

Health And Safety Issues Of Older Workers Surveyed In The Construction Industry

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Abstract: The study aimed to gain a better understanding of age-related construction worker's health and safety issues and discuss practical solutions to improve safety and health of the older workers in the construction industry. A two-page survey questionnaire was developed and sent out to the safety managers, directors, or coordinators in the construction firms. The participants were employed in 27 companies that employed 12,452 employees and have been in business for an average of 75 years. All of the companies had a written safety program, but only 50% of the companies represented in the survey had the Health and Wellness programs. The findings suggested that the construction industry was in fact well aware of the worker health concerns that the aging construction workforce has been facing. The survey also revealed that there was an overwhelming agreement that older workers were still very valuable to the industry. The occupational ergonomic, health and safety professionals should pay more attention to develop creative and effective health/wellness programs that any size organization can use, with the ultimate goal being to have a sustainable and healthier aging workforce in the industry. The results of other findings are also discussed in detail.

Keywords: Aging workforce, Safety, Health, Ergonomics, Wellness, Construction industry

1. Introduction

The U.S. labor market continued to gain strength and the job growth in the construction industry picked up in 2012 (Bureau of Labor Statistics [BLS], 2013a; 2013b). Construction comprises establishments primarily engaged in the construction of buildings or engineering projects including new work, additions, alterations, or maintenance and repairs (BLS, 2013c). The incident rate of occupational injuries and illnesses reported for 2011 was unchanged for the first time in a decade during which the total recordable cases among the private industry employers declined significantly each year (BLS, 2013d). The American workforce has continually grown older and more than 40% of construction workers are baby boomers born between the years of 1946 and 1964 (Welch, 2012). The older construction workers are more likely to experience severe-type injuries and musculoskeletal disorders (MSDs) compared with younger construction workers (Dong, Wang, Daw, & Ringen, 2011). The MSDs are injuries or illnesses affecting the connective tissues of the body such as muscles, nerves, tendons, joints, cartilage, or spinal disks. It is noted that musculoskeletal disorders, commonly known as ergonomic injuries, accounted for one-third of all injuries and illnesses cases requiring days away from work are injuries or illnesses (BLS, 2013e). This trend can result in higher indemnity, rather than medical costs, as older construction worker's injuries and illnesses may require more days away from work and may result in disabilities and physical limitations (Choi, 2009). Construction workers compared with white-collar workers of the same age (50 and up) had increased risk of arthritis, back

problems, chronic lung disease, functional limitations, work disability, and work-related injuries (Dong, Wang, Daw, & Ringen, 2011). The other factors that contribute to the higher claims cost for the aging construction worker is the overall decreasing health status of the American population, considering two-thirds of Americans are overweight, in conjunction with the inherent occupational risks and lifestyles typically associated with the construction industry (Stein, 2011).

It is beyond doubt that the U.S. construction industry is getting older and the aging workforce is more susceptible to the occupational hazards and risks. The higher injury costs associated with worker age are likely due in part to the severity of the injuries sustained by older workers (Schwatka, Butler, & Rosecrance, 2011). Understanding the health and safety needs of the older worker is critical; especially in the construction industry as the physical job demands are mostly high. The purpose of this pilot study is to recognize age-related construction worker's health and safety concerns and discuss practical interventions in order to improve safety and health of the aging construction workforce.

2. Methodology

To achieve the study objectives, the authors first researched injury and illness trends in the U.S. construction fields. This research was conducted through many different sources: books, electronic copies of books, scholarly journals articles, and web sites. Upon the completion of the literature reviews, a draft survey was developed and then distributed to the construction contractors. The preliminary survey instrument was administered in person to five general contractors in Wisconsin. This preliminary survey was very helpful in that it enlightened the authors on the finer points of conduction to a final survey. The biggest improvement would be to have more exact questions; meaning that the responses are more a reflection of analytical results. This could be achieved by: (1) providing the respondent with specific responses to choose from examples, (2) making the survey more user friendly/easier to complete with simple check or circle and examples, and (3) if one has to use an open ended question, ask for more specifics (example one response or their top choice do not allow multiple responses). Based upon the responses of the five contractors, the survey instrument was further refined. A two-page final survey questionnaire was developed (see *Appendix: the survey instrument*). The target audience of the survey was safety managers, directors, or coordinators in the construction firms. The construction contractors were identified and selected from the personal and professional contacts as well as the online yellow pages directory.

Over 300 construction companies in the Midwestern United States were contacted via email or telephone to gain their approval for distribution of the survey. The telephone or email contact script included affiliation of the researcher, purpose of the project, and description of the questionnaire. Seventy-four construction companies agreed to participate in the survey. Distribution methodology involved emails, faxing or postal mailing the survey to companies and having them filled out by safety personnel (e.g., director, manager or coordinator) within the company. The questionnaire respondents had very extensive knowledge and fieldwork experiences in the construction operations, and actively interacted with their field workers in hourly and/or daily bases. The survey questionnaire covered basically four parts. The first part of the survey was designed to collect background information, such as type of work, the number of employees, and the classification of the company. In the second part, questions were asked about the older construction workers in their firms. The third part was designed to collect information regarding their health and safety programs. Finally, in the fourth part, questions were asked about the injuries/illnesses and health information of their employees.

3. Survey Results

Of the 74 construction firms agreed to participate, 27 completed the survey. This represents a response rate of 36%.

3.1 Background

The participants represented companies that have been around anywhere from 5 to 150 years with an actual average age of 75 years in the construction business. The companies represented in the survey are also responsible for employing an estimated 12,452 construction workers. The size of the participating companies greatly varied, with some employing as few as 25 workers, and others as many as 4000. Table 1 provides data on the workforce and the type of work of the participating construction contractors.

Table 1. Workforce and Type of Work of Participating Construction Contractors

Contractor	Type of contractor	Number of employees
1	General Contractor	200
2	Plumbing, Heating & Air-Conditioning	240
3	Water, Sewer, Pipeline and Power Line	225
4	Heavy Construction	1000
5	Highway and Street Construction	120
6	Electrical, Specialty Systems Contractor	1500
7	Plumbing, Heating & Air-Conditioning	400
8	Marine Construction	100
9	Masonry Work	60
10	Structural Steel Erection	250
11	Mechanical Service and Construction	35
12	Construction & Maintenance in Wind and Solar	25
13	Roofing, Siding and Steel Metal Work	43
14	Electrical Construction	300
15	General Contractor	200
16	Bridge and Elevated Highway Construction	400
17	General Contractor	185
18	Concrete Work	69
19	General Contractor	201
20	Roofing, Siding and Steel Metal Work	4000
21	Masonry Work	600
22	General Contractor	44
23	Highway & Street Construction	800
24	Commercial roofing	100
25	Wrecking and Demolition Work	75
26	General Contractor	30
27	General Contractor	1250
Total number of employees represented in the 27 returned surveys		12,452

3.2 Older Construction Workers

The second section of the survey focused questions regarding the aging workforce in the construction industry. First, 74% of the respondents (20 of 27 companies) perceived that an “older” construction worker was older than 50 years old, 22% (6 of 27) said it was anyone older than 45 years old. The remaining (4%) claimed that 40 years old was the cut off. All of the respondents (27 of 27 companies) either agreed or strongly agreed that older workers were valuable to the construction industry. Forty-one percent (11 of 27) agreed that older workers were more valuable than younger workers, followed by 60% as neutral. One-third of the respondents (9 of 27) agreed that older workers were more safely than younger workers, while 67% (18 of 27) were either neutral or disagreed. Sixty-seven percent (18 of 27 companies) did agree that on average the cost of an injury for an older worker was higher than that of a younger worker, and 22% thought the cost was the same and 11% thought younger workers’ injuries were more expensive (Figure 1). In regards to the productivity of the two groups, 41% of the respondents (11 of 27) thought it was about the same and 26% thought older workers were more productive and 18% thought it was younger workers, and 15% were unsure (Figure 2).

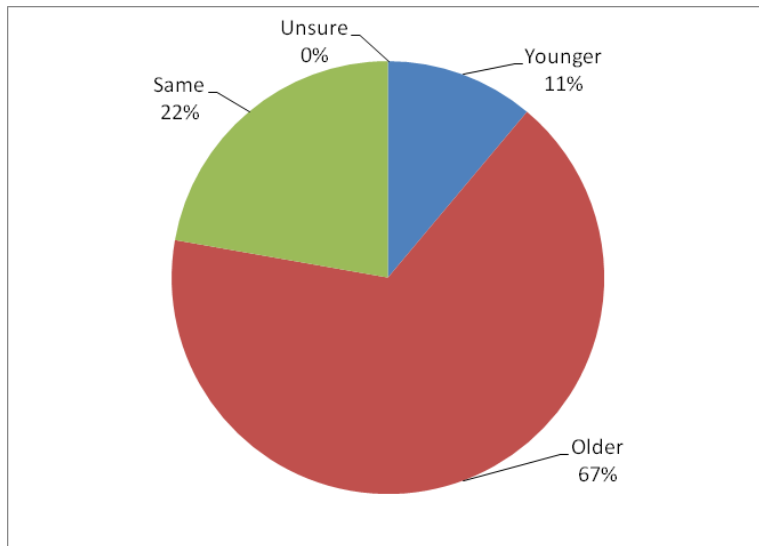


Figure 1. Perception of Highest Cost of Injuries

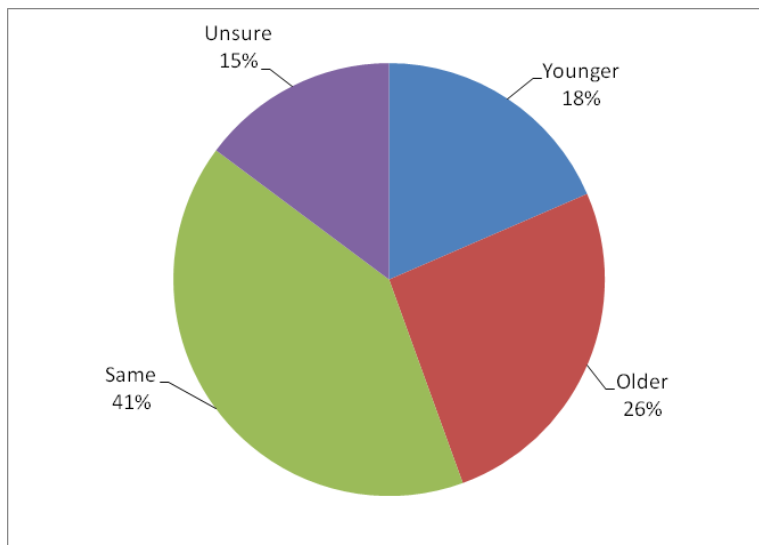


Figure 2. Perception of Highest Productivity

The respondents were then asked if they were aware of any company policies on the specific management of older workers. It turned out that 85% (23 of 27 companies) were not aware of anything such policies, but 15% were aware of policies (e.g., physical and health screens, exercises, and muscle/skeletal injury prevention). When asked if they would support programs aimed at maximizing older workers' potential, seventy percent (19 of 27) answered "Yes" and the rest said they were "Unsure". The respondents who answered "Yes" were asked to give examples of programs that they would support and some examples are: keeping older workers healthy and active, mentorship type programs to teach the younger workers, updated process and procedures, stretch and flex/warm ups, healthy lifestyle training and crew leadership programs. The second question asked the participants, to the best of their knowledge, to indicate which age group the most overweight/obese is. Fifty-six percent (15 of 27) claimed that the age group of 45-54 years old was the most overweight, followed by 35-44 (22%), 55-64 (15%), and 25-34 (4%), and older than 64 (4%).

3.3 Safety and Health Programs

The survey also contained a section in which participants were asked to provide information regarding the safety and health programs. All of the companies (27 of 27) represented in the survey did have a written Safety Program that has been reviewed at least annually and most of these programs had been implemented at least 20 years ago. However, only about 50% of the firms had a Health and Wellness program. When asked “How important is the worker’s health and wellness perceived in your company”, forty-one percent (11 of 27) reported that it was extremely important followed by 33% as important, and 26% claimed that it was either neutral or not important. Only about 40% of the companies had a rewards system that attempted to motivate employees to be healthier. Most of these programs were based on insurance premium discounts, fitness cost/gym membership reimbursements, safety bucks, and peer recognition. About 56% of the respondents (15 of 27 companies) had programs which encourage employees to do physical exercise, followed by 52% had blood pressure screen and 48% had tobacco cessation program. Thirty percent of the respondents had nutrition training and weight loss program respectively. However, only 11% of the respondents (3 of 27) reported that healthier food choices were available to the employees on the job site (Figure 3).

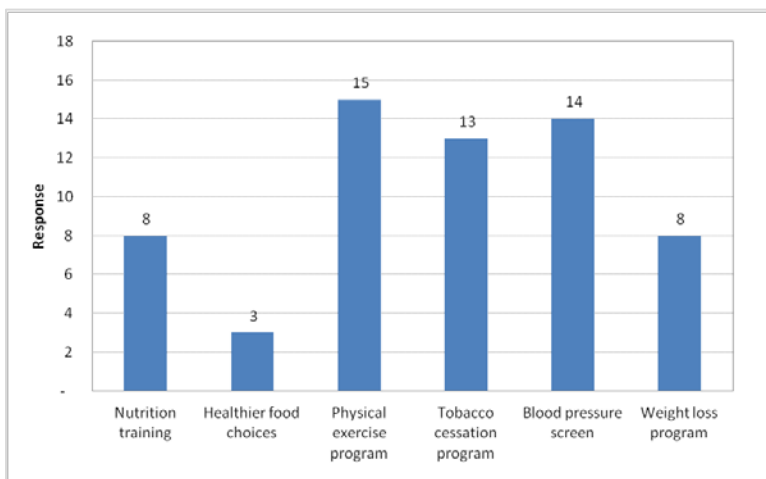


Figure 3. Workers Wellness Programs

3.4 Injuries and Illnesses

In the last section, the participants were asked to provide information in regards to the injuries and illnesses that the employees were experiencing in their companies. The first question asked the respondents to select most common types of work-related injury or illness. Forty-eight percent of respondents (20 of 42 total cases) selected was sprain/strain followed by cuts (31%), bruises (14%), fractures (5%) and others (2%) (Figure 4).

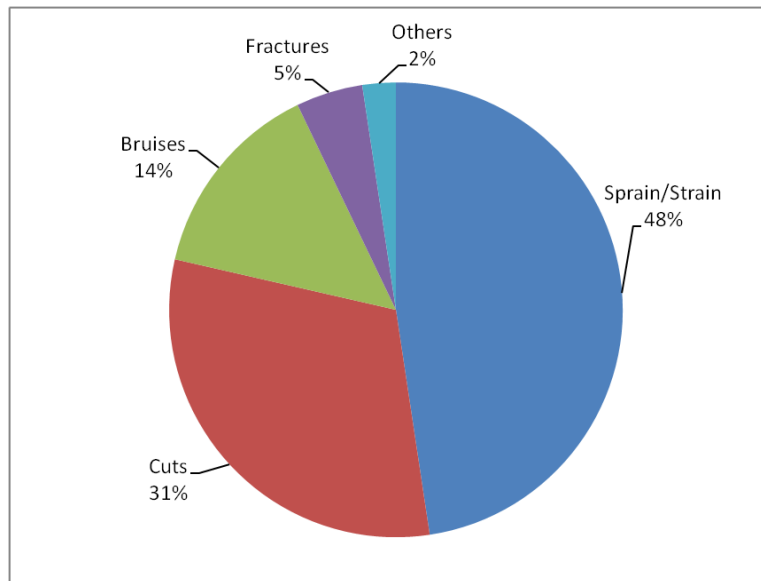


Figure 4. Common Types of Work-related Injury or Illness

The next question asked the respondents to select all applicable common types of diseases the worker had in their firms. The options included high blood pressure, diabetes, lung disease, asthma, heart disease, high blood cholesterol, arthritis, and others. The total number of checkmarks was recorded for each option. Thirty-five percent of respondents (15 of 43 total cases) selected high blood pressure as the most common type of diseases. Next, high cholesterol (23%) and arthritis (16%) were selected as the second and third common types of diseases respectively. The following are the remaining responses: heart disease (12%), diabetes (7%), lung disease (2%), and others (5%) (Figure 5).

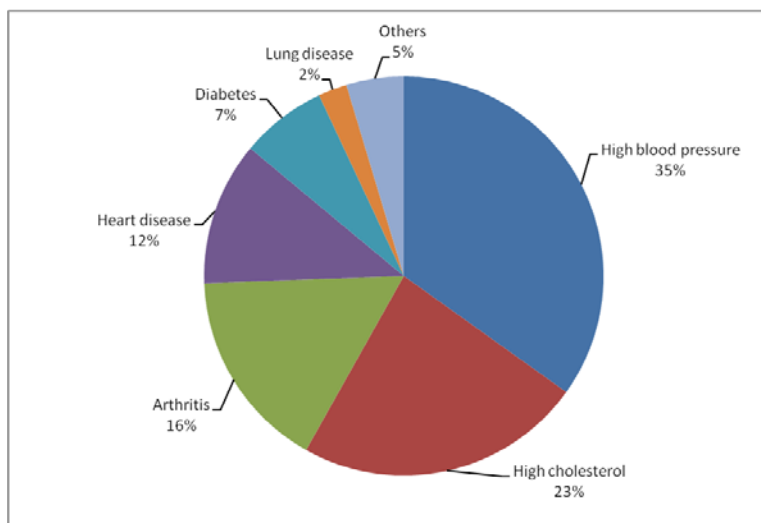


Figure 5. Common Types of Age-related Diseases

4. Discussion

The construction industry appeared very well aware of the health and safety concerns that their “older construction worker” is dealing with on a daily basis. The common types of age-related diseases reported were high blood pressure, high cholesterol, arthritis, heart disease, and diabetes. These conditions were right in line with the literature (Dong et al., 2011; Stein, 2011). It is interesting to point out that the majority of the respondents perceived that an “older” worker was older than 50, and only 4% of the respondents indicated that the cut-off for an “older” worker was 40. Note that the U.S. Department of Labor uses older workers (over 40) in some statistics, while some Bureau of Labor Statistics stratifications use >45 years for injury and illness reporting. The aging process is affected by multiple factors, including genetic makeup, environmental and socio-economic conditions. It can be of attention to anyone who is individually experiencing signs of aging, which includes about everybody over the age of 40 (Spirduso, 1995). The decremental theory of aging proposes that, as persons advance in age, some work capacities, both physical (cardiovascular function, muscle strength, endurance) and cognitive (sensorimotor performance, decision time, memory), decline lessening the person’s ability to cope with multiple job demands. Moreover, work-related musculoskeletal disorders (WMSDs) are a tremendous concern to the U.S. construction industry (BLS, 2013e). The current study coincides that the most common type of injury and illness was WMSDs (e.g., sprain and strain). It is known that one major cause of work-related musculoskeletal disorders is overexertion (CPWR, 2012). Note that WMSD prevention interventions should be accomplished with effective ergonomics programs including the following elements: employer commitment of time, personnel & resources, active employee involvement in identifying problems & finding solutions, system to identify and analyze risk factors, worker and management training, medical management, and regular evaluation of the program’s effectiveness (NIOSH, 2007; Choi & Woletz, 2012). Additionally, there is a growing interest in, and use of, stretch and flex (SF) programs to reduce the ergonomic-related injuries by construction specialty contractors (Rajendran, 2013; Boatman et al., 2012). Along with comprehensive ergonomic programs, a SF program could be helpful to prevent or reduce the severity of musculoskeletal disorders or injuries. Some other benefits to the SF session may include team-building, communication, increased worker morale, and safety planning (Rajendran, 2013).

5. Concluding Remarks

The findings of this study highlighted the construction worker’s age-related health, safety and ergonomic considerations. The construction firms perceived that older workers were very valuable to the industry whereas the cost of an injury for an older worker were higher than that of a younger worker. The study indicated that sprain/strain and cut injuries were most frequent types of injuries whilst high blood pressure and high cholesterol were mostly age-related diseases. Also, the survey results found that the construction organizations seemed lagging behind with Health and Wellness programs. To make it better, the workplace health and wellness campaign should advocate for healthier food choices, blood pressure screenings, and weight loss programs, in conjunction with information on occupational ergonomic hazards in construction. It is warranted that the construction safety and health programs need to expand its range and scope in order to reduce physical demands, reduce obesity and smoking, and improve work ability among older construction workers. Occupational ergonomic, health and safety professionals in the industry should continue to explore ways to alleviate the recognized the job task-related ergonomic hazards and integrate effective health and wellness programs in the construction workplace. It should be noted that the results of the study may be different from the other parts of the country when the survey is limited to one region. A larger sample representing the U.S. construction industry will be administered to develop a national database, while the findings of this research can still provide some valuable insights into the health and safety considerations of the older construction workers.

6. References

- Boatman, L., Chaplan, D., & Teran, S. (2012). Creating the climate for making ergonomic changes. Retrieved from <http://www.cpwr.com/pdfs/ChaplanErgoClimateFINAL.pdf>.
- Bureau of Labor Statistics (2013a). Monthly Labor Review Online, U.S. Labor Market Continued to Improve in 2012. U.S. Department of Labor. Retrieved from <http://www.bls.gov/opub/mlr/2013/03/art1full.pdf>.
- Bureau of Labor Statistics (2013b). Economic News Release: Employment Situation Summary. U.S. Department of Labor. <http://www.bls.gov/news.release/empsit.nr0.htm>.
- Bureau of Labor Statistics (2013c). Industries at a Glance: Construction NAICS 23. U.S. Department of Labor. Retrieved from <http://www.bls.gov/iag/tgs/iag23.htm>.

- Bureau of Labor Statistics (2013d). Economic News Release: Nonfatal Occupational Injuries and Illnesses Requiring Days Away From Work. U.S. Department of Labor. Retrieved from <http://www.bls.gov/news.release/osh2.nr0.htm>.
- Bureau of Labor Statistics (2013e). Musculoskeletal Disorders and Days Away from Work. U.S. Department of Labor. <http://www.bls.gov/opub/ted/2008/dec/wk1/art02.htm>.
- Choi, S.D. (2009). Safety and ergonomic considerations for an aging workforce in the US construction industry. *Work*, 33, 307-315.
- Choi, S.D., & Woletz, T. (2010). Do stretching programs prevent work-related musculoskeletal disorders? *Journal of Safety, Health and Environmental Research*, 6, 1-19.
- CPWR (2012). The Center for Construction Research and Training. The Construction Chart Book: The U.S. Construction Industry and Its Workers. Retrieved from <http://www.cpwr.com/rp-chartbook.html>.
- Dong, X., Wang, X., Daw, C., & Ringen, K. (2011). Chronic diseases and functional limitations among older construction workers in the United States: A 10-year follow-up study. *Occupational Environmental Medicine*, 53, 372-380.
- NIOSH (2007). *Simple Solutions: Ergonomics for Construction Workers*. National Institute for Occupational Safety and Health. US Department of Health and Human Services. DHHS (NIOSH) Publication No. 2007-122.
- Rajendran, S. (2013). Stretching & flex programs: perceptions of construction specialty firms. *Journal of Safety, Health & Environmental Research*, 8, 81-87.
- Schwatka, N.V., Butler, L.M., & Rosecrance, J.R. (2011). An aging workforce and injury in the construction industry. *Epidemiologic Reviews*, 34(1), 156-167.
- Stein, R. (2011). Baby boomers appear to be less healthy than parents. The Washington Post. Retrieved from <http://www.washingtonpost.com/wp-dyn/content/article/2007/04/19/AR2007041902458.html>.
- Spirduso, W.W. (1995). *Physical Dimensions of Aging*. Champaign, IL: Human Kinetics.
- Welch, L. (2012). The aging worker in the U.S. construction industry. OH&S Occupational Health & Safety. <http://ohsonline.com/Articles/2010/03/01/The-Aging-Worker.aspx?p=1>.

7. Appendix: The Survey Instrument

Background

- What is your company's NAIC #?
- What are the primary types of work that your company does?
- How long has your company been in business?
- What are your title and your job function in your company?
- How many construction workers do you employ?
- From the age groups on the line below, list number of employees you have for each age group.
16-19 20-24 25-34 35-44 45-54 55-64 64+

Older Construction Workers

- How old do you consider an "older" worker to be in years?
35+ yrs 40+ yrs 45+ yrs 50+ yrs
- Older workers are valuable to the construction industry?
(Strongly disagree) 1 2 3 4 5 (Strongly agree)
- Older workers are more valuable than younger workers?
(Strongly disagree) 1 2 3 4 5 (Strongly agree)
- Older workers tend to work more safely than younger workers?
(Strongly disagree) 1 2 3 4 5 (Strongly agree)
- Are you aware of any company policies on the specific management of older workers?
Yes No Unsure If 'Yes', what are they?
- Is the cost of injuries on average higher among younger or older workers?
Younger Older Same Unsure
- Who do you think are more productive, younger or older workers?
Younger Older Same Unsure
- Would you support programs aimed at maximizing older workers' potential?
Yes No Unsure
If 'Yes', what specific programs would you support? (Please list)

Safety & Health Programs

- Do you have a safety program? Yes No Unsure
 If 'Yes', do you have a *written* safety program?
 Yes No Unsure
 If so, when was the last time it was reviewed?
- How long has your safety program been implemented?
- Do you have a *health and wellness* program?
 Yes No Unsure
 If 'Yes', please describe?
 If not, have you formulated an *action plan* to develop one? Yes No Unsure
- How important is the worker's *health and wellness* perceived in your company?
 (Not important) 1 2 3 4 5 (Extremely important)
- Does your company have any reward systems to help motivate employees to be *healthier*?
 Yes No Unsure
 If 'Yes', what are they (e.g., bonus, promotion, peer recognition, safety bucks, fitness membership, etc.)?
- Does your company provide classes or training on proper nutrition?
 Yes No Unsure
- How many times per week do your employees eat lunch at a restaurant?
- Are there healthier food choices available to the employees on the job site?
 Yes No Unsure
- Does your company have programs which encourage employees to do physical exercise?
 Yes No Unsure
- Is smoking allowed on the job site?
 Yes No Unsure
- Does your company have a tobacco cessation program?
 Yes No Unsure
- Does your company have blood pressure screenings?
 Yes No Unsure
- Does your company have a weight loss program?
 Yes No Unsure
 If 'Yes' please describe:

Injuries/Illnesses & Health Issues

- How many non-fatal injuries your company's OSHA 300 log show?
- What are the most common types of *work-related injury or illness* your workers have?
 Sprain/Strain Fractures Burns Cuts Bruises Carpal Tunnel Syndrome
- What are the most common types of *diseases* your workers have?
 High blood pressure Diabetes Lung disease Asthma Heart disease High blood cholesterol Arthritis
 Others (Please list)
- To the *best of your knowledge*, which age group is the most *overweight/obese*?
 16-19yrs 20-24yrs 25-34yrs 35-44yrs 45-54yrs 55-64yrs 64+yrs
- Please select/check only *one* age-range *per* disease (by each row)

	16-19	20-24	25-34	35-44	45-54	55-64	64+
High blood pressure							
Diabetes							
Lung disease							
Asthma							
Heart disease							
High blood cholesterol							
Arthritis							