

## Commentary

# Conference Summary Understanding Small Enterprises Conference, 25–27 October 2017

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## Abstract

**Objectives:** The specific objectives of the 2017 Understanding Small Enterprises Conference were to: (i) identify successful strategies for overcoming occupational safety and health (OS&H) barriers in small and medium-sized enterprises (SMEs); (ii) disseminate best practices to research and business communities; (iii) build collaborations between different stakeholders including researchers, insurers, small enterprises, government agencies; and (iv) better inform OS&H research relevant to SMEs.

**Methods:** A two and a half day international conference was organized, building upon three previously successful iterations. This conference brought together researchers, practitioners, and other stakeholders from 16 countries to share best practices and emerging strategies for improving OS&H in SMEs.

**Findings:** Cross-cutting themes that emerged at the conference centered around: 1) stakeholder and intermediary involvement; 2) what occupational health and safety looks like across different industries; 3) intervention programs (tools and resources); 4) precarious and vulnerable work and the informal sector; and 5) Total Worker Health® in SMEs.

**Conclusion:** A number of innovative initiatives were shared at the conference. Researchers must build collaborations involving a variety of stakeholder groups to ensure that OS&H solutions are successful in SMEs. Future OS&H research should continue to build upon the successful work of the 2017 Understanding Small Enterprises Conference.

**Keywords:** occupational health; safety; small and medium-sized enterprises; Total Worker Health®

## Introduction

This special issue of the journal *Annals of Work Exposures and Health* focuses on occupational safety and health (OS&H) in small and medium-sized enterprises (SMEs) and provides an overview of the 2017 Understanding Small Enterprises Conference (USE) 2017, as well as a selection of papers reflecting the types of work emerging in the field. Regardless of how one chooses to define micro, very small, small, and medium-sized businesses, SMEs make up the majority of business around the world. In 2015, in the USA, 88% of enterprises had fewer than 20 employees (U.S. Census, 2015). Further, small enterprises are a majority of businesses across all industry sectors (Cunningham *et al.*, 2014). Similarly, in the European Union (EU), 99% of all non-financial enterprises were SMEs (EU-OSHA, 2018). SMEs cover a large percentage of the workforce and these employers and workers face unique challenges, as compared to larger enterprises.

Small enterprises employ a disproportionate number of workers in every high-risk sector, including accommodation and food services, service industries, extraction, wholesale trade, construction, and agriculture/forestry/fishing/hunting (NIOSH, 1999; Cunningham *et al.*, 2014). Not surprisingly, these workers bear a disproportionate burden of occupational fatalities, illnesses, and injuries (Fabiano *et al.*, 2004; Fenn and Ashby, 2004; Buckley *et al.*, 2008). Small enterprises do not offer the same level of health protection, health promotion, or employee benefits found in larger enterprises (Breslin *et al.*, 2010; MacEachen *et al.*, 2010; Pronk, 2013; McCoy *et al.*, 2014; Anger *et al.*, 2015; Newman *et al.*, 2015). Further, small enterprises present unique challenges for OS&H researchers, given the diversity of characteristics such as size, business age, structure, location (rural, urban), use of subcontracting, employment of a contingent workforce, culture, and manager-centricity. Further, small enterprises employ a much higher proportion of workers from vulnerable categories including migrant, seasonal, part-time, minority, and low wage workers, among others (Cunningham *et al.*, 2014).

There remains a relative paucity of OS&H research, considering the magnitude of the problem. What literature does exist often fails to account for the unique characteristics of small enterprises (Pinder *et al.*, 2016). Researchers who are generally interested in small enterprises typically lack OS&H expertise (Hasle and Limborg, 2006). Further, many studies take OS&H approaches that are successful for larger enterprises and try to adapt them to smaller enterprises, without considering how small enterprises differ from their

larger counterparts (Hasle and Limborg, 2006). Even less research has been done examining how paradigms like Total Worker Health® (TWH) can be applied to SMEs (Institute of Medicine, 2014). It is also important to understand the organization and culture of small enterprises, including obstacles such as lack of safety and health resources, lack of dedicated staff, and lack of ability to identify hazards (NIOSH, 1999; Linnan *et al.*, 2008; McCoy *et al.*, 2014; EU-OSHA, 2018). Sustainable research communities around OS&H issues in small enterprises and more high-quality research have been identified as needs in this field (Hasle and Limborg, 2006; EU-OSHA, 2018).

There is emerging recognition that due to the unique nature of SMEs, different strategies, and approaches are necessary in research and in practice. Further, to truly represent the SME perspective, it is important to engage a variety of stakeholders, including enforcement agencies, OS&H professionals, insurance companies, trade associations, labor unions, and chambers of commerce, among many others (Cunningham and Sinclair, 2015; Legg *et al.*, 2015). In response to the unique needs of SMEs, the multiple stakeholders with interest, and the growing number of researchers internationally, the first Understanding Small Enterprises Conference was held in 2009 and has subsequently been hosted in 2013, 2015, and most recently in 2017.

The USE 2017 was a two and a half day event held in Denver, CO, from 25 to 27 October 2017. USE 2017 brought together researchers, practitioners, and other stakeholders in the area of OS&H research in small enterprises to learn and to network. The specific objectives for the conference were to: 1) identify successful strategies for overcoming OS&H barriers in small enterprises; 2) disseminate best practices to research and business communities; 3) build collaborations between different stakeholders (e.g., researchers, insurers, small enterprises, government agencies); and 4) better inform OS&H research relevant to small enterprises.

USE 2017 built upon the three successful iterations of the conference. Previous conference themes were *Understanding the Issues* (2009), *Putting Understanding into Action* (2013), and *A Healthy Working Life in a Healthy Business* (2015). The theme of USE 2017 was *Worker Well-Being and Sustainable Business Health: From Ideas to Achievable Reality*. See <https://useconference.com> for more conference details. The final USE 2017 conference program included 8 keynote addresses, 4 plenary panels, 12 concurrent sessions with 59 individual presentations, and 12 poster presentations. Table 1 presents a summary of the conference program. There were 146 conference attendees, representing

**Table 1.** USE 2017 Conference Program Summary.

Keynote addresses	Boudreau, John: Is 'Human Resource Management' a Catalyst or an Impediment to Achieving Worker Well-Being and Sustainable Business Success? Brosseau, Lisa: What is Total Worker Health for Small Manufacturing Businesses? Lessons Learned from an Integrated Workplace Safety—Smoking Cessation Intervention Study Hasle, Peter: Between a Rock and a Hard Place—the Small Business Dilemmas in the Control of Occupational Health and Safety LaMontagne, Anthony: Workplace Mental Health: Developing an Integrated Approach in Small Enterprises Marín, Luz Stella: Safety Training for Small Construction Contractors: Cases from Colombia and the USA Ringen, Knut: Challenges for Safety and Health in Industries with Contingent or Intermittent Employment: Experience from the Construction Industry in the USA Sorensen, Glorian: Pathways to Implementing Total Worker Health: Implications for Small Enterprises Weil, David: The Fissured Workplace and the Future of Work
Panels	Research to Practice Plenary Small Business Perspective Plenary I Small Business Perspective Plenary II The Future: Where do We Go From Here? Plenary
Concurrent sessions	Improving Safety in Small Enterprises Occupational Safety and Health in Small Industrial Settings Tools, Resources, and Systems for Small Enterprises Total Worker Health in Small Enterprises Vulnerable Workers Workers and Their Families Ergonomics in Small Enterprises Impact of Business Size Meaningful Work Support Networks The Role of Public Health in Small Enterprises USE Conference in Review: What Have We Learned and Achieved? Health and Safety Management Systems Health Services for Small Enterprises Prevention in High-Risk Industries The Informal Economy Wellness Programs in Small Enterprises Workplace Health and Safety in Construction

16 countries. Roughly, a third of attendees were non-research stakeholders, which allowed for an exchange of ideas between researchers and representatives from small enterprises and intermediary organizations. Papers were solicited for this special issue from the presenters at USE 2017. In addition, NIOSH will publish Conference Proceedings containing extended abstracts from other presentations from USE 2017.

### Cross-cutting conference themes

A number of themes cut across the USE 2017 presentations including: 1) stakeholder and intermediary involvement; 2) what OS&H looks like in different industries; 3) intervention programs (tools and resources);

4) precarious or vulnerable workers and the informal sector; and 5) TWH in SMEs.

### Stakeholder and intermediary involvement

Researchers have demonstrated the importance of gaining input from a range of stakeholder groups and intermediaries who have a role in implementing OS&H in SMEs. Examples of stakeholders include government agencies, regulators, OS&H professionals, human resources, insurance, trade associations, chambers of commerce, educational organizations, and customers, among others (Cunningham and Sinclair, 2015; Legg *et al.*, 2015). SMEs may rely more heavily on intermediary organizations than their larger counterparts, due to a lack of capacity for undertaking such activities on

their own (Sinclair *et al.*, 2013). Hasle and Limborg (2006) note that intermediaries serve as important conduits between successful and cost-effective interventions, and the SMEs who lack the expertise and resources to implement OS&H practices. In order to be successful, intermediaries and SMEs have an expectation of a mutually beneficial relationship that builds upon shared goals (Sinclair *et al.*, 2013).

Recognizing the importance of the contribution of multiple stakeholders, the USE 2017 planning committee made a particular effort to engage with various stakeholders when soliciting abstracts and developing the final conference program. One of the highlights of USE 2017 was bringing together researchers, public health practitioners, small enterprise owners, and intermediaries to have rich discussions around the OS&H issues facing SMEs. Participants at USE 2017 came from organizations such as NIOSH, the U.S. Small Business Administration, chambers of commerce, U.S. Occupational Safety and Health Administration (OSHA), and economic development organizations. To increase the academic and practitioner understanding of the role of various stakeholders, keynote addresses explored the perspectives of owner-managers (Hasle, 2017), human resources (Boudreau, 2017), and labor (Ringen, 2017). Further, three-panel sessions incorporated the experiences of small business owners and managers, to inform conference attendees about the business side of OS&H in SMEs. Conference evaluations noted the success and importance of these panel sessions and the value attendees placed on learning about business owners' and other non-academic stakeholders' perspectives.

USE 2017 further included the role of stakeholders and intermediaries through a number of concurrent session presentations that provided new evidence for the importance of stakeholders on OS&H in SMEs. Some examples included the Michigan Healthy Nail Salon Cooperative, which is an interdisciplinary organization that focuses on research, education, and advocacy to improve the health and safety of nail salon workers (Sayler, 2017). This academic/non-profit collaboration demonstrated the potential for academic researchers and non-profit organizations to work together to improve OS&H in SMEs. Another conference presenter outlined the different stakeholders from two industries (construction and transportation) and presented results from collective interviews and good practices that were identified (Caroly *et al.*, 2017). In both cases, there were multiple stakeholders, including local and national prevention stakeholders, government agencies, labor, and health-care, among others. Other stakeholder and intermediary perspectives that were represented at the conference

included vocational colleges (Bejan, 2017), community-based coalitions (Tellis, 2017), occupational health services (Rajala, 2017), and workers' compensation (Parker *et al.*, 2017; Schwatka *et al.*, 2017). A common theme that emerged was that stakeholder groups often provided much-needed advice, information, and training for SMEs.

### What OS&H looks like in different industries

There is recognition that unique problems are encountered in different industries, such as chemical exposures in nail salons or fall hazards on construction sites. There is still a need to identify hazards and examine root causes to improve OS&H SME outcomes (Legg *et al.*, 2015). However, SMEs across industries face many shared OS&H challenges, including limited time, a lack of OS&H expertise and resources, limited OS&H personnel, and lack of ability to identify hazards (NIOSH, 1999; EU-OSHA, 2018). While OS&H remains a responsibility of employers, and is not itself particularly novel, it can be considered an innovation in many SMEs, as OS&H activities are often new to them (Sinclair *et al.*, 2013). Similarly, some processes, methods, and solutions that are standard in one industry may be less utilized in another industry. In an NIOSH report examining how intermediaries distribute health and safety information to member organizations, researchers found large differences based on National Occupational Research Agenda (NORA) sectors. For example, the construction industry was more likely to disseminate information than were other sectors, and the services sector proved particularly poor at information exchange (NIOSH, 2017). Common OS&H tools and resources for prevention and interventions are addressed separately in the next section.

To add to the knowledge base of industry-specific challenges and solutions that can transfer across industries, the USE Conference included nearly two dozen posters and concurrent presentations that focused on specific industries, many of them from high-risk sectors, such as agriculture, construction, and auto repair. Conference participants pinpointed OS&H challenges in SMEs such as the contingent nature of the workforce (Betit, 2017—construction; Sayler, 2017—nail salons), high workforce demands (Bretns, 2017—breweries; Mera Chu, 2017—security guards), and lack of resources (Caroly *et al.*, 2017—transportation and construction; Ortiz and Scholl, 2017—construction; Pereira and Furlan, 2017—metallurgical enterprises). Further, the small business panels assembled SME stakeholders from a wide variety of industries including a restaurateur, a camp director, a contract superintendent from a glass and glazing company, and a resource manager

from an organic dairy farm. These panels provided rich discussions of the similarities and differences that SMEs face when addressing OS&H, across a range of industries and countries. The conference planners believed it was important for researchers and representatives of different industries to learn about the challenges and successes of OS&H in other industries. In fact, the quality and variety of topics and presenters were one of the identified strengths by those who completed a post-conference evaluation.

### Intervention programs (tools and resources)

Previous research in the field of OS&H in SMEs has shown that you cannot merely take what works in larger enterprises and expect the same results in smaller enterprises (Hasle and Limborg, 2006). Some of the reasons for this lack of generalizability were outlined in the introduction and are related to specific characteristics of SMEs, such as lack of resources. Additionally, OS&H is often not a priority for SMEs, perhaps due to the infrequent nature of incidents, lack of economic incentives, and limited access to solutions (lack of knowledge and training in OS&H; Champoux and Brun, 2003). What this means for the development of intervention programs is that a variety of methods must be developed, implemented, and evaluated to determine what is most successful for SMEs. Common tools that have been developed for SMEs include checklists (both risk assessment and action-oriented), OS&H management systems, training and education, and a combination of industrial hygiene, health promotion, and behavioral interventions (Hasle and Limborg, 2006; Legg *et al.*, 2015). Also, there is a strong need for communication research tailored to different size and type of small business (Schulte *et al.*, 2017). There remains much to learn about the effectiveness and sustainability of intervention programs in SMEs. Past reviews have indicated that the quality of intervention design and evaluation remains limited (Hasle and Limborg, 2006; Breslin *et al.*, 2010).

To add to the body of research, the USE 2017 conference program included descriptions of many interventions programs, tools, and resources to improve OS&H in SMEs. Some of these included improved and expanded toolbox talks (Betit, 2017—construction), educational trainings (Bejan, 2017—auto mechanics; Lagerstrom, 2017—loggers; Marin, 2017—construction), and assessment of readiness for OS&H assistance (Cunningham, 2017). Other common tools included site visits and interviews to assess health and safety programs, policies, and practices (Rohlman, 2017) and development of partnerships to support employers and employees (Haas, 2017; Sayler, 2017).

Previous USE conferences, in particular USE 2015, highlighted the need to translate research findings into practical tools that could be disseminated digitally as one area to focus on moving forward (van Lieshout, 2015). Digital tools are less expensive, easier to customize and share, and more convenient, taking into account the ubiquity of mobile devices. USE 2017 included many presentations on tools and resources for prevention that were practical digital applications, thus building upon the need to increase the research base for this topic. Some examples included: (i) a virtual safety consultant tool that catalogs an inventory of NIOSH construction material, organizes it, puts it into plain language, and uses the content in an app for small construction sites (Burnett and Fazio, 2017); (ii) a Health Risk Calculator that incorporates data from both the employees' health risk assessments and employers' workers' compensation claims data to create an online, interactive tool that allowed employers to input business and employee characteristics to see how changes in health conditions and in occupational injuries affect estimates of workers' compensation costs (Schwarka, 2017); (iii) an online tool that allows SMEs to complete a risk assessment and develop a mock-up of a workplace in order to identify simple solutions (Malenfer, 2017); and (iv) an audit tool that helps users in the demolition sector assess exposures and behavior, as well as follow progress over time (Limborg, 2017). Another common feature of all of the presentations was the involvement of stakeholders in all parts of the process, including development, implementation, and evaluation, in the spirit of community participatory research.

### Precarious or vulnerable workers and the informal sector

The changing nature of the workplace means that OS&H researchers in SMEs must also take into account the needs of the most precarious or vulnerable workers. It has been noted that workers face different risks, even when they perform the same job, based on a number of social and personal factors, including, among others, race, gender, immigration status, temporary worker status, and the size of the enterprise in which they work (NIOSH and ASSE, 2015). Further, it is recognized that workers often have more than one risk factor and when compounded, leads to even larger health and safety disparities (NIOSH and ASSE, 2015).

The informal sector largely lies outside of governmental control and regulations. It is marked by increased uncertainty on the part of workers in terms of job security, wages, and workplace protections (Weil, 2009) and is often due to employers changing the nature of the



working relationship (Chen, 2016). Examples of this include shifting employees to the status of independent contractors, subcontractors, and the rise of day laborers, among others (Weil, 2009). Around the world, the informal sector represents a large number and proportion of workers. According to a 2014 report, informal employment is over half of all non-agricultural employment across most of the developing world, and as high as 82% in South Asia (Vanek *et al.*, 2014). While informal work is a large and varied category, informal workers are more likely to suffer work-related injuries and illnesses when compared with employees performing similar work in the formal sector (Chen, 2016).

Precarious and vulnerable work and the informal sector was a theme that permeated USE 2017. Previous USE conferences identified this topic as an important area, particularly for certain sectors and developing countries (Legg *et al.*, 2015; van Lieshout, 2015). As such, the planning committee made a commitment to include presentations that addressed vulnerable and precarious workers and the informal sector. Two full concurrent sessions were devoted to this cross-cutting theme, with presentations that addressed nail salon workers (Saylor, 2017), cannabis industry workers (Walters and Fisher, 2017), and agricultural workers (Butler-Dawson and Krisher, 2017), among others. The session devoted to the informal sector included work conducted in promoting marketable skills in Ethiopia (Gizaw, 2017), auto mechanic villages in Nigeria (Shamusideen and Selle, 2017), and migrant swap-meet workers in Los Angeles, California (Flores Morales, 2017).

Discussion of precarious and vulnerable workers was common across many of the other presentations as well, such as in construction (Ortiz and Scholl, 2017—aging workers, Keller, 2017—immigrant safety training) and among self-employed merchants (Woo, 2017). Further, multiple keynote addresses touched on this theme, including an address about the fissured workplace that examined how changes in the very nature of employment have changed from formal employer–employee relationships to those consisting largely of subcontractors who are not offered the same workplace benefits and protections as more traditional workers (Weil, 2017). Other keynote addresses touched on this with regard to contingent and intermittent employment in the construction industry (Marin, 2017; Ringen, 2017). Taken together, the USE conference advanced the research knowledge with regard to precarious and vulnerable workers and made the case that addressing OS&H in SMEs must take into account the nature of the enterprise, the shifting design of work, and changes in the composition of the employer–employee relationship.

## TWH in SMEs

The final cross-cutting theme of USE 2017 was TWH and SMEs. TWH is defined by NIOSH as the 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 (NIOSH, 2018). Increasingly, understanding contemporary work, workplaces, and workforces require a broad consideration of the factors that affect the health and safety of workers, including those in SMEs (Schwatka *et al.*, 2018b). TWH is a means to address these factors and holds potential for reaching OS&H objectives in SMEs using more integrated approaches suited to organizations with comparatively few employees. While a research base is being built around TWH programs and interventions, they mostly take place in larger businesses. Much less attention has been paid to TWH in SMEs.

Recent attempts have been made to bring together those who are researching and practicing TWH. In 2014, the Institute of Medicine (IOM) held a workshop on TWH, seeking to bring together stakeholders who were working on TWH programs to gain insight into best practices. One of the areas highlighted at this workshop was TWH for SMEs, recognizing the unique challenges they face (IOM, 2014). Further, in 2015, another workshop was held to present the scientific evidence supporting the TWH model. A position paper that emerged from that workshop acknowledged the lack of high-quality research related to the effectiveness of TWH interventions in enterprises of any size (Bradley *et al.*, 2016). A number of recommendations emerged, including to ‘ensure that future intervention studies represent an appropriate range of worker populations and settings’, with specific attention drawn to smaller enterprises, recognizing that they are underrepresented in the research literature (Bradley *et al.*, 2016). Studies on interventions that apply suitable methods within a SME-relevant conceptual framework are beginning to emerge in the literature and are the subject of ongoing research in the TWH research community (Schwatka *et al.*, 2018b).

To build upon the previous TWH workshops, the USE 2017 Conference helped advance the research base specifically related to TWH in SMEs. Concepts related to TWH were found throughout the USE 2017 program, with specific attention given to the topic through three keynote addresses (Brosseau, 2017; LaMontagne, 2017; Sorensen, 2017), five posters, and 18 individual sessions organized into five concurrent sessions, including: (i) TWH in Small Enterprises; (ii) Workers and their Families; (iii) Meaningful Work; (iv) The Role of Public Health in Small Enterprises; and (v) Wellness Programs

in Small Enterprises. Key takeaways were that conditions of work influence poor health and safety outcomes (Brosseau, 2017; Sorensen, 2017) and that TWH can serve as a value-add to both employees and the business's bottom line (Sorensen, 2017). Others indicated that the motivation for TWH was to improve the health of employees, but also to address concepts related to meaningful work, such as improved employee morale and increased employee retention (Tenney, 2017). SME culture and climate toward both health and safety was a recurring theme throughout the sessions.

## Conclusions and future directions

In conclusion, the burden of occupational injury and illnesses in SMEs remains high. The potential impact of research and research-to-practice solutions that 'specifically' address the needs of workers in SMEs is also high. We need more research on OS&H interventions involving multiple stakeholder groups and intermediaries in both the design and dissemination phases. We need to increase consideration of health and safety disparities in SMEs, in a time of rapid change in the nature and design of work. There is a need to address the unique structural, social, economic, and cultural challenges facing SME employers and employees.

The roundtable discussion of what the USE conference series has achieved since 2009 (Limborg *et al.*, 2017b) concluded that much work still remains in: 1) better characterizing what defines a small enterprise, especially with consideration of increasing precarious employment; 2) finding ways to effectively engage SME stakeholders; and 3) finding ways to integrate OS&H into the broader contexts of SME business and governance issues. Future OS&H research opportunities will continue to build upon the successful work that was presented at USE 2017 and should address the cross-cutting themes from the conference.

## Overview of papers

The 9 articles presented in this issue were solicited from presenters at USE 2017 and underwent the same peer-reviewed process that typically occurs for the journal. Like the conference presentations, these articles encompass many of the cross-cutting conference themes. Taken together, they should provide the reader with an overview of highlights from USE 2017, as well as the current state of research in the field of OS&H in SMEs. Many of the articles encompass more than one of the cross-cutting conference themes, demonstrating the interconnectedness of the research emerging in this field.

One paper has a primary focus of the role of intermediaries in OS&H in SMEs. Hasle and Refslund (2018) argue for the potential of improving OS&H in SMEs by including intermediaries, but note that the interests of SMEs and intermediaries must be aligned in order to maximize the potential outcomes (Hasle and Refslund, 2018). They propose a classification of the main types of intermediaries, which include regulators, advisors, social partners, and other intermediaries and discuss the roles of each in improving OS&H in SMEs.

Four papers focus on OS&H approaches for specific industries, the first being auto body collision and machine tool technology education (Bejan *et al.*, 2018) and the others focused on the construction industry (Cunningham and Jacobson, 2018; Marín and Roelofs, 2018; Ringen *et al.*, 2018). The focus of the work by Bejan and colleagues was to document how OS&H is taught and assessed over the course of a 2-year vocational college program in auto body collision. They identified gaps and made recommendations for future training, which included providing trade-specific OS&H information, coaching, and support (Bejan *et al.*, 2018). Ringen and colleagues provide an overview of the construction industry that describes trends over that past decade related to the 2008–2010 recession, followed by the recovery period. They also include a description of the characteristics of the construction industry that lead to increased OS&H risks, including marginal employment and immigrant workers, lack of training, and a lack of minimum qualifications for becoming a construction contractor (Ringen *et al.*, 2018). Cunningham and colleagues, building upon the high-risk nature of the construction industry, describe their efforts to understand how owners and managers from small construction businesses talk about safety. They examine the correspondence of employers' self-rated readiness for improvement with the ultimate goal of implementing new or improved OS&H practices (Cunningham and Jacobson, 2018). Marín and Roelofs (2018) focus on OS&H in small construction enterprises, describing a community-based participatory approach to recruiting participants into research to increase stakeholder involvement and ultimately worker health. The authors describe multiple strategies and associated levels of success with each.

Two papers in this issue focus on tools and resources for improving OS&H in SMEs. LaMontagne and colleagues (2018) describe an integrated approach to worksite mental health in SMEs which focuses on protecting mental health by reducing risks, promoting mental health by developing positive aspects of work, and responding to mental health problems in the current workforce. The authors

walk through their approach and provide practical advice for beginning the often difficult workplace mental health conversation in SMEs. Schulte and colleagues describe a communication research strategy focused on SMEs. The authors posit that SMEs are a diverse group and many challenges exist for targeting OS&H communications. A first step is to divide small businesses into smaller, more homogeneous categories that will benefit from targeted communication strategies (Schulte *et al.*, 2018).

Two papers primarily focus on TWH in SMEs. The first utilized a case study approach to examine the health and safety policies, practices, and programs using a TWH framework (Rohlman *et al.*, 2018). Eight themes emerged from their site visits which the authors describe in detail. They conclude that the unique needs of SMEs need to be considered as TWH diffuses from larger to smaller enterprises. Schwatka and co-authors report on a longitudinal study which looked at changes in health, absenteeism, and presenteeism in organizations that participate in worksite wellness programs. The authors examine the relationship of business size to the occurrence of chronic and non-chronic health conditions. They conclude that SMEs may have the most to gain from worksite health promotion programs, due to higher employee participation rates and health improvements observed in SMEs (Schwatka *et al.*, 2018a).

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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.
- Bejan A. (2017) Working successfully with small business owners: results and lessons from the collision auto repair safety study. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Bejan A, Parker D, Skan M *et al.* (2018) Health and safety education in auto body collision and machine tool technology programs in vocational colleges: challenges and opportunities. *Ann Work Expo Health*; 62: S81–S92.
- Betit E. (2017) Leveraging an evidence-based approach to communicate safety and health information to small employers and their employees. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Boudreau JW. (2017) Is ‘human resource management’ a catalyst or an impediment to achieving worker well-being and sustainable business success? Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- 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.
- Brents, C. (2017) Application of inertial measurement units to evaluate low back kinematic demands of keg handling tasks in microbreweries. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Breslin FC, Kyle N, Bigelow P *et al.*; Small Business Systematic Review Team. (2010) Effectiveness of health and safety in small enterprises: a systematic review of quantitative evaluations of interventions. *J Occup Rehabil*; 20: 163–79.
- Brosseau, L. (2017) What is total worker health for small manufacturing businesses? Lessons learned from an integrated workplace safety – smoking cessation intervention study. Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Buckley JP, Sestito JP, Hunting KL. (2008) Fatalities in the landscape and horticultural services industry, 1992–2001. *Am J Ind Med*; 51: 701–13.
- Burnett, G, Fazio, G. (2017) Improved safety tools for small enterprises through lean startup. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Butler-Dawson, J, Krisher L. (2017) Understanding occupational and non-occupational risks associated with reduced kidney function in sugarcane workers in Guatemala. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Caroly S, Gaudin D, Malenfer M *et al.* (2017) Coordination between stakeholders to improve the risk prevention in MSEs: case studies in transport and construction programs. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- 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. *Saf Sci*; 41: 301–18.
- Chen MA. (2016) The informal economy: recent trends, future directions. *New Solut*; 26: 155–72.
- Cunningham T. (2017) Assessing the potential for occupational safety and health assistance among small construction firms. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Cunningham T, Jacobson CJ. (2018) Safety talk and safety culture: discursive repertoires as indicators of workplace safety and health practice and readiness to change. *Ann Work Expo Health*; 62: S55–S64.
- 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.
- Cunningham TR, Sinclair R, Schulte P. (2014) Better understanding the small business construct to advance research on delivering workplace health and safety. *Small Enterprise Res*; 21: 148–60.
- EU-OSHA. (2018). Safety and health in micro and small enterprises. Available at <https://osha.europa.eu/en/themes/safety-and-health-micro-and-small-enterprises>. Accessed 13 February 2018.
- Fabiano B, Currò F, Pastorino R. (2004) A study of the relationship between occupational injuries and firm size and type in the Italian industry. *Saf Sci*; 42: 587–600.
- Fenn P, Ashby S. (2004) Workplace risk, establishment size and union density. *Br J Ind Relations*; 42: 461–80.
- Flores Morales, J. (2017) Legality and ways of reconciling health (in)access among Mexican immigrant micro-entrepreneurs in a Southern California swap meet. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Gizaw, Y. (2017) Assessment of the relevance and impact of promoting marketable skills for the informal sector implemented in Addis Ababa, Ethiopia. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Haas, K. (2017) Health communities are good business – a public health approach for leveraging worksite wellness to tackle community health challenges. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Hasle, P. (2017) Between a rock and a hard place – small business dilemmas in the control of occupational health and safety. Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Hasle P, Limborg HJ. (2006) A review of the literature on preventive occupational health and safety activities in small enterprises. *Ind Health*; 44: 6–12.
- Hasle P, Refslund B. (2018) Intermediaries supporting OHS improvements in small businesses: development of typology and discussion of consequences for preventive strategies. *Ann Work Expo Health*; 62: S65–S71.
- Institute of Medicine. (2014) *Promising and best practices in total worker health workshop summary*. Washington, D.C.: The National Academies Press.
- Keller, B. (2017) Overlapping vulnerabilities of immigrant safety training in small construction firms. Poster presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Lagerstrom, E. (2017) A mixed-methods analysis of logging industries in Montana and Idaho. Poster presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- LaMontagne A. (2017) Workplace mental health: developing an integrated approach in small enterprises. Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- LaMontagne A, Shann C, Martin A. (2018) Developing an integrated approach to workplace mental health: a hypothetical conversation with a small business owner. *Ann Work Expo Health*; 62: S93–S100.
- Legg SJ, Olsen KB, Laird IS *et al.* (2015) Managing safety in small and medium enterprises. *Saf Sci*; 71: 189–96.
- Limborg HJ. (2017) Prevention of dust exposure by implementing a culture of prevention in the demolition sector. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Limborg HJ, Hasle P, Antonsson AB *et al.* (2017) USE Conference in review: what have we learned and achieved since then? Round table presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- 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.
- van Lieshout H. (2015) Lessons learned. Closing USE2015 and moving forward to USE2017. Available at <https://useconference.files.wordpress.com/2017/01/lessons-learned-2015.pdf>. Accessed 13 February 2018.
- MacEachen E, Kosny A, Scott-Dixon K *et al.*; Small Business Systematic Review Team. (2010) Workplace health understandings and processes in small businesses: a systematic review of the qualitative literature. *J Occup Rehabil*; 20: 180–98.
- Malenfer M. (2017) The assets of online interactive tools to improve OSH in MSEs. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Marin LS. (2017) Safety training for small construction contractors: cases from Columbia and the USA. Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Marin LS, Roelofs C. (2018) Engaging small residential construction contractors in community-based participatory research to promote safety: strategies and lessons learned. *Ann Work Expo Health*; 62: S72–S80.
- McCoy K, Stinson K, Scott K *et al.* (2014) Health promotion in small business: a systematic review of factors influencing adoption and effectiveness of worksite wellness programs. *J Occup Environ Med*; 56: 579–87.
- Mera Chu, NA. (2017) Sleep habits and frequency of excessive daytime sleepiness in shift-work security agents from an agency in Piura-Peru. Poster presentation at

- the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- National Institute for Occupational Safety and Health (NIOSH). (1999) *Identifying high-risk small business industries: The basis for preventing occupational injury, illness, and fatality*. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health Publication No. 1999-107.
- National Institute for Occupational Safety and Health (NIOSH) & American Society for Safety Engineers (ASSE). (2015) *Overlapping vulnerabilities: The occupational safety and health of young workers in small construction firms*. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health Publication No. 2015-178.
- National Institute for Occupational Safety and Health (NIOSH). (2017) *Workplace safety and health information dissemination, sources, and needs among trade associations and labor organizations*. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health Publication No. 2017-166.
- National Institute for Occupational Safety and Health (NIOSH). (2018) What is Total Worker Health? Available at <https://www.cdc.gov/niosh/twh/default.html>. Accessed 13 February 2018.
- Newman LS, Stinson KE, Metcalf D *et al.* (2015) Implementation of a worksite wellness program targeting small businesses: the Pinnacol Assurance Health Risk Management Study. *J Occup Environ Med*; 57: 14–21.
- Ortiz B, Scholl J. (2017) Developing products to prevent work-related musculoskeletal disorders in aging construction workers in small construction firms. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Parker D, Yamin S, Bejan A *et al.* (2017) Small business: Does safety climate matter? Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Pereira PRA, Furlan JB. (2017) Examination of corporate social responsibility and sustainability indicators in small Brazilian metallurgical enterprises. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Pinder J, Gibb A, Dainty H *et al.* (2016) Occupational safety and health and smaller organisations: research challenges and opportunities. *Policy Prac Health Saf*; 14:34–49.
- Pronk NP. (2013) Integrated worker health protection and promotion programs: overview and perspectives on health and economic outcomes. *J Occup Environ Med*; 55(12 Suppl): S30–7.
- Rajala K. (2017) Occupational health cooperation between small enterprises and occupational health services. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Ringin K. (2017) Challenges for safety and health in industries with contingent or intermittent employment: Experience from the construction industry in the United States. Keynote presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Ringin K, Dong XS, Goldenhar LM *et al.* (2018) Construction safety and health: lessons from a decade of turmoil. *Ann Work Expo Health*; 62: S25–S33.
- Rohlman D. (2017) Discovery and dissemination of total worker health practices among midwest small employers. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Rohlman D, Campo S, Hall J *et al.* (2018) What could Total Worker Health® look like in small enterprises? *Ann Work Expo Health*; 62: S34–S41.
- Sayler SK. (2017) Promoting health and safety in nail salons through the Michigan Health Nail Salon Cooperative (MHNSC). Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Schulte P, Cunningham T, Guerin R *et al.* (2018) Components of an occupational safety and health communication research strategy for small and medium sized enterprises. *Ann Work Expo Health*; 62: S12–S24.
- Schulte PA, Cunningham TR, Nickels L *et al.* (2017) Translation research in occupational safety and health: a proposed framework. *Am J Ind Med*; 60: 1011–22.
- Schwatka N. (2017) Health risk and workers' compensation calculator: An online resource for businesses. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Schwatka N, Brockbank C, Kinnett K *et al.* (2017) A case study of a public-private partnership to bring worksite wellness to small business. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Schwatka N, Smith D, Weitzenkamp D *et al.* (2018a) The impact of worksite wellness programs by size of business: a three-year longitudinal study of participation, health benefits, absenteeism, and presenteeism. *Ann Work Expo Health*; 62: S42–S54.
- Schwatka NV, Tenney L, Dally MJ *et al.* (2018b) Small business total worker health: a Conceptual and methodological approach to facilitating organizational change. *Occ Health Sci*; Epub ahead of print 08 March 2018. doi:10.1007/s41542-018-0013-9
- Shamusideen K, Selle D. (2017) Healthy work environment: Promoting good work practices through workplace design and wellness programme among artisans (informal workers) in 'Mechanic's Village' (automobile repair garages) in Abeokuta, Nigeria. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Sinclair RC, Cunningham TR, Schulte PA. (2013) A model for occupational safety and health intervention diffusion to small businesses. *Am J Ind Med*; 56: 1442–51.
- Sorensen G. (2017) Pathways to implementing Total Worker Health: Implications for small enterprises. Keynote

- presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Tellis J. (2017) How local business networks are connecting the dots on wellness. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Tenney L. (2017) An assessment of a Total Worker Health intervention in small business. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- United States Census Bureau. (2015) Establishment Characteristics Data Tables. Available at [https://www.census.gov/ces/dataproducts/bds/data\\_estab2015.html](https://www.census.gov/ces/dataproducts/bds/data_estab2015.html). Accessed 21 March 2018.
- Vanek J, Chen MA, Carre F *et al.* (2014) Statistics on the informal economy: Definitions, regional estimates, and challenge. WIEGO Working Paper Number 2. Available at <http://www.wiego.org/sites/default/files/publications/files/Vanek-Statistics-WIEGO-WP2.pdf>. Accessed 13 February 2018.
- Walters KM, Fisher GG. (2017) Is the ‘grass’ greener? Work and well-being in the Colorado cannabis industry. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Weil D. (2009) Rethinking the regulation of vulnerable work in the USA: a sector-based approach. *J Ind Relations*; 51: 411–30.
- Weil D. (2017) The fissured workplace and the future of work. Oral presentation at the Understanding Small Enterprises Conference. 25–27 October 2017. Denver, CO.
- Woo KH (2017) *Participatory action oriented health care program for self-employed merchants in a traditional market, Korea.*