



April 2016

WORKPLACE SAFETY AND HEALTH

Additional Data Needed to Address Continued Hazards in the Meat and Poultry Industry

Accessible Version

GAO Highlights

Highlights of [GAO-16-337](#), a report to congressional requesters

Why GAO Did This Study

DOL is responsible for gathering data on workplace injuries and illnesses, including those in the meat and poultry industry, where workers may experience injuries and illnesses such as sprains, cuts, burns, amputations, repetitive motion injuries, and skin disorders. GAO was asked to examine developments since its 2005 report, which found this industry was one of the most hazardous in the United States and that DOL data on worker injuries and illnesses may not be accurate, and recommended that DOL improve its data collection.

This report (1) describes what is known about injuries, illnesses, and hazards in the meat and poultry industry since GAO last reported, and (2) examines DOL's challenges gathering injury and illness data in this industry. GAO analyzed DOL data from 2004 through 2015, including injury and illness data through 2013, the most recent data available, and examined academic and government studies and evaluations on injuries and illnesses. GAO interviewed DOL and other federal officials, worker advocates, industry officials, and workers, and visited six meat and poultry plants selected for a mix of species and states. The information gathered in these visits is not generalizable to all plants or workers.

What GAO Recommends

GAO is making three recommendations, including that DOL improve its data on musculoskeletal disorders and sanitation workers in the meat and poultry industry. DOL, USDA, and CDC concurred with GAO's recommendations.

View [GAO-16-337](#). For more information, contact Cindy Brown Barnes at (202) 512-7215 or brownbarnesc@gao.gov, or Steve Morris at (202) 512-3841 or morriss@gao.gov.

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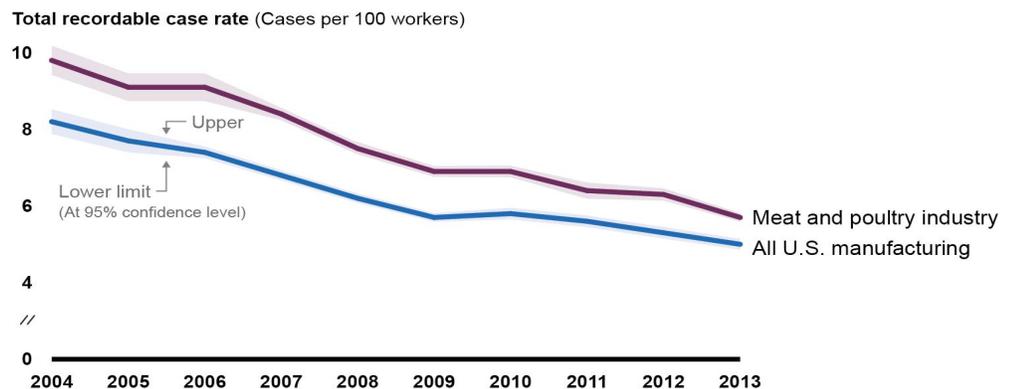
WORKPLACE SAFETY AND HEALTH

Additional Data Needed to Address Continued Hazards in the Meat and Poultry Industry

What GAO Found

Injury and illness rates in the meat and poultry slaughtering and processing industry declined from 2004 through 2013, similar to rates in all U.S. manufacturing, according to Department of Labor (DOL) data (see figure), yet hazardous conditions remain. The rates declined from an estimated 9.8 cases per 100 full-time workers in 2004 to 5.7 in 2013. However, these rates continued to be higher than rates for manufacturing overall. Meat workers sustained a higher estimated rate of injuries and illnesses than poultry workers, according to DOL data. Centers for Disease Control and Prevention (CDC) evaluations and academic studies have found that workers continue to face the hazardous conditions GAO cited in 2005, including tasks associated with musculoskeletal disorders, exposure to chemicals and pathogens, and traumatic injuries from machines and tools.

Injury and Illness Rates among Workers in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013



Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Note: The meat and poultry industry refers to the animal slaughtering and processing industry, North American Industry Classification System code 31161, which includes animal (except poultry) slaughtering, meat processed from carcasses, rendering and meat byproduct processing, and poultry processing including slaughter.

DOL faces challenges gathering data on injury and illness rates for meat and poultry workers because of underreporting and inadequate data collection. For example, workers may underreport injuries and illnesses because they fear losing their jobs, and employers may underreport because of concerns about potential costs. Another data gathering challenge is that DOL only collects detailed data for those injuries and illnesses that result in a worker having to take days away from work. These detailed data do not include injuries and illnesses such as musculoskeletal disorders that result in a worker being placed on work restriction or transferred to another job. Further, DOL does not have complete injury and illness data on meat and poultry sanitation workers because they may not be classified in the meat and poultry industry if they work for contractors. Federal internal control standards require agencies to track data to help them make decisions and meet their goals. These limitations in DOL's data collection raise questions about whether the federal government is doing all it can to collect the data it needs to support worker protection and workplace safety.

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Abbreviations

BLS	Bureau of Labor Statistics
CDC	Centers for Disease Control and Prevention
CFOI	Census of Fatal Occupational Injuries
CPS	Current Population Survey
DOL	Department of Labor
FSIS	Food Safety and Inspection Service
HHS	Department of Health and Human Services
MSD	Musculoskeletal disorder
NAICS	North American Industry Classification System
NIOSH	National Institute for Occupational Safety and Health
OES	Occupational Employment Statistics

OSH Act	Occupational Safety and Health Act of 1970
OSHA	Occupational Safety and Health Administration
SOII	Survey of Occupational Injuries and Illnesses
USDA	United States Department of Agriculture

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April 25, 2016

The Honorable Patty Murray
Ranking Member
Committee on Health, Education, Labor, and Pensions
United States Senate

The Honorable Robert P. Casey, Jr.
United States Senate

The Honorable Robert C. "Bobby" Scott
Ranking Member
Committee on Education and the Workforce
House of Representatives

Workers in the meat and poultry slaughtering and processing industry face numerous workplace hazards, including slippery floors, high-speed repetitive tasks, dangerous equipment and tools, high-pressure water, and chemical exposure.¹ The Department of Labor's (DOL) Occupational Safety and Health Administration (OSHA) is the federal agency responsible for assuring safe and healthful working conditions, in part by enforcing related workplace safety and health standards for this and other industries. DOL's Bureau of Labor Statistics (BLS) gathers and reports data on worker injury and illness rates. In 2005, we found that the meat and poultry slaughtering and processing industry was one of the most hazardous in the United States, and that DOL's data may not accurately

¹For the purposes of this report, "meat" generally refers to hog and cattle, and "poultry" generally refers to chicken and turkey. In addition, we use the term "meat and poultry industry" to refer to companies in the animal slaughtering and processing industry, North American Industry Classification System (NAICS) code 31161. The animal slaughtering and processing industry code (meat and poultry industry) includes "animal (except poultry) slaughtering" (NAICS code 311611); "meat processed from carcasses" (NAICS code 311612); "rendering and meat byproduct processing" (NAICS code 311613); and "poultry processing" (NAICS code 311615), which covers poultry slaughtering and processing. The meat and poultry industry is within the manufacturing industry (NAICS codes 31-33).

reflect plants' incidences of injury and illness because of underreporting.² The Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS), which is responsible for ensuring food safety for meat and poultry products, as well as catfish and processed egg products, began implementing a pilot project in 1998 at certain poultry and hog plants that allowed for increased slaughter line speeds at evisceration, among other things.³ In 2013, we found that some stakeholder groups were concerned that these faster line speeds endanger worker safety.⁴ In 2014, USDA decided not to increase the maximum evisceration line speeds for chicken plants, and slightly increased maximum line speeds for turkey plants.⁵

You asked us to review issues related to meat and poultry worker safety. This report (1) describes what is known about injuries, illnesses, and hazards in the meat and poultry industry since we last reported, and (2) examines what, if

²GAO, *Workplace Safety and Health: Safety in the Meat and Poultry Industry, While Improving, Could be Further Strengthened*, [GAO-05-96](#) (Washington, D.C.: Jan. 12, 2005). In 2009, we found that OSHA's efforts to ensure accurate recordkeeping by employers may not be adequate, and we recommended that DOL take steps to improve the accuracy of its data (GAO, *Workplace Safety and Health: Enhancing OSHA's Records Audit Process Could Improve the Accuracy of Worker Injury and Illness Data*, [GAO-10-10](#) (Washington, D.C.: Oct. 15, 2009)).

³In slaughter plants that have received USDA approval to be inspected by FSIS and thereby produce meat and poultry products to ship in interstate commerce, there is a slaughter production line made up of multiple operations. This line begins with the arrival of the animal in the receiving yard, includes evisceration, and runs to the point where carcasses are chilled before they are further processed. In this report, we use the term "evisceration line" to refer to the line in slaughter production that includes evisceration of the animal to present its internal organs for inspection.

⁴GAO, *Food Safety: More Disclosure and Data Needed to Clarify Impact of Changes to Poultry and Hog Inspections*, [GAO-13-775](#) (Washington, D.C.: Aug. 22, 2013).

⁵Modernization of Poultry Slaughter Inspection, 79 Fed. Reg. 49,566 (Aug. 21, 2014). Poultry slaughter plants may choose to operate under the new poultry inspection system included in the rule or may continue to operate under the pre-existing inspection system. For those poultry slaughter plants that choose to operate under the new poultry inspection system, plant employees assume more responsibility for conducting the types of activities currently performed by USDA inspectors on the slaughter line. According to agency officials, the rule ended the pilot project for poultry plants, and plants that were operating under the pilot project currently operate under the new poultry inspection system. The 25 poultry plants in the pilot were allowed to run their slaughter lines up to 175 birds per minute for chickens, compared to 140 birds per minute for plants not in the pilot; and up to 55 birds per minute for turkeys, compared to 51 birds per minute for light turkeys and 45 birds per minute for heavy turkeys for plants not in the pilot. Under the new system, plants may run their lines up to 140 birds per minute for chickens, and up to 55 birds per minute for turkeys.

any, challenges DOL faces in gathering data on injury and illness rates in this industry.

To describe what is known about worker injuries, illnesses, and hazards in the meat and poultry industry since we last reported and to examine the challenges that DOL faces in gathering data, we obtained and analyzed the most recent data available from:

- BLS's Survey of Occupational Injuries and Illnesses (SOII) for calendar years 2004 through 2013, including rates of various injuries such as musculoskeletal disorders (MSD) that resulted in days away from work in calendar year 2013;⁶
- BLS's Census of Fatal Occupational Injuries (CFOI) for calendar years 2004 through 2013 to better understand the number of fatalities and the hazards that may have caused them;
- BLS's pilot study on MSDs, collected from 2011 through 2013, to obtain more information on the occurrence of MSDs and the challenges of collecting data on them;
- the Current Population Survey (CPS), which is sponsored jointly by BLS and the Census Bureau, from March 2015 to describe how the demographics of meat and poultry workers may pose a challenge to gathering data;⁷ and
- BLS's Occupational Employment Statistics (OES) survey data from May 2014 to describe wage levels of meat and poultry workers.

To assess the reliability of the data, we reviewed documents related to the data sources and interviewed agency officials knowledgeable about these data. All estimates produced from the analysis of these data are subject to sampling errors. We express our confidence in the precision of

⁶This survey provides estimates of the number and rate of workplace injuries and illnesses based on logs kept by private industry employers during the year. MSDs include conditions such as tendonitis, carpal tunnel syndrome, and lower back injuries. Symptoms of these disorders can include swelling in the joints, limited range of motion, numbness or tingling sensations, and loss of strength. Events or exposures that can lead to the injury or illness are bodily reaction/bending, climbing, crawling, reaching, twisting, overexertion, and repetition.

⁷U.S. Census Bureau, Bureau of Labor Statistics, *Current Population Survey, 2015 Annual Social and Economic (ASEC) Supplement* (Washington, D.C.: 2015).

the results as a 95 percent confidence interval. We found these data were sufficiently reliable for our purposes in generally describing injury and illness rates as well as worker demographics.

In addition, we reviewed literature from peer-reviewed journals, OSHA documents, and the Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health's (NIOSH) health hazard evaluations in the meat and poultry industry that focused on factors that affected injury and illness rates and hazards since we last reported.

To examine the challenges DOL faces in gathering data on injuries and illnesses, we reviewed relevant federal laws and regulations, as well as documentation from OSHA and NIOSH, and interviewed officials from OSHA (including officials from all 10 regional OSHA offices), FSIS, and NIOSH.⁸ We also identified and interviewed 13 stakeholder groups (unions, worker advocacy groups, and industry trade organizations) with sufficient knowledge about worker safety in the meat and poultry industry, in part based on previous work and on referrals from other stakeholder groups, and reviewed information we obtained from these groups. In addition, we visited six meat and poultry plants—selected to cover a mix of species and states, as well as union and non-union plants and two plants that were part of the FSIS pilot project. We also interviewed plant management, FSIS management and inspectors, and plant safety and health staff. To assess DOL's efforts based on the information gathered in interviews and site visits, we used federal internal control standards that call for agencies to track data and to undertake accurate and timely recording to accomplish agency objectives.⁹ The information gathered from these interviews and documents is not generalizable to all plants or workers. The methodology described in this paragraph also helped inform our examination of what is known about worker injuries, illnesses, and hazards. See appendix I for more information on our scope and methodology.

We conducted this performance audit from December 2014 to April 2016 in accordance with generally accepted government auditing standards.

⁸CDC's NIOSH is the federal agency that conducts research and makes recommendations to prevent worker injuries and illnesses, among other responsibilities.

⁹GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: November 1999).

Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

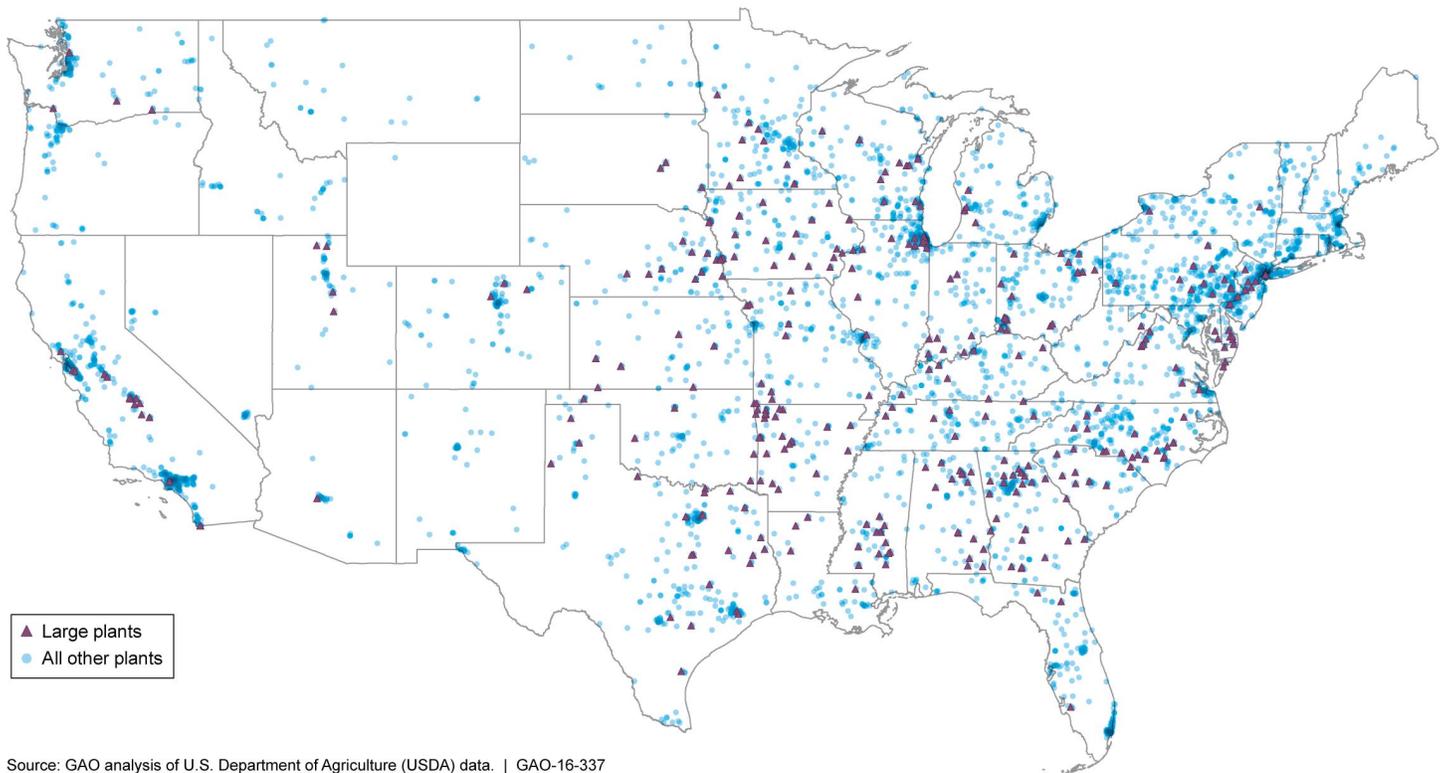
Background

According to March 2015 CPS data, an estimated 526,000 workers were employed in the animal slaughtering and processing industry.¹⁰ There were about 5,350 meat and poultry plants in the United States as of September 2015, of which around 1,100 were slaughter and processing plants, according to the USDA (see fig. 1). In 2014, more than 30 million beef cattle, 100 million hogs, 200 million turkeys, and 8 billion chickens were slaughtered in the United States, according to USDA's National Agricultural Statistics Service data.¹¹

¹⁰The actual estimate is 526,299 workers. This estimate has a 95 percent confidence interval from 446,623 to 616,051. All demographic estimates for the meat and poultry industry in this report are based on the CPS from March 2015 and refer to workers in the meat and poultry industry. We express our confidence in the precision of estimates as 95 percent confidence intervals. This is the interval that would contain the actual population values for 95 percent of the CPS samples that BLS could have drawn.

¹¹According to a 2015 industry report, the top four beef producers package 85 percent of the beef cattle in the United States. The top four pork producers control nearly 65 percent of the market. The poultry industry is nearly as concentrated, with the top four poultry producers processing almost 60 percent of the market.

Figure 1: Meat and Poultry Plants in the United States, as of September 2015

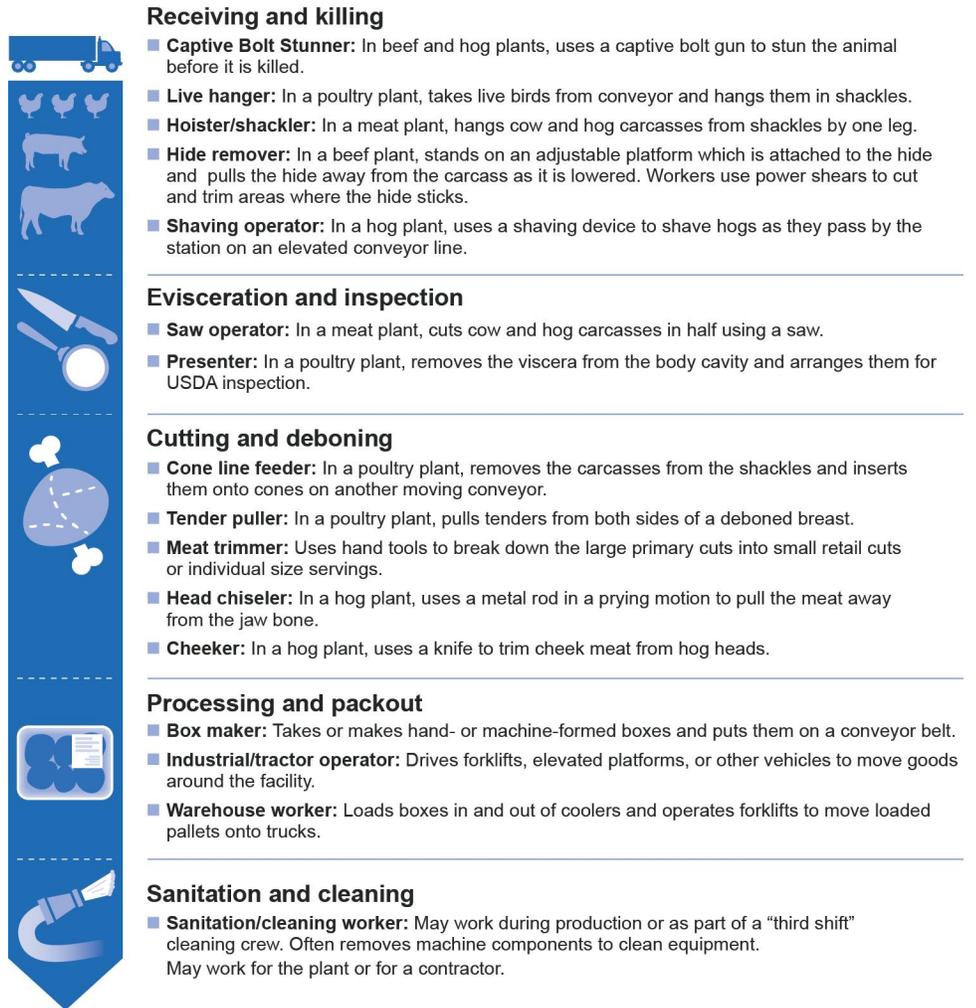


Source: GAO analysis of U.S. Department of Agriculture (USDA) data. | GAO-16-337

Note: USDA defines large plants as establishments that have 500 or more employees.

Meat and poultry plants are generally designed for an orderly flow from point of entry of the living animal to the finished food product. Typically, the animal is brought to the meat or poultry plant and taken to the kill floor area, where the slaughter occurs. Workers and machines behead and eviscerate the animal, among other things, after which it is chilled for several hours. FSIS inspectors ensure that the carcass meets federal food safety standards. Workers and machines next process the carcass and may break it into small portions that can be transported directly to supermarkets. Slaughter and processing of meat and poultry require workers to perform a high number of repetitive motions. Although plants have increased automation, much of the work is still done by hand through the use of saws, knives, and other tools (see fig. 2).

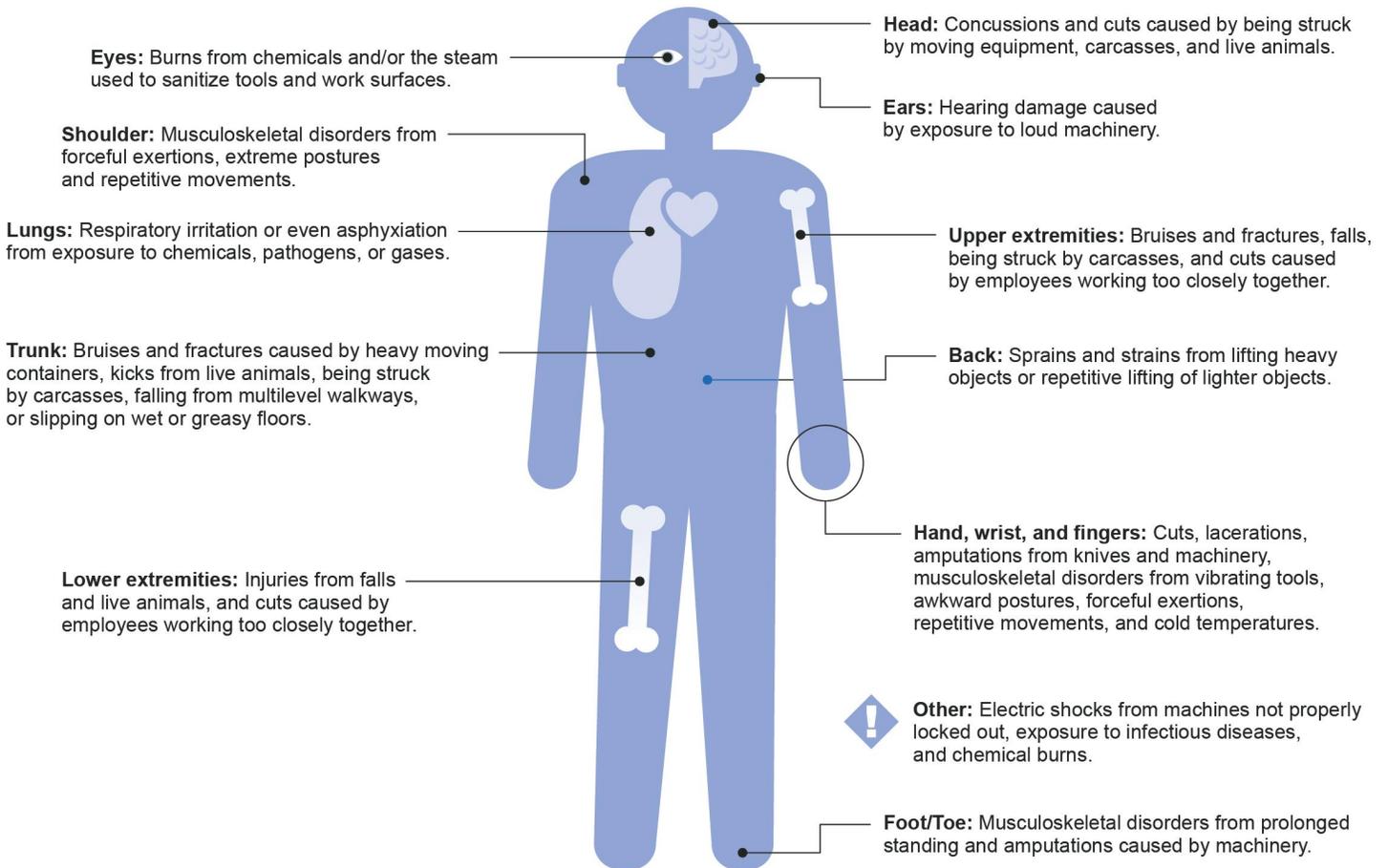
Figure 2: Common Jobs in Meat and Poultry Plants



Source: GAO analysis of documents from the Occupational Safety and Health Administration (OSHA), advocacy groups, and industry stakeholders. | GAO-16-337

Workers may sustain many different types of injuries at meat and poultry plants (see fig. 3).

Figure 3: Nature of Injuries Potentially Sustained by Meat and Poultry Workers and Parts of Body Affected



Source: GAO analysis of documents from the Bureau of Labor Statistics (BLS), Centers for Disease Control and Prevention (CDC), and Occupational Safety and Health Administration (OSHA). | GAO-16-337

To carry out its responsibilities under the Occupational Safety and Health Act of 1970 (OSH Act), OSHA establishes workplace safety and health standards, conducts inspections, investigates complaints from workers and reports of fatalities and serious injuries at worksites, and provides training and outreach, among other activities.¹² To supplement its enforcement efforts, OSHA offers cooperative programs to help employers prevent injuries, illnesses, and fatalities in the workplace. OSHA conducts inspections in response to imminent danger, fatalities, catastrophic events

¹²See generally 29 U.S.C. §§ 651-678.

such as hospitalizations, and worker complaints, and also selects worksites for programmed inspections based on injury incidence rates, previous citation history, or random selection.¹³ OSHA is directly responsible for setting and enforcing these standards for private sector employers, including meat and poultry plants, in 29 states, the District of Columbia, and 4 U.S. territories.¹⁴ The remaining 21 states and 1 territory have assumed responsibility for workplace safety and health under an OSHA-approved state plan. These “state-plan states” adopt and enforce their own standards (which must be “at least as effective” in providing safe and healthful employment as the federal standards).¹⁵

The OSH Act and OSHA’s regulations require covered employers to prepare and maintain records of certain injuries and illnesses sustained by their workers.¹⁶ Specifically, non-exempt employers are required to record information about every work-related death and each new work-related injury or illness that results in loss of consciousness, days away from work, restricted work or transfer to another job, or medical treatment beyond

¹³Until March 2015, OSHA selected worksites across the country for programmed inspections under its Site Specific Targeting program, which relied on data OSHA collected from worksites under the OSHA Data Initiative. The OSHA Data Initiative ended in 2012.

¹⁴These states include: Alabama, Arkansas, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Kansas, Louisiana, Maine, Massachusetts, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Dakota, Texas, West Virginia, and Wisconsin. The territories include American Samoa, Guam, the Northern Mariana Islands, and the U.S. Virgin Islands.

¹⁵29 U.S.C. § 667, 29 C.F.R. pt. 1952. The states include Alaska, Arizona, California, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, and Wyoming. The territory is Puerto Rico.

¹⁶29 U.S.C. § 657(c). Employers with 10 or fewer employees at all times during the previous calendar year are exempt from routinely keeping OSHA injury and illness records. Establishments in certain industries classified by OSHA as lower-hazard are also partially exempt from routinely keeping OSHA injury and illness records. For the recordkeeping regulations for private sector employers, see 29 C.F.R. pt. 1904. States operating OSHA-approved state plans must have substantially identical recordkeeping requirements. For the recordkeeping regulations for federal employers, see 29 C.F.R. §§ 1960.66-1960.73.

first aid.¹⁷ OSHA has established three different forms for employers to record injuries and illnesses: the Form 300 Log of Work-Related Injuries and Illnesses (log), the Form 301 Injury and Illness Incident Report (incident report), and the Form 300-A Summary of Work-Related Injuries and Illnesses.¹⁸ For each recordable injury or illness, the employer must record specified information on the log, including the worker's name, job title, date of injury or illness, a brief description of the injury or illness, and, if applicable, the number of days the worker was away from work, assigned to restricted duties, or assigned to another job as a result of the injury or illness. Employers must also classify the injury or illness according to categories provided on the OSHA log. These categories include injury, skin disorder, respiratory condition, poisoning, hearing loss, and "all other illnesses." In addition to the log, for each case employers must prepare an incident report, which includes descriptive information about the case, including details about the injury or illness, how it occurred, and the treatment provided. Finally, employers are also required to prepare a summary of all injuries and illnesses annually, which is to be posted at the workplace.¹⁹ Although these three forms are not routinely provided to OSHA, they must be kept for 5 years and provided upon request in certain circumstances, such as during an OSHA inspection or in response to BLS's SOII.²⁰ In addition, all covered employers, including those exempt from the routine recordkeeping requirements, must report all work-related fatalities to

¹⁷In addition, employers must record any significant work-related injury or illness that is diagnosed by a physician or other licensed health care professional, as well as certain types of injuries or illnesses that meet additional criteria. 29 C.F.R. §§ 1904.7-1904.11. Under OSHA's regulations, first aid consists of specified types of treatment, including cleaning, flushing, or soaking wounds on the surface of the skin; using wound coverings, such as bandages; using non-prescription medications; draining fluids from blisters; using simple irrigation or a cotton swab to remove debris from the eyes; massage; and drinking fluids to relieve heat stress. 29 C.F.R. § 1904.7(b)(5).

¹⁸Employers subject to the recordkeeping requirements must use the OSHA forms or equivalent forms for recordable injuries and illnesses. 29 C.F.R. § 1904.29.

¹⁹29 C.F.R. § 1904.32.

²⁰29 C.F.R. §§ 1904.33, 1907.40-1907.42. In 2013, OSHA proposed amending its recordkeeping regulations to require employers to electronically submit certain injury and illness records to OSHA on a regular basis. Improve Tracking of Workplace Injuries and Illnesses, 78 Fed. Reg. 67,254 (Nov. 8, 2013). The comment period ended on March 8, 2014. 79 Fed. Reg. 778 (Jan. 7, 2014). In August 2014, OSHA issued a supplemental notice of proposed rulemaking, soliciting comments on an additional proposal that would prohibit employers from taking certain actions to discourage employee reporting. 79 Fed. Reg. 47,605 (Aug. 14, 2014). Comments were due October 14, 2014. As of April 12, 2016, a final rule had not been published.

OSHA within 8 hours and all work-related in-patient hospitalizations, amputations, or losses of an eye within 24 hours.²¹

With respect to federal employers, such as USDA, each federal agency is generally required to establish and maintain a comprehensive and effective occupational safety and health program that is consistent with OSHA's standards.²² The mission of USDA's Safety and Health Management Division is to develop department-wide policies and promote and assist the development of USDA safety programs. USDA's FSIS occupational safety and health program has safety and health committees that may analyze injury and illness data to identify the cause of an injury and develop preventative measures, among other things. FSIS safety and health specialists investigate safety concerns of FSIS inspectors in meat and poultry plants.

BLS is responsible for collecting and distributing statistical information on issues related to labor, and one of the studies it conducts is the SOII.²³ Employers' OSHA logs are the main source of data for the annual SOII.²⁴ In addition to collecting information on all recorded injuries and illnesses, the survey, which draws from a sample of about 230,000 employers, requests detailed case data from employers for injuries or illnesses that resulted in at least 1 day away from work.²⁵ This detailed case data includes information on the type, or nature, of the injury or illness and the exposure, or event, that caused it. OSHA officials told us that they use these data to help them develop national and regional emphasis programs that focus on specific industries or worksite hazards, and to select high hazard workplaces to receive OSHA support and assistance.

Within the Department of Health and Human Services (HHS), CDC's NIOSH is the federal agency that conducts occupational safety and health

²¹29 C.F.R. § 1904.39.

²²29 U.S.C. § 668. Executive Order 12196, issued on February 26, 1980, prescribes executive branch agencies' and OSHA's responsibilities. 29 C.F.R. Part 1960 contains OSHA's regulations for federal agency programs.

²³See generally 29 U.S.C. §§ 1-9b. The OSH Act requires DOL to develop and maintain an effective program of collection, compilation, and analysis of occupational safety and health statistics. 29 U.S.C. § 673.

²⁴BLS also collects data on fatalities through the CFOI.

²⁵Cases involving days away from work are cases requiring at least 1 day away from work with or without days of job transfer or restriction.

research and workplace evaluations, and makes recommendations to prevent worker injuries and illnesses.²⁶ At the request of employees, employee representatives, or employers, NIOSH may conduct a health hazard evaluation at a work site, such as a poultry plant, to determine if health hazards—such as chemical exposure or ergonomic hazards—are present.²⁷ NIOSH provides assistance and information by phone and in writing to the requester and may visit the workplace to assess exposure and employee health.

USDA, under the Federal Meat Inspection Act and the Poultry Products Inspection Act, is responsible for ensuring the safety and wholesomeness of meat and poultry products that enter interstate commerce.²⁸ In 2013, over 3,700 USDA FSIS inspectors worked in meat and poultry plants to provide continuous inspection of each meat and poultry carcass and its parts. Among other regulations, USDA sets maximum line speeds for slaughter plants in order to allow FSIS inspectors sufficient time to perform proper inspection procedures.²⁹

Federal Data Show a Decline in Injuries and Illnesses, Yet Meat and Poultry Workers Continue to Face Hazardous Conditions

²⁶See generally 29 U.S.C. §§ 669-671.

²⁷29 U.S.C. § 669(a)(6); 42 C.F.R. pt. 85.

²⁸21 U.S.C. §§ 601-695 and 21 U.S.C. §§ 451-472. The Federal Meat Inspection Act was originally enacted in 1907 as part of the USDA appropriations act, and the Poultry Products Inspection Act was enacted in 1957. Both pieces of legislation have been amended a number of times throughout the years.

²⁹See, for example, 9 C.F.R. §§ 381.67-381.69, 381.76, 310.1.

Federal Data Show a Decline in Injury and Illness Rates for Meat and Poultry Workers

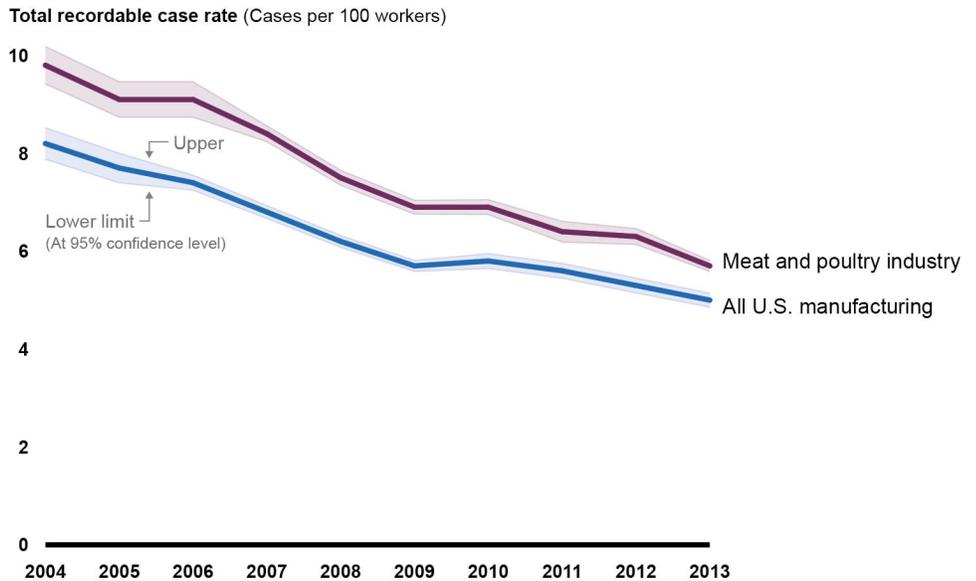
Injury and illness rates of total recordable cases in the meat and poultry industry declined from an estimated 9.8 cases per 100 full-time workers in calendar year 2004 to 5.7 cases in 2013, according to BLS data (see fig. 4).³⁰ The decline is comparable to all U.S. manufacturing, which dropped from an estimated 8.2 cases to 5 cases per 100 full-time workers.³¹

However, the rates in the meat and poultry industry remained higher than those of manufacturing from 2004 through 2013.

³⁰Under OSHA's recordkeeping regulations, an injury or illness—such as an MSD—is considered to be work-related if an event or exposure in the work environment either caused or contributed to the resulting condition or significantly aggravated a pre-existing condition. When we refer to the “meat and poultry industry,” we are referring to companies in the animal slaughtering and processing industry, NAICS code 31161. Estimates of injury and illness incidence rates presented in this report are based on BLS data and have 95 percent confidence intervals. The 95 percent confidence intervals for these estimates are 9.42 lower bound and 10.18 upper bound (2004 estimate) and 5.59 lower bound and 5.81 upper bound (2013 estimate), respectively. When we refer to workers in the meat and poultry industry, we are excluding USDA inspectors. We report any information on injuries and illnesses among USDA inspectors at meat and poultry plants separately.

³¹The manufacturing sector comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. Manufacturing sector establishments are often described as plants, factories, or mills, and they characteristically use power-driven machines and equipment for handling. The manufacturing sector under NAICS code 311 includes the meat and poultry industry. The 95 percent confidence intervals for these estimates are 7.88 lower bound and 8.52 upper bound (2004 estimate), and 4.86 lower bound and 5.14 upper bound (2013 estimate).

Figure 4: Injury and Illness Rates in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013



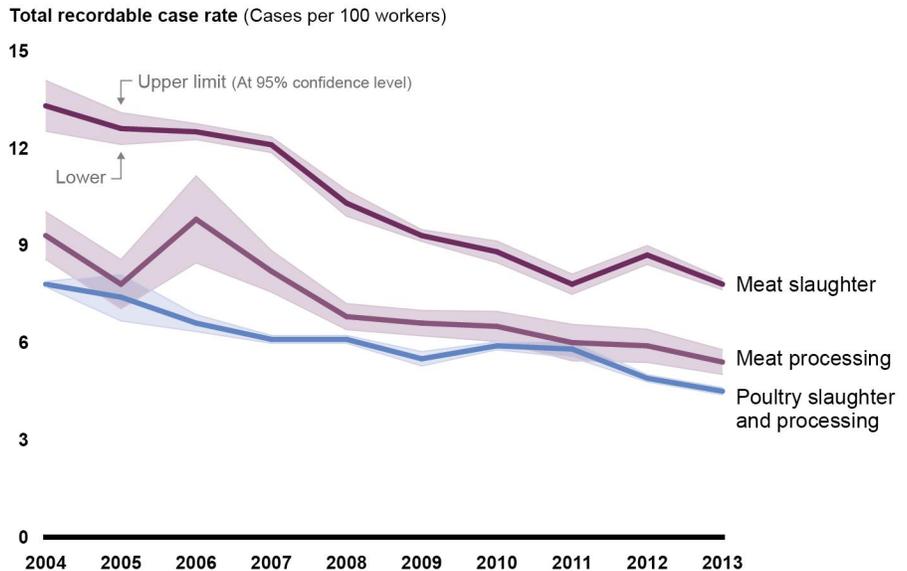
Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Note: Total recordable case rate is per 100 workers. "Meat and poultry industry" refers to companies in the animal slaughtering and processing industry, North American Industry Classification System (NAICS) code 31161, which includes "animal (except poultry) slaughtering" (NAICS 311611); "meat processed from carcasses" (NAICS code 311612); "rendering and meat byproduct processing" (NAICS code 311613); and "poultry processing," which includes slaughter (NAICS code 311615). All U.S. manufacturing refers to companies in NAICS codes 31-33.

While injury and illness rates have declined in the meat and poultry industry, meat workers sustained a higher estimated rate of injuries and illnesses than poultry workers from calendar years 2004 through 2013, according to BLS data (see fig. 5). For example, in calendar year 2013 there were an estimated 7.8 cases per 100 full-time workers in meat slaughter and 5.4 cases for meat processing, compared to an estimated 4.5 cases for poultry slaughter and processing.³²

³²The 95 percent confidence intervals for these estimates are 7.63 lower bound and 7.97 upper bound (meat slaughtering), 5.02 lower bound and 5.78 upper bound (meat processing), and 4.39 lower bound and 4.61 upper bound (poultry), respectively.

Figure 5: Injury and Illness Rates in the Meat Industry (Meat Slaughter and Meat Processing Industries), Compared with Rates in the Poultry Industry, Calendar Years 2004 through 2013



Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Note: Estimates of injury incidence rates in this figure are based on BLS data and have 95 percent confidence intervals. Based on the North American Industry Classification System, we refer to the meat industry as (a) meat slaughter, which is “animal (except poultry) slaughtering” (NAICS code 311611) and (b) meat processing, which is “meat processed from carcasses” (NAICS code 311612), e.g., sausage plants. We excluded rates from the “rendering and meat byproduct processing” industry (NAICS code 311613) because it includes companies that are primarily engaged in producing by-products of meat, such as oils. The poultry industry includes companies that slaughter and process poultry (NAICS code 311615).

The highest rates of injuries that resulted in days away from work in 2013 fell under the category of traumatic injuries—defined by BLS as injuries occurring from a single event over the course of a work shift—and included sprains, strains, and tears (see table 1). BLS collects data for injuries and illnesses that resulted in days away from work in order to understand the types of injuries and illnesses occurring and the events leading to them. BLS reports these data per 10,000 full-time workers—versus the rate per 100 full-time workers that is used for all injuries and illnesses. We are unable to show rates for these types of injuries over the past 10 years because BLS’s changes to some injury classifications in 2011 prevent direct comparisons over time. (Additional information on injury and illness rate estimates is contained in appendix I.)

Table 1: Incidence Rates of Injury and Illness Cases with Days Away From Work in the Meat and Poultry Industry by Selected Types, Calendar Year 2013

Type of injury or illness	Rate per 10,000 full-time workers	95 percent confidence interval – lower bound	95 percent confidence interval – upper bound
Sprains, strains, and tears ^a	25.5	23.15	27.85
Open wounds ^b	14.2	12.50	15.90
Cuts and lacerations ^c	10	8.59	11.41
Burns ^d	4.2	3.29	5.11
Carpal tunnel syndrome ^e	4.1	3.21	4.99

Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Note: Estimates of injury and illness incidence rates in this table are based on Bureau of Labor Statistics (BLS) data and have 95 percent confidence intervals. These injuries and illnesses resulted in days away from work and rates are calculated per 10,000 full-time workers. The selected injury or illness types are all categorized by BLS as traumatic injuries except carpal tunnel syndrome, which falls under the category of diseases and disorders of body systems.

^aSprains, strains, and major tears of muscles, joints, tendons, and ligaments. It is a subcategory of traumatic injuries, which BLS defines as injuries occurring from a single event over the course of a work shift.

^bOpen wounds refer to broken skin or outward opening beyond the superficial skin surface, and can include amputations, cuts or lacerations, and puncture wounds. It is a subcategory of traumatic injuries.

^cCuts and lacerations is a subcategory of open wounds and excludes lacerations of internal organs or blood vessels of the trunk in the absence of an open wound.

^dBurns refer to tissue damage resulting from a variety of sources, including heat, flame, hot substances, lightning, radiation, extremely cold objects, and electricity, as well as the corrosive action of chemicals.

^eCarpal tunnel syndrome—a condition of the hand and fingers caused by compression of a major nerve where it passes over the carpal bones through a passage at the front of the wrist—is a subcategory of diseases and disorders of body systems.

The events that led to injuries or illnesses that resulted in days away from work also varied (see table 2). In calendar year 2013, “overexertion and bodily reaction,” a term BLS uses to capture injuries and illnesses resulting from activities such as overexertion when lifting and repetitive motion, was cited most frequently as the event that led to an injury (estimated 40.1 per 10,000 full-time workers).³³ This is consistent with the findings in our 2005 report that back sprains and strains among meat and poultry

³³The 95 percent confidence intervals for this estimate are 37.03 lower bound and 43.17 upper bound.

workers can be caused from lifting heavy objects or repetitive lifting of lighter objects.³⁴

Table 2: Incidence Rates of Injury and Illness Cases with Days Away From Work in the Meat and Poultry Industry by Selected Events, Calendar Year 2013

Type of event	Rate per 10,000 full-time workers	95 percent confidence interval – lower bound	95 percent confidence interval – upper bound
Overexertion and bodily reaction ^a	40.1	37.03	43.17
Repetitive motion ^b	15.6	13.80	17.40
Falls, slips, and trips ^c	16.6	14.75	18.45
Contact with objects or equipment ^d	28.1	25.62	30.58
Struck by object or equipment ^e	14.1	12.41	15.79

Source: GAO analysis of Bureau of Labor Statistics (BLS) injury and illness data. | GAO-16-337.

Note: Estimates of injury and illness incidence rates in this table are based on BLS data and have 95 percent confidence intervals. These rates are associated with injuries or illnesses that resulted in days away from work and are calculated per 10,000 full-time workers. Event or exposure refers to the manner in which the injury or illness was produced or inflicted by the source of the injury or illness.

^aOverexertion and bodily reaction include non-impact cases in which injury or illness results from free bodily motion, excessive physical effort, repetition of a bodily motion, an unnatural position, or remaining in the same position over time.

^bRepetitive motion applies when motion imposes stress or strain on some part of the body due to the repetitive nature of the task. It is a subcategory within overexertion and bodily reaction.

^cFalls, slips, and trips include falls on the same level, falls and jumps to lower levels, falls and jumps that were curtailed by a device, and slips and trips that do not result in a fall.

^dContact with objects or equipment refers to contact between the injured person and the source of injury, except when the contact was due to a fall, transportation incident, fire or explosion, or assault or violent act.

^eThe “struck by” codes apply to injuries produced by forcible contact or impact between the injured person and the source of injury when the motion producing the contact is primarily that of the source of injury rather than the person. It is a subcategory within contact with objects and equipment.

³⁴[GAO-05-96](#).

Some injuries have resulted in fatalities. According to BLS fatality data, 151 meat and poultry workers sustained fatal injuries in calendar years 2004 through 2013.³⁵ Over that time, transportation incidents were the most frequent cause of death.³⁶ For example, in calendar years 2011 through 2013, 46 meat and poultry workers sustained fatal injuries and 19 of these fatalities were caused by transportation incidents, such as being struck by a vehicle. Other causes of fatalities included violence from a person or animal, contact with objects or equipment, and exposure to harmful substances or environments.

Meat and poultry workers experienced higher illness rates than other manufacturing workers (see fig. 6). In calendar year 2013, there were an estimated 159.3 cases per 10,000 full-time meat and poultry workers, compared to an estimated 35.9 cases for manufacturing overall.³⁷ To better understand illness rates, OSHA classifies total recordable cases of illnesses into five categories, such as skin diseases and respiratory conditions, which BLS reports per 10,000 workers.³⁸ In the meat and poultry industry, illnesses accounted for over one-fourth of all reported injury and illness cases in calendar year 2013.³⁹ According to BLS's website, working

³⁵Fatal injury counts exclude illness-related deaths unless precipitated by an injury event. The CFOI has published data on fatal occupational injuries for the United States since 1992. Since 2004, the classification systems and definitions of many data elements have changed. We reported total fatalities over a 10-year period rather than annual totals within each major category because of changes in data elements over the same period.

³⁶In 2011, the BLS Occupational Injury and Illness Classification System's definition of transportation accidents and its subcategories—highway accidents, such as vehicle struck an object on the side of the road and non-collision accidents, such as vehicle overturned—changed to transportation incidents, which includes pedestrian struck by a vehicle, collision with another vehicle, and collision between rail and roadway vehicles.

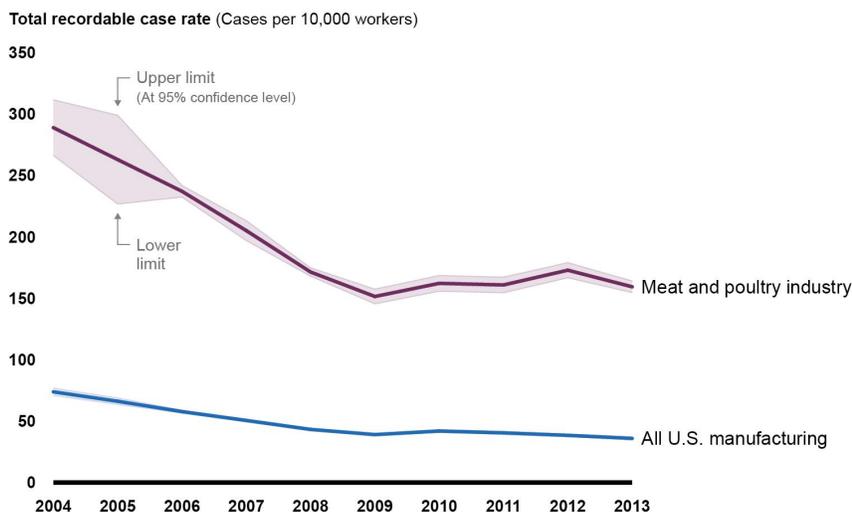
³⁷The 95 percent confidence intervals for these estimates are 154.62 lower bound and 163.98 upper bound (animal slaughtering and processing—meat and poultry industry) and 34.77 lower bound and 37.03 upper bound (manufacturing), respectively.

³⁸BLS uses five categories of occupational illnesses and disorders to classify recordable illnesses. These categories include skin diseases or disorders, respiratory conditions, poisoning, hearing loss, and all other occupational illnesses. According to BLS, the category "all other occupational illnesses" covers any occupational illness not covered in the preceding categories, such as heatstroke and other effects of environmental heat; freezing, frostbite, and other effects of exposure to low temperatures; decompression sickness; effects of ionizing radiation (isotopes, x-rays, radium); effects of nonionizing radiation (welding flash, ultra-violet rays, lasers); anthrax; and bloodborne pathogenic diseases.

³⁹The 95 percent confidence intervals for the estimated proportion, 27.8 percent, are 26.8 lower bound and 28.7 upper bound, respectively.

conditions can be difficult in the meat and poultry industry because workers are exposed to hazards that may lead to an injury or an illness. In 2013, BLS categorized the poultry industry (104.2 cases per 10,000) and part of the meat industry—animal (except poultry) slaughtering—(319.7 cases per 10,000) as high-rate industries for illnesses because these industries had the highest incidence rate of total illness cases, compared to other industries with at least 500 cases.⁴⁰

Figure 6: Illness Rates in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013



Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Note: Total recordable case rate is per 10,000 workers. Estimates of illness incidence rates in this figure are based on BLS data and have 95 percent confidence intervals. “Meat and poultry industry” refers to companies in the animal slaughtering and processing industry, North American Industry Classification System (NAICS) code 31161, which includes “animal (except poultry) slaughtering.” (NAICS code 311611); “meat processed from carcasses” (NAICS code 311612); “rendering and meat byproduct processing” (NAICS code 311613); and “poultry processing” (NAICS code 311615). All U.S. manufacturing refers to companies in NAICS codes 31-33.

USDA data show that its inspectors experience injuries and illnesses similar to those experienced by other meat and poultry workers. According to USDA’s 2014 workers’ compensation claims data, falls,

⁴⁰Animal (except poultry) slaughtering is the NAICS code (311611) used to describe the meat slaughter and processing industry, but it does not include companies that process meat from carcasses (NAICS code 311612), such as sausage plants. 95 percent confidence intervals for these estimates are 98.28 lower bound and 110.12 upper bound (poultry processing) and 310.93 lower bound and 328.47 upper bound (animal except poultry slaughtering), respectively.

slips, and trips were the most frequent causes of injuries among meat and poultry inspectors.⁴¹ USDA inspectors at plants we visited told us injuries and illnesses among inspectors vary, depending on whether they work in a meat or poultry plant.⁴² Specifically, inspectors told us that compared to inspectors in poultry plants, inspectors in meat plants sustain more cuts or lacerations because they make several cuts during hog and cattle inspections, while poultry inspections generally do not require any cuts to animal carcasses. Additionally, they said inspectors in poultry plants sustain more repetitive motion injuries due to faster line speeds. Some inspectors experience respiratory ailment symptoms due to chlorine used in poultry plants, according to USDA inspectors.

⁴¹The Federal Employees' Compensation Act program provides workers' compensation coverage to federal and postal employees for work-related injuries and illnesses.

⁴²BLS data do not include injuries and illnesses for USDA inspectors working in meat and poultry plants.

Evaluations, Studies, and Stakeholder Views Indicate that Hazardous Work Conditions Persist

Health Hazard Evaluations by CDC's National Institute on Occupational Safety and Health (NIOSH):

According to the CDC, NIOSH's Health Hazard Evaluation Program was designed to deal with problems whose causes, implications, and solutions are not well understood. NIOSH's interdisciplinary teams have experience with many types of hazards, including chemicals, biological agents, ergonomics, and heat. Methodologies used in recent NIOSH health hazard evaluations on meat and poultry plants have included:

- Testing nerve conduction in live hang and processing line workers
- Assessing hand activity and force used by workers in specific jobs
- Reviewing plant medical records
- Reviewing lab testing conducted by other sources for pathogen infections
- Conducting employee breathing tests to assess asthma symptoms after chlorine gas release
- Interviewing employees in multiple languages to gather information on the causes of injuries and illnesses
- Taking air samples to determine the causes of eye and respiratory irritation

After NIOSH completes an evaluation, the agency typically makes recommendations to the employer on how to reduce or eliminate identified hazards and prevent related injuries and illnesses. According to officials, NIOSH disseminates the results of its evaluations as broadly as possible to help make industry-wide improvements even though evaluations focus on individual plants. According to NIOSH's 2014 annual report, NIOSH received 209 requests and completed 33 field investigation reports and 118 consultation letters.

Source: Centers for Disease Control and Prevention. | GAO-16-337

Since our findings in 2005 on meat and poultry workers facing hazardous work conditions,⁴³ NIOSH health hazard evaluations and academic studies have found that meat and poultry workers continue to face the types of hazards we cited, including hazards associated with musculoskeletal disorders, chemical hazards, biological hazards from pathogens and animals, and traumatic injury hazards from machines and tools.⁴⁴ NIOSH's findings are generally supported by OSHA documents and academic literature we reviewed, as well as by statements from workers and worker advocacy groups. (See appendix II for more information on NIOSH's findings from eight health hazard evaluations in poultry plants we reviewed.) In addition, other factors, such as employer emphasis on safety, worker training, and line speeds, may affect hazards and the risk of injuries and illnesses, according to literature we reviewed and the workers and officials we interviewed from federal agencies, the meat and poultry industry, and worker advocacy groups.

⁴³GAO-05-96. In 2005, we found that workers face several hazardous conditions in meat and poultry plants, including hazards from chemicals, animals, pathogens, machines and tools, and work stress, such as performing identical motions for long periods of time.

⁴⁴NIOSH published eight health hazard evaluations from 2007 through 2015 that describe various hazards in poultry plants. These evaluations examined injury and illness risk due to repetitive motions that caused injuries, and exposure to hazardous chemicals and bacteria that caused illnesses and symptoms in poultry workers and USDA inspectors. NIOSH responds to health hazard evaluation requests from employers, employees, or employee representatives.

Hazards Associated with Musculoskeletal Disorders

Meat and poultry work continues to require forceful exertions, awkward postures, and repetitive motions for many job tasks, which can lead to injuries. In a 2015 health hazard evaluation of a poultry plant, NIOSH reported 59 percent of the 32 job tasks evaluated—from receiving to deboning—had average levels of hand activity and force above the American Conference of Governmental Industrial Hygienists threshold limit value, and carpal tunnel syndrome among workers likely resulted from repetitive motion and the forceful nature of these job tasks.⁴⁵ Similarly, in a 2014 health hazard evaluation of a poultry plant, NIOSH found 41 percent of participants worked in jobs that had levels of hand activity and force above the American Conference of Governmental Industrial Hygienists threshold limit values.⁴⁶ In a 2008 NIOSH health hazard evaluation of a turkey plant, NIOSH found that hanging and unloading racks of turkey franks (hot dogs) during processing increased the risk of musculoskeletal disorders due to awkward postures, repetitive motions, and heavy lifting.⁴⁷ According to the evaluation, in raw and cooked production, workers hung and removed franks from racks on 50-inch metal rods weighing up to 38 pounds, and reported discomfort in their backs and shoulders. NIOSH’s recommendations included job redesign and job rotation from lifting to non-lifting tasks to alleviate these hazards. Workers we interviewed also said that the repetitive nature of meat and poultry work leads to injuries. For example, one meat worker with more than 20 years of experience told us he almost constantly experiences discomfort and pain in his hands and that he only gets relief when he is not working.

⁴⁵Jessica G. Ramsey, Kristin Musolin, and Charles Mueller, *Evaluation of Carpal Tunnel Syndrome and Other Musculoskeletal Disorders Among Employees at a Poultry Processing Plant* (NIOSH, CDC; March 2015). The poultry processing plant asked NIOSH to evaluate risk factors for musculoskeletal disorders among workers at the plant in order to fulfill a USDA requirement for participation in a pilot project. NIOSH compared its measurements of hand activity and force with the limits recommended by the American Conference of Governmental Industrial Hygienists—a private corporation and scientific association that develops recommendations or guidelines to assist in the control of occupational health hazards.

⁴⁶Kristin Musolin, et. al., *Evaluation of Musculoskeletal Disorders and Traumatic Injuries Among Employees at a Poultry Processing Plant* (NIOSH, CDC; March 2014). NIOSH received a request from a poultry processing plant in South Carolina to identify the potential for increase in musculoskeletal and upper extremities trauma due to a planned evisceration line speed increase. The plant requested the evaluation in order to obtain an evisceration line speed waiver under USDA’s *Salmonella* Initiative Program.

⁴⁷Jessica Ramsey and John Gibbins, *Ergonomic Evaluation of Frank Hangers at a Turkey Processing Plant* (NIOSH, CDC; May 2008).

Chemical Hazards

Chemicals are a hazard in meat and poultry plants because they can create a harmful environment if they accumulate within an enclosed space.⁴⁸ Findings from two NIOSH health hazard evaluations suggested that exposure to chlorine may be associated with self-reported symptoms of respiratory illness or eye irritation.⁴⁹ In its 2012 evaluation, NIOSH found that employees in an exposed group were more likely to report certain work-related symptoms than employees in an unexposed group, including chest tightness; sneezing; blurry vision; and burning, itchy, or dry eyes.⁵⁰ NIOSH also found that while chlorine levels met USDA requirements, chlorine-related by-products called chloramines were often implicated as a more likely cause of irritation.⁵¹ According to NIOSH, there is no valid air sampling method to consistently detect levels of this by-product in plants. Hazardous chemicals in meat and poultry plants also include ammonia, which is used as a refrigerant. For example, a state OSHA official told us process safety management related to ammonia handling is among the

⁴⁸USDA established *Salmonella* standards for certain poultry products in 1996 and 2005, and revised these standards in 2011. To comply with these standards, the industry uses chlorine to reduce levels of pathogens on poultry, according to the National Chicken Council.

⁴⁹Lilia Chen, Judith Eisenberg, Srinivas Durgam, and Charles Mueller, *Evaluation of Eye and Respiratory Symptoms at a Poultry Processing Facility—Oklahoma* (NIOSH, CDC; March 2012); Francisco Meza, Charles Mueller, and Bradley King, *Evaluation of Health Effects of a Chlorine Gas Release in a Poultry Processing Plant—Arkansas* (NIOSH, CDC; February 2013 Revised/September 2012). See appendix II for details of these studies. A third NIOSH evaluation did not find an association between chlorine exposure and respiratory symptoms. Specifically, NIOSH received a request for technical assistance from USDA to evaluate potential exposures of USDA inspectors to chlorine-related compounds at a poultry processing plant in Louisiana. USDA inspectors reported respiratory symptoms at the end of their work shifts. The small numbers of participants in this study may have limited the investigators' ability to find statistically significant associations between work-related symptoms and levels of chlorine and chlorine related compounds. Bradley King, Angela Warren and Charles Mueller. *NIOSH Health Hazard Evaluation Report*, HETA#2004-0337-3051 (NIOSH, CDC; November 2007). See appendix II for additional details.

⁵⁰Chen et al. 2012. See appendix II for more details. According to OSHA, the poultry industry uses a wide variety of cleaners and sanitizers, in part to decrease pathogenic bacteria on poultry products, including chlorine sprays and rinses on processing equipment and chlorine in the chiller. OSHA regulations establish the permissible exposure limit for chlorine in the air at covered workplaces, Food and Drug Administration regulations apply to the use of chlorine as a food additive, and USDA regulations establish requirements for chlorine levels used to reduce pathogens in processing poultry products.

⁵¹According to NIOSH, chloramines are chlorine by-products that result from an interaction between chlorine and nitrogenous material from poultry.

top three violations in the meat and poultry industry.⁵² An OSHA regional official said common injuries in the meat and poultry industry stem from chemicals such as chlorine and ammonia, among other things.

Peracetic acid, an antimicrobial agent used to kill bacteria on poultry carcasses, may be harmful to workers. In November 2011 and January 2012, OSHA inspected a poultry plant after the death of a USDA inspector who worked there, including conducting chemical sampling at the plant. A regional OSHA official told us that OSHA suspected chemical exposure as the cause of death for the USDA inspector. According to OSHA and USDA officials, OSHA was unable to attribute the cause of death to any work-related conditions. In a June 2014 USDA letter to OSHA, USDA stated that it conducted additional air sampling at the poultry plant and did not detect any antimicrobial chemicals. However, according to an OSHA 2014 news release, OSHA cited the plant for, among other violations, failure to provide employees with information and training about the hazards of products that contain peracetic acid and bleach, as required by OSHA's hazard communication standard. This citation was upheld by the Occupational Safety and Health Review Commission.⁵³ The administrative law judge who upheld the hazard communication citation noted that employees told the OSHA compliance officer they had experienced respiratory ailment symptoms and rashes consistent with the exposure symptoms described in the chemical manufacturer's safety data sheets, but the employer failed to train workers on chemical hazards, according to OSHA.

Biological Hazards— Pathogens and Animals

Meat and poultry workers continue to be exposed to biological hazards associated with handling live animals, including contact with feces, blood, and bacteria, which can increase their risk for many diseases, according to a NIOSH evaluation and investigations we reviewed. In a 2012 health hazard evaluation, NIOSH investigated exposure to the pathogen

⁵²According to OSHA's website, OSHA's standards on process safety management emphasize the management of hazards associated with highly hazardous chemicals. See, e.g., 29 C.F.R. § 1910.119 and app. A.

⁵³Other citations were also contested by the employer; some were upheld, others were vacated.

*Campylobacter*⁵⁴ in a poultry plant and found gastrointestinal illness appeared to be common, yet underreported, based on interviews with workers.⁵⁵ In the live hang area at poultry plants, workers lift live poultry from the supply conveyer belt and hang the birds by their feet from a shackle conveyer belt. In doing so, workers can be covered with poultry feces and dust that can carry pathogens and other diseases, according to OSHA. NIOSH observed that the 20 air vents above the heads of the live hang area employees could spread contamination, and it advised the plant to modify the supply vents. NIOSH also observed inconsistent hand hygiene and use of personal protective equipment in the area and recommended the plant provide training to all employees.⁵⁶ In response, the plant instituted a monthly safety training meeting; offered computerized training in English and Spanish, including a competency test; and provided required personal protective equipment at no cost to employees, including smocks and safety glasses, as well as optional respirators and face shields in the live hang area.⁵⁷ According to NIOSH, the number of plant employees with confirmed cases of *Campylobacter* infection dropped from 21 in 2011 to 6 in 2013 once these preventative measures were implemented.

In 2007, NIOSH assisted CDC and the Indiana, Minnesota, and Nebraska departments of health in their investigations of a progressive neurological disorder⁵⁸ among workers in three hog slaughter plants, and in 2008 NIOSH

⁵⁴*Campylobacter* are bacteria that live in the intestinal tracts of animals and can cause disease in humans through contact with infected animals. Typical symptoms of illness from *Campylobacter* are abdominal cramps, fever, and diarrhea, and rare cases can result in long-term secondary complications, including a form of inflammatory arthritis that can last for years.

⁵⁵Marie A. dePerio, John D. Gibbins, and R. Todd Niemeier, *Campylobacter Infection and Exposures Among Employees at a Poultry Processing Plant—Virginia* (NIOSH, CDC; April 2012).

⁵⁶According to NIOSH and OSHA, fatalities and injuries among workers are substantially reduced with the use of personal protective (safety) equipment, such as gloves, safety glasses, earplugs, hard hats, respirators, coveralls, vests and full body suits, which protects workers from death and disabling injuries and illnesses.

⁵⁷NIOSH reported these findings after conducting a follow-up plant visit. NIOSH conducts follow-up site visits with a small number of employers each year to learn about the impact and outcome of its health hazard evaluations.

⁵⁸According to Minnesota investigators, patients with the disorder experienced significant symptoms, including numbness, tingling, and limb weakness. State investigators hypothesized that workers who developed the disorder had been exposed to aerosolized pig protein that might have induced an autoimmune disorder.

Traumatic Injury Hazards— Machines and Tools

conducted a health hazard evaluation at the hog slaughter plant in Minnesota.⁵⁹ These plants had replaced saws with compressed air devices to reduce the risk of amputation, but the devices increased brain tissue splatter, causing a neurological disorder in several workers when they inhaled the animal matter, according to state officials. According to state and NIOSH investigators, workers at two of the plants also said line speed was a factor because the faster speeds meant they were unable to place the skulls completely on the device before triggering the compressed air, causing greater splatter.⁶⁰ According to state officials, no new cases emerged after the three plants discontinued use of compressed air devices and the brain removal job task.

Dangerous machines and tools remain a hazard within the meat and poultry industry, according to OSHA officials, workers we interviewed, and an academic study we reviewed. According to OSHA, moving machine parts can cause severe workplace injuries, such as crushed fingers or hands, amputations, burns, or blindness. OSHA officials we spoke with cited a lack of machine guarding—safety features on manufacturing equipment to prevent contact with the body or to control hazards from the machine—as a top safety violation at meat and poultry plants.⁶¹ Workers we spoke with experienced injuries from this hazard. For example, one meat worker showed us his scarred hand and said it had been caught in a machine, which crushed his finger and removed skin, necessitating a skin graft. Another worker’s apron was caught in a machine, which pulled her arm in before the machine could be turned off. As a result, she told us she can no longer work or perform daily activities with that arm. In addition to machinery, meat and poultry workers frequently use tools such as sharp knives, hooks, and saws. An academic study we reviewed examining the incidence of injuries, lacerations, and infections among poultry and pork processing workers employed by 10 companies found

⁵⁹Two of the three plants participated in the USDA pilot project that allowed for faster line speeds, according to NIOSH officials.

⁶⁰Stacy M. Holzbauer, et al., “Epidemiologic Investigation of Immune-Mediated Polyradiculoneuropathy among Abattoir Workers Exposed to Porcine Brain”, *PLoS One*, vol. 5, no. 3 (2010).

⁶¹OSHA’s machine guarding standard may be found at 29 C.F.R. § 1910.212. According to OSHA’s guidance, any machine part, function, or process that may cause injury must be safeguarded, and when the operation of a machine or accidental contact injures the operator or others, the hazards must be eliminated or controlled.

sharp tools were most frequently reported as sources of lacerations.⁶² A former meat worker we interviewed said he was injured twice by a neighboring worker's hook when the other worker moved too close to him while trying to perform his task (see fig. 7).

Figure 7: Workers in a Hog Slaughter and Processing Plant Use Hooks and Other Tools



Source: North American Meat Institute. | GAO-16-337

Additional Factors May Affect Hazardous Conditions

Emphasis on worker safety, training, and line speeds may affect the risk of injuries and illnesses in the meat and poultry industry, but the underlying conditions remain, according to literature we reviewed, NIOSH

⁶² Emmanuel Kyeremateng-Amoa, et al., "Laceration Injuries and Infections Among Workers in Poultry Processing and Pork Meatpacking Industries," *American Journal of Industrial Medicine*, vol. 57 (2014).

health hazard evaluations, and interviews with federal officials, workers, and representatives of worker advocacy and industry groups.⁶³

- **Emphasis on worker safety:** Emphasis placed on worker safety is a factor affecting workplace hazards, according to workers we interviewed and representatives from worker advocacy and industry groups. Some workers told us plants do not emphasize safety even when workers complain about hazardous conditions, but workers from two plants we visited said their company has a strong emphasis on worker safety. In at least half of the NIOSH health hazard evaluations we reviewed, NIOSH recommended or encouraged implementing worker safety programs or OSHA’s safety guidelines to help resolve identified hazards. Industry officials and a worker advocacy group told us plants should emphasize safety because it is in their best interest. Representatives from a worker advocacy group and industry officials told us that larger employers in the meat and poultry industry tend to have better worker safety practices than smaller ones. Representatives of meat and poultry industry associations also highlighted the implementation of worker safety programs in some plants over the last 20 years. In one study we reviewed, the authors suggested that workplace safety practices—such as the importance of safety to management, worker training, and proper use of safety equipment—can be modified to improve hazardous conditions in poultry plants.⁶⁴
- **Training:** Worker training is critical to mitigating hazards and ensuring safety in the meat and poultry industry, but it remains a challenge, according to industry officials and workers with whom we spoke. In at least half of the NIOSH health hazard evaluations we reviewed, NIOSH recommended implementing proper training of workers. However, industry officials said providing proper training can be a challenge because of different languages spoken by workers. For example, staff at two plants we visited said there are at least 20

⁶³We reviewed two studies that focused on factors that may affect the risk of injuries in meat and poultry processing. One study relied on a community-based approach to recruit study participants, specifically Hispanic workers in western North Carolina poultry plants. The findings from these studies are not generalizable to illustrate conditions and factors in all meat and poultry plants in the United States.

⁶⁴Thomas A. Arcury, et. al. “Employer, Use of Personal Protective Equipment, and Work Safety Climate: Latino Poultry Processing Workers,” *American Journal of Industrial Medicine*, vol. 56 (2013).

languages spoken in their plants.⁶⁵ At most of the plants we visited, managers told us that workers receive training during orientation and additional training may include annual training and working side-by-side with an experienced worker on the production line. Workers told us new hires receive video training on hazards and personal protective equipment, and acknowledge receipt of this training by signing an attestation document. Some meat and poultry workers told us the training is not always adequate. A hog plant worker said supplementary training should be provided on the job and at slower line speeds to ensure workers know how to do their jobs properly. One study we reviewed found that when workers in Nebraska and Iowa hog plants used an alternative method to accomplish a task, such as using different equipment, or performed a task in a different location within the plant, it was associated with increased risk of lacerations.⁶⁶ The authors recommended expanded training and evaluation of tool sharpening procedures.

- Line speed: High line speeds resulting from increased automation and other factors may exacerbate hazards, according to plant workers and worker advocacy groups.⁶⁷ In 2013, 15 stakeholder groups petitioned OSHA and USDA, asking OSHA to establish a “work-speed” workplace safety and health standard—a regulation that would set the number of animals or products processed per minute on a production line in relation to staffing levels—to protect workers in the meat and poultry industry. The petition also requested that USDA and OSHA ensure that worker safety be protected in any rulemaking related to line and work speeds in this industry. USDA acknowledged receipt of the petition in 2013 and officials told us the agency made several changes to the poultry inspection final rule that addressed some of the issues in the petition, namely not increasing the maximum evisceration line speed in young chicken plants. In 2015, OSHA denied the petition and cited limited resources as its reason for not conducting a

⁶⁵According to OSHA officials, the agency requires worker training to be provided in a language and manner that the worker understands.

⁶⁶Lina Lander, et al., “A Case-crossover Study of Laceration Injuries in Pork Processing,” *Occupational Environmental Medicine*, vol. 69 (2012).

⁶⁷Since 2005, speed has increased on evisceration lines due to increased automation, according to industry officials.

comprehensive analysis and rulemaking.⁶⁸ Plant workers told us that meat and poultry plants are primarily concerned with production, and employers do not want the line to slow down even when the plant is understaffed. Industry officials we met with disagreed. According to representatives of a meat industry trade association, staffing is typically increased when line speed increases, and it is important to staff the line so that plant workers and USDA inspectors can accomplish all work tasks effectively.⁶⁹ According to NIOSH officials, increasing line speed and workers may increase the risk of “neighbor cuts” due to workers’ close proximity. OSHA and NIOSH officials told us line speed—in conjunction with hand activity, forceful exertions, awkward postures, cold temperatures, and other factors such as rotation participation and pattern—affects the risk of both musculoskeletal disorders and injuries among workers. NIOSH examined the effect of increased evisceration line speed on worker safety at one plant in a 2014 health hazard evaluation, but the agency could not draw conclusions about its impact.⁷⁰ Specifically, NIOSH stated in a 2014 letter to USDA that it could not draw conclusions on line speed and safety because the amount of time between the first and second visits (10 months) was not sufficient for a change in workers’ health to appear and the manner in which the plant modified the production lines resulted in no change in exposure to risk factors for musculoskeletal disorders for any individual worker, among other things.⁷¹ NIOSH stated that the plant’s consolidated evisceration lines resulted in a reduction of the number of birds processed because the plant combined two separate lines at 90 birds per minute into one line operating at approximately 170 birds per minute. In a 2015 health hazard evaluation, NIOSH found hand activity and force above recommended levels, as noted above, and after the evaluation the

⁶⁸In 2012, we found that it takes on average more than 7 years for OSHA to develop and issue workplace safety and health standards. GAO, *Workplace Safety and Health: Multiple Challenges Lengthen OSHA’s Standard Setting*, GAO-12-330 (Washington, D.C.: Apr. 2, 2012).

⁶⁹North American Meat Institute, “Line Speeds in the Meat and Poultry Plants—Fact Sheet,” accessed Sept. 16, 2015, <https://www.meatinstitute.org/index.php?ht=a/GetDocumentAction/i/93046>.

⁷⁰Kristin Musolin, et al. (March 2014). The plant asked NIOSH to identify the potential for an increase in musculoskeletal and upper extremities trauma due to a planned line speed increase.

⁷¹In the 2014 NIOSH letter to USDA, NIOSH also noted that the plant did not adopt most of the recommendations it made after its first visit, including redesigning the jobs to reduce risk of forceful and repetitive motions.

plant automated several jobs; however, the agency concluded that musculoskeletal disorder risks remain for many workers.⁷²

DOL Faces Challenges Gathering Data on Injury and Illness Rates Because of Industry Characteristics and Inadequate Data Collection

Meat and Poultry Worker Vulnerability and Employer Practices May Contribute to Underreporting of Injuries and Illnesses

Workers and employers may underreport injuries and illnesses in the meat and poultry industry because of worker concerns over potential loss of employment, and employer concerns over potential costs associated with injuries and illnesses, according to federal officials, worker advocacy groups, and studies. As a result, the injury and illness rates discussed in the previous section may not reflect complete data. In 2009, we reported on concerns about underreporting across all industries, including discrepancies between BLS's annual survey used to calculate injury and illness rates and other data such as medical records.⁷³ Due to concerns about reporting and also in response to findings and recommendations from our work in 2005 and 2009, OSHA undertook its Injury and Illness Recordkeeping National Emphasis Program.⁷⁴ For this program, OSHA inspected recordkeeping and reporting accuracy in a nongeneralizable sample of over 300

⁷²Jessica G. Ramsey, Kristin Musolin, and Charles Mueller, March 2015.

⁷³[GAO-10-10](#). According to BLS officials, the Bureau is conducting work to determine whether collecting occupational injury and illness data from workers through a household survey, when combined with employer-provided data, could produce more complete and accurate estimates of workplace injuries and illnesses.

⁷⁴[GAO-05-96](#) and [GAO-10-10](#). In 2005, GAO questioned the validity of the decline in the meat and poultry industry's injury and illness rates because of the many hazards in plants and the types of work being performed. Additionally, the national emphasis program responded to our 2009 recommendation that OSHA improve its efforts to verify the accuracy of employer-provided injury and illness data.

establishments, primarily in industries with high average rates of injuries and illnesses. A 2013 analysis of data from this program indicates that OSHA identified reporting errors at establishments it inspected, but the prevalence of underreporting cannot be determined based on these data.⁷⁵ While OSHA and BLS recognize that underreporting exists, the extent is unknown.

Underreporting continues to occur in the meat and poultry industry, according to worker advocacy groups and selected OSHA hazard alert letters we reviewed.⁷⁶ Some meat and poultry workers may be less likely to report injuries and illnesses because of their vulnerable status as undocumented or foreign-born workers, according to federal officials and representatives of worker advocacy groups we interviewed. About 28.7 percent of meat and poultry workers were foreign-born noncitizens in 2015 compared to about 9.5 percent of all manufacturing workers, according to CPS data.⁷⁷ The meat and poultry industry has been a starting point for new immigrants, as many jobs require little formal education or prior experience, according to a meat industry trade association. According to an OSHA official, worker advocacy groups, and plant managers at one plant we visited, some employers in the meat and poultry industry recruit refugees—in part, to replace undocumented workers—and some

⁷⁵ERG, *Analysis of OSHA's National Emphasis Program on Injury and Illness Recordkeeping*, a report prepared at the request of the Department of Labor, Occupational Safety and Health Administration, Office of Statistical Analysis (Lexington, Mass.: Nov. 1, 2013). The study looked at unrecorded cases and underrecorded cases, which OSHA defined as a recorded case that resulted in days away from work, restricted work, or job transfer, but that was not indicated as such by the employer. The recordkeeping national emphasis program initially targeted establishments with low reported rates of cases involving days away from work, restricted work activity, and job transfer (0.0 to 4.2 per 100 full-time equivalent workers) in primarily high-rate industries (Directive number 10-02 (CPL 02)(original directive)), but later adjusted its focus on manufacturing industries with reported rates from at least 4.2 to 8.0 per 100 full time-time equivalent workers (Directive Number 10-07 (CPL 02)(revised directive)). Establishment targeting was based on establishment-specific rates from OSHA's Data Initiative. The original directive's targeting focused on rates for 2007, and the revised directive's targeting focused on rates for 2008. The review focused on both the target year and subsequent year.

⁷⁶After an inspection, OSHA may send an employer a hazard alert letter if the criteria for issuing a citation are not met, yet OSHA determines that the hazard warrants some type of notification.

⁷⁷Current Population Survey (March 2015). The 95 percent confidence intervals are 23.4 lower bound and 34.7 upper bound, and 8.8 lower bound and 10.4 upper bound, respectively. This is the interval that would contain the actual population values for 95 percent of the CPS samples that the BLS could have drawn.

companies hire prison labor. Further, according to data from BLS, the meat and poultry industry had an hourly mean wage of \$12.50 per hour in 2014 and an annual mean wage of \$26,010.⁷⁸ While above the federal minimum wage of \$7.25 per hour, these wages are just above the 2014 federal poverty guidelines for a family of four.⁷⁹ Workers who face economic pressures or have a tenuous immigration status may fear job loss or deportation if they report or seek treatment for work-related injuries and illnesses, according to federal officials and worker advocacy groups. For example, a community-based doctor told us that soon after he approved some injured meat workers' work restriction requests, they returned and asked him to send a note to their workplace to end their work restriction because their employer had threatened to fire them if they could not do their jobs. Language barriers can also make it difficult for some of these workers to communicate about and report injuries, according to a worker advocacy group.⁸⁰ In addition, NIOSH officials told us that in some cultures someone who reports an injury or illness is considered weak.

Some meat and poultry industry employers may not record worker injuries and illnesses because of certain disincentives, according to federal officials and representatives of worker advocacy groups we interviewed. We previously found that generally, employers may not record workers' injuries and illnesses because of disincentives such as fear of increasing their workers' compensation costs or jeopardizing their chances of being awarded contracts for new work.⁸¹ Federal officials and representatives of worker advocacy groups we interviewed told us that some employers in the meat and poultry industry may underreport workplace injuries to keep workers' compensation insurance premiums low. In addition, some employers may underreport to avoid triggering OSHA inspections or promote the image of

⁷⁸OES Wage Data (May 2014). The 95 percent confidence intervals are \$12.21 lower bound and \$12.79 upper bound, and \$25,398 lower bound and \$26,622 upper bound, respectively.

⁷⁹Updated annually by the HHS, the federal poverty guidelines are derived from the poverty thresholds developed by the Census Bureau and used to determine eligibility for certain federal programs. The 2014 poverty guideline for a four-person household in the contiguous 48 states and Washington, D.C., was \$23,850 per year. Annual Update of the HHS Poverty Guidelines, 79 Fed. Reg. 3593 (Jan. 22, 2014).

⁸⁰According to BLS's CPS data, in 2015, an estimated 34 percent of meat and poultry workers were Hispanic, compared to an estimated 16.4 percent in the manufacturing industry as a whole. The 95 percent confidence intervals are 28.2 lower bound and 40.3 upper bound, and 15.5 lower bound and 17.3 upper bound, respectively.

⁸¹[GAO-10-10](#).

a safe workplace, according to a worker advocacy group and managers at one plant we visited. At one meat plant we visited, workers recalled incidents in which supervisors told injured workers they were not hurt and to go back to work rather than report their injury. NIOSH officials and a worker advocacy group attribute some underreporting in the meat and poultry industry to lack of paid sick leave, which may cause injured or ill workers to stay on the job so they can get paid. For example, some poultry plants use point systems to track sick days and may penalize workers for taking too many, according to worker advocacy groups. A former meat worker who was injured on the job told us he was suspended for three days after taking time off from work to recover and was later terminated. Workers and representatives of worker advocacy groups told us these systems discourage workers from reporting their injuries and illnesses. OSHA officials also expressed concerns that employer-sponsored safety programs with incentives—such as those that offer rewards for no injuries over time—may pressure meat and poultry workers to not report work-related injuries and illnesses.⁸²

Plant health units, which provide certain types of medical assistance to workers with injuries and illnesses at some plants, may also discourage reporting of injuries and illnesses, according to OSHA and worker advocacy groups.⁸³ In an effort to maintain a clean safety record and avoid recording injuries in their OSHA logs, some plant health units may repeatedly offer first aid treatments—for example, compresses and over-the-counter painkillers and ointments—rather than refer workers to a doctor, according to two OSHA hazard alert letters, worker advocacy groups, and workers we

⁸²In 2012, we found that little research exists on the effect of workplace safety incentive programs on workers' reporting of injuries and illnesses, although experts identified a link between certain types of programs and reporting. In response to our recommendation in 2012 that OSHA increase consistency across its cooperative programs with employers to improve worker safety, in 2013 OSHA aligned its policy so that these programs prohibit participating employers from having safety incentive programs that focus on injury and illness rates. GAO, *Workplace Safety and Health: Better OSHA Guidance Needed on Safety Incentive Programs*, [GAO-12-329](#) (Washington, D.C.: Apr. 9, 2012).

⁸³According to OSHA, the purpose of a first aid station, or health unit, is to provide first aid care for acute injuries, which can be done with the appropriate supplies and trained personnel. OSHA's Medical Services and First Aid Standard requires that, in the absence of an infirmary, clinic, or hospital in near proximity to the workplace that is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid and adequate first aid supplies shall be readily available. 29 C.F.R. § 1910.151(b).

interviewed.⁸⁴ We were told about multiple incidents in which meat and poultry workers were punished for visiting the health unit too often or ignored by health unit staff when they sought further medical care. For example:

- In 2014, OSHA sent a hazard alert letter to a poultry plant, recommending that the plant voluntarily take steps to improve its medical management practices.⁸⁵ In the letter, OSHA identified practices that were contrary to good medical practice for managing work-related MSDs, including prolonged treatment by nursing station staff without referral to a physician. The letter included one example in which a worker made over 90 visits to the nursing station before referral to a physician.
- In 2015, OSHA sent a hazard alert letter to another poultry plant, also recommending voluntary improvements to the plant's medical management practices.⁸⁶ The letter noted that based on OSHA's investigation, it appeared that the plant used its first aid station to prevent injuries from appearing on the plant's OSHA log, such as by not referring workers to a physician for evaluation or treatment when appropriate.
- One worker told us that after he fell off a platform, the health unit provided ice and denied his request to be referred to a physician for x-rays. When he received an x-ray several days later, it confirmed that he had a fracture.
- A representative of a worker advocacy group told us about an incident in which a nurse gave a worker with an injured wrist some cream and

⁸⁴As previously discussed, under OSHA's recordkeeping regulations, only work-related injuries and illnesses resulting in death, days away from work, restricted work or transfer to another job, loss of consciousness, medical treatment beyond first aid, or diagnosis of a significant injury or illness are recordable.

⁸⁵In addition to sending the hazard alert letter, OSHA also issued various citations to this poultry plant, including for ergonomic and recordkeeping violations. According to OSHA officials, these citations have been contested by the employer, and as of February 2016 are still pending.

⁸⁶In addition to the hazard alert letter, OSHA also issued various citations to this plant, including for ergonomic hazards and recordkeeping violations. According to OSHA officials, these citations have been contested by the employer and as of February 2016 are still pending.

sent him home. The worker sought medical treatment on his own, which confirmed that he had a fractured wrist.

Meat and poultry industry representatives said underreporting is not a major issue, although some employers may not understand all of the reporting requirements. A meat industry trade association we interviewed noted that they organize seminars on reporting requirements and encourage employers to record all incidents in order to document improvement and avoid OSHA citations. Industry group representatives also stated that the decline in injury and illness rates discussed above is due in part to increased automation and industry efforts to enhance plant safety. OSHA officials concurred that increased automation in the industry has positively affected safety in limited areas of meat and poultry plants.

DOL Lacks Information That Could Help It Address Meat and Poultry Workers' Musculoskeletal Disorders

Musculoskeletal Disorders (MSD):

MSDs are caused by forceful exertion or exposure to physical factors such as repetition, force, vibration, or awkward postures. For example, NIOSH reported that job tasks that require repetitive movement and forceful hand and wrist exertion increase the risk for tendonitis. An increased exposure to cold temperatures, which are common in meat and poultry plants, may increase the potential for MSDs to develop.

NIOSH and OSHA provide a number of tips to prevent and treat MSDs in the meat and poultry industry. Employers should:

- enable workers to sharpen and change knives regularly so they do not have to exert undue force to make cuts;
- involve workers in an ergonomics program to improve problem-solving and hazard identification;
- train engineers and maintenance personnel in how to prevent and correct ergonomic problems; and
- establish an effective medical management program with effective reporting, evaluation, treatment and referrals, and run by healthcare staff trained in MSD prevention.

Source: GAO analysis of NIOSH and OSHA documentation. | GAO-16-337.

DOL lacks key information about MSDs in the meat and poultry industry because of the way it gathers information on these conditions. It is particularly challenging to gather data on MSDs because the gradual nature of these injuries makes it harder for workers to recognize and report them, according to experts and worker advocacy groups. As discussed earlier, existing federal data and health hazard evaluations suggest that MSDs in the meat and poultry industry are common and can be disabling. In 2013, the incidence rate of MSDs that resulted in at least 1 day away from work was an estimated 39.2 cases per 10,000 workers in the meat and poultry industry overall and 25.2 cases per 10,000 workers in the poultry industry, according to BLS's SOII.⁸⁷ The 2013 incidence of carpal tunnel syndrome—an MSD—for cases that resulted in days away from work in the meat and poultry industry was an estimated 4.1 cases per 10,000, compared to 2.1 cases per 10,000 for manufacturing overall.⁸⁸ A 2015 health hazard evaluation of a poultry plant by NIOSH found that over one-third of the workers who participated in the study had evidence of carpal tunnel syndrome.⁸⁹ A 2014 NIOSH health hazard evaluation of poultry plant workers found that over two-thirds of workers interviewed reported experiencing pain, burning, numbness, or tingling in their hands over the preceding 12 months and that over half reported pain, aching, or stiffness in their backs during the same timeframe (see fig. 8).⁹⁰

⁸⁷The estimate for the meat and poultry industry has a 95 percent confidence interval from 36.2 to 42.2. The estimate for the poultry industry has a 95 percent confidence interval of 22.3 to 28.1. We did not compare MSD incidence across years because of changes in how BLS collected these data during our report's time frame.

⁸⁸The estimate for the meat and poultry industry has a 95 percent confidence interval from 3.2 to 5.0. The estimate for manufacturing has a 95 percent confidence interval from 2.0 to 2.2. The rate for poultry slaughter and processing was higher—5.4 cases per 10,000 in 2013. The estimate for the poultry industry has a 95 percent confidence interval of 4.0 to 6.8.

⁸⁹Jessica G. Ramsey, et al. (March 2015).

⁹⁰Kristin Musolin, et al. (March 2014).

Figure 8: Poultry Workers Cutting and Trimming Chickens



Source: National Chicken Council. | GAO-16-337

Poultry workers cut and trim chicken as it moves along a line. According to a worker advocacy group, poultry workers may make specific cuts thousands of times each shift.

OSHA and worker advocacy groups have also documented the debilitating effects of MSDs. OSHA reports, for example, that MSDs can be painful and disabling, and may cause permanent damage to musculoskeletal tissues.

Despite these concerns, DOL lacks information about MSDs in the meat and poultry industry because of how the data are collected. Specifically,

BLS's annual SOII only collects injury and illness details—such as the type of injury or illness—on cases that result in workers having to take days off from work.⁹¹ For example, the survey does not collect detailed information on MSDs that resulted in a worker being placed on work restriction, transferred to a different job, or continuing in the same job after medical treatment, making it more difficult to identify and track these MSDs. From 2011 to 2013, BLS conducted a pilot study, for which the SOII was modified to collect data for six selected industries (including food manufacturing) on the case circumstances and worker characteristics for cases where the worker was placed on work restriction or transferred to a different job. This pilot study found many of the MSDs occurring in the food manufacturing industry—which includes the meat and poultry industry—result in the worker being transferred to other jobs or restricted from activity in a current job without days away from work.⁹² For each calendar year from 2011 through 2013, the BLS study found that far more MSD cases in the food manufacturing industry resulted in job transfer or restricted work than in days away from work. For example, in 2013, the most recent data available, there were about 13,000 cases with job transfer or restricted work in this industry, compared to about 6,000 with days away from work.

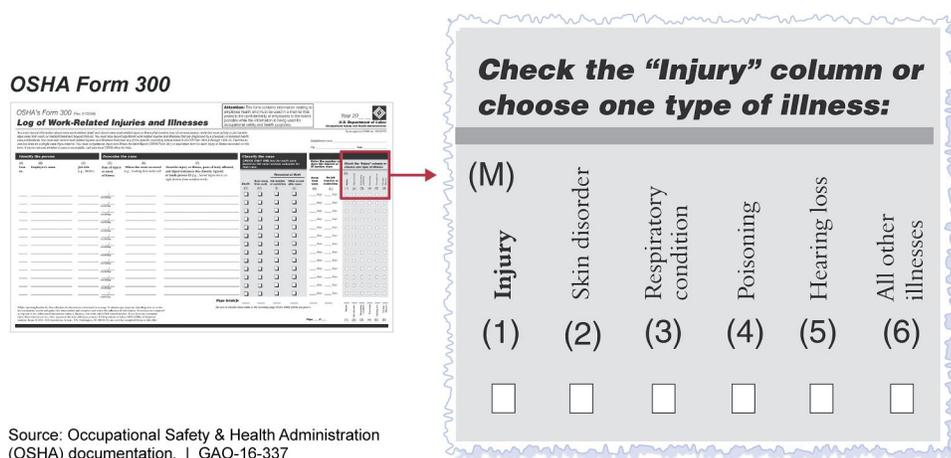
The OSHA log, which employers use to respond to BLS's SOII, also does not specifically classify recorded injuries or illnesses as MSDs. For each injury or illness recorded on the log, OSHA requires employers to check off a column indicating whether it is an injury or one of four specified types of illnesses: skin disorder, hearing loss, poisoning, or respiratory condition. Otherwise, the employer is to check "all other illnesses" (see fig. 9). However, the OSHA log does not include a place where employers can check off whether a recorded injury or illness is an MSD. Such

⁹¹BLS uses days away from work as a key measure of an injury's or illness's severity.

⁹²BLS, *Occupational Injuries and Illnesses: A Pilot Study of Job Transfer or Work Restriction Cases, 2011-2013*, report 1056 (Washington, D.C.: July 2015). BLS undertook this pilot study to learn whether increases in cases resulting in job transfer or restricted work, and decreases in those resulting in days away from work, signaled a need for additional data collection. BLS asked establishments involved in the study to submit detailed information about case circumstances (from which MSD data were derived) that resulted in restricted work, job transfer, or days away from work. In addition to the meat and poultry industry, the food manufacturing industry includes animal food manufacturing, grain and oilseed milling, seafood product preparation and packaging, and others. In May 2015, the meat and poultry industry made up just under one-third of the food manufacturing industry in terms of the number of employees, according to BLS.

information would only be included in the incident report, which is maintained by the employer and generally not sent to OSHA or BLS.⁹³ Attempting to compile MSD data using individual incident reports would be difficult.

Figure 9: Occupational Safety and Health Administration Injury and Illness Log (Form 300) Requires Employers to Check Off Whether Recorded Cases Are Certain Conditions



Source: Occupational Safety & Health Administration (OSHA) documentation. | GAO-16-337

Note: See appendix III for a larger image of OSHA's Injury and Illness Log.

A former OSHA official said the agency added these columns to the log because OSHA determined that tracking these particular conditions was important to overseeing worker safety and health. Having these columns enables OSHA to more easily distinguish specific illnesses and conditions from other recorded cases.

Before 2001 the OSHA log included a column for "repeated trauma" cases, which included some, but not all, MSDs, as well as some non-MSD cases such as hearing loss. OSHA revised its recordkeeping regulations in 2001 and replaced this column with two, one column for MSDs and another for hearing loss.⁹⁴ However, the MSD column never went

⁹³ As previously mentioned, although none of the OSHA recordkeeping forms are routinely provided to DOL, they must be provided upon request in certain circumstances.

⁹⁴ Occupational Injury and Illness Recording and Reporting Requirements, 66 Fed. Reg. 5916 (Jan. 19, 2001).

into effect,⁹⁵ and in 2003, the agency deleted the MSD column after determining the column was not necessary or supported by the record.⁹⁶ Some public commenters had also expressed concern that the column was not necessary, did not clearly define MSDs, and imposed a paperwork burden. Because the column was deleted, the current OSHA log does not specifically classify MSDs, although MSDs must be recorded as injuries or illnesses on the log if they meet the criteria in OSHA's recordkeeping regulations. In 2010, OSHA again proposed a rule that would have required employers to check off in a separate column on the OSHA log whether an already-recorded injury or illness was an MSD, stating that information generated from the column would improve the accuracy and completeness of national occupational injury and illness statistics, provide valuable industry-specific information to assist the agency in its activities, inform workers and employers, and would not be cost-prohibitive.⁹⁷ However, the Department of Labor Appropriations Act, 2012 prohibited any funds from being used for the MSD column proposed rule.⁹⁸ The prohibition was extended by the 2013

⁹⁵OSHA delayed the effective date of the provision that would add an MSD column to the log twice. At the time, the agency said it was reconsidering the MSD column requirement and MSD definition in light of the agency's decision to develop a comprehensive plan to address ergonomic hazards.

⁹⁶Occupational Injury and Illness Recording and Reporting Requirements, 68 Fed. Reg. 38,601 (June 30, 2003). OSHA explained that it was not persuaded that the MSD column would provide the type of detailed information that would make it a useful tool for addressing MSDs at the establishment level or materially improve national statistics on MSDs, among other reasons. The agency did note, however, that the addition of columns might be warranted if a type of injury or illness was misrepresented in the BLS data for cases resulting in days away from work.

⁹⁷Occupational Injury and Illness Recording and Reporting Requirements, 75 Fed. Reg. 4728 (Jan. 29, 2010). In its cost analysis for the proposed rule, OSHA determined that because the proposal would merely restore the revisions it made in 2001, all the findings related to economic impact, such as the determination that the regulation was economically feasible and would have no significant impact on small entities, would remain the same. OSHA concluded that inserting a column to track MSDs would be economically feasible because the potential costs of the proposed rule were limited to the time for affected employers to familiarize themselves with the column reporting procedures and the time to mark MSDs on the employer's OSHA log.

⁹⁸Pub. L. No. 112-74, div. F, § 111, 125 Stat. 786, 1064 (2011) ("None of the funds made available by this Act may be used to continue the development of or to promulgate, administer, enforce, or otherwise implement the Occupational Injury and Illness Recording and Reporting Requirements—Musculoskeletal Disorders (MSD) Column regulation ... being developed by the Occupational Safety and Health Administration of the Department of Labor.")

appropriations act,⁹⁹ but was not included in subsequent appropriations. Since then, OSHA has not attempted to add an MSD column to the OSHA logs.

OSHA officials told us that it is vital to have accurate data on MSDs in the meat and poultry industry, and OSHA stated in its 2010 proposed rule to add a column to track MSDs that data from the column would assist the agency in targeting its inspections, outreach, guidance, and enforcement, among other things. BLS officials told us it would be a significant improvement if there were data that would quantify the extent of MSDs, as current data collection methods fall short. Although they stated they did not see a need for a column, representatives of trade associations for the meat and poultry industry we interviewed agreed that tracking MSDs at the plant level helps employers prevent and respond to these injuries.¹⁰⁰ More MSD data would be helpful to OSHA and researchers, and a column on the OSHA injury log dedicated to MSDs could also make it simpler for employers to calculate their MSD rates, according to representatives of worker advocacy groups. Currently, employers must examine numerous entries in their OSHA injury log to calculate these rates. According to CDC, the first step in addressing health issues such as injuries is obtaining a full understanding of the extent of the problem.¹⁰¹ Federal internal control standards also call for accurate and timely recording to accomplish agency objectives.¹⁰² Without improving data on MSDs, BLS's statistics on these conditions will remain limited and OSHA's efforts to oversee employers and ensure workplace safety and health will continue to be hindered.

⁹⁹Consolidated and Further Continuing Appropriations Act, 2013, Pub. L. No. 113-6, div. F, § 1104, 127 Stat. 198. 413.

¹⁰⁰According to OSHA guidance, to implement a program to prevent MSDs, a plant should regularly review reports of MSDs on its OSHA log, as well as examine records from its health unit and workers compensation claims, among other things.

¹⁰¹National Center for Injury Prevention and Control. *CDC Injury Fact Book* (Atlanta, Ga.: Centers for Disease Control and Prevention, 2006).

¹⁰²[GAO/AIMD-00-21.3.1](#).

DOL Lacks Information on Injury and Illness Rates of Meat and Poultry Sanitation Workers

DOL does not know the extent to which injuries and illnesses occur among meat and poultry sanitation workers—who may be employed directly by a plant or work for a separate contract sanitation company—because of how data on these workers are collected.¹⁰³ Although they labor in the same plants and under working conditions that can be as hazardous as those of production workers, in 2005 we found sanitation workers employed by contract sanitation companies were not classified by BLS in the SOII as working in the meat and poultry industry.¹⁰⁴ We concluded that OSHA, as a result, was not considering all injuries and illnesses at a plant when selecting plants to be inspected because some worker injuries and illnesses were not included in OSHA logs at those sites. We recommended that DOL require certain plants to provide OSHA with worksite-specific data of injuries and illnesses of workers employed by contract cleaning and sanitation companies so these data could be included in the rates OSHA uses to select plants for inspection.¹⁰⁵ DOL did not implement this recommendation, citing a decision it had already made against requiring employers in the construction industry to collect contract worker data because of the burden to that industry, among other things.

DOL has not taken action to improve data on sanitation workers, despite continued concerns expressed by OSHA about how sanitation work by both plant employees and contracted workers is one of the most hazardous occupations in the industry. Many sanitation workers work overnight during a plant’s “third shift” and are responsible for cleaning floors, machinery, and all product contact surfaces throughout the plant to comply with USDA requirements. Workplace hazards for sanitation workers employed directly by plants and those employed by contract sanitation companies include potential exposure to electrical, mechanical, hydraulic, and other sources of energy and potentially harmful chemicals. In 2013, for example, a 41-year-old sanitation worker was killed when he fell into an industrial blender at a meat plant, according to a fatality investigation report by the Oregon Fatality Assessment and Control Evaluation program of the Oregon Institute of Occupational Health

¹⁰³According to BLS, it is not possible to get a full count of meat and poultry sanitation workers employed by contract sanitation companies because the CPS—the primary source of labor force statistics in the United States—generally does not identify contract workers.

¹⁰⁴[GAO-05-96](#).

¹⁰⁵At that time, OSHA relied on its OSHA Data Initiative to select plants for inspection. That initiative no longer exists.

Sciences. In 2015, according to an OSHA citation, a sanitation worker at a poultry plant lost two of his fingertips when a machine he was cleaning was mistakenly turned on. Two weeks later at the same plant, according to the same citation, a 17-year-old sanitation worker lost part of his leg when he was caught in a machine that lacked safety mechanisms.¹⁰⁶

Another challenge in tracking injury and illness rates among sanitation workers is that even for those workers directly employed by meat and poultry plants (as opposed to those working for a contractor), the plants use different occupational titles for these workers on their OSHA logs. Employers record the injured workers' job titles on their OSHA log, then, in its SOII, BLS codes these data using a standardized system.¹⁰⁷ BLS officials told us that under this system these workers' occupations may be listed as "janitors and cleaners," "cleaners of vehicles or equipment," or other occupational categories such as "production workers-all other" or "food processing workers-all other." As a result of using these various occupational titles, which may cover regular production workers as well, DOL is not able to determine which injuries and illnesses pertain to meat and poultry sanitation workers.

According to BLS, it also may not be possible to gather separate injury and illness data on those meat and poultry sanitation workers who are employed by contract sanitation companies. Under OSHA's recordkeeping requirements, either the contract sanitation company or the plant may be required to track these workers' injuries, depending on which entity is providing day-to-day supervision.¹⁰⁸ As a result, injury and illness data for these workers in BLS's SOII may be coded according to their employer's industry—janitorial services, for example—and would therefore not be captured in injury and illness rates for the meat and poultry industry. Officials at four of the six plants we visited told us that the contract sanitation company they work with maintains the injury log for these

¹⁰⁶According to OSHA officials, as of February 2016 the agency was still in settlement discussions with the employer regarding these citations.

¹⁰⁷The Standard Occupational Classification system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 840 detailed occupations according to their occupational definition.

¹⁰⁸29 C.F.R. § 1904.31(b)(3) and (b)(4).

workers.¹⁰⁹ Officials at one contract sanitation company told us that both they and the plants with which they contract keep OSHA logs, and that the data the company sends to BLS from its OSHA log are coded under the “janitorial services” industry.¹¹⁰ BLS officials told us that it may not be possible to require contract sanitation companies to identify the industry of the companies they contract with because many of these companies provide services to a wide variety of businesses.

As a result of how DOL gathers information on meat and poultry sanitation workers’ injuries and illnesses, OSHA has little data to work with when determining how to oversee these workers’ safety and health. Federal internal control standards call for agencies to track data to help them make decisions and meet their goals.¹¹¹ According to OSHA, inaccurate data can lead to misleading conclusions regarding incidence, trends, causation, and effectiveness of abatement strategies. Because of limitations in the BLS data on injuries and illnesses of workers in meat and poultry plants, OSHA cannot fully assess the extent to which it is fulfilling its worker safety mission or successfully carrying out its enforcement and other activities. In addition, the agency may not be doing all it can to ensure sanitation workers are protected from workplace hazards.

Several new developments may make it easier for OSHA to obtain more data on sanitation workers at meat and poultry plants. As of January 2015, employers covered by federal OSHA are required to report all work-related in-patient hospitalizations, amputations, and losses of an eye directly to OSHA within 24 hours.¹¹² Previously, OSHA received more limited information on amputations and hospitalizations through direct employer

¹⁰⁹The other two plants did not respond to our e-mail query following our visit.

¹¹⁰Two other contract sanitation companies we approached declined to meet with us.

¹¹¹[GAO/AIMD-00-21.3.1](#).

¹¹²Occupational Injury and Illness Recording and Reporting Requirements—NAICS Update and Reporting Revisions, 79 Fed. Reg. 56,130 (Sept. 18, 2014) (revising 29 C.F.R. § 1904.39). States with OSHA-approved state plans were required to adopt a rule identical to or at least as effective as this rule, although the timing of implementation in state-plan states may vary. The previous rule required employers to report hospitalizations of three or more employees directly to OSHA within 8 hours. Under the previous rule, amputations and losses of an eye were required to be recorded, but were not required to be reported to OSHA directly. The revised rule left in place the existing requirement that employers report all work-related fatalities to OSHA within 8 hours.

reports.¹¹³ Reports on such cases involving meat and poultry sanitation workers may provide OSHA with additional details on injuries to this population. In addition, in October 2015, OSHA initiated two regional emphasis programs for the poultry industry in the southern United States. These programs—along with an ongoing regional emphasis program on poultry industry sanitation workers in the same region—mean OSHA will conduct more poultry plant inspections and gather more data on risks to sanitation and other workers, a former OSHA official told us.

OSHA may also be able to work with NIOSH to gather information about sanitation worker injuries and illnesses. NIOSH officials told us that they recently were able to conduct studies in other industries because OSHA had negotiated their access after issuing citations. OSHA officials agreed that NIOSH reports could be useful to their inspections. NIOSH's last health hazard evaluation of meat and poultry sanitation workers was conducted in 2002. At that time, NIOSH examined the use of sanitizing agents, such as bleach, in a meat processing plant, and analyzed their connection to respiratory disorders among five sanitation workers in that plant.¹¹⁴ All five sanitation workers reported symptoms consistent with known irritant effects of bleach, such as throat irritation and burning or stinging eyes, and the symptoms disappeared when the use of bleach was discontinued.¹¹⁵ Since then, NIOSH has not conducted any additional health hazard evaluations on meat and poultry sanitation workers, since they must rely on plant management, workers, or worker representatives to request a health hazard

¹¹³As previously mentioned, although OSHA does not routinely collect employer injury and illness records, OSHA's regulations currently require employers to collect data in the OSHA log and make these records available to OSHA during inspections.

¹¹⁴Melody Kawamoto and Bradley King, *Health Hazard Evaluation at Cincinnati Processing*, HETA 2002-0201 (NIOSH, Nov. 22, 2002).

¹¹⁵NIOSH evaluators interviewed five employees, all of whom described having these symptoms when using sanitizing agents such as bleach.

evaluation.¹¹⁶ However, NIOSH can also self-initiate studies on occupational safety and health issues and may conduct studies in response to requests from federal, state, or local agencies.¹¹⁷ In the absence of additional studies on meat and poultry sanitation workers, both OSHA and NIOSH may be missing an opportunity to learn more about the nature and extent of sanitation worker injuries and illnesses.

Conclusions

While overall injury and illness rates have decreased since our last report, meat and poultry workers continue to face worksite hazards that put them at risk of severe and lasting injury. Obtaining complete information about injuries and illnesses in the meat and poultry industry continues to be a challenge that affects DOL's ability to calculate accurate rates and ensure safe and healthy workplaces. Recent OSHA inspections suggest that more injuries occur than are reported, although the extent of underreporting is not known, and vulnerable workers such as immigrants and noncitizens may fear for their livelihoods and feel pressured not to report injuries. Our findings raise questions about whether the federal government is doing all it can to ensure it collects the data it needs to support worker protection and workplace safety. Strengthening DOL's data collection on worker injuries and illnesses is the first step towards achieving that goal. Collecting accurate and complete data on MSDs is particularly important, because these disorders are common among this workforce and can be severe and debilitating. However, OSHA does not have a cost-effective method for distinguishing MSDs from other recorded cases, hindering OSHA's efforts to ensure workplace safety and health. In addition, OSHA and BLS continue to face challenges determining the rates of injury and illness among meat and poultry sanitation workers.

¹¹⁶NIOSH conducts its health hazard evaluations under the statutory authority in section 20(a)(6) of the OSH Act, which requires NIOSH to determine, "following a written request by any employer or authorized representative of employees...whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found." 29 U.S.C. § 669(a)(1). If the request is not from the employer, NIOSH's regulations require it to be signed by (1) an authorized representative or an officer of the organization representing the employees for purposes of collective bargaining, (2) an employee of the employer authorized by two or more employees employed in the same place to represent them, or (3) one of three or less employees employed in the place of employment where the substance or physical agent is normally found. 42 C.F.R. § 85.3-1.

¹¹⁷According to NIOSH officials, when deciding whether to initiate a study of a hazard in an industry, the agency will consider the number of workers affected, the severity of the health effects, and other public health factors that could affect the industry.

Until DOL is able to gather more complete data on sanitation workers in these plants, it does not have an accurate picture of total injuries and illnesses in the meat and poultry industry, and it cannot know how to best protect these sanitation workers. New developments provide an opportunity for DOL to learn more about the injuries and illnesses suffered by these workers and to develop ways to better track them. NIOSH, the federal agency responsible for researching workplace safety and health, may be well-placed to conduct an in-depth study on the injuries and illnesses experienced by this population.

Recommendations for Executive Action

We are making the following three recommendations:

To strengthen DOL's efforts to ensure employers protect the safety and health of workers at meat and poultry plants, the Secretary of Labor should direct the Assistant Secretary for Occupational Safety and Health, working together with the Commissioner of Labor Statistics as appropriate, to develop and implement a cost-effective method for gathering more complete data on MSDs.

To develop a better understanding of meat and poultry sanitation workers' injuries and illnesses:

- The Secretary of Labor should direct the Assistant Secretary for Occupational Safety and Health and the Commissioner of Labor Statistics to study how they could regularly gather data on injury and illness rates among sanitation workers in the meat and poultry industry.
- The Secretary of Health and Human Services should direct the Director of the Centers for Disease Control and Prevention to have NIOSH conduct a study of the injuries and illnesses these workers experience, including their causes and how they are reported. Given the challenges to gaining access to this population, NIOSH may want to coordinate with OSHA to develop ways to initiate this study.

Agency Comments and Our Evaluation

We provided a draft of this report to the Secretary of Labor, the Secretary of Agriculture, and the Secretary of Health and Human Services for their review and comment. DOL and HHS provided comments, reproduced in appendixes IV and V, respectively. DOL generally agreed with our recommendations and stated that their implementation would make a difference in working conditions in the meat and poultry industry. DOL also noted that it may not be easy to implement our recommendations

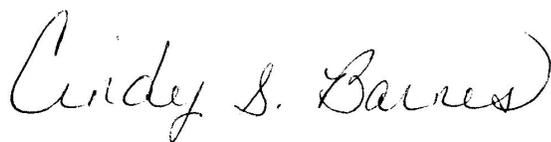
due to resource constraints. We are pleased that DOL agreed with our recommendations.

HHS concurred with our recommendation to have NIOSH conduct a study of the injuries and illnesses of sanitation workers in the meat and poultry industry. HHS noted the previous difficulties NIOSH has had gaining access to these workplaces and the potential resource commitment involved in conducting such a study. In the report we acknowledged the access challenge and noted that OSHA has negotiated access for NIOSH in other industries, which is why we suggested in the recommendation that NIOSH may want to coordinate with OSHA.

USDA generally agreed with our findings and recommendations, and provided technical comments, which we incorporated as appropriate.

As agreed with your office, unless you publicly announce the comments of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees, the Secretary of Labor, the Secretary of Agriculture, and the Secretary of Health and Human Services. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact us at (202) 512-7215 or brownbarnesc@gao.gov or at (202) 512-3841 or morriss@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VI.



Cindy Brown Barnes
Director, Education, Workforce, and Income Security Issues



Steve D. Morris
Director, Natural Resources and Environment

Appendix I: Scope and Methodology

This report (1) describes what is known about injuries, illnesses, and hazards in the meat and poultry industry since we last reported, and (2) examines what, if any, challenges the Department of Labor (DOL) faces in gathering data on injury and illness rates in this industry.

To describe what is known about injuries, illnesses, and hazards in the meat and poultry industry since we last reported, we analyzed and reported survey data from DOL's Bureau of Labor Statistics' (BLS) Survey of Occupational Injuries and Illnesses (SOII) for calendar years 2004 through 2013 (the most recent year for which data were available).¹ The SOII provides estimates of the number and frequency (incidence rates) of workplace injuries and illnesses by industry and also by detailed case circumstances, such as injury type and event, and worker characteristics for cases that result in days away from work, based on data from logs kept by employers (survey respondents)—private industry and state and local governments. Survey respondents provide counts for all recordable injuries and illnesses under Occupational Safety and Health Administration (OSHA) recordkeeping regulations. Survey respondents also provide additional information for a subset of cases, specifically those that involved at least 1 day away from work. In 2011, the BLS Occupational Injury and Illness Classification System and definitions of some injuries changed, thereby preventing direct comparison of case characteristics over time. We report estimates of detailed case characteristics from various injuries and illnesses, such as carpal tunnel syndrome, that resulted in days away from work in the most recent calendar year available, 2013.

To report SOII data from the meat and poultry industry (using North American Industry Classification System (NAICS) code 31161 for the animal slaughtering and processing industry) and manufacturing overall (NAICS codes 31-33), BLS provided estimates of each industry's injury

¹We reported the estimated incidence rates of total recordable cases of injuries and illnesses per 100 workers from calendar years 2004 through 2013. For illnesses, we reported the estimated incidence rates per 10,000 workers. For injuries and illnesses with days away from work, we also reported the estimated incidence rates per 10,000 workers.

and illness incidence rates and their associated relative standard errors.²

All estimates produced from the analysis of the SOII data are subject to sampling errors. We express our confidence in the precision of the results as a 95 percent confidence interval. This is the interval that would contain the actual population value for 95 percent of the samples the respective agency could have drawn. For estimates derived from BLS's SOII data, we used the agency-provided relative standard errors to estimate the associated confidence intervals. All estimates we report have the associated 95 percent confidence interval provided.

We also reviewed BLS's Census of Fatal Occupational Injuries (CFOI) data for calendar years 2004 through 2013, the most recently available data, to better understand the number of fatalities and their circumstances, including causes in the meat and poultry industry. The CFOI is a federal-state cooperative program that has been implemented in all 50 states and the District of Columbia since 1992. According to BLS, the CFOI program uses diverse state, federal, and independent data sources to identify, verify, and describe fatal work injuries to ensure counts are as complete and accurate as possible. CFOI compiles a count of all fatal work injuries occurring in the United States during the calendar year. Fatal injury counts exclude illness-related deaths unless precipitated by an injury event. As previously stated, in 2011 the classification systems and definitions of some data elements changed, and this change may not allow comparing CFOI data within specific fatality categories to previous years. Therefore, we reported total fatalities over a 10-year period rather than annual totals within each major fatality category.

To assess the reliability of BLS SOII and CFOI data, we reviewed documents related to the data sources, such as BLS's Handbook of Methods, and we interviewed agency officials knowledgeable about these data. We found that SOII and CFOI data were sufficiently reliable for our purposes in generally reporting estimated incidence rates of injuries and illnesses in the meat and poultry industry and manufacturing overall,

²We use the term "meat and poultry industry" to refer to companies in the animal slaughtering and processing industry, North American Industry Classification System (NAICS) code 31161. The animal slaughtering and processing industry code includes animal (except poultry) slaughtering (NAICS code 311611), meat processed from carcasses (NAICS code 311612), rendering and meat byproduct processing (NAICS code 311613), and poultry processing (NAICS code 311615) which covers poultry slaughter and processing.

describing injuries and illnesses, and reporting total fatalities in the meat and poultry industry.

We also obtained and reviewed fiscal year 2014 workers' compensation data from USDA's Food Safety and Inspection Service (FSIS) to describe the injuries, illnesses, and hazards experienced by inspectors in meat and poultry plants. USDA's workers' compensation data includes injuries and illnesses from workers who filed a workers' compensation form. A limitation of this data source is that workers' compensation data likely undercounts injuries and illnesses. To assess the data's reliability, we interviewed agency officials, reviewed documentation on FSIS's workers' compensation program, and checked the data for discrepancies. We found the data were sufficiently reliable for our purposes.

We reviewed literature from peer-reviewed journals, Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) health hazard evaluations, and OSHA guidance documents on factors that affected injury and illness rates and hazards in the meat and poultry industry since we last reported.

- We conducted a literature search for studies that examined factors affecting injury and illness rates, as well as hazards in the meat and poultry industry. Based on our literature review, we reported information from four peer-reviewed studies. To identify studies from peer-reviewed journals, we conducted searches of various databases, such as Web of Science, Scopus, and ProQuest and requested suggestions from officials we interviewed. We further limited our review to studies on meat and poultry workers only; therefore, we excluded any studies that made comparisons between workers in the meat and poultry industry and other industries. From this review, we identified 19 studies that appeared in peer-reviewed journals between 2005 and 2015. Of the 19 studies, we excluded two studies that summarized findings from two NIOSH health hazard evaluations that we had previously obtained and reviewed. We noted that 8 of the 17 studies relied on a community-based approach to obtain participants rather than recruiting them directly from plants. These studies focused exclusively on a subset of the worker population within the meat and poultry industry, namely women and Hispanic or Latino poultry workers in North Carolina. We included observations from 1 of the 8 studies, which focused on Hispanic poultry workers, but we noted study limitations in the report. We included findings from 3 of the other 9 studies: (1) a study on a neurological disorder experienced by workers in three hog plants that illustrated hazards related to animals,

(2) a study on lacerations in meatpacking describing hazards related to machines and tools, and (3) a study on laceration injuries experienced by meat and poultry workers employed by 10 companies representing 22 poultry plants and 8 pork plants to illustrate factors that may affect injury and illness rates in the meat and poultry industry.

- We identified and reviewed eight NIOSH health hazard evaluations published from 2007 to 2015 that describe various hazards in poultry plants, as well as factors that may affect injury and illness rates in this industry.³ NIOSH officials told us the agency has not conducted similar evaluations in meat plants to those it conducted in poultry plants because the agency has not received any requests to do so. Findings from NIOSH evaluations we reviewed are not generalizable to illustrate hazards in all poultry processing plants in the United States.
- We reviewed OSHA guidance documents on hazards in meat and poultry plants, including OSHA's e-Tool for poultry processing which details workplace hazards by job task in the poultry industry.

To examine the challenges DOL may face in gathering data on injury and illness rates in this industry, we reviewed relevant federal laws and regulations, as well as OSHA documentation. We also reported BLS data and reviewed documentation on musculoskeletal disorders (MSD), including a pilot study on cases involving job transfer and work restriction from data collected from 2011 through 2013. We obtained and analyzed data on worker demographics from the Current Population Survey (CPS), jointly sponsored by BLS and the Census Bureau, from March 2015, the most recent data available. We assessed the reliability of CPS data by reviewing documentation, interviewing knowledgeable agency officials,

³NIOSH is a research institute within CDC. The mission of the NIOSH Health Hazard Evaluation Program is to respond to requests from employees, employers, and union representatives to evaluate potential health hazards in their workplace. A health hazard evaluation is a study of a workplace and it can help reduce hazards and create more healthful workplaces. It is done to learn whether workers are exposed to hazardous materials or harmful conditions. Once an evaluation is completed, NIOSH makes recommendations on ways to reduce or eliminate identified hazards and prevent work-related injury and illness. According to NIOSH's website, NIOSH is not a regulatory agency so recommended changes do not have to be made, but experience has shown that many employers address problems identified in reports to improve the health and safety of their workforce. According to NIOSH's 2014 annual report, NIOSH received 209 evaluation requests and completed 33 field investigation reports and 118 consultation letters.

and performing electronic data testing, and determined the data were sufficiently reliable for our purposes. Because the CPS estimates are based on probability samples, they are subject to sampling error. For the CPS estimates in this report, we estimated sampling error and produced confidence intervals using the methods provided in the technical documentation of CPS's March 2015 supplement. To report wages of meat and poultry workers, we used estimates of average annual and monthly wages for slaughterers and meat packers (Standard Occupational Classification code 513023) in the animal slaughtering and processing industry (NAICS 31161) and their associated relative-standard errors from BLS's Occupational Employment Statistics (OES) survey data from May 2014. We used the relative-standard errors to calculate 95 percent confidence intervals for estimates derived from BLS's OES survey data. We found the BLS and CPS data were sufficiently reliable for our purposes. We interviewed OSHA officials—including officials from all 10 regional OSHA offices—and FSIS and NIOSH officials. We also interviewed Georgia Tech Research Institute staff who conducted research on sanitation workers in the poultry industry to learn about hazards faced by sanitation workers in the meat and poultry industry. Moreover, to describe challenges in gathering data on sanitation workers, we reviewed a 2002 NIOSH evaluation on sanitation workers and interviewed one sanitation company that provides cleaning services in the meat and poultry industry.⁴ Of the two other sanitation companies we approached, one declined to meet with us and other company did not respond to our request.

To respond to both objectives, we interviewed representatives from stakeholder groups and visited several meat and poultry plants. We identified and interviewed 13 stakeholder groups (unions, worker advocacy groups, and industry trade organizations) with sufficient knowledge about worker safety in the meat and poultry industry, in part based on previous work as well as referrals from other stakeholder groups. We also reviewed information obtained from these groups. These stakeholder groups were the American Federation of Government Employees/National Joint Council of Food Inspection Locals, the Government Accountability Project, Legal Aid of North Carolina, the National Chicken Council, the National Council for Occupational Safety and Health, the National Turkey Federation, Nebraska Appleseed, the

⁴NIOSH (2002).

North American Meat Institute, Oxfam America, the Southern Poverty Law Center, Student Action with Farmworkers, the United Food and Commercial Workers International Union, and the U.S. Poultry and Egg Association. We attended a meat industry conference on worker safety, as well as a worker safety conference organized by the National Council for Occupational Safety and Health. Finally, we visited six meat and poultry plants—selected to cover a mix of species (chicken, turkey, hog, and cattle) and states (Missouri, Nebraska, North Carolina, and Virginia),⁵ as well as union and non-union plants and two plants that were part of the FSIS pilot project—where we met with plant management, USDA’s FSIS management and inspectors, and plant safety and health staff. We also met with current and former workers, who were selected either by unions, worker advocacy groups, or plant managers. The information gathered in these interviews is not generalizable to all plants or workers. To assess DOL’s efforts based on the information gathered in interviews and site visits, we used federal internal control standards that call for agencies to track data and to undertake accurate and timely recording to accomplish agency objectives.⁶

We conducted this performance audit from December 2014 to April 2016 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

⁵OSHA is responsible for overseeing workplace safety and health for private-sector employers in Missouri and Nebraska; while in North Carolina and Virginia, the state is responsible for such oversight under an OSHA-approved state plan.

⁶[GAO/AIMD-00-21.3.1.](#)

Appendix II: Summary of Selected Health Hazard Evaluations in the Poultry Industry Conducted by the National Institute for Occupational Safety and Health, 2007-2015

The National Institute for Occupational Safety and Health (NIOSH) conducted eight health hazard evaluations published from 2007 to 2015 that describe various hazards in poultry plants. Table 3 presents a summary of selected findings and recommendations from these health hazard evaluations. Selected findings on hazards are not generalizable to all poultry processing plants in the United States. This table is not intended to be a complete list of NIOSH's findings and recommendations; for more complete information, refer directly to the cited NIOSH health hazard evaluation.

Table 3: Selected NIOSH Health Hazard Evaluations' Findings and Recommendations, 2007-2015

NIOSH evaluation	Selected findings, methodology, and recommendations
<p>Evaluation of Carpal Tunnel Syndrome and Other Musculoskeletal Disorders Among Employees at a Poultry Processing Plant, March 2015 Report No. 2014-0040-3232 Jessica Ramsey, Kristin Musolin, and Charles Mueller</p>	<p>Background: NIOSH received a request from a poultry plant in Maryland to evaluate risk factors for musculoskeletal disorders (MSD). The plant requested the evaluation in order to modify its poultry processing and inspections procedures as part of a USDA pilot project.</p> <p>Selected methodology: NIOSH conducted the evaluation from February 2014 to April 2014 using observation and physical examination, such as nerve conduction testing of 96 percent of the workers invited to participate in the assessment (191 of 199 workers), initial interviews with 44 plant workers, and reviewing the Department of Labor Occupational Safety and Health Administration (OSHA) injury and illness logs from 2010-2013 collected in the plant, among other things.</p> <p>Selected findings:</p> <ul style="list-style-type: none"> • 59 percent of the jobs NIOSH evaluated had average levels of hand activity and force above the American Conference of Governmental Industrial Hygienists—a private corporation and scientific association that develops recommendations or guidelines to assist in the control of occupational health hazards— threshold limit value. • 34 percent of participants met NIOSH's case definition for carpal tunnel syndrome, likely due to the repetitive and forceful nature of the work. <p>Selected recommendations:</p> <p>Plant—</p> <ul style="list-style-type: none"> • Design job tasks to lessen hand activity and force, so that they are below the American Conference of Governmental Industrial Hygienists threshold limit value. • Implement a job rotation schedule that rotates employees between jobs that use different muscle groups and rotates them from high- to low-risk jobs. • Reduce line speed on the cone line—the part of the processing line designed for cut-up or deboning of poultry and use additional cone lines to reduce repetition for each person on the line. <p>Workers—</p> <ul style="list-style-type: none"> • Report symptoms and injuries as soon as possible to supervisors and onsite medical staff.

**Appendix II: Summary of Selected Health
Hazard Evaluations in the Poultry Industry
Conducted by the National Institute for
Occupational Safety and Health, 2007-2015**

NIOSH evaluation	Selected findings, methodology, and recommendations
<p>Evaluation of Musculoskeletal Disorders and Traumatic Injuries Among Employees at a Poultry Processing Plant March 2014 Report No. 2012-0125-3204 Kristin Musolin, et al.</p>	<p>Background: NIOSH received a request from a poultry processing plant in South Carolina to identify the potential for increase in musculoskeletal and upper extremities trauma due to the planned evisceration line speed increase. The plant requested an evaluation in order to obtain a line speed waiver under USDA's <i>Salmonella</i> Initiative Program. NIOSH evaluated MSDs and traumatic injuries among employees at a poultry processing plant before (baseline) and after (follow-up) an increase in evisceration line speed.</p> <p>Selected methodology: NIOSH conducted the evaluation from May 2012 through June 2013, using observation of work processes, nerve conduction testing (representative sample of 284 employees based on job title and task), administering a questionnaire to 318 workers (out of 375 first-shift production line employees and live hang contractors), and reviews of OSHA injury and illness logs from 2009-2012 collected in the plant, among other things.</p> <p>Selected findings:</p> <ul style="list-style-type: none"> • At baseline, 41 percent of participants (130 of 318) were working in jobs that had levels of hand activity and force above the action limit for American Conference of Governmental Industrial Hygienists threshold limit value. • 42 percent of participants (126 of 301) had evidence of carpal tunnel syndrome at the baseline assessment and the prevalence of hand or wrist symptoms (pain, burning, numbness, or tingling) was similar at baseline and follow-up. • The Fresh Plant's rate of OSHA recordable work-related injuries and illnesses was higher than the poultry processing industry average for 2009–2012. • As part of the line speed increase, two evisceration lines were combined into one, which resulted in a similar number of birds processed by most employees at follow-up compared to the number of birds processed at baseline. <p>Selected recommendations:</p> <p>Plant—</p> <ul style="list-style-type: none"> • Design job tasks so that they are below the American Conference of Governmental Industrial Hygienists threshold limit value. • Implement a job rotation schedule in which employees rotate between jobs that use different muscle groups and are below the action limit of American Conference of Governmental Industrial Hygienists threshold limit value for hand activity and force. • Enhance reporting, screening, and medical assessment onsite to prevent MSDs and traumatic injuries. <p>Workers—</p> <ul style="list-style-type: none"> • Promptly report symptoms and injuries to supervisors and onsite medical staff.

**Appendix II: Summary of Selected Health
Hazard Evaluations in the Poultry Industry
Conducted by the National Institute for
Occupational Safety and Health, 2007-2015**

NIOSH evaluation

Evaluation of Sensitization and Exposure
to Flour Dust, Spices, and Other
Ingredients Among Poultry Breeding
Workers

April 2013

Report No. 2009-0131-3171

Elena Page, et al.

Selected findings, methodology, and recommendations

Background: NIOSH received a request from the United Food and Commercial Workers union based on concerns that employees at a poultry breeding plant in Georgia were experiencing asthma, bronchitis, and nasal symptoms from exposure to breeding dust, which consists of flour, spices, and other ingredients.

Selected methodology: NIOSH conducted the evaluation from June 2009 through March 2010 by observing work processes, testing air samples for inhalable flour dust, wheat, and soy, testing workers' blood for allergies to flour dust and other ingredients, interviewing 47 of more than 400 workers, and reviewing OSHA injury and illness logs from 2005 to 2009 collected in the plant.

Selected findings:

- Employees were overexposed to flour dust and other breeding ingredients due to a lack of ventilation and poor work practices.
- Employees were sensitized to flour dust, wheat, spices, and other ingredients because of high exposures.
- Employees had work-related asthma symptoms, cough, and rhinoconjunctivitis symptoms —a combination of rhinitis and conjunctivitis which may be characterized by allergic eye and nose symptoms such as nasal congestion and itchy watery eyes, among other things.

Selected recommendations:

Plant—

- Start a respiratory protection program.
- Hire a physician to evaluate employees for symptoms before they begin work at the plant and periodically evaluate them.
- Use a local exhaust ventilation system to lower flour dust levels.

Workers —

- Wear respirators properly.
 - Report any health problems to supervisor or plant nurse for a medical evaluation.
-

Appendix II: Summary of Selected Health Hazard Evaluations in the Poultry Industry Conducted by the National Institute for Occupational Safety and Health, 2007-2015

NIOSH evaluation

Evaluation of Health Effects of a Chlorine Gas Release in a Poultry Processing Plant – Arkansas

September 2012/

Revised February 2013

Report No. 2011-0128-3166

Francisco Meza, Charles Mueller, and Bradley King

Selected findings, methodology, and recommendations

Background: NIOSH received a request for technical assistance from OSHA to evaluate employee health effects after a chlorine gas release in a poultry processing plant in Arkansas.

Selected methodology: NIOSH conducted the evaluation from June 2011 through January 2012. At the first site visit, 523 employees present at the incident completed a questionnaire covering acute health symptoms. This group and 22 additional employees present during the incident, but unavailable during the first visit, completed a questionnaire covering post-traumatic stress disorder and asthma symptoms. Of the 116 employees at the second site visit reporting asthma symptoms, but with no history of asthma symptoms prior to the gas release, 101 participated in a breathing test.

Selected findings:

- Several factors led to the chlorine gas release including labeling in English only, lack of literacy in English, storage of incompatible chemicals in similar containers, and failure to read labels.
- 21 percent of the participants (116) had asthma symptoms four months after the release. Of these, three participants had breathing tests consistent with reactive airway dysfunction syndrome—asthma condition caused by a single high exposure to an irritant such as chlorine—six months after the release.
- 19 percent of the participants (106) had post-traumatic stress disorder symptoms four months after the release.

Selected recommendations:

Plant—

- Train employees in their native language about chemical hazards.
- Properly label containers in English, Spanish, and Marshallese.
- Refer employees who still experience symptoms to a trained health care provider.
- Keep incompatible chemicals in different sized or different colored barrels to help keep them from being mixed up.

Workers—

- Read labels on all chemicals.
 - Report symptoms to supervisor or plant health clinic.
 - Tell managers about any safety and health concerns.
 - Participate in all safety training offered by the plant.
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**Appendix II: Summary of Selected Health
Hazard Evaluations in the Poultry Industry
Conducted by the National Institute for
Occupational Safety and Health, 2007-2015**

NIOSH evaluation	Selected findings, methodology, and recommendations
<p><i>Campylobacter</i> Infection and Exposures Among Employees at a Poultry Processing Plant – Virginia April 2012 Report No. HETA 2011-0058-3157 Marie dePerio, John Gibbins, and R. Todd Niemeier</p>	<p>Background: NIOSH received a request from management representatives at a poultry processing plant in Virginia regarding the occurrence of <i>Campylobacter</i>—bacteria that live in the intestinal tracts of animals and can be transmitted to humans through contact with infected animals—infections, which can cause diarrheal illness, among employees.</p> <p>Selected methodology: NIOSH conducted the evaluation in May 2011 by observing work practices, interviewing 88 workers, evaluating the ventilation system in the live hang area, and reviewing records from the plant, among other things.</p> <p>Selected findings:</p> <ul style="list-style-type: none"> • 29 confirmed cases of <i>Campylobacter</i> infection were found among plant employees over 3.5 years. • 18 of 28 infected employees (64 percent) started working at the plant after January 1, 2011, 19 of the 28 infected employees (68 percent) worked in the receiving or live hang area, and 15 of 28 infected employees (54 percent) lived at a state-operated diversion center (state correctional facility that housed non-violent offenders who participated in paid work). • 28 employees reported being ill with gastrointestinal symptoms such as diarrhea, abdominal cramps, and nausea at some time between January and May 2011, and all 28 reported having diarrhea. 13 of the 28 employees reported seeing a healthcare provider at the plant for their symptoms. • Air vents in the live hang area were above the heads of employees. The vents directed air down toward the conveyor belt. This may spread contamination. <p>Selected recommendations:</p> <p>Plant—</p> <ul style="list-style-type: none"> • Reduce <i>Campylobacter</i> contamination in the plant through improved sanitation and engineering controls with an initial focus on the live hang area. • Consider redirecting airflow from ducts in the live hang area away from live chickens. • Provide personal protective equipment—equipment worn to minimize exposure to serious workplace injuries and illnesses, such as gloves or coveralls—free of charge. • Improve training on employee hand washing and the use of personal protective equipment. <p>Workers—</p> <ul style="list-style-type: none"> • Wash hands before and after work. • Wear personal protective equipment. • Inform medical office of diarrhea symptoms.

Appendix II: Summary of Selected Health Hazard Evaluations in the Poultry Industry Conducted by the National Institute for Occupational Safety and Health, 2007-2015

NIOSH evaluation

Evaluation of Eye and Respiratory Symptoms at a Poultry Processing Facility – Oklahoma

March 2012

Report No. HETA 2007-0284 & 2007-0317-3155

Lilia Chen, et al.

Selected findings, methodology, and recommendations

Background: NIOSH received requests from a poultry processing plant and USDA for a health hazard evaluation at a poultry plant in Oklahoma because of reported eye and respiratory irritation symptoms among production employees and USDA inspectors.

Selected methodology: NIOSH conducted the evaluation from October 2007 through October 2008. NIOSH asked two employee groups—employees working in areas exposed to super-chlorinated water (97 exposed workers and inspectors) and employees in unexposed areas (271 employees)—to complete a questionnaire about their symptoms. NIOSH conducted breathing and eye tests on 39 exposed workers, tested air samples for chlorine and chlorine by-products, interviewed 14 poultry processing workers and 10 USDA inspectors, and reviewed the plant’s records on chlorinated water concentrations, among other things.

Selected findings:

- Employees in the exposed group were more likely to report certain work-related symptoms in the previous month than employees in the unexposed group. These symptoms included chest tightness, sneezing, dry eyes, blurry vision, and burning or itchy eyes.
- Of 39 exposed employees, two had significant declines in their breathing tests over a shift and 37 exposed employees did not.
- Most of the air samples taken for trichloramine—a chemical compound of nitrogen trichloride used to mitigate or kill bacteria—had concentrations below the level that NIOSH could accurately measure. The chlorine concentrations in the wash water met USDA requirements.

Selected recommendations:

Plant—

- Redesign ventilation system.
- Ensure staff are adequately trained to test and control water chemistry parameters.
- Encourage employees to report symptoms to plant health office and USDA inspectors to report symptoms to their management.

Workers—

- Report eye and respiratory irritation to managers and seek evaluation by medical personnel
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**Appendix II: Summary of Selected Health
Hazard Evaluations in the Poultry Industry
Conducted by the National Institute for
Occupational Safety and Health, 2007-2015**

NIOSH evaluation	Selected findings, methodology, and recommendations
Ergonomic Evaluation of Frank Hangers at a Turkey Processing Plant May 2008 Report No. HETA 2007-0098-3061 Jessica Ramsey and John Gibbons	<p>Background: NIOSH received a union request for a health hazard evaluation to evaluate the potential workplace hazards and ways to decrease the risk for musculoskeletal injuries.</p> <p>Selected methodology: NIOSH conducted the evaluation in March 2007 using observation, voluntary interviews with 10 of 24 current workers who hang or remove franks in the deli-cook division and two former workers, and review of the OSHA injury and illness logs for 2003-2006 collected in the plant, among other things.</p> <p>Selected findings:</p> <ul style="list-style-type: none">• Hanging and unloading franks (hot dogs) increases the risk of musculoskeletal injury due to awkward postures, repetitive motions, and heavy lifting.• Among the 10 workers currently hanging franks, 5 reported back and/or shoulder pain when hanging and removing franks and 4 said the height of the racks made their work difficult. All of these workers reported the pain was minor and controllable with rest or over-the-counter analgesics, but two workers reported seeking private medical care. None were diagnosed with specific MSDs. <p>Selected recommendations:</p> <p>Plant—</p> <ul style="list-style-type: none">• Train employees to recognize ergonomic hazards and ask them to participate in the process of identifying hazards and making modifications.• Provide workers with taller platforms in both the raw and cooked production areas.• Rotate workers from lifting to non-lifting jobs so that lifting tasks are limited to less than two hours per rotation. <p>Workers—</p> <ul style="list-style-type: none">• Step as close as possible to racks when hanging and removing franks to minimize horizontal reach.

Appendix II: Summary of Selected Health Hazard Evaluations in the Poultry Industry Conducted by the National Institute for Occupational Safety and Health, 2007-2015

NIOSH evaluation

NIOSH Health Hazard Evaluation Report – HETA #2004-0337-3051, USDA Food Safety Inspection Service, Natchitoches, Louisiana

November 2007

Report No. 2004-0337-3051

Bradley King, Angela Warren, and Charles Mueller

Selected findings, methodology, and recommendations

Background: NIOSH received a request for technical assistance from USDA to evaluate potential exposures to chloramines in a poultry processing facility in Louisiana.

Selected methodology: NIOSH conducted the evaluation from August through September 2004 by collecting and testing air samples of chlorine and chlorine-related compounds and asking the plant’s USDA inspectors to complete initial and end of work shift questionnaires about respiratory symptoms on days that air samples were collected. 12 of 24 inspectors completed an initial questionnaire and 14 of 24 inspectors completed end of work shift questionnaires to assess acute symptoms during a shift.

Selected findings:

- Trichloramine—a chemical compound of nitrogen trichloride—levels were higher at the Maestro and Nu-Tech stations (evisceration lines where chlorinated water was used) than in the offices or processing areas.
- Levels of soluble chlorine compounds did not differ significantly between the Maestro and Nu-Tech stations and processing areas, but were lower in the offices within the plant.
- USDA inspectors most commonly reported itchy or stuffy nose, cough, frequent sneezing, and burning or stinging eyes, among other things, but the small number of participants may have limited the ability to find statistically significant associations between work-related symptoms and trichloramine or soluble chlorine levels.

Selected recommendations:

Plant—

- Possible solutions include improving ventilation throughout the evisceration areas, improving engineering controls for capturing airborne chlorine compounds around equipment such as sprayers, and improving flushing of used wash water.

USDA Inspectors—

- Continue to report symptoms to health specialists at USDA to allow for continued investigation.
- Continue to collaborate with plant owners to identify specific controls that may be implemented for the prevention of such symptoms.

Source: GAO analysis of CDC NIOSH health hazard evaluations. | GAO-16-337

Note: NIOSH is a research institute within CDC. NIOSH is the federal agency responsible for conducting research to identify and prevent workplace hazards. The mission of the NIOSH Health Hazard Evaluation Program is to respond to requests from employees, employers, and employee representatives to evaluate potential health hazards in their workplace. A health hazard evaluation is a study of a workplace that is done to learn whether workers are exposed to hazardous materials or harmful conditions. Once an evaluation is completed, NIOSH typically makes recommendations on ways to reduce or eliminate identified hazards and prevent related injuries and illnesses. According to NIOSH’s website, NIOSH-recommended changes do not have to be made, but experience has shown that many employers address problems identified in reports to improve the health and safety of their workforce. According to NIOSH’s 2014 annual report, NIOSH received 209 requests and completed 33 field investigation reports and 118 consultation letters.

Appendix IV: Comments from the Department of Labor

U.S. Department of Labor

Assistant Secretary for
Occupational Safety and Health
Washington, D.C. 20210



APR 01 2016

Ms. Cindy Brown Barnes, Director
Education, Workforce, and Income Security Issues
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Mr. Steve D. Morris, Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Ms. Brown and Mr. Morris:

Thank you for the opportunity to comment on the Government Accountability Office's (GAO) draft report, *Workplace Safety and Health: Additional Data Needed to Address Continued Hazards in the Meat and Poultry Industry*. The following comments are submitted on behalf of the Department of Labor's (DOL) Occupational Safety and Health Administration (OSHA) and Bureau of Labor Statistics (BLS). Both agencies appreciate your detailed review of the numerous workplace hazards in the meat and poultry slaughtering and processing industries.

As you note, meat and poultry work continues to require forceful exertions, awkward postures, and repetitive cutting motions, putting enormous stress on workers' hands, arms, shoulders and backs, leading to serious musculoskeletal injuries. Workers suffer from cuts and gashes from handling knives, scissors and saws, and are subject to chemical exposures causing burns, and respiratory problems. Poultry workers have an injury rate more than 50% higher than the injury rate for all U.S. workers.

OSHA generally agrees with the recommendations found in this report and believes that their implementation would make a difference in working conditions within the meat and poultry industries. However, the specific steps that you have recommended may not be easily or quickly implemented, due to resource constraints.

We wish to note, that with respect to GAO's recommendation that OSHA and BLS study how data is gathered on injury and illness rates among sanitation workers in the meat and poultry industry, OSHA and BLS will participate in a multi-agency study on data collection conducted by the National Academy of Sciences. In addition to this initiative, we remain committed to further development of the tools to improve data, recordkeeping and general studies of meat and poultry worker injuries and illnesses.

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OSHA welcomes GAO's evaluation of the slaughter and processing industries and its assessment of OSHA's efforts to increase awareness, improve worker protections and hold employers accountable for both workers on the production lines and in sanitation services.

The agency will continue to work to improve our data within our available resources. OSHA appreciates the opportunity to review and respond to GAO's draft report.

Sincerely,

A handwritten signature in blue ink, appearing to read 'D. Michaels', is written over the word 'Sincerely,'.

David Michaels, PhD, MPH

Appendix V: Comments from the Department of Health and Human Services



DEPARTMENT OF HEALTH & HUMAN SERVICES

OFFICE OF THE SECRETARY

Assistant Secretary for Legislation
Washington, DC 20201

APR 08 2016

Cindy Brown Barnes
Director, Education, Workforce, and Income Security Issues
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Ms. Barnes:

Attached are comments on the U.S. Government Accountability Office's (GAO) report entitled, "*Workplace Safety and Health: Additional Data Needed to Address Continued Hazards in the Meat and Poultry Industry*" (GAO-16-337).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

A handwritten signature in black ink that reads "Jim R. Esquea".

Jim R. Esquea
Assistant Secretary for Legislation

Attachment

GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S DRAFT REPORT ENTITLED: WORKPLACE SAFETY AND HEALTH: ADDITIONAL DATA NEEDED TO ADDRESS CONTINUED HAZARDS IN THE MEAT AND POULTRY INDUSTRY (GAO-16-337)

The U.S. Department of Health and Human Services (HHS) appreciates the opportunity from the Government Accountability Office (GAO) to review and comment on this draft report.

GAO Recommendation

GAO recommends that the Secretary of HHS should direct the Director of the Centers for Disease Control and Prevention (CDC) to have the national Institute for Occupational Safety and Health (NIOSH) conduct a study of the injuries and illnesses these workers experience, including their causes and how they are reported. Given the challenges to gaining access to this population, NIOSH may want to coordinate with the Occupational Safety and Health Administration to develop ways to initiate this study.

HHS Response

HHS concurs with GAO's recommendation and agrees a study concerning injuries and illnesses among workers in the Meat and Poultry Industry would provide further documentation of the hazards faced by workers in that industry. CDC notes previous difficulty in gaining access to Meat and Poultry Industry workplaces; initiating such a study is strongly contingent on getting access to the relevant workplaces. CDC also notes that the staff and financial resource commitment likely involved to support such a study would be large.

Appendix VI: GAO Contacts and Staff Acknowledgments

GAO Contacts

Cindy Brown Barnes, (202) 512-7215 or brownbarnesc@gao.gov
Steve Morris, (202) 512-3841 or morriss@gao.gov

Staff Acknowledgments

In addition to the contacts named above, Blake Ainsworth, (Assistant Director), Mary Denigan-Macauley (Assistant Director), Eve Weisberg (Analyst-in-Charge), Nkenge Gibson (Analyst-in-Charge), Leah English, Monika Gomez, Susan Aschoff, James Bennett, Sarah Cornetto, and Lorraine Ettaro made significant contributions to this report.

Also contributing to this report were Diann Baker, Carl Barden, Carol Bray, Angela Clowers, Marcia Crosse, Grant Mallie, Sheila McCoy, John Mingus, and Michelle Sager.

Appendix VII: Accessible Data

Agency Comment Letter

Text of Appendix IV:
Comments from the
Department of Labor

Page 1

U.S. Department of Labor
Assistant Secretary for Occupational Safety and Health
Washington, D.C. 20210
APR 01 2016
Ms. Cindy Brown Barnes, Director
Education, Workforce, and Income Security Issues
U.S. Government Accountability Office 441 G Street, NW
Washington, DC 20548
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David Michaels, PhD, MPH

Text of Appendix V:
Comments from the
Department of Health and
Human Services

Page 1

DEPARTMENT OF HEALTH & HUMAN SERVICES
OFFICE OF THE SECRETARY
Assistant Secretary for Legislation
Washington, DC 20201

APR 08 2016

Cindy Brown Barnes

Director, Education, Workforce, and Income Security Issues

U.S. Government Accountability Office

441 G Street NW

Washington, DC 20548

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Jim R. Esquea

Assistant Secretary for Legislation

Attachment

Page 2

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Data Tables

Data Table for Highlights Figure: Injury and Illness Rates among Workers in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013

	Meat and poultry industry			All U.S. manufacturing		
	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)
2004	9.8	9.42	10.18	8.2	7.88	8.52
2005	9.1	8.74	9.46	7.7	7.4	8
2006	9.1	8.74	9.46	7.4	7.25	7.55
2007	8.4	8.24	8.56	6.8	6.67	6.93
2008	7.5	7.35	7.65	6.2	6.08	6.32
2009	6.9	6.76	7.04	5.7	5.59	5.81
2010	6.9	6.75	7.05	5.8	5.65	5.95
2011	6.4	6.19	6.61	5.6	5.45	5.75
2012	6.3	6.14	6.46	5.3	5.15	5.45
2013	5.7	5.59	5.81	5	4.86	5.14

Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Accessible Text for Figure 2: Common Jobs in Meat and Poultry Plants

Receiving and killing

- Captive Bolt Stunner: In beef and hog plants, uses a captive bolt gun to stun the animal before it is killed.
- Live hanger: In a poultry plant, takes live birds from conveyor and hangs them in shackles.
- Hoister/shackler: In a meat plant, hangs cow and hog carcasses from shackles by one leg.
- Hide remover: In a beef plant, stands on an adjustable platform which is attached to the hide and pulls the hide away from the carcass as it is lowered. Workers use power shears to cut and trim areas where the hide sticks.

- Shaving operator: In a hog plant, uses a shaving device to shave hogs as they pass by the station on an elevated conveyor line.

Evisceration and inspection

- Saw operator: In a meat plant, cuts cow and hog carcasses in half using a saw.
- Presenter: In a poultry plant, removes the viscera from the body cavity and arranges them for USDA inspection.

Cutting and deboning

- Cone line feeder: In a poultry plant, removes the carcasses from the shackles and inserts them onto cones on another moving conveyor.
- Tender puller: In a poultry plant, pulls tenders from both sides of a deboned breast.
- Meat trimmer: Uses hand tools to break down the large primary cuts into small retail cuts or individual size servings.
- Head chiseler: In a hog plant, uses a metal rod in a prying motion to pull the meat away from the jaw bone.
- Cheeker: In a hog plant, uses a knife to trim cheek meat from hog heads.

Processing and packout

- Box maker: Takes or makes hand- or machine-formed boxes and puts them on a conveyor belt.
- Industrial/tractor operator: Drives forklifts, elevated platforms, or other vehicles to move goods around the facility.
- Warehouse worker: Loads boxes in and out of coolers and operates forklifts to move loaded pallets onto trucks.

Sanitation and cleaning

- Sanitation/cleaning worker: May work during production or as part of a “third shift” cleaning crew. Often removes machine components to clean equipment.
- May work for the plant or for a contractor.

Source: GAO analysis of documents from the Occupational Safety and Health Administration (OSHA), advocacy groups, and industry stakeholders. | GAO-16-337

Accessible Text for Figure 3: Nature of Injuries Potentially Sustained by Meat and Poultry Workers and Parts of Body Affected

- **Head:** Concussions and cuts caused by being struck by moving equipment, carcasses, and live animals.
- **Eyes:** Burns from chemicals and/or the steam used to sanitize tools and work surfaces.
- **Ears:** Hearing damage caused by exposure to loud machinery.
- **Shoulder:** Musculoskeletal disorders from forceful exertions, extreme postures and repetitive movements.

- **Upper extremities:** Bruises and fractures, falls, being struck by carcasses, and cuts caused by employees working too closely together.
- **Lungs:** Respiratory irritation or even asphyxiation from exposure to chemicals, pathogens, or gases.
- **Trunk:** Bruises and fractures caused by heavy moving containers, kicks from live animals, being struck by carcasses, falling from multilevel walkways, or slipping on wet or greasy floors.
- **Back:** Sprains and strains from lifting heavy objects or repetitive lifting of lighter objects.
- **Hand, wrist, and fingers:** Cuts, lacerations, amputations from knives and machinery, musculoskeletal disorders from vibrating tools, awkward postures, forceful exertions, repetitive movements, and cold temperatures.
- **Lower extremities:** Injuries from falls and live animals, and cuts caused by employees working too closely together.
- **Foot/Toe:** Musculoskeletal disorders from prolonged standing and amputations caused by machinery.
- **Other:** Electric shocks from machines not properly locked out, exposure to infectious diseases, and chemical burns.

Data Table for Figure 4: Injury and Illness Rates in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013

	Meat and poultry industry		All U.S. manufacturing			
	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)
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2005	9.1	8.74	9.46	7.7	7.4	8
2006	9.1	8.74	9.46	7.4	7.25	7.55
2007	8.4	8.24	8.56	6.8	6.67	6.93
2008	7.5	7.35	7.65	6.2	6.08	6.32
2009	6.9	6.76	7.04	5.7	5.59	5.81
2010	6.9	6.75	7.05	5.8	5.65	5.95
2011	6.4	6.19	6.61	5.6	5.45	5.75
2012	6.3	6.14	6.46	5.3	5.15	5.45
2013	5.7	5.59	5.81	5	4.86	5.14

Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Data Table for Figure 5: Injury and Illness Rates in the Meat Industry (Meat Slaughter and Meat Processing Industries), Compared with Rates in the Poultry Industry, Calendar Years 2004 through 2013

	Meat slaughter			Meat processing			Poultry slaughter and processing		
	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)	Upper limit (At 95% confidence level)	Cases per 100 workers	Lower limit (At 95% confidence level)
2004	13.3	12.52	14.08	9.3	8.57	10.03	7.8	7.72	7.88
2005	12.6	12.11	13.09	7.8	7.04	8.56	7.4	6.67	8.13
2006	12.5	12.26	12.75	9.8	8.46	11.14	6.6	6.34	6.86
2007	12.1	11.86	12.34	8.2	7.56	8.84	6.1	5.98	6.22
2008	10.3	9.9	10.7	6.8	6.4	7.2	6.1	5.98	6.22
2009	9.3	9.12	9.48	6.6	6.21	6.99	5.5	5.28	5.72
2010	8.8	8.47	9.13	6.5	6.04	6.96	5.9	5.78	6.02
2011	7.8	7.49	8.11	6	5.44	6.56	5.8	5.54	6.06
2012	8.7	8.41	8.99	5.9	5.39	6.41	4.9	4.79	5.01
2013	7.8	7.63	7.97	5.4	5.02	5.78	4.5	4.39	4.61

Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Data Table for Figure 6: Illness Rates in the Meat and Poultry Industry, Compared with Rates in All U.S. Manufacturing, Calendar Years 2004 through 2013

	Meat and poultry industry			All U.S. manufacturing		
	Upper limit (At 95% confidence level)	Cases per 10,000 workers	Lower limit (At 95% confidence level)	Upper limit (At 95% confidence level)	Cases per 10,000 workers	Lower limit (At 95% confidence level)
2004	288.8	266.16	311.44	73.8	70.91	76.69
2005	262.8	226.74	298.86	66.1	63.51	68.69
2006	237	232.35	241.65	57.7	56.57	58.83
2007	205	196.96	213.04	50.5	49.51	51.49
2008	171.3	167.94	174.66	43.2	42.35	44.05
2009	151.4	145.47	157.33	39	38.24	39.76
2010	162.1	155.75	168.45	41.9	40.75	43.05
2011	160.8	154.5	167.1	40.4	39.29	41.51
2012	172.8	166.7	178.9	38.4	37.42	39.38
2013	159.3	154.62	163.98	35.9	34.77	37.03

Source: GAO analysis of Bureau of Labor Statistics injury and illness data. | GAO-16-337

Related GAO Products

Food Safety: USDA Needs to Strengthen Its Approach to Protecting Human Health from Pathogens in Poultry Products. [GAO-14-744](#). Washington, D.C.: September 30, 2014.

Food Safety: More Disclosure and Data Needed to Clarify Impact of Changes to Poultry and Hog Inspections. [GAO-13-775](#). Washington, D.C.: August 22, 2013.

Workplace Safety and Health: OSHA Can Better Respond to State-Run Programs Facing Challenges. [GAO-13-320](#). Washington, D.C.: April 16, 2013.

Workplace Safety and Health: Further Steps by OSHA Would Enhance Monitoring of Enforcement and Effectiveness. [GAO-13-61](#). Washington, D.C.: January 24, 2013.

Workplace Safety and Health: Multiple Challenges Lengthen OSHA's Standard Setting. [GAO-12-330](#). Washington, D.C.: April 2, 2012.

Workplace Safety and Health: Enhancing OSHA's Records Audit Process Could Improve the Accuracy of Worker Injury and Illness Data. [GAO-10-10](#). Washington, D.C.: October 15, 2009.

Workplace Safety and Health: Safety in the Meat and Poultry Industry, While Improving, Could Be Further Strengthened. [GAO-05-96](#). Washington, D.C.: January 12, 2005.

Food Safety: Weaknesses in Meat and Poultry Inspection Pilot Should Be Addressed Before Implementation. [GAO-02-59](#). Washington, D.C.: December 17, 2001.

Community Development: Changes in Nebraska's and Iowa's Counties with Large Meatpacking Plant Workforces. [GAO/RCED-98-62](#). Washington, D.C.: February 27, 1998.

GAO's Mission

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