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Original Article

# What Could Total Worker Health® Look Like in Small Enterprises?

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## Abstract

Small enterprises have fewer resources, are more financially precarious, and have higher rates of occupational injury and illness compared with larger enterprises. Interventions that address the promotion of health and well-being in addition to traditional occupational safety and health hazards, a Total Worker Health® (TWH) approach, may be effective in reducing injuries and preventing illness. However, little research has examined the impact of TWH interventions in small enterprises. The aim of this research was to explore and characterize health and safety practices, policies, and programs in small Midwestern enterprises from a TWH perspective. Utilizing a case studies approach, site visits were conducted with small business, between 10 and 250 employees, from 2014 through 2016 and included workplace audits and interviews with multiple employees in varying roles within each organization. Both open and closed coding were used to identify specific themes. Eight themes emerged from the site visits: value and return on investment, organizational factors, program design, engaging employees, low-cost strategies, evaluation, and integration. These themes overlapped with both the National Institute for Occupational Safety and Health's (NIOSH) Essential Elements of TWH and the NIOSH Fundamentals. Industry sector and enterprise size also affect resources and integration of these resources. As TWH expands to organizations of all sizes, it is necessary to address the unique needs of smaller enterprises.

**Keywords:** total worker health; occupational safety; wellness; small business

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Work exposures, including organizational and environmental factors, not only increase the risk of injury and illness but also affect health behaviors and outcomes (Miranda *et al.*, 2015; Zhang *et al.*, 2015). Conversely, injuries, health behaviors, and well-being outside of the work environment can affect performance at work,

including injuries, turnover, absenteeism, and productivity (Goetzl *et al.*, 2004). In 2007, total medical costs in the USA from fatal and non-fatal occupational injuries and illnesses were an estimated \$250 billion in direct and indirect costs (Leigh, 2011). Furthermore, injured workers suffer from lower income and wages compared with those non-injured workers (Seabury *et al.*, 2014). To manage escalating healthcare costs for both the employers and employees, employers of all sizes are motivated to find and implement evidence-based solutions to reduce injuries and protect health.

Workplace interventions that address the promotion of health and well-being in addition to traditional occupational safety and health hazards may be more effective than programs addressing these separately (Sorensen *et al.*, 2013; Anger *et al.*, 2015). The National Institute for Occupational Safety and Health's (NIOSH) Total Worker Health® (TWH) approach, defined as interventions (policies, programs, and practices) that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being, specifically meets this need (NIOSH, n.d.). Both small and large enterprises report a return on investment (ROI) from implementing safety and health programs, but the return is less in smaller enterprises compared with larger enterprises (Merchant *et al.*, 2013; Goetzl *et al.*, 2014). A recent review of intervention studies that included both occupational safety and health promotion demonstrated that these combined programs were found to affect multiple outcomes associated with safety and chronic disease, indicating the benefits of TWH interventions (Anger *et al.*, 2015). However, the majority of TWH research to date has primarily addressed larger enterprises (typically more than 500 employees), leaving a lacuna of studies and evidence-based programs for smaller enterprises (Pronk, 2013; Bradley *et al.*, 2016).

### Disparities in small enterprises

The vast majority of workers are employed in small enterprises (Bowen *et al.*, 2009), which have higher rates of occupational injury and illness compared with larger enterprises (Cunningham and Sinclair, 2015). Smaller employers tend to focus on traditional workplace hazards (e.g. chemical exposure, repetitive motion) but often fail to consider the impact of the work environment or organization on health behaviors (e.g. substance use, physical activity) and/or health outcomes (e.g. psychosocial stress, cardiovascular disease). Smaller enterprises have fewer resources, are more financially precarious

(Lamm, 1997; Antonsson, 2002), and have fewer occupational safety and health programs compared with their larger counterparts (Linnan *et al.*, 2008). Owners often juggle multiple responsibilities, including employee safety and health programs, despite a lack of formal training in occupational safety and health (Lamm, 1997; Gardner *et al.*, 1999; Champoux and Brun, 2003). This may lead to less effective methods of both traditional and non-traditional hazard control (Gardner *et al.*, 1999; Antonsson, 2002; NIOSH, 2016a). NIOSH's TWH program has adapted the traditional hierarchy of controls (Schill, 2017), which recognizes that the most effective option is to eliminate the hazard before encouraging personal change. However, hazard elimination or reduction is not always possible.

### Components of successful TWH implementation

There are recognized components for the successful implementation of workplace safety and health programs. NIOSH has identified four major categories to increase the likelihood of success in adoption of TWH interventions (NIOSH, 2008). These include organizational culture and leadership (e.g. demonstrated leadership from top and middle management), program design (e.g. recognizing and eliminating known hazards, tailoring programs to the specific workplace), program implementation and resources (e.g. starting small and scaling up, having a strategic communication plan), and program evaluation (e.g. from needs assessment to outcome evaluation). The TWH approach emphasizes the 'integration' of protection from work-related safety and health hazards with the promotion of injury and illness prevention efforts. Indicators of integration may vary based on organizational size, and little is known about the integration in small enterprises. NIOSH has released two documents which provide businesses with best-practice typologies of areas that need to be considered when implementing TWH programs. In 2008, NIOSH released the Essential Elements of Effective Workplace Programs and Policies for Improving Worker Health and Wellbeing (Essential Elements), and in 2016, they updated the Essentials as the Fundamentals of Total Worker Health® Approaches: Essential Elements for Advancing Worker Safety, Health, and Well-being (NIOSH, 2016b; Fundamentals; Table 2). Although both reports suggest overall best practices based on published research, the research is heavily skewed toward larger employers. Therefore, the needs of small enterprises might be different regarding the implementation of TWH.

## Health and safety in the Midwest

Occupational safety and health disparities vary by region. The Midwest has disproportionately higher rates of fatal injuries and risky health behaviors. For example, in Federal Region VII workplace, fatalities rates range from 4.2 to 6.0 per 100 000 workers, which exceeds the national rate (3.8 per 100 000 workers in 2014; [United Health Foundation, 2015](#), December 3). Moreover, the Midwest is predominantly rural, which is associated with lower life expectancy ([Singh and Siahpush, 2014](#)) and poorer general health status, which increases healthcare costs ([Merchant et al., 2014](#)). Rates of smoking, drinking, and obesity are higher than national averages ([Hymel et al., 2011](#); [United Health Foundation, 2015](#)). These disparities demonstrate the need for TWH interventions to address the needs of small employers, particularly in the Midwest, which like the rest of the USA, is also dominated by small employers.

## Research objective

While the NIOSH materials to date suggest that TWH is appropriate for all workplaces of all sizes (e.g. [NIOSH, 2008, 2016b](#)), there has been limited attention to TWH adoption among small enterprises. The aim of this research was to explore and characterize health and safety practices, policies, and programs in small Midwestern enterprises from a TWH perspective.

## Materials and methods

Small Midwestern businesses in Iowa and Nebraska, between 10 and 250 employees, recognized for exemplary safety and/or wellness programs by their peers and other experts in local, state, and national awards competitions were selected as successful adopters of interventions that address worker safety and health ([Table 1](#)). Utilizing a case study approach, site visits were conducted from 2014 through 2016. The project was reviewed by the University's Institutional Review Board and deemed non-human subjects research.

Workplace audits included a tour of facilities and interviews with multiple employees in varying roles within each organization such as owners, employees, safety managers, and human resource directors. A semi-structured interview protocol facilitated the discussion. Interviews were video- and/or audio-taped, and photographs were taken to document practices, programs, and policies. Written and visual materials describing programs or policies were collected and coded. Both open and closed coding ([Lincoln and Guba, 1985](#)) were

used to identify specific themes (e.g. organizational factors, program design factors). Referential adequacy, peer debriefing, and member checking were employed to ensure the credibility of the findings ([Lincoln and Guba, 1985](#)). To achieve referential adequacy, coding began with data collected in round 1 of the site visits with 13 small enterprises. Round 2 site visits were then conducted at 19 enterprises. One enterprise was an umbrella organization (<250 employees total), which included seven operations in geographic proximity ([Table 1](#)). Data from the second-round site visits were analyzed to ensure that no new themes emerged, ensuring saturation. Peer debriefing was achieved through coding conducted by the first two authors (one who attended and one who did not attend the site visits) to ensure agreement on what was in the data in terms of major themes. Findings have been presented to more than 40 individuals representing those participating in the study, other small enterprises, and experts in occupational safety, health, and TWH to ensure findings were appropriately represented.

Following the initial coding, additional site visits were implemented to ensure saturation had been reached. The second set of site visits included a more diverse pool of small employers according to size and industry and also included non-award winners and public and private employers ([Table 1](#)).

## Results

Evidence of eight different themes emerged from the study. Themes included value on investment (VOI) and ROI, organizational factors, program design, engaging employees, low-cost strategies, evaluation, and integration ([Table 2](#)). Our results are also compared with the NIOSH essential elements ([NIOSH, 2008](#)) and the NIOSH fundamentals ([NIOSH, 2016b](#)) in [Table 2](#).

### Value and return on investment

Participants tended to focus on VOI rather than ROI but acknowledged that both are important to get leadership buy in. Many employers described the value in terms of team morale and collaboration, reduced turnover, and engagement at work. In addition, there was recognition that there can be immediate effects, but most often, benefits will take time (e.g. 'have to have faith that with time incentives will pay off'). Larger small enterprises (those with more than 100 employees who provide health insurance) reported positive impacts on insurance premiums for both the employer (e.g. reduced costs) and employees (e.g. no annual increase, midyear rebates).

**Table 1.** List of site visits by industry and size.

Employer industry	Size
PHASE 1	
Municipal waste management	<50
Warehouse services	<50
Manufacturing	<50
Manufacturing, distribution	<50
Communication technology	50–99
Communication technology	50–99
Steel fabrication, manufacturing	50–99
Retail distribution	50–99
Transportation	50–99
Manufacturing	100–249
Utility management, service	100–249
Manufacturing	100–249
Distribution, service	100–249
PHASE 2	
Accounting	<50
Retail	<50
Insurance	<50
Transportation	50–99
Same employer (multiple businesses)	100–249
Agriculture	(<50)
Forestry	(<50)
Manufacturing, retail distribution	(<50)
Retail distribution	(<50)
Manufacturing, retail distribution	(<50)
Retail	(<50)
Agriculture	(<50)
Waste management, recycling	100–249
Electrical engineering, service	100–249
Municipal government	50–99
Municipal government	100–249
Municipal government	100–249
Municipal government	100–249
Municipal government	100–249
Municipal government	<50
Municipal transportation	<50

However, because they are still small, there is a recognition that even one catastrophic claim to their workers' compensation insurance or health insurance coverage could eliminate the ROI. Other benefits to employees included feeling valued, increased productivity, and a quicker return to work if injured.

### Organizational factors

Organizational factors identified included demonstrated top management support, multilevel leadership, a participatory approach, and policy development for a long-term organizational change. Upper management in small

employers was frequently engaged in daily activities and interacted with all levels of employees, making management buy in easier to observe in small enterprises compared with larger enterprises. Employees' direct access to senior management and their perception of senior management's commitment to the employee contributed to what is perceived as a 'family atmosphere.' This analogy was prevalent at all site visits.

There were lots of visible signs demonstrating management commitment to employee health and safety, which ranged from mission statements that explicitly stated support for employee health and safety to signage and visual endorsement through their purposeful participation in programs and behaviors (e.g. wearing gloves and respirators, using seatbelts in the forklift, biking to work). Furthermore, companies demonstrated organizational commitment from the day an employee is hired. Safety and wellness are addressed during orientation and continues throughout the tenure of the job.

### Program design

Employers identified the need to analyze existing programs, policies, and practices, as well as examine relevant data in order to prioritize needs and direct resources accordingly. Many stated it was important to think about what they had and how they could build from there to create interventions. For example, after identifying an increase in musculoskeletal injuries, several employers responded by adopting programs addressing workplace design as well as wellness-related topics.

In terms of wellness, there were multiple approaches at the individual level including programs addressing smoking cessation, weight management, and physical activity. At a broader level, environmental changes included replacing vending machine options with healthier choices, installing bike racks, providing fitness equipment on site, or discounted gym memberships. Policies addressing safety and health included smoke-free workplaces, cell phone use, personal protective equipment (PPE), equipment maintenance, and flexible schedules.

It was also apparent that the nature of the workplace dictated the type and format of programs. Manufacturing facilities emphasized the elimination of slip, trip, and fall hazards through the use of well-marked walking paths through the facility and housekeeping policies. Most of the office facilities were concerned with the hazards associated with sedentary work and utilized multiple solutions such as workstation design, policies for standing meetings, programs for physical activity, and simple solutions such as moving the printer away from the desk. Worksite challenges were common across all types of facilities (e.g. weight loss, physical activity). Program

**Table 2.** Themes identified from site visits, NIOSH Essential Elements, and NIOSH Fundamentals of Total Worker Health.

Themes identified from site visits	Essential elements major categories	Fundamentals major categories
VOI/ROI		
Organizational factors	Organizational culture and leadership	Element 1: Demonstrate leadership commitment to worker safety and health at all levels of the organization.
Program design	Program design	Element 2: Design work to eliminate or reduce safety and health hazards and promote worker well-being. Element 4: Ensure confidentiality and privacy of workers.
Engaging employees	Program implementation and resources	Element 3: Promote and support worker engagement throughout program design and implementation.
Low-cost strategies	Program implementation and resources	Element 2: Design work to eliminate or reduce safety and health hazards and promote worker well-being. Element 4: Ensure confidentiality and privacy of workers. Element 5: Integrate relevant systems to advance worker well-being.
Evaluation	Program evaluation	
Integration		Element 5: Integrate relevant systems to advance worker well-being.

delivery was tailored to employee preferences, for example online versus paper reporting, lunch-and-learns versus online resources, and group classes versus individual coaching.

### Engaging employees

There were multiple opportunities for employee participation in decision-making, including participation in safety and wellness committees and meetings, informal interactions with management, suggestion boxes, and so on. One unique example was a large whiteboard in a break room where employees could post suggestions and concerns, and then management would respond and indicate how this was addressed or changes implemented. This provided opportunities for both management and employees to provide input into identifying problems, opportunities, and solutions and also provided a way to publically keep management accountable.

Tailoring programs to meet the needs and preferences of workers was a key program element. One company, recognizing the hazard/risk for eye injuries, had difficulty with employees complying with policy to wear eye protection at all times. Employees were least likely to wear the eye protection when they were observed or interacting with the public. To increase adherence, the workers were involved in the selection of new eye protection and were able to select functional, but stylish, safety glasses. The employees not only became more adherent but also asked whether they could use the safety glasses off the job. Recognizing the benefits, the employer changed their policy to allow employees to use these both on and off the job.

There were also some challenges in engaging employees, such as the need to protect confidentiality at all stages including program design and evaluation. For example, many enterprises utilized contests to promote health behaviors. However, not everyone wants others to know detailed information about their behaviors or outcomes (e.g. weight), which needs to be considered in program design and communication. Another challenge is workers who work off-site or do not work a standard schedule. Most programs tend to be offered during the typical work week and assume physical presence. Although recognizing the need to offer programs during later shifts, most employers found the cost prohibitive. Furthermore, the discussions focused on full-time employees and did not address part-time or seasonal workers.

In order to encourage participation, employers recognize that programs need to be of interest to employees. Most workplaces indicated their employees' experienced psychosocial stress and several included programs to address this such as visiting chaplains, financial planning/management, and flexible schedules in addition to employee assistance programs (EAPs). Participation also increased if families were able to participate, such as making exercise facilities available to families, including families in challenges and workplace events, addressing safety and health at work and home (e.g. fire safety, ladder safety, PPE use). Identifying employees who are passionate about safety and/or health to promote activities was another way to increase participation. Publicly recognizing those individuals can also be helpful in reinforcing and modeling healthy and safe behaviors.

Incentives such as premium reductions, discounts, gift cards, and small prizes were frequently used. One company recognized one employee per month who exemplified commitment to safety and/or health by providing that employee with a superhero figure that they could place in their workspace for the month.

### Low-cost strategies

All employers indicated a strong need for effective, low-cost strategies. During the site visits, they shared their examples and asked us for other ideas. Many programs had limited budgets and were led by individuals with limited training and expertise in health and safety or they hired external consultants. One recommended low-cost solution is to change out the food in the vending machines. However, identifying vendors to provide healthier choices was a challenge. To overcome this, employers provided healthy food options in break rooms that were low or no cost to employees and hydration stations. Employers also tended to promote PPE to mitigate hazards instead of focusing on more costly engineering solutions. Many solutions were implemented slowly and over time. A ‘start small and scale up’ approach helped contain costs and allowed employees time to adapt to changes. In addition, there was an emphasis on communicating programming and promoting policies through existing staff meetings, newsletters, signage in frequently used spaces (e.g. bathrooms and breakrooms), and online. Another solution was to place promotional material in paycheck envelopes to be taken home where family members also had access.

### Evaluation

There was a clear interest in evaluation metrics. However, some metrics are not appropriate, such as health risk assessments, because the small number of employees makes it difficult to protect confidentiality. In addition to wanting low-cost program solutions, they also wanted low-cost and easy-to-implement evaluation solutions, such as suggestion boxes, verbal feedback at meetings, short surveys after activities, or new policy initiation.

Many employers used qualitative data such as open-ended comments on evaluation forms and in meetings. There was a considerable amount of attention to process measures such as the number of participants in a given program but less attention to outcomes of specific programs, policies, and practices. There also tended to be a lack of cohesive and comprehensive evaluation plans. In many cases, employers were utilizing a continuous improvement model, making adjustments based on feedback as quickly as possible. They were willing to

abandon programs that were not working (e.g. low participation rates, strong negative feedback).

Some employers made concerted efforts to look at existing data, such as workers compensation claims, benefits data, sick leave use, and turnover. However, few indicated they had done a more formal evaluation or considered quantitative data that they might already have, such as workers compensation claims. Two of the companies, both municipalities, began specific health programs after a review of workers’ compensation claims indicated high musculoskeletal injury rates among a specific work group. Larger programs were more likely to have quantitative data or could afford an outside vendor to assist with evaluation.

### Integration

While most did not know the term ‘Total Worker Health’, there was evidence of health and safety integration, an essential tenet of TWH. Integration occurred through combined or joint safety and health committee meetings, the use of health data to develop programming addressing safety or safety data to address health needs. Safety is often required by law to be in place. Wellness programs tended to be more recently introduced and were adopted after safety programs had been implemented. Furthermore, wellness programs often had the added burden of demonstrating ROI or VOI. Wellness staff always talked about the value of safety, but safety staff were less likely to talk about the value of wellness. There was some recognition of the link between safety and health (‘safer workforce is healthier- healthier is safer’).

Some employers created innovative, low-cost integrated activities. One noteworthy example was contests to complete different tasks or activities to complete a bingo card. Examples included seatbelt use, fruit/vegetable consumption, fire drills at home/work, sunscreen use, and mental health breaks during the work day.

### Discussion

Small enterprises included ROI, VOI, and low-cost strategies as critical elements for the implementation of safety and health programming. This suggests that as TWH expands to organizations of all sizes, there are unique needs of smaller enterprises. The findings are consistent with a panel report from the National Institutes of Health Pathways to Prevention Workshop entitled ‘What’s work got to do with it?’ (Bradley *et al.*, 2016). The panel reviewed the current state of the evidence supporting TWH and identified small enterprises as a priority area. The panel also recognized that consideration



of ROI and VOI may look different in small enterprises compared with larger ones. Although recognized as important, ROI and VOI are not included in either the NIOSH Essential Elements or NIOSH Fundamentals. Although not unique to small enterprises, they may have a greater influence on adoption of programs due to limited resources and the lack of demonstrated effectiveness in smaller enterprises.

Industry sector and enterprise size also impacted resources and integration of these resources. Industry sector affected whether the emphasis was on health protection or health promotion. Enterprise size also impacted resources and integration of these resources. When there were fewer resources, including personnel, integration was likely occurring due to features of small enterprises and not due to a strategic effort to integrate programming. Very small employers are often integrated *de facto* due to the limited number of employees; one employee may have multiple responsibilities. For example, smaller enterprises rarely had staff dedicated exclusively to safety and/or health. Consistent with previous research, owners tended to have multiple responsibilities, including the safety and health of employees (Lamm, 1997; Gardner *et al.*, 1999) and therefore had integrated programming. We found that the motivation for integration did not initially occur because of a perceived benefit to safety and/or health but rather due to a lack of resources.

NIOSH considers integration to be a key component of TWH. However, the research to date doesn't fully consider the reason for integration and focuses instead on indicators of integration (Sorensen *et al.*, 2013; Williams *et al.*, 2016). In small enterprises, growth may make them vulnerable to discontinuing integrated programming once they have additional resources to hire dedicated personnel. Future research, particularly with small enterprises, should more explicitly examine motivating factors in addition to indicators of integration.

The focus of the study was to explore and characterize health and safety programming in small enterprises from a TWH perspective. As a qualitative study, the focus was to collect in-depth information from a smaller sample of employers rather than to survey a larger, more generalizable sample on a fewer number of factors. Given the scope, another limitation is that we could not compare by sector or size of employer. Resulting themes had some overlap with both the NIOSH Essential Elements (2008) as well as the NIOSH Fundamentals (NIOSH, 2016b; Table 2). Future studies should evaluate the prevalence of themes among a large, national sample.

## Declaration

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## References

- Anger WK, Elliot DL, Bodner T *et al.* (2015) Effectiveness of total worker health interventions. *J Occup Health Psychol*; 20: 226–47.
- Antonsson AB, Birgersdotter L, Bornberger-Dankvardt S. (2002) *Small enterprises in Sweden: health and safety and the significance of intermediaries in preventive health*. Stockholm, Sweden: Arbetslivsinstitutet.
- Bowen M, Morara M, Mureithi S. (2009) Management of business challenges among small and micro enterprises in Nairobi-Kenya. *KCA J Bus Manag*; 2: 16–31.
- Bradley CJ, Grossman DC, Hubbard RA *et al.* (2016) Integrated interventions for improving total worker health: a panel report from the National Institutes of Health Pathways to Prevention Workshop: total worker health-What's work got to do with it? *Ann Intern Med*; 165: 279–83.
- Champoux D, Brun J-P. (2003) Occupational health and safety management in small size enterprises: an overview of the situation and avenues for intervention and research. *Safety Science*; 41: 301–18. doi:10.1016/S0925-7535(02)00043-7
- Cunningham TR, Sinclair R. (2015) Application of a model for delivering occupational safety and health to smaller businesses: case studies from the US. *Saf Sci*; 71: 213–25.
- Gardner D, Carlopio J, Fonteyn PN *et al.* (1999) Mechanical equipment injuries in small manufacturing businesses. Knowledge, behavioral, and management issues. *Safety Science*. doi:10.1016/S0925-7535(99)00019-3
- Goetzel RZ, Long SR, Ozminkowski RJ *et al.* (2004) Health, absence, disability, and presenteeism cost estimates of certain physical and mental health conditions affecting U.S. employers. *J Occup Environ Med*; 46: 398–412.
- Goetzel RZ, Tabizi M, Henke RM *et al.* (2014) Estimating the return on investment from a health risk management program offered to small Colorado-based employers. *J Occup Environ Med*; 56: 554–60.
- Hymel PA, Loeppke RR, Baase CM *et al.* (2011) Workplace health protection and promotion: a new pathway for a healthier—and safer—workforce. *J Occup Environ Med*; 53: 695–702.
- Lamm F. (1997) Small businesses and OH&S advisors. *Saf Sci*; 25: 153–61.
- Leigh JP. (2011) Economic burden of occupational injury and illness in the United States. *Milbank Q*; 89: 728–72.
- Lincoln YS, Guba EG. (1985) *Naturalistic inquiry*. Newbury Park, CA: Sage Publications.

- Linnan L, Bowling M, Childress J *et al.* (2008) Results of the 2004 National Worksite Health Promotion Survey. *Am J Public Health*; **98**: 1503–9.
- Merchant JA, Lind DP, Kelly KM *et al.* (2013) An employee total health management-based survey of Iowa employers. *J Occup Environ Med*; **55**: S73–7.
- Merchant JA, Kelly KM, Burmeister LF *et al.* (2014) Iowans speak about their health: the rural-urban divide. Real Iowan Research Initiative. Available at HWCE website: <http://www.public-health.uiowa.edu/hwcmw/wp-content/uploads/2014/05/Full-Report-Appendices-7-14-11.pdf>. Accessed 4 March 2018.
- Miranda H, Gore RJ, Boyer J *et al.* (2015) Health behaviors and overweight in nursing home employees: contribution of workplace stressors and implications for worksite health promotion. *Sci. World J*; **2015**: 915359.
- National Institute for Occupational Safety and Health (NIOSH). (2008). Essential elements of effective workplace programs and policies for improving worker health and wellbeing. Available at <https://www.cdc.gov/niosh/docs/2010-140/pdfs/2010-140.pdf>. Accessed 4 March 2018.
- National Institute for Occupational Safety and Health (NIOSH). (2016a). Hierarchy of controls. Available at <https://www.cdc.gov/niosh/topics/hierarchy/default.html>. Accessed 4 March 2018.
- National Institute for Occupational Safety and Health (NIOSH). (2016b). *Fundamentals of Total Worker Health® approaches: essential elements for advancing worker safety, health, and well-being*. In Lee MP, Hudson H, Richards R *et al.*, editors on behalf of the NIOSH Office for Total Worker Health®. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. DHHS (NIOSH) Publication No. 2017–112. Available at [https://www.cdc.gov/niosh/docs/2017-112/pdfs/2017\\_112.pdf](https://www.cdc.gov/niosh/docs/2017-112/pdfs/2017_112.pdf). Accessed 3 March 2018.
- National Institute for Occupational Safety and Health (NIOSH). (n.d.). What is Total Worker Health®? Available at <https://www.cdc.gov/niosh/twh/totalhealth.html>. Accessed 4 March 2018.
- Pronk NP. (2013) Integrated worker health protection and promotion programs: overview and perspectives on health and economic outcomes. *J Occup Environ Med*; **55**: S30–7.
- Schill AL. (2017) Advancing well-being through Total Worker Health®. *Workplace Health Saf*; **65**: 158–63.
- Seabury SA, Lakdawalla DN, Walter D *et al.* (2014) Patient outcomes and cost effects of Medicaid formulary restrictions on antidepressants. *Forum Health Econ Policy*; **17**: 153–68.
- Singh GK, Siahpush M. (2014) Widening rural–urban disparities in life expectancy, US, 1969–2009. *Am Journal of Prev Med*; **46**: e19–29. doi:10.1016/j.amepre.2013.10.017
- Sorensen G, McLellan D, Dennerlein JT *et al.* (2013) Integration of health protection and health promotion: rationale, indicators, and metrics. *J Occup Environ Med*; **55**: S12–8.
- United Health Foundation. (2015) United Health Foundation’s America’s Health Rankings. Available at <http://www.americashealthrankings.org/search?q=occupational+fatalities>.
- Williams JA, Schult TM, Nelson CC *et al.* (2016) Validation and dimensionality of the integration of health protection and health promotion score: evidence from the PULSE small business and VA medical center surveys. *J Occup Environ Med*; **58**: 499–504.
- Zhang Y, Flum M, West C *et al.* (2015) Assessing organizational readiness for a participatory occupational health/health promotion intervention in skilled nursing facilities. *Health Promot Pract*; **16**: 724–32.