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Firefighters as distributors of workplace safety and health information to small businesses

Brenna M. Keller* and Thomas R. Cunningham

National Institute for Occupational Safety and Health, Education and Information Division, 1090 Tusculum Avenue, MS C-10, Cincinnati, OH 45226, United States

Abstract

Background—Small businesses bear a large burden of injury and death, and are difficult to reach with occupational safety and health (OSH) information. The National Institute for Occupational Safety and Health (NIOSH) developed a pilot study testing the feasibility of fire departments disseminating OSH information to small businesses during fire inspections.

Methods—Two sets of postcards were developed with unique, trackable URLs for the NIOSH Small Business Resource Guide. One set was distributed by firefighters, the other was mailed to small businesses. Participating inspectors were met with to discuss their experience.

Results—Neither distribution method resulted in a substantial number of site visits. Inspectors believed distributing postcards was an easy addition to their duties, and saw value in safety information.

Conclusions—There are barriers beyond awareness of availability that prevent small business owners from seeking OSH information. Research should focus on identifying barriers and developing better OSH information diffusion mechanisms.

Keywords

Small business; Dissemination; Intermediary; Occupational safety and health; Diffusion

*Corresponding author. bkeller1@cdc.gov (B.M. Keller), tcunningham@cdc.gov (T.R. Cunningham).

Ethics review and approval

The study was approved by the NIOSH Institutional Review Board (IRB). Written consent was not required as participating firefighters did not disclose personal information. Oral consent was obtained from all firefighters.

Disclaimer

The findings and conclusions in this paper are those of the authors and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

Conflict of interest

The authors have no conflicts of interest.

Author contributions statement

Brenna Keller: substantial contributions to the acquisition, analysis, and interpretation of data; drafting the work and revising it critically for important intellectual content; final approval of the version to be published; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Thomas Cunningham: drafting the work and revising it critically for important intellectual content; final approval of the version to be published; agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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1. Introduction

Small businesses comprise a vital part of the United States economy. There are 39.8 million workers in businesses with fewer than 100 employees, comprising 34.3% of the American workforce (Caruso, 2015). Evidence suggests that employees of small businesses are at a higher risk and share a disproportionate burden of injury and death compared with employees at larger businesses (Hasle and Limborg, 2006; Hasle et al., 2012; Olsen et al., 2012; Page, 2009; Mendeloff et al., 2006; Sørensen et al., 2007; Breslin et al., 2010; Legg et al., 2015; Micheli and Cagno, 2010). However, occupational safety and health (OSH) research, assistance efforts, and government regulation often focus on larger businesses (Hasle et al., 2012; Page, 2009; Champoux and Brun, 2003). Smaller businesses generally do not hire staff devoted to safety and health activities and often lack the ability to identify and control hazards (Hasle and Limborg, 2006; Hasle et al., 2012; Olsen et al., 2012; Lentz and Wenzl, 2006; Champoux and Brun, 2003). Smaller businesses may need more assistance from external organizations (e.g., government and insurance agencies) to protect the health and safety of their workers than larger businesses, but external forces are often ill-suited to support OSH in smaller businesses due to factors such as geographical dispersion and variability of work settings (Sinclair et al., 2013; Olsen et al., 2012; Page, 2009; Lentz and Wenzl, 2006; MacEachen et al., 2010; Legg et al., 2015; Champoux and Brun, 2003).

A primary approach for providing OSH assistance to smaller businesses is distributing OSH information. Schulte et al. (2003) identified three stages of OSH information dissemination: (1) transmitting or distributing information; (2) the receipt of information; and (3) the processing and ultimate use of information. However, the authors suggest that critical OSH information may not always reach the business owner, or, if it does, the information may not be what is needed. Furthermore, a review of the literature on OSH in small enterprises concluded written information has little effect, and that a personal contact between a business owner and a trusted intermediary is more effective (Hasle and Limborg, 2006). Thus, a more tailored approach, beyond simply distributing written OSH information is needed to assist small businesses.

Given that outreach to small businesses is difficult, especially when they are not members of a trade association or larger organization, it has been suggested that partnerships with influential individuals or groups can aid diffusion of OSH information (Bruening et al., 2015; Hasle and Limborg, 2006; Sinclair et al., 2013). Researchers from the National Institute for Occupational Safety and Health (NIOSH) developed a diffusion model for small businesses in which an initiating organization (often a governmental public health/safety organization) works with an intermediary organization to transmit OSH information to small businesses (Sinclair et al., 2013). Intermediaries are organizations that deliver goods or services to small businesses and that might also deliver OSH information and programs. In this model, emphasis is placed on both the intermediary and the small business, ensuring that the goals of the intermediary align with both the initiator and the small business in order for diffusion to be successful. This approach has been supported in demonstrations using accountants (Hasle et al., 2010), as well as trade associations, chambers of commerce, insurance providers, and equipment suppliers (Cunningham and Sinclair, 2015).

Due to the increased burden of occupational injury in small businesses and the difficulty of outreach, a pilot study was developed to examine the feasibility of NIOSH working with fire departments to disseminate OSH information to smaller businesses during fire inspections. A secondary objective was to examine small business owner response to OSH resources when delivered by fire inspectors, compared to the same information being provided by mail. Fire departments are trusted community organizations, or intermediaries, especially in regard to safety. Interventions using firefighters in community education have demonstrated success, including a face-to-face intervention to increase 911 calls and aspirin use in older adults experiencing chest pain (Meischke et al., 2006). Fire departments typically conduct annual inspections of all businesses within their service area, which could provide an opportunity for a trusted intermediary to provide small businesses with OSH materials. Using a combination of quantitative website tracking and qualitative focus groups/ interviews, the authors aimed to determine if fire departments can be useful intermediaries for delivering OSH information.

2. Materials and methods

2.1. Procedures

In order to determine the feasibility of using fire departments to disseminate OSH materials, two sets of postcards were created. Both sets contained a unique URL linking to the online NIOSH Small Business Resource Guide (NIOSH, 2014). Other than the difference in URL, the postcards were identical. Both prominently feature the URL, and claim “Protect your employees. Save money.” They advertise the NIOSH Small Business Resource Guide as containing “a broad range of workplace safety & health information for busy small business owners and manager.” The first set was given to partner fire departments. The second set was mailed to small businesses. This second set was mailed to create a control condition comparable to methods of distributing OSH information used in previous studies. The unique URLs allowed the authors to monitor web visits resulting from the postcards.

For a period of three months, January through March 2015, the postcards were given by a fire department inspector to the business owner or manager who was on site at the time of the business’s annual fire inspection. The fire inspectors were instructed to identify the postcards as a source for safety information, and they were told to refer any questions to NIOSH. During the same time period, the other set of postcards was mailed to a similar set of small businesses in a comparable geographic area. The unique URLs were monitored through the end of April 2015 to determine how many website visitors had navigated to the Small Business Resource Guide via each set of postcards.

Following the project, the authors met with fire department staff involved in the project to discuss their perceptions of the pilot program. The debriefing meetings were conducted in person in two focus groups of around 15 fire inspectors at the larger fire department, and an interview with one fire inspector at the smaller fire department. Approximately two-thirds of all fire inspectors participating in the pilot program participated in the debriefing meetings. The meetings were conducted at the firefighters’ convenience. All debriefing meetings were recorded and transcribed. They were then reviewed and analyzed for themes.

It was hypothesized that: (1) distribution of NIOSH information by the fire department would result in increased use of the NIOSH Small Business Resource Guide; (2) information distributed through fire inspections would generate more web traffic than information mailed to small businesses; and (3) fire inspectors would be able to distribute the postcard to small businesses without reporting undue burden.

2.2. Measures

Both sets of postcards contained identical content except that each set contained a unique URL, ensuring the ability to track web hits from the two different distribution channels. The metric utilized for this pilot study was “click-throughs,” the total number of times that visitors arrived at the Small Business Resource Guide via the postcard URLs. Additionally, qualitative information was collected from the fire inspectors during a debriefing meeting about their experience with the project. Discussion topics included perception of burden associated with the task, perception of the receptivity of the small business owner, and feasibility of expanding this distribution channel nationwide.

2.3. Participants

Nine fire departments in the Greater Cincinnati area were initially contacted and asked to participate in the pilot program. Fire departments were contacted based on either size of service area or previous willingness to assist in research. Three did not respond, one declined participation, three agreed to participate. Two more fire departments agreed to participate after the pilot subjects were chosen. They were told they would be contacted if the project expanded in the future. Participating fire departments were given postcards to distribute during the first three months of 2015. One fire department was in Northern Kentucky, and two were in Ohio. An unexpected set-back to the project was an unusually bad winter, with colder temperatures and more snow than average. All of the fire departments were unable to conduct all planned inspections during the program period, and a combination of weather and computer system problems caused one of the Ohio departments to drop out of the program. Thus, follow-up discussions and analysis only include data from two fire departments, or about 30 fire inspectors.

The mailed postcards were sent to small businesses in the Indianapolis, Indiana metropolitan area. Indianapolis was selected due to size and regional comparability to Cincinnati, while still being far enough away to avoid overlap. Addresses were obtained using a distribution list. Consistent with literature on OSH outreach to small businesses, franchises were excluded from the mailing list due to being part of larger companies (MacEachen et al., 2010; Hasle et al., 2012). Only businesses with fewer than 50 employees received the postcards.

3. Results

3.1. Web traffic

The two fire departments distributed a total of 625 postcards (275 by one and 350 by the other). There were seven “click-throughs” from the firefighter-distributed URL during the reporting period, indicating that approximately 1.1% of the postcards resulted in a visit to

the Small Business Resource Guide. There were 1350 cards mailed; 116 were returned as undeliverable, leading to a revised total of 1202 mailed. There were nine “click-throughs” from the mailed URL, indicating that approximately 0.8% of the postcards resulted in a visit to the Small Business Resource Guide. For a visual depiction of the dissemination process, see Fig. 1. During the same time period, there were 354 unique visits to the Small Business Resource Guide homepage, a slight (3.5%) increase from the 342 unique visits the four months prior to the intervention (September–December 2014). Combining the “click-throughs” from both postcards, approximately 4.5% ($n = 16$) of the web traffic during the reporting period was the result of either the firefighter-delivered or mailed postcard. When broken down by city, there were 4 visits from Cincinnati and 5 from Indianapolis the four months prior to the intervention. During the intervention period, there were 16 visits from Cincinnati (a 300% increase) and 11 visits from Indianapolis (a 120% increase). Although the intervention did not produce a staggering number of web traffic to the Small Business Resource Guide, it does appear to have contributed to an increase from the targeted cities.

3.2. Interviews

Overwhelmingly, the firefighters believed that the dissemination of the postcards was easy. There were no major problems mentioned, and no one believed that the dissemination required much additional effort on their part. They felt as though it was easy to incorporate into other tasks. One firefighter stated, “It was not a problem to do ... I just attached it to my forms as I went out.” However, there was an issue with the timeline of the project. One fire department mentioned that the summer, beginning around June, is their busiest time for inspections. The unusually severe winter weather during the study period reduced the number of inspections that would have been conducted. When temperatures are below freezing, as one firefighter put it, “We kind of stay in. We carry a lot of things that freeze.”

The firefighters discussed the potential challenge of reaching the right person. They most frequently interact with a manager or maintenance person rather than the business owner. As one fire-fighter mentioned, “It may not make it to the person who actually cares.” People who received the cards were mostly polite and receptive, but it was unknown by the firefighters whether they would actually visit the site. According to one firefighter, “They seemed nice and genuine that they had an interest in it. I don’t know how far that was going to go, if they were just being nice or if they were actually going to look into it further.” Another potential problem discussed by one of the fire departments was the case sensitivity of the URL on the postcards. If it was not typed in exactly as written, the correct website could not be reached. As one firefighter pointed out, the case sensitivity “may affect the results too, because they may get to the wrong website and just stop there.”

Benefits of using fire departments to distribute OSH information were highlighted, including the trust that people have in the fire department, the fact that they visit businesses every year, and the focus they have on education and customer service. According to one firefighter, “It’s more customer service. I mean, that’s what we’re all here for, is to reach out and touch them and say, ‘Hey look, here’s another service that we can provide.’ The more that we can reach out and touch them from different avenues, you know, the better off they are.” Another mentioned, “Education is an issue, and part of our problem is education, public education.

So people know what to do, know where to go, who to call, and we're giving them the right steps." Some firefighters were very invested in their role as an intermediary between NIOSH and small businesses, mentioning that they visited the Small Business Resource Guide. As one firefighter stated, "I knew what I was talking about," allowing that firefighter to better recommend the resource guide. However, there was concern that a nationwide program would not be able to be implemented everywhere as many rural, volunteer fire departments do not conduct annual inspections. There was concern that outside of metropolitan areas with a "well-established organization," this program is "probably not going to work."

4. Discussion

Public health initiating organizations, such as NIOSH, have had to rely on dissemination strategies that depend on information-seeking of small business owner/managers (e.g. posting materials online) or methods such as direct mailing, which has limited effect in transmitting OSH information to small businesses (Schulte et al., 2003). This study aimed to address the limitations of these two approaches by testing the effect of using fire departments to deliver OSH information to small businesses. Although the study failed to demonstrate a clear benefit of using fire departments to distribute safety and health information compared to directly mailing the material to business owners, it did provide some valuable insights regarding fire departments and their value as intermediaries for reaching small businesses with safety and health assistance. Firefighters viewed community safety education as a critical component of their work. This emphasis on safety education has the potential to make fire departments effective intermediaries between public health initiators and small businesses. It is unknown whether all participating firefighters were as engaged with the pilot program. Perhaps a protocol for the interaction between the firefighters and small businesses would be useful for standardizing the interaction while still allowing the messages to be customized to the businesses.

There is an interesting gap between the quantitative and qualitative data. On the one hand, both sets of postcards failed to garner a substantial number of web hits. It did not matter whether they were hand-delivered by the fire department or mailed to small business owners; both had extremely low response rates. While the data may suggest there is low overall interest in the Small Business Resource Guide, we cannot determine the level of interest in the website among business owners with the design of the current study. There did appear to be more of an increase in web visits from Cincinnati compared with Indianapolis (in other words, firefighter-delivered versus mailed), but the numbers are still too small to make any kind of definitive claim. On the other hand, the qualitative data demonstrated that fire departments are able and willing to disseminate OSH materials. Distributing the postcard was a simple addition to their regular job duties, and they saw value in educating small businesses about safety and health. The difference in results between the website visits and interviews suggests that there are other significant barriers aside from awareness of the availability of information that prevent small business owners from actively seeking OSH information. Although the specific barriers for the recipients of the postcards are currently unknown, literature on OSH in small businesses suggests that factors such as lack of resources and production pressures are often encountered in small businesses (Bruening et al., 2015; Olsen et al., 2012; Brosseau and Li, 2005; Parker et al., 2012; Masi and Cagno,

2015). Additional barriers may be that small businesses would prefer receiving safety information in a method other than an online source, or simply would prefer an easier way to reach online safety information, such as a barcode which could be scanned by a mobile device.

4.1. Limitations

This study had seven key limitations. (1) It cannot be determined how many web hits came from a single postcard, thus, one user visiting the Small Business Resource Guide multiple times would not be noted. (2) It cannot be known which fire department distributed which cards. Therefore, it cannot be determined if one fire department had more success in the dissemination process. All web hits could come from postcards distributed by one fire department. (3) The fire departments were not randomly selected. Many fire departments were approached within the Cincinnati metropolitan area, and the fire departments that participated were those that self-selected by expressing interest in the project. Thus, it is possible that if an attempt were made to conduct a larger scale program, a significant number of fire departments may perceive participation to be burdensome. (4) The late winter/early spring during which the study took place was unusually brutal, with temperatures far below normal and a much heavier than usual snowfall. The weather hampered the fire departments' ability to conduct inspections, and contributed to one fire department withdrawing from the study. (5) The URLs on the postcards were case sensitive, so if they were not typed exactly as they appeared on the postcards, they would not work. This limitation was specifically mentioned by one of the fire departments. Users who found difficulty typing the URL may have used a search engine to reach the Small Business Resource Guide, which would not have been captured in the quantitative data. (6) The comparability of the small businesses receiving the postcards via mail and fire inspector delivery cannot be determined, as the researchers did not have access to fire department databases and did not monitor the exact businesses visited during the pilot period. (7) The participating firefighters may have impacted the quantitative results if they visited the Small Business Resource Guide via the URL on the postcard.

4.2. Conclusions

At this time, use of fire departments nationwide to disseminate OSH information as part of annual fire inspections seems feasible; however, the intervention materials designed to direct small business owners to web-based OSH resources are likely in need of improvement. Although the fire inspectors who did participate saw value in providing business owners with health and safety information and did not view dissemination as a burden, there was almost no increase in web traffic visiting the Small Business Resource Guide. Given the positive responses of the fire inspectors, there may be an opportunity for NIOSH to partner with fire departments in the future to disseminate OSH information in a different format. Future research could be useful to determine how much time firefighters are willing to spend on OSH information dissemination. Additionally, the firefighters did not solicit a commitment from the business representatives to visit the Small Business Resource Guide. Given the role firefighters serve in providing safety education (e.g., Saltmarsh, 2010), firefighters may be able to influence greater levels of OSH information seeking behavior among small businesses by specifically directing the owner/operator to review particular

OSH resources and/or asking the owner/operator to commit to seeking specific OSH resources. Future research could focus on this influence, including the ability to reach the decision-maker within the business.

Future research could seek to discover better methods of disseminating OSH information to small businesses; for example, exploring the information-seeking behavior of small business owners. It was mentioned in the interviews that fire inspectors usually send reports to businesses via email, and that they could consider including a link to OSH information at that time. An email could contain a cue to action, asking recipients to click the link. Perhaps an emailed link would lead to more visits to the Small Business Resource Guide, as case sensitivity would not be an issue and it would be extremely easy for business owners to click a link. There is currently a small, but steady flow of web traffic to the resource guide webpage, which could likely increase with targeted communication efforts. Additionally, future research should continue to examine additional barriers and motivations related to small business owners' willingness to seek and use OSH information. Interventions may be more effectively designed based on specific behavior-change theories, such as the Health Belief Model (Champion and Skinner, 2008), which identifies benefits and barriers to behavior change, as well as the self-efficacy to make the change and perceptions of susceptibility and severity of occupational illness or injury. Finally, although this program required fire-fighters to use a passive approach to OSH information dissemination, future research could focus on a more active intermediary approach.

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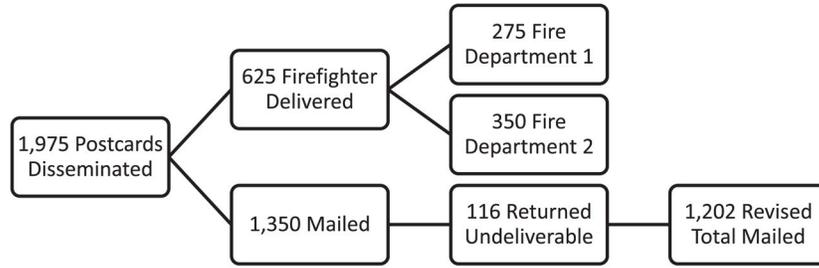


Fig. 1.
Dissemination Flowchart.

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