipment

21. Provide proper equipment for the task
22. Inspect equipment for functionality/condition (e.g., in cases with faulty lifts, broken seatbelt or backup alarm, worn labels that are illegible, damaged boards used as scaffold planks)
23. Enforce proper use of equipment
24. Install safety protection (e.g., guardrails, nets, alarms, warning signs)
25. Prevention through design (e.g., safety features added by manufacturer to equipment, safer design of worksite)
29. Other

B.3. Training

31. Provide job training (does NOT include safety training, but if both are mentioned, use both 31 and 32)
32. Provide safety training (includes ensuring employee awareness of safe work procedures)
33. CPR training (Cardiopulmonary resuscitation)
34. Provide training in a language the employee can understand
35. Train local emergency medical services on safe worksite practices and rescue procedures prior to incident (e.g., when and how to enter a trench in case of collapse)
39. Other

B.4. Organizational

41. Develop safety checklist
42. Conduct job safety (hazard) analysis
43. Ensure safe worksite conditions (e.g., barricade area below overhead work, restrict roof work during high winds)
44. Improve employer awareness (e.g., become familiar with available resources on safety standards and safe work practices, monitor workers for signs of alcohol and drug use)
45. Verify employee qualifications for the job (e.g., employee has proper training or certifications for equipment operation or task performance)
46. Designate competent person for worksite safety monitoring
47. Establish clear communication system (e.g., spotters, 2-way radios, signal person)
48. Enforce safety requirements of subcontractors (e.g., subcontractors must provide general contractors with written comprehensive safety program)
49. Other

B.5. Violations

51. Enforce child labor laws
52. Disciplinary procedures for non-cooperation
59. Other

B.6. Other

999. Other (not under any major categories)

Xiuwen Sue Dong, DrPH, is Data Center Director for CPWR — the Center for Construction Research and Training. She currently serves as PI of several research projects funded by the U.S. National Institute for Occupational Safety and Health (NIOSH). Dong is the lead author of many publications. Her research covers multiple issues in occupational safety and health, focusing on construction workers. She has a doctoral degree in Public Health from the George Washington University and a master's degree in labor economics from the University of Massachusetts, Amherst.

Julie A Largay received her MPH in Epidemiology from the George Washington University, and her bachelor degree in Economics from the University of Virginia, Charlottesville. She has five years of experience in occupational health research and extensive rich knowledge of numerous data sources available both publicly and privately.

Xuanwen Wang, Ph.D., is Senior Research Associate at CPWR- the Center for Construction Research and Training. She received her Ph.D. in Economics from Clemson University. She currently works on construction safety and health surveillance, and several other NIOSH funded projects. She has seven years of experience in occupational health research and extensive rich knowledge of numerous data sources available both publicly and privately.

Chris Trahan Cain, CIH, is Executive Director of CPWR —The Center for Construction Research and Training. She manages operations of the construction research, training, and service programs funded by federal agreements, grants, and contracts. She also manages relationships with CPWR's external partners in the Building Trades Unions, non-construction unions, the larger safety and health construction community, and government partners. She leads CPWR staff in finding synergies among departments in order to capitalize on programs funded by different federal grants. She has been working in construction safety and health on behalf of NABTU for over 20 years.

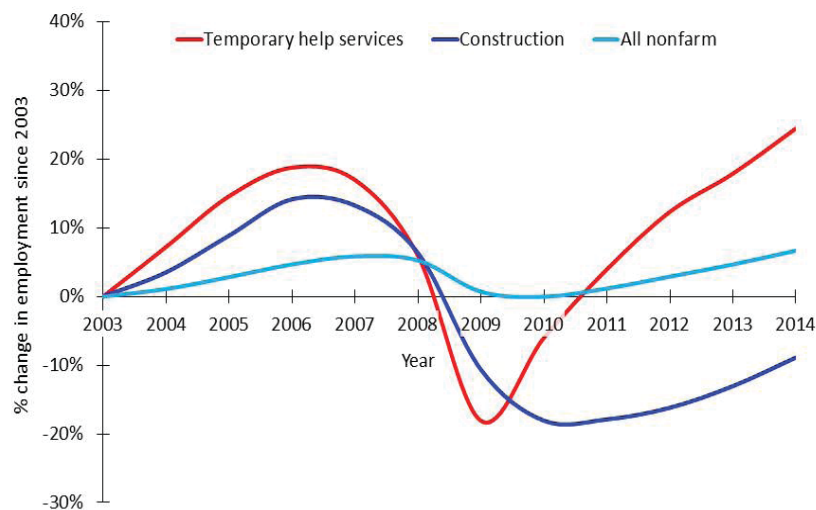
Nancy Romano, MS, is a Safety and Occupational Health Specialist with the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research, Surveillance and Field Investigations Branch, Field Investigations Team in Morgantown West Virginia, and is the Project Officer for the NIOSH Fatality Assessment and Control Evaluation (FACE) Program. Nancy has been with NIOSH since 1999. Nancy has a Master of Science in Safety Management and is a Certified Safety and Health Manager (CSHM). Nancy is a NIOSH Construction Sector Program, Steering Committee Member and previously served as the Assistant Coordinator for 5 years.

Temporary Workers in the Construction Industry

CPWR Data Center: Xiuwen Sue Dong, DrPH, Xuanwen Wang, PhD, and Julie A. Largay, MPH

In today's economy, more businesses use temporary workers to quickly and efficiently address changing labor needs (GAO, 2015). Temporary workers, often referred to as "temps," are easily hired when demand increases, and laid off when demand decreases, which is perceived to be a result of employers' desire to reduce labor costs (Luo et al., 2010). Temporary workers are more vulnerable to workplace safety and health hazards and retaliation from employers than workers in traditional employment arrangements since they are often not given adequate safety and health training (OSHA, 2015). Despite the importance of worker safety and health, information on temporary workers in the construction industry is scarce. To provide insights for the development of construction safety and health interventions, this report profiles temporary workers in the construction industry, including the overall trends for "temps," worker demographics, employment experiences, job exposures, and income and fringe benefits.

1. Percent change in employment, 2003-2014 (Seasonally adjusted: private wage-and-salary workers)



KEY FINDINGS

- Temporary help services in the U.S. significantly increased since the economic recovery, and temporary employment grew in construction as well.
- Temporary construction workers were younger, more often Hispanic (43%) or foreign-born (41%), and had no high school degree (48%) compared to regular workers.
- About 75% of temporary construction workers were employed in small establishments with 10 or fewer employees.
- The wage rate for temporary construction workers was 24% lower than that for regular workers.
- More than half of temporary construction workers did not have health insurance, and another 12% received public insurance coverage.
- Temporary construction workers had higher job exposures and more concerns about unemployment than regular workers.

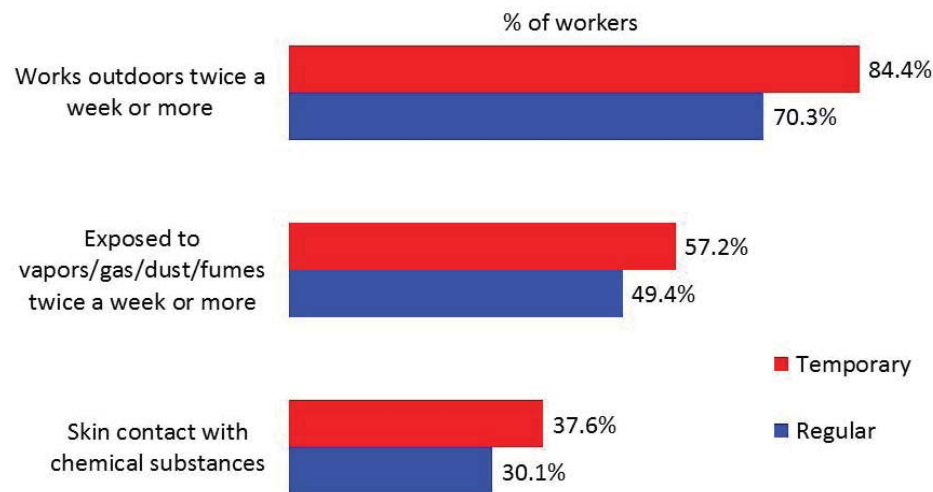
Note: Chart 1 - See page 2 for description.

Source: U.S. Bureau of Labor Statistics, 2003-2014 Current Employment Statistics. Calculations by the authors.

SECTION 5: Job Exposures and Employment Security

Temporary workers³ appeared more likely to experience occupational hazards than regular workers. In 2010, over 84% of temporary construction workers performed outdoor work at least twice a week compared to 70% of regular workers (Chart 18). Furthermore, 57% of temporary workers reported exposure to vapors, gas, dust, or fumes at least twice a week, which was higher than 49% of regular workers. Temporary workers were also more likely to have skin contact with chemical substances than regular workers (38% vs. 30%, respectively).

18. Job exposures in construction, temporary vs. regular workers, 2010



³Definition from the Occupational Health Supplement to the National Health Interview Survey (NHIS-OHS): Respondents who answered “yes” to the following question: “Some people are in temporary jobs that last only for a limited time or until the completion of a project. [Is your/Was your] job temporary?” The NHIS sample includes adults aged 18+ years who are currently employed or were employed at some point in the past 12 months.

Source: 2010 Occupational Health Supplement to the National Health Interview Survey. Calculations by the authors.

CERTIFICATE OF SERVICE

I hereby certify that on May 14, 2018, I served a copy of the foregoing Brief for *Amicus Curaie* North America's Building Trades Unions through the E-file system on the following counsel of record:

Scott Gladman
U.S. Department of Labor, Office of the Solicitor
200 Constitution Avenue, N.W.
Washington, D.C. 20210
(202) 693-5493
Glabman.Scott@dol.gov

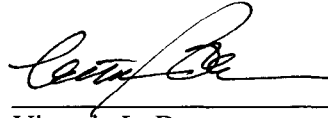
Robert Dunlevey
Taft, Stettinius & Hollister
40 North Main Street, Suite 1700
Dayton, Ohio 45423
(937) 228-2838
rdunlevey@taftlaw.com

Arthur G. Sapper, Esq.
Melissa A. Bailey, Esq.
OGLETREE, DEAKINS, NASH, SMOAK & STEWART, P.C.
Suite 1000
1909 K Street NW
Washington, D.C. 20006
(202) 263-0270
arthur.sapper@ogletree.com

Cynthia L. Rice
CALIFORNIA RURAL LEGAL ASSISTANCE, INC.
1430 Franklin Street, Suite 103
Oakland, CA 94612
(510) 267-0762
crice@crla.org

Javier J. Castro
CALIFORNIA RURAL LEGAL ASSISTANCE, INC.
145 East Weber Avenue
Stockton, CA 95202
(209) 946-0605
jcastro@crla.org

Ronald J. Melton
CALIFORNIA RURAL LEGAL ASSISTANCE, INC.
449 Broadway Street
El Centro, CA 92243
(760) 353-0220
rmelton@crla.org



Victoria L. Bor
Sherman Dunn, P.C.
900 Seventh Street, N.W., Suite 1000
Washington, D.C. 20001
Phone: (202) 785-9300
Fax: (202) 775-1950