Commentary

Nonstandard Work Arrangements and Worker Health and Safety

John Howard, MD, JD*

Arrangements between those who perform work and those who provide jobs come in many different forms. Standard work arrangements now exist alongside several nonstandard arrangements: agency work, contract work, and gig work. While standard work arrangements are still the most prevalent types, the rise of nonstandard work arrangements, especially temporary agency, contract, and "gig" arrangements, and the potential effects of these new arrangements on worker health and safety have captured the attention of government, business, labor, and academia. This article describes the major work arrangements in use today, profiles the nonstandard workforce, discusses several legal questions about how established principles of labor and employment law apply to nonstandard work arrangements, summarizes findings published in the past 20 years about the health and safety risks for workers in nonstandard work arrangements, and outlines current research efforts in the area of healthy work design and worker well-being. Am. J. Ind. Med. 60:1–10, 2017. © 2016 Wiley Periodicals, Inc.

KEY WORDS: contingent; temp; gig; independent contractor; misclassification; precarious

INTRODUCTION

In the late 20th century, many firms began abandoning their reliance on the traditional employer–employee relationship and moved toward increasing reliance on nonstandard work arrangements, shifting much of the risk of doing business on the worker [Cappelli, 1999; Karoly and Panis, 2004; Cappelli and Keller, 2012]. This move toward enhanced labor market flexibility has aided firms economically [Ono, 2009], but has also launched a debate about whether this trend has hurt workers, particularly low-wage workers [Hatton, 2013; Weil, 2014; Hill, 2015]. Much of the debate centers on what legal rules govern workers in these nonstandard work relationships [Kalleberg et al., 2000, 2013; Stone, 2004, 2006].

Although arrangements between those who perform work and those who provide jobs now come in many different forms, there is no single taxonomy to uniformly describe standard and nonstandard work arrangements [Bernhardt, 2014]. Public and private sector estimates of the size of the nonstandard workforce use different definitions, making occupational health and safety surveillance and research challenging.

The field of occupational safety and health involves the identification and elimination of the risks associated with work. The list of potential risk factors is long and includes chemical, physical, and biological agents, as well as psychosocial and organizational factors. Do the new, nonstandard ways work is being arranged present health and safety risks to workers? Evidence is accumulating that the work arrangement itself may put the health of workers at

National Institute for Occupational Safety and Health, Washington, DC
*Correspondence to: John Howard, National Institute for Occupational Safety and Health, 395 E Street, SW, Suite 9200, Washington, DC 20201. E-mail: zkz1@cdc.gov

Accepted 27 September 2016
DOI 10.1002/ajim.22669. Published online 25 October 2016 in Wiley Online Library (wileyonlinelibrary.com).

risk [Benach and Muntaner, 2007]. This article describes the major standard and nonstandard work arrangements and the potential managerial, legal, and health and safety challenges associated with nonstandard arrangements.

Standard Work Arrangements

Throughout the 20th century, two types of standard work arrangements have existed side by side. The first is the "industrial" model, which is found in the manufacturing and service sectors. Jobs in the industrial model were characterized as "regular," full-time jobs with the same employer for an individual's entire working life. This standard arrangement involves an individual who provides services exclusively to one employer on a predictable work week schedule (usually 40 hr per week) at the employer's place of business with the mutual expectation of long-term career development [Broschak and Davis-Blake, 2006]. In the industrial type of standard employment relationship, the employer controls the manner and means by which the worker provides services for the employer. The exercise of directive control by the employer over how the individual provides services is the central requirement that legally establishes the employment relationship [American Law Institute, 2015]. The second type of standard work arrangement is the "craft" model, which is found chiefly in the construction industry. In the craft model, workers with specialty construction skills are dispatched to different construction projects for varying lengths of time. When the project ends, so does the worker's employment. In many ways, the new nonstandard work arrangements look more like the "craft" model, and less like the industrial model.

Beginning in the 1930s, Federal and state employment laws establishing minimum labor standards were enacted to provide a worker in the 20th century's standard employer-employee relationship important labor protections and benefits. Among these are (i) old-age assistance and disability benefits [Social Security Act, 1935]; (ii) collective bargaining rights [National Labor Relations Act, 1935]; (iii) minimum wage, overtime, and child labor protections [Fair Labor Standards Act, 1938]; (iv) employment discrimination protections [Title VII of the Civil Rights Act, 1964; the Age Discrimination in Employment Act, 1967; and the Americans With Disabilities Act, 1990]; (v) safety and health protections [Occupational Safety and Health Act, 1970]; (vi) pension, health, and other employee benefits [Employee Retirement Income Security Act, 1974; Family and Medical Leave Act, 1993]; and (vii) unemployment insurance and workers compensation benefits (various federal and state laws). Many of these laws assume the existence of a standard employer–employee relationship. Recently, many are being legally tested to see whether, and if so how, they apply to nonstandard work arrangements.

Nonstandard Work Arrangements

Nonstandard workers are referred to by different names—temporary help, contingent, part-time, on-call, direct hire, agency, contract, app-based, on-demand, free-lancer, and gig workers [General Accountability Office (GAO), 2006]. The unifying feature shared by workers involved in nonstandard work arrangements is that they have no expectation of permanence, even if the work is performed well [Stone, 2004]. Employers call nonstandard work arrangements "flexible" [Kalleberg and Marsden, 2005], while workers perceive them as "precarious" [Stone, 2004]. Sustaining the standard work arrangement in many firms has been "relegated just below customer relationship management" [Weil, 2014].

Along with a heightened sense of temporariness and precariousness, nonstandard work arrangements come with a loss of access to legal protections and social benefits enjoyed by standard arrangement workers. Independent contractors do not have a legal right to a safe workplace and are not legally eligible for workers' compensation benefits if they are injured on the job [Berkowitz and Smith, 2016]. Some gig workers do not earn the minimum wage. Many nonstandard workers are now exposed to "irregular, unstable, temporary, or precarious working conditions common to what is usually known as informal work in developing countries." [Siqueira, 2016].

Agency work arrangements

By the late 1940s, firms began to use a new type of nonstandard arrangement where employees are hired by an agency labor supplier for time-limited work assignments at the premises of another employer. The staffing agency-based temporary help services model is viewed as a type of co-employment or joint employment arrangement [Cappelli and Keller, 2013]. Under this arrangement, the agency labor supplier often pays wages, unemployment and workers' compensation premiums and otherwise takes on the legal responsibilities of an employer. The leasing company, agency, or host employer may argue that it has no employment relationship with the agency worker, and, therefore, no duty to ensure the agency employee is protected against employment law violations. However, in an agency arrangement, two employers actually share legal responsibility for protecting the safety and health of employees [Occupational Safety and Health Administration and National Institute for Occupational Safety and Health, 2015]. The agency work arrangement can led to confusion as to who is responsible for protecting the worker from harm.

In 1956, staffing agencies, many of which were small businesses, placed 20,000 employees in mostly clerical and factory jobs, but by the 1970s the number of temporary workers grew to about 200,000 [Luo et al., 2010]. Growth in

agency work arrangements grew throughout the 1970s and 1980s [Pfeffer and Baron, 1988]. From 1982 to 1998, the total number of jobs in the temporary help supply industry rose 577%, while the total number of jobs grew at only 41% during the same period [GAO, 2000]. The Great Recession of 2007–2009 reduced employment across all work arrangements. As the economy recovers from the downturn, so have staffing agencies. In 2014, the U.S. staffing firms hired 32.7% more workers in 2014 than they did in 2013, bringing annual staffing employment back to pre-recession levels [Poole, 2015].

Contract work arrangements

Excluded from Federal labor law protections are workers who are not legally recognized as employees, but rather are "independent contractors" [Muhl, 2002]. The Internal Revenue Service (IRS) definition of independent contractor is "that an individual is an independent contractor if the payer has the right to control or direct only the result of the work and not what will be done and how it will be done" [Internal Revenue Service, 2016]. In this type of nonstandard work arrangement, a worker provides services to a firm as part of a business relationship, and not as part of an employment relationship. Unlike an employee, an independent contractor retains entrepreneurial control over exactly how services are to be provided to the firm [American Law Institute, 2015]. Increasingly, firms have classified or reclassified employees as independent contractors. Challenges alleging workers are misclassified as independent contractors when they should be classified as employees have arisen with increasing frequency.

Gig work arrangements

By the beginning of the 21st century, rapid advances in digital technology gave rise to work intermediated by a digital online platform. Workers in this new type of nonstandard arrangement are often referred to as "app-based" workers because they connect with customers by means of mobile technology mediated by the Internet [Smith and Leberstein, 2015]. Many "gig" workers are classified by their platform "employer" as independent contractors. Some of these workers may be employees who are improperly classified as independent contractors.

Brief Profile of the Nonstandard Workforce

Size

An accurate count of the size of the nonstandard workforce is difficult to obtain because of the heterogeneous nature of nonstandard work arrangements and the absence of a "standard" definition of "nonstandard" work [Kalleberg, 2000; Bernhardt, 2014]. Many estimates of nonstandard work use the temporal attachment of the worker to work as an essential definitional feature when estimating the size of the nonstandard workforce. For example, the Bureau of Labor Statistics (BLS) uses the term "contingent" to describe most nonstandard work arrangements, and defines "contingent" work as "any work arrangement which does not contain an explicit or implicit contract for long-term employment" [Polivka and Nardone, 1989]. Any nonstandard work arrangement can involve work that does not involve an expectation of long-term employment, so the BLS definition maps closely to all types of nonstandard arrangements discussed in this article.

Beginning in 1995, BLS supplemented its monthly current population survey with a survey of the contingent workforce called the Contingent Work Supplement (CWS). In 2005, the BLS reported that *contingent workers* accounted for 1.8–4.1% of total employment, similar to their 1995 estimate of 2.2–4.9% of total employment. *Workers in alternative arrangements* accounted for 10.7% of total employment. Independent contractors accounted for 7.4%, on-call (or part-time) workers accounted for 1.8%, and temporary help agency workers accounted for 0.9%. In 2005, contingent workers and workers in alternative arrangements together represented a range from 12.5% to 14.8% of total employment [BLS, 2005]. Due to budgetary constraints, BLS has not conducted a CWS survey since 2005.

In 2015, the GAO reported in a letter to Senators Murray and Gillibrand that "the size of the contingent workforce can range from less than 5 percent to more than a third of total employed labor force, depending on widely-varying definitions of contingent work" [GAO, 2015]. GAO then estimated that "a core group of contingent workers, such as agency temps and on-call workers, comprised about 7.9 percent of the employed labor force in 2010" [GAO, 2015].

A 2013 study by researchers from the National Institute for Occupational Safety and Health (NIOSH) reported 18.7% of adults work in nonstandard arrangements (i.e., largely jobs that were "temporary") [Alterman et al., 2013]. A 2015 RAND-Princeton Contingent Work Survey reported that the percentage of workers engaged in alternative work arrangements (as defined by BLS) increased from 10.1% to 15.8% in 2015 [Katz and Krueger, 2016]. In sum, estimates of the nonstandard workforce range from around 8% to 18% of the total workforce.

The proportion of the total workforce represented by the gig workforce remains very small. Workers who provide services through online intermediaries make up less than one percent of the workforce according to the few studies to date of the gig workforce [Dooko et al., 2015; Lehmann, 2015; Katz and Krueger, 2016]. In 2016, JP Morgan Chase reported

that from 2012 to 2015, about 0.6% of the workforce earned income from the online labor platform economy [Farrell and Greig, 2016].

Industry

In 1984, most temporary agency workers were engaged in office and administrative support occupations [Carey and Hazelbaker, 1986]. By 2008, 65% of agency workers could still be found in office support, but were also found in occupations in the transportation, utilities, material moving, manufacturing, and professional and business services industries [Dey et al., 2010]. Even though agency workers are engaged in hazardous jobs across several different industry sectors, especially in for-hire transportation, for the purpose of tracking labor participation, they are generally classified as working in the *services* sector because all staffing agency employers are *services* sector employers [Luo et al., 2010]. Given this approach to classification, the burden of injury and illness in some higher hazard industries may be underestimated.

Demographics

Independent contractors compared to workers in standard arrangements are more likely to be older, male, and white [BLS, 2005]. Internationally and in the United States, agency workers are more likely to be women, younger, minority, have no high school degree, and earn a lower hourly wage [International Labour Organization, 2013; GAO, 2015; Nicholson, 2015). Historically, only a minority of nonstandard workers—chiefly independent contractors—were found in higher wage occupations in healthcare, business and financial operations, and construction and extraction industries. Recently, though, nonstandard occupational groups are expanding out of the low-wage sector into legal services, business and financial operations, informational technology, and education occupations [Luo et al., 2010].

Safety Management Issues in Nonstandard Work Arrangements

Nonstandard arrangements pose a number of challenging management issues for providers of nonstandard jobs, for workers involved in these arrangements, and for occupational health and safety professionals. The use of nonstandard arrangements creates a blended workforce where standard and nonstandard workers work together on the same project or do the same type of work. Differences in the way standard and nonstandard workers are managed can negatively affect standard workers' attitudes toward the firm and toward their nonstandard co-workers [Davis-Blake et al., 2003]. Even though standard workers have been perceived as shielded from the deconstruction of the employment relationship, there is accumulating evidence that the use of temporary workers can be negatively associated with a standard employee's perception of their own job security [Pedulla, 2013].

A blended workforce can pose challenges for safety managers. Temporary and permanent employees may differ in the training they receive for the job, the protective equipment they are provided, the dangers associated with the tasks they are assigned, and their perception of safety practices [Zohar and Luria, 2005]. Perception of the organizational culture, including safety climate, may not be uniform across standard and nonstandard work arrangements. To account for this, safety managers need to take employee heterogeneity into account when developing workplace safety practices [Luria and Yagil, 2010].

Some host or client employers incorrectly behave as if they do not share safety and health responsibilities to protect temporary agency or leased workers in their workplaces. Rather, they act as if the safety and health responsibilities for workers lie with agency or with the employee leasing company. OSHA has historically relied upon its multi-employer citation policy to ensure shared safety and health responsibilities to protect all workers at a site. Recent tragic fatalities and serious injuries involving temporary help agency workers have refocused OSHA's attention on the temporary worker safety issue [Broward, 2013]. In 2015, OSHA and NIOSH jointly developed a set of recommendations aimed at how agency and host employers can fulfill their mutual responsibilities to safeguard temporary agency workers at hazardous workplaces [Occupational Safety and Health Administration and National Institute for Occupational Safety and Health, 2015].

Among the set of eight recommendations made by OSHA and NIOSH about how temporary agency/employee leasing employer, and the host employer, can better protect their shared workers, three propose expanded responsibilities for agencies and employee leasing companies. First, prior to accepting a new host employer as a client, or taking on a new project for an existing host employer, the agency and host employers should conduct an on-site risk assessment of the work to identify the training and personal protective equipment necessary to keep newly assigned workers safe. Second, agency employers should train their staff to recognize basic safety and health hazards that may exist at a host employer's worksite [Occupational Safety and Health Administration and National Institute for Occupational Safety and Health, 2015]. These two recommendations involve the agency or leasing company employer much more in the safety of dispatched workers than appears the current business practice of many temporary help services agencies or employee leasing

companies. A third important recommendation is directed at the host employer who should provide agency employees with general and site-specific safety training that is identical or equivalent to the training provided to the host employer's employees prior to their performing the job. Often the host employer assumes that the temporary services workers have received sufficient training prior to being dispatched.

Legal Issues in Nonstandard Work Arrangements

A significant challenge facing nonstandard arrangement workers and their job providers involves determining which entity, if any, is responsible for providing various job protections to these workers. Two questions often arise. First, is a nonstandard worker an employee or an independent contractor? Employers often label workers as independent but increasingly those labels are being challenged. Second, when a worker is hired by one employer—often a staffing agency—when is the host employer jointly responsible for with the staffing agency for ensuring compliance with labor and employment laws? Each law establishing labor standards relies upon a different test for who is an employer of an employee. As a result, an employer may be responsible for safety and health compliance and paying wages for a group of nonstandard workers, even if that employer is not responsible for providing health insurance or pension benefits to those workers [Dau-Schmidt and Ray, 2004].

In *Nationwide Mutual Insurance Co. v. Darde (1992)*, the Supreme Court held that the common law "direction and control" test determined the existence of an employer–employee relationship when any federal law—including the Occupational Safety and Health Act of 1970—defines an employer as an entity "who has employees." The Court said that several different factors must be considered in determining "the hiring party's right to control the manner and means by which the product is accomplished," including the extent of the hired party's discretion over when and how long to work, the method of payment, whether the work is part of the regular business of the hiring party, and other similar factors indicating the level of control exerted by the hiring party.

In *Secretary of Labor v. Froedtert Memorial Hospital* (2004), the Occupational Safety and Health Review Commission (OSHRC) applied the *Darden* factors that indicate "direction and control" to determine when one employer is jointly responsible for safety and health compliance with another employer. According to OSHRC, no one factor is decisive, but control over the manner and means by which a worker accomplishes the assigned tasks remains an important consideration. In addition, even when one employer is not a "joint employer" with another, one employer may have a legal duty under the OSH Act to protect the employees of another employer from hazards under OSHA's multi-employer citation policy [Rabinowitz, 2016].

Under the Fair Labor Standards Act (FLSA), which controls wage and working hour conditions, an employer may be responsible for the wages of an employee if the employer "suffers or permits" the work [Weil, 2015]. The "suffer and permit" standard for identifying joint employers is the broadest test among the employment laws.

The classification of gig workers has become controversial and has led to court challenges in several states, especially the classification of workers involved with Internet transportation platforms firm like Uber. Many firms in the gig economy maintain they are not employers, they have no employees, and their business model merely offers an online platform, allowing independent contractors and consumers to find each other [Smith and Leberstein, 2015]. However, workers claim the "platform" directs and controls many employment-like activities, treating them *as if* they were employees and not independent contractors [Smith and Leberstein, 2015]. As independent contractors, these workers are denied access to the government labor safety net established through Federal and state labor laws [Abraham and Taylor, 1996]. In a recent California case, a Federal district court judge said "the Court cannot conclude as a matter of law that Plaintiffs are Uber's independent contractors rather than their employees" [*O'Connor v Uber Technologies, Inc., 2015*]. Uber appealed and the case settled, so there is no resolution of the issue for now.

The misclassification of employees as independent contractors has grown into such a prevalent practice, denying workers critical protections and legal benefits, that the U.S. Department of Labor launched a "*DOL Misclassification Initiative,*" partnering with 31 states and the Internal Revenue Service to get workers the wages, benefits and protections to which they are entitled as employees [U.S. Department of Labor, 2015]. Denying injured workers coverage under state workers' compensation insurance can lead to financial ruin for the worker and his or her family, and transfer the costs of injury care to the public when it should be borne by the employer or job provider [Berkowitz and Smith, 2016].

Misclassification is international in scope. In 2006, the International Labour Organization (ILO) noted the difficulties of establishing whether or not an employment relationship exist. The ILO also noted an increase in the attempt to disguise the employment relationship leading to uncertainty about access to labor protections and benefits, and urged the development of national labor policies responsive to worker protections in new employment arrangements (ILO, 2006). While international and national government efforts are directed at providing guidance to resolve the (mis)classification of employees as independent contractors, others are

proposing to create new category of worker [Harris and Krueger, 2015] or significantly modify the established government safety net or abandon it altogether [Lehrer, 2016].

Occupational Health and Safety Issues and Nonstandard Arrangements

Work was established as social determinant of health by the Whitehall Studies. Whitehall I examined the mortality rates of male British civil servants in standard employment arrangements against their civil service grade levels over 10 years (1967–1977). A strong association was discovered between grade levels and mortality rates from a range of causes; men in the lowest grade had a mortality rate three times higher than that of men in the highest grade [Marmot et al., 1978. Whitehall II (1985–1988) found a similar dose–response gradient between mortality and grade level for both women and men [Marmot et al., 1991]. After 25 years, the Whitehall Studies continue to show employment grade differences in mortality [Van Rossum et al., 2000].

The Whitehall Studies established a new field of public health research by demonstrating the connection between socioeconomic status, psychosocial factors, and health outcomes [Gorman, 2012]. In the field of occupational health and safety, the Whitehall Studies also sparked a broader examination of work. The study of work organization factors as hazardous agents that could adversely affect workers' health and safety joined the traditional study of working conditions related to the physical, chemical, and biological agents involved in the processes, conditions, materials, and tasks workers perform. Only recently has attention turned to the study of work arrangements as hazardous "agents" that could also affect a worker's health [Benach and Muntaner, 2011].

Studies as early as the 1990s showed that poor mental health outcomes in workers could result from (i) major organizational changes [Ferrie et al., 1998]; (ii) downsizing [Vahtera et al., 1997; Kivimäki et al., 2000]; or (iii) sudden unemployment [Bartley, 1994; Dooley et al., 1996]. By 2006, a review of 27 studies indicated a solid association between psychological morbidity and temporary employment [Virtanen et al., 2006]. Studies of work-related injuries have also showed higher injury rates among agency workers than standard workers. Hospital agency nurses in the healthcare industry had higher rates of sharps injuries than their standard co-workers [Aiken et al., 1997]; agency workers in the petrochemical industry had higher rates of injury, especially when they were engaged in maintenance and turnaround procedures [Rebitzer 1995]; and agency workers had twice the injury rate than standard co-workers in plastics manufacturing industry [Morris, 1999].

By 2000, researchers were being encouraged to study the health-damaging potential of the new "flexible" forms of employment that were beginning to replace the previously studied industrial model standard arrangements [Benach et al., 2000]. In 2002, as a part of the first decade of the U.S. National Occupational Research Agenda (NORA), a public-private partnership to discuss priorities for research, a comprehensive plan for investigating and reducing occupational safety and health risks associated with hazards arising from work organization factors was developed that included surveillance, health effects studies, interventions, and promotion of work organization as a distinctive field in occupational health and safety research [Sauter et al., 2002]. A new branch of occupational health and safety research emerged that focused on the ways work was arranged, scheduled, and managed as important work-related and worker-related risk factors for health [Ferrie et al., 2008].

Since the NORA work organization research plan was published in 2002, a number of mortality and morbidity studies have been published indicating that workers in nonstandard arrangements are at higher risk of physical and mental injuries than are workers in industrial model standard work arrangements [Cummings and Kreiss, 2008]. In 2003, a study using longitudinal data collected from 10 Finnish towns showed that the overall mortality rate for temporary workers was 1.2–1.6 times greater than the rate for permanent employees largely from alcohol-related and smoking-related cancer [Kivimäki et al., 2003]. Importantly, workers who moved from temporary to permanent employment experienced a lower mortality risk than those who remained temporary workers. As a result of these studies, researchers realized that treating the "employed" as a single epidemiologic group may attenuate the associations between various types of work arrangements and mortality [Kivimäki et al., 2003].

In 2005, a systematic review of international, peer-reviewed studies showed that 7 of 13 reports showed an increased risk of work-related injuries among contingent workers [Virtanen et al., 2005]. In 2006, study of agency and contract workers reported that nonstandard workers had two times the rate of fatal and nonfatal work-related injuries than standard workers [Benavides et al., 2006]. In 2010, a Washington State study of the workers' compensation claims rate for agency workers found their rate to be double those of standard workers [Smith et al., 2010].

Illness outcomes were found greater in workers in nonstandard arrangements [Benach et al., 2004; Virtanen et al., 2005]. Increased illness morbidity may be related to the lack of paid sick leave benefits for nonstandard workers. Working while sick can increase the risk of injury. Workers with paid sick leave benefits were 28% less likely than workers without access to paid sick leave to sustain a work-related injury [Asfaw et al., 2012].

In the past 20 years, studies have demonstrated the existence of differential health risks between workers and nonstandard work arrangements. Why these differential risks

occur are not entirely clear. Workers in nonstandard arrangements may bear more injury risk because they are assigned more hazardous work and are reluctant to object [Rousseau and Libuser, 1997; Thebaud-Mony, 1999; Boden et al., 2016]. They may lack sufficient general or site-specific safety training [Kochan et al., 1994; Aronson, 1999; Occupational Safety and Health Administration, 2015], or lack access to appropriate personal protective equipment to do the job assigned them without risk of injury or death [Cummings and Kreiss, 2008]. Nonstandard workers who are assigned a series of temporary jobs lack a social connection to the permanent workers in their serial workplaces, workers who might be able to help protect them from worksite-specific hazards. Workers may also be reluctant to object to doing hazardous work, ask for additional training, or complain to OSHA because of their precarious status as nonstandard workers [Benavides et al., 2006; Foley et al., 2014; National Institute for Occupational Safety and Health, 2015]. Confusion may exist in part-time, agency, contract, and gig work arrangements, over who exactly bears the responsibility for various aspects of workplace safety [National Institute for Safety and Health, 2015].

Healthy Work Design and Worker Well-Being

Since occupational safety and health professionals have limited power to determine the specific work arrangements firms, employers, or Internet platforms use to accomplish work, more direct steps must be taken to identify the health and safety risks to workers associated with nonstandard work arrangements and develop interventions to mitigate or eliminate those risks. The global economic pressures that promote the growth of nonstandard work arrangements may only increase. While work organization, as a field of occupational health and safety research, has advanced in the past 20 years, an understanding of the pathways and mechanisms by which nonstandard work arrangements can affect worker health remains incomplete [Benach et al., 2014].

Better definitional clarity is needed to distinguish the standard arrangements from the increasing varieties of nonstandard work arrangements [Bernhardt, 2014; Benach et al., 2016]. Regular, government-based surveillance of the size of the workforce engaged in the various nonstandard work arrangements is also vital to accurately gauge potential health effects. Improved surveillance would also support design of prospective studies of the health effects from nonstandard arrangement as well as lead to effectiveness studies of regulatory, policy, and health and safety interventions [Boden et al., 2016]. The development, evaluation, and validation of tools to measure physical and social exposure variables found in nonstandard arrangements need to be done [Vives et al., 2010, 2015; Benach et al., 2012]. Also needed are health outcome studies and interventions that can prevent work-related and worker injury, illness, and fatalities across the spectrum of work arrangements [Sauter et al., 2002).

CONCLUSION

While nonstandard work arrangements may offer expanded economic opportunities for businesses, mounting evidence shows that these novel ways of working pose occupational health and safety risks for some workers. What kinds of risks, how much risk, and the number of workers who bear the risks from nonstandard work arrangements are not entirely clear. But what is exceedingly clear is that additional steps must be taken to develop healthier work designs and arrangements that safeguard the health and well-being of all workers, regardless of the work arrangement. In the Third Decade of NORA (2016–2026), NIOSH will convene partners from organizational science, epidemiology, occupational psychology, economics, sociology, law, management, labor health and safety, and worker advocacy to explore models for healthy work design *and* worker well-being, continuing to address the ever-shifting challenges workers face as they navigate the global economy.

AUTHOR'S CONTRIBUTIONS

The author made all the contributions to the conception or design of the article and the acquisition, analysis, and interpretation of data for the article. The author drafted the article and provided final approval of the version to be published. The author agrees to be accountable for all aspects of the article in ensuring that questions related to the accuracy or integrity of any part of the article are appropriately investigated and resolved.

ACKNOWLEDGMENT

The author wishes to thank Randy Rabinowitz, J.D. for her invaluable assistance in reviewing the author's exposition of the legal issues associated with nonstandard work arrangements.

FUNDING

There was no funding source.

ETHICS APPROVAL AND INFORMED CONSENT

None.

DISCLOSURE (AUTHOR)

The author reports no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

Steven Markowitz declares that he has no competing or conflicts of interest in the review and publication decision regarding this article.

DISCLAIMER

The findings and conclusions in this commentary are solely those of the author and do not necessarily represent the views of the National Institute for Occupational Safety and Health, the Centers for Disease Control and Prevention, or the U.S. Department of Health and Human Services.

REFERENCES

Abraham KG, Taylor SK. 1996. Firms' use of outside contractors: Theory and evidence. J Labor Econ 14(3):394–424.

Age Discrimination in Employment Act. 1967. Title 29 United States code Sections 621–634.

Aiken LH, Sloane DM, Klocinski JL. 1997. Hospital nurses' occupational exposure to blood: Prospective, retrospective, and institutional reports. Am J Public Health 87:103–107.

Alterman T, Luckhaupt SE, Dahlhamer JM, Ward BW, Calvert GM. 2013. Prevalence rates of work organization characteristics among workers in the U.S.: Data from the 2010 National Health Interview Survey. Am J Ind Med 56(6):647–659.

American Law Institute. 2015. Restatement of the law, employment law: Conditions for the existence of employment relationship, Section 1.01.

Americans With Disabilities Act. 1990. Title 42 United States Code Sections 12101–12213.

Aronson G. 1999. Contingent workers and health and safety. Work Employ Soc 13(3):439–459.

Asfaw A, Pana-Cryan R, Rosa R. 2012. Paid sick leave and nonfatal occupational injuries. Am J Public Health 102(9):e59–e64.

Bartley M. Unemployment and ill health: Understanding the relationship. J Epidemiol Community Health 48:333–337.

Benach J, Benavides FG, Platt S, Diez-Roux A, Muntaner C. 2000. The health-damaging potential of new types of flexible employment: A challenge for public health researchers. Am J Public Health 90(8):1316–1317.

Benach J, Gimeno D, Benavides FG, Martinez JM, Torne MM. 2004. Types of employment and health in the European Union: Changes from 1995 to 2000. Eur J Public Health 14(3):314–321.

Benach J, Muntaner C. 2007. Precarious employment and health: Developing a research agenda. J Epidemiol Community Health 61:276–277.

Benach J, Muntaner C. 2011. Employment conditions network (EMCONET). Employment and working conditions as health determinants. In: Lee JH, Sadana R, editors. Improving equity in health by addressing social determinants. Geneva: WHO. pp. 165–195. https://www.cugh.org/sites/default/files/Improving%20Equity%20in%20 Health%20by%20Addressing%20Social%20Determinants.pdf. Accessed September 16, 2016.

Benach J, Puig-Barrachina V, Vives A, Tarafa G, Muntaner C. 2012. The challenge of monitoring employment-related health inequalities. J Epidemiol Community Health 66(12):1085–1087.

Benach J, Vives A, Amable M, Vanroelen C, Tarafa G, Muntaner C. 2014. Precarious employment: Understanding an emerging social determinant of health. Annu Rev Public Health 35:229–253.

Benach J, Vives A, Tarafa G, Delclos C, Muntaner C. 2016. What should we know about precarious employment and health in 2025? Framing the agenda for the next decade of research. Int J Epidemiol 45(1):232–238.

Benavides FG, Benach J, Muntaner C, Delclos GL, Catot N, Amable M. 2006. Associations between temporary employment and occupational injury: What are the mechanisms? Occup Environ Med 63(6):416–421.

Berkowitz D, Smith R. 2016. On-demand workers should be covered by workers' compensation. National Employment Law Project. The rights on demand series. http://nelp.org/content/uploads/Policy-Brief-On-Demand-Covered-Workers-Compensation.pdf. Accessed August 8, 2016.

Bernhardt A. 2014. Labor standards and the reorganization of work: Gaps in data and research. Institute for Research on Labor and Employment Paper No. 100–14. http://www.irle.berkeley.edu/workingpapers/100-14.pdf. Accessed September 16, 2016.

Boden L, Spieler EA, Wagner G. 2016. The changing structure of work: Implications for workplace safety and health in the US. United States Department of Labor/Occupational Safety and Health Administration. http://www.dol.gov/asp/evaluation/completed-studies/Future_of_Work_the_implications_for_workplace_health_and_safety.pdf. Accessed September 16, 2016.

Broschak JP, Davis-Blake A. 2006. Mixing standard work and nonstandard deals: The consequences of heterogeneity in employment arrangements. Acad Manag J 49:372–393.

Broward C. 2013. OSHA cites Bacardi in man's fatal accident first day on the job. The Florida Times Union. http://jacksonville.com/news/crime/2013-02-11/story/osha-cites-bacardi-mans-fatal-accident-first-day-job. Accessed August 4, 2016.

Bureau of Labor Statistics. 2005. Contingent and alternative employment arrangements. http://www.bls.gov/news.release/pdf/conemp.pdf. Accessed July 11, 2016.

Cappelli P. 1999. Career jobs are dead. Calif Manage Rev 42(1):146–167.

Cappelli P, Keller JR. 2012. A study of the extent and potential causes of alternative employment arrangements. Ind Labor Relate Rev 66(4):873–901.

Cappelli P, Keller JR. 2013. Classifying work in the new economy. Acad Manag Rev 38(4):575–596.

Carey ML, Hazelbaker KL. 1986. Employment growth in the temporary help industry. Mon Labor Rev 1986:37–44.

Cummings KJ, Kreiss K. 2008. Contingent workers and contingent health. JAMA 299(4):448–450.

Dau-Schmidt KG, Ray, MD. 2004. The definition of "employee" in American labor and employment law. Japanese Institute for Labor and Policy Training, Comparative Labor Law Seminar 2004: The

mechanism for establishing and changing terms and conditions of employment/the scope of labor law and the notion of employees. http://www.jil.go.jp/english/events/documents/clls04_dauschmidt2.pdf. Accessed July 22, 2016.

Davis-Blake A, Broschak JP, George E. 2003. Happy together? How using non-standard workers affects exit, voice, and loyalty among standard employees. Acad Manag J 46:475–485.

Dey M, Houseman S, Polivka A. 2010. What do we know about contracting out in the United States? In: Abraham KG, Spletzer JR, Harper MJ, editors. Labor in the new economy. Chicago, IL: University of Chicago Press. pp. 267–304.

Dooko J, Mumford M, Schanzebach DW. 2015. Workers and the online gig economy. Hamilton Project Framing Paper. https://www.brookings.edu/wp-content/uploads/2016/07/workers_and_the_online_gig_economy.pdf. Accessed August 7, 2016.

Dooley D, Fielding J, Levi L. 1996. Health and unemployment. Annu Rev Public Health 17:449–465.

Employee Retirement Income Security Act. 1974. Title 29 United States Code, Chapter 18.

Fair Labor Standards Act. 1938. Title 29 United States Code Sections 201–219.

Family and Medical Leave Act. 1993. Title 29 United States Code Sections 2601 *et seq*.

Farrell D, Greig, F. 2016. Paychecks, paydays, and the online platform economy: Big data on income volatility. New York, NY: JP Morgan Chase Institute. https://www.jpmorganchase.com/corporate/institute/report-paychecks-paydays-and-the-online-platform-economy.htm. Accessed September 16, 2016.

Ferrie JE, Shipley MJ, Marmot MG, Stansfeld S, Davey Smith G. 1998. The health effects of major organizational change and job insecurity. Soc Sci Med 46:243–254.

Ferrie JE, Westerlund H, Virtanen M, Vahtera J, Kivimäki M. 2008. Flexible labor markets and employee health. Scand J Work Environ Health 6:98–110.

Foley M, Ruser J, Shor G, Shuford H, Sygnatur E. 2014. Contingent workers: Workers' compensation data analysis strategies and limitations. Am J Ind Med 57:764–775.

General Accountability Office. 2000. Contingent workers: Incomes and benefits lag behind those of rest of workforce. Washington, DC: GAO/HEHS-00-76. http://www.gao.gov/new.items/he00076.pdf. Accessed September 16, 2016.

General Accountability Office. 2006. Employer arrangements: Improved outreach could help ensure proper worker classification. Washington, DC: GAO-06-656. http://www.gao.gov/new.items/d06656.pdf. Accessed September 16, 2016.

General Accountability Office. 2015. Contingent workforce: Size, characteristics, earnings, and benefits. Washington, DC: GAO-15-168R. http://www.gao.gov/assets/670/669766.pdf. Accessed July 31, 2016.

Gorman S. 2012. Inequality, stress and health: The Whitehall studies. http://scienceblogs.com/thepumphandle/2012/10/03/inequality-stress-and-health-the-whitehall-studies/. Accessed August 6, 2016.

Harris SD, Krueger AB. 2015. A proposal for modernizing labor laws for 21st century work: The independent worker. The Hamilton Project. http://www.hamiltonproject.org/assets/files/modernizing_labor_laws_for_twenty_first_century_work_krueger_harris.pdf. Accessed September 1 6, 2016.

Hatton E. 2013. The rise of the permanent temporary economy. New York Times. http://opinionator.blogs.nytimes.com/2013/01/26/the-rise-of-the-permanent-temp-economy/?_r=0. Accessed July 11, 2016.

Hill S. 2015. Raw deal: How the uber economy and runaway capitalism are screwing American workers. New York: St. Martin's Press.

Internal Revenue Service. 2016. Independent contractor defined. https://www.irs.gov/businesses/small-businesses-self-employed/independent-contractor-defined. Accessed September 7, 2016.

International Labour Organization. 2006. R198—Employment relationship recommendation. (No. 198). http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312535. Accessed July 21, 2016

International Labour Organization. 2013. Women and men in the informal economy: A statistical picture. Geneva: ILO.

Kalleberg AL. 2000. Nonstandard employment relations: Part-time, temporary and contract work. Ann Rev Soc 26(1):341–365.

Kalleberg AL. 2013. Good jobs, bad jobs: The rise of polarized and precarious employment systems in the United States, 1970s to 2000s. New York, NY: Russell Sage Foundation.

Kalleberg AL, Marsden P. 2005. Externalizing organizational activities: Where and how US establishments use employment intermediaries. Socioecon Rev 3:389–416.

Kalleberg AL, Reskin BF, Hudson K. 2000. Bad jobs in America: Standard and nonstandard employment relations and job quality in the United States. Am Soc Rev 65:256–278.

Karoly LA, Panis CWA. 2004. The 21st century at work: Forces shaping the future workforce and workplace in the United States. RAND Corporation.

Katz LF, Krueger AB. 2016. The rise and nature of alternative work arrangements in the United States, 1995–2015. National Bureau of Economic Research. http://scholar.harvard.edu/files/lkatz/files/katz_krueger_cws_v3.pdf?m=1459369766. Accessed July 31, 2016.

Kivimäki M, Vahtera J, Pentti J, Ferrie JF. 2000. Factors underlying the effect of organizational downsizing on health of employees: Longitudinal cohort study. Br Med J 320:971–975.

Kivimäki M, Vahtera J, Virtanen M, Elovainio M, Pentti J, Ferrie J. 2003. Temporary employment and risk of overall and cause-specific mortality. Am J Epidemiol 158(7):663–668.

Kochan TA, Smith M, Wells JC, Rebitzer JB. 1994. Human resource strategies and contingent workers: The case of safety and health in the petrochemical industry. Hum Resour Manag 33(1):55–77.

Lehmann, RJ. 2015. 6 charts that debunk the 'gig' economy. R Street Shorts No. 11. http://www.rstreet.org/wp-content/uploads/2015/07/R-STREET-SHORTS-NO-11.pdf. Accessed August 2, 2016.

Lehrer E. 2016. The future of work. Nat Affairs 28:35–52.

Luo T, Mann A, Holden R. 2010. The expanding role of temporary help services from 1990 to 2008. Mon Labor Rev 133(8):3–16.

Luria G, Tagil D. 2010. Safety perception referents of permanent and temporary employees: Safety climate boundaries in the industrial workplace. Accid Anal Prev 42:1423–1430.

Marmot MG, Rose G, Shipley M, Hamilton PJS. 1978. Employment grade and coronary heart disease in British civil servants. J Epidemiol Community Health 32:244–249.

Marmot MG, Smith GD, Stansfeld S, Patel C, North F, Head J, White I, Brunner E, Feeney A. 1991. Health inequalities among British civil servants: The Whitehall II study. Lancet 337:1387–1393.

Morris JA. 1999. Injury experience of temporary workers in a manufacturing setting: Factors that increase vulnerability. AAOHN J 47:470–478.

Muhl CJ. 2002. What is an employee? The answer depends on federal law. Mon Labor Rev 125:3–11.

National Institute for Occupational Safety and Health. 2015. Addressing the hazards of temporary employment. NIOSH Science Blog. http://blogs.cdc.gov/niosh-science-blog/2015/06/16/temp-workers/. Accessed July 31, 2016.

National Labor Relations Act. 1935. Title 29 United States Code Sections 151–169.

Nationwide Mutual Insurance Company v. Darden, 503 U.S. 318, 322–323 (1992).

Nicholson JR. 2015. Temporary help workers in the U.S. labor market. ESA Issue Brief #03-15). http://www.esa.doc.gov/sites/default/files/temporary-help-workers-in-the-us-labor-market.pdf. Accessed September 17, 2017.

Occupational Safety and Health Act. 1970. Title 29 United States Code Sections 651–678.

Occupational Safety and Health Administration. 2015. Adding inequality to injury: The cost of failing to protect workers on the job. https://www.dol.gov/osha/report/20150304-inequality.pdf. Accessed August 2, 2016.

Occupational Safety and Health Administration and National Institute for Occupational Safety and Health. 2015. Protecting temporary workers. http://www.cdc.gov/niosh/docs/2014-139/pdfs/2014-139.pdf. Accessed September 17, 2016.

O'Connor v Uber Technologies, Inc., No. C-13-3826 EMC. 2015. https://onlabor.files.wordpress.com/2015/04/uber-order.pdf. Accessed July 21, 2016.

Ono Y. 2009. Why do firms use temporary workers? Federal Reserve Bank of Chicago, Chicago Fed letter, March 2009, No. 260. https://www.chicagofed.org/publications/chicago-fed-letter/2009/march-260. Accessed July 13, 2016.

Pedulla DS. 2013. The hidden costs of contingency: Employers' use of contingent workers and standard employees' outcomes. Soc Forces 92(2):691–722.

Pfeffer J, Baron JN. 1988. Taking workers back out: Recent trends in the structuring of employment. In: Staw BM, Cummings LL, editors. Research in organizational behavior. Greenwich, CT: JAI Press. Vol. 10, pp. 257–303.

Polivka A, Nardone T. 1989. On the definition of 'contingent work.' Mon Labor Rev. 9–14.

Poole C. 2015. Steady growth continues: Staffing and recruiting grows faster than the economy and the labor market. American Staffing Association. https://americanstaffing.net/posts/2015/10/22/steady-growth-continues/. Accessed September 10, 2016.

Rabinowitz R. 2016. Missed opportunities: How OSHA should ensure worker safety in the fissured workplace. Who is an employee and who is the employer? Proceedings of the New York University 68th Annual Conference on Labor. LexisNexis, 2016. Series editor: Samuel Estreicher; volume editor: Kati L. Griffith).

Rebitzer JB. 1995. Job safety and contract workers in the petrochemical industry. Ind Relat 34:4–57.

Rousseau DM, Libuser C. 1997. Contingent workers in high risk environments. Calif Manag Rev 39(12):103–123.

Sauter SL, Brightwell WS, Colligan MJ, Hurrell J, Katz T, LeGrande DE, Lessin N, Lippin RA, Lipscomb JA, Murphy LR, et al. 2002. The changing organization of work and the safety and health of working people. DHHS (NIOSH) Publication No. 2002–116.

Secretary of Labor v. Froedtert Memorial Hospital, 20 BNA OSHC 1500 (No. 97–1839, 2004).

Siqueira CE. 2016. Does informal employment exist in the United States and other developed countries? New Solut 26(2):337–339.

Smith R, Leberstein S. 2015. Rights on demand: Ensuring workplace standards and worker security in the on-demand economy. Washington, DC: National Employment Law Project. http://www.nelp.org/publication/rights-on-demand/. Accessed July 18, 2016.

Smith CK, Silverstein BA, Bonauto DK, Adams D, Fan ZJ. 2010. Temporary workers in Washington state. Am J Ind Med 53:135–145.

Social Security Act. 1935. Title 42 United States Code Chapter 7.

Stone KVW. 2004. From widgets to digits: Employment regulation in the changing workplace. New York, NY: Cambridge University Press.

Stone KVW. 2006. Legal protections for atypical employees: Employment law for workers without workplaces and employees without employers. Berkeley J Emp Labor L 27:251–286.

Thebaud-Mony A. 1999. Contracting and subcontracting by the French nuclear power industry. Int J Occup Environ Health 5(4):296–299.

Title VII of the Civil Rights Act. 1964. Title 42 United States Code Sections 2000e-2.

U.S. Department of Labor. 2015. Misclassification of employees as independent contractors. https://www.dol.gov/whd/workers/misclassification/. Accessed July 22, 2016.

Vahtera J, Kivimäki M, Pentti J. 1997. Effect of organizational downsizing on health of employees. Lancet 350:1124–1128.

Van Rossum CTM, Shipley MJ, Van de Mheen H, Grobbee DE, Marmot MG. 2000. Employment grade differences in cause specific mortality. A 25 year follow up of civil servants from the first Whitehall study. J Epidemiol Community Health 54(3):178–184.

Virtanen M, Kivimäki M, Joensuu M, Virtanen P, Elovainio M, Vahtera J. 2005. Temporary employment and health: A review. Int J Epidemiol 34:610–622.

Virtanen M, Kivimäki M, Joensuu M, Virtanen P, Elovainio M, Vahtera J. 2006. Temporary employment and health: A review. Int J Epidemiol 34(3):610–622.

Vives A, Amable M, Ferrer M, Moncada S, Llorens C, Muntaner C, Benavidea FG, Benach J. 2010. The employment precariousness scale (EPRES): Psychometric properties of a new tool for epidemiological studies among waged and salaried workers. Occup Environ Med 67:548–555.

Vives A, Gonzalez F, Moncada S, Llorens C, Benach J. 2015. Measuring precarious employment in times of crisis: The revised employment precariousness scale (EPRES) in Spain. Gac Sanit 29(5):379–382.

Weil D. 2014. The fissured workplace: Why work became so bad for so many and what can be done to improve it. Cambridge, MA: Harvard University Press.

Weil D. 2015. The application of the fair labor standards act's "suffer or permit" standard in the identification of employees who are misclassified as independent contractors. Administrator's interpretation 2015-1. Wage and Hour Division, U.S. Department of Labor. https://www.dol.gov/whd/workers/misclassification/AI-2015_1.htm. Accessed July 22, 2016.

Zohar D, Luria G. 2005. A multilevel model of safety climate: Cross-level relationships between organization and group-level climates. J Appl Psychol 90:616–628.