Assessment of Occupational Injury among Fire Fighters Using a Follow-back Survey (NEW Information Collection Request)

Request for Office of Management and Budget Review and Approval for Federally Sponsored Data Collection

Section A

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Goal of the study: The purpose of this project is to describe nonfatal occupational injuries and exposures incurred by fire fighters and treated in a nationally stratified sample of emergency departments (EDs).

Intended use of the resulting data: The results of this study will provide detailed insight into the incidence and characteristics of nonfatal occupational injuries and exposures among fire fighters. This information will increase awareness of the need to implement and improve prevention efforts and, consequently, reduce occupational injuries and illnesses among fire fighters.

Methods to be used for data collection: Data will be collected via follow-back telephone interviews with injured and exposed fire fighters. This questionnaire contains questions about the respondent's injury or exposure that sent them to the ED, their specific activity at the time of their injury or exposure, work experience and competencies, and recovery experience.

Subpopulation to be studied: Injured and exposed fire fighters who are captured in a national ED surveillance system.

Data analysis: This descriptive study will include both quantitative and qualitative methods. Quantitative analysis will involve computing weighted results to describe nonfatal injuries and exposures among fire fighters treated in EDs. Qualitative data analysis will involve identifying themes within the data based on narrative information collected during the interviews.

A. Justification

A.1 Circumstances making the collection of information necessary

Under P.L. 91-596 Section 20 (Attachment A), the National Institute for Occupational Safety and Health (NIOSH) is tasked with conducting research involving innovative methods, techniques, and approaches for dealing with occupational safety and health problems. The proposed study addresses this directive through the use of a routine surveillance system that captures nonfatal occupational injuries and illnesses to workers and offers an option to capture more detailed data through telephone interview methodology. This is a new information collection request. Approval is being requested for a three year period (2018 through 2021).

Fire fighters play a vital role in community safety. With over 1 million workers at almost 27,000 fire departments in the U.S. [NFPA, 2016], this workforce undertakes many critical public safety activities including fighting structure and wildland fires, responding to motor vehicle incidents, operating at hazardous material incidents, and assisting emergency medical services (EMS) workers during medical calls. It is also recognized that there is not a single injury surveillance system for the U.S. fire service [Widman et al., 2017]. Several studies have investigated conditions and causes of fire fighter injuries and exposures [Britton et al., 2013; Frost et al., 2016; Jahnke et al., 2013; Poplin et al., 2012; Walton et al., 2003], but they were limited by population inclusion criteria and coverage. These studies included a limited number of departments, only a portion of the workforce (e.g., Federal wildland fire fighters), or excluded volunteers. This study attempts to address some of these limitations by using data from an ongoing collection of occupational injuries and exposures from a stratified national sample of U.S. emergency departments (EDs). Results will provide an up-to-date picture of nonfatal injuries and exposures to fire fighters treated in EDs and detailed insight into events that lead to the largest number of nonfatal injuries and exposures among fire fighters.

The Division of Safety Research (DSR) within the National Institute for Occupational Safety and Health (NIOSH) is conducting this project. The primary data collection component of this study involves a fire fighter follow-back telephone interview survey that was developed in fiscal year 2016 (Attachment C). The survey was developed by the project team and reviewed by scientific and subject matter experts for both content and structure. It was pilot tested on nine injured fire fighters. NIOSH has successfully used the same data source and approach to collect detailed data on populations such as EMS workers and older workers, as well as injury events such as exposure to bloodborne pathogens and workplace violence.

A.2 Purpose and use of information collection

The data for this study will be collected to provide national estimates of nonfatal injuries and exposures among fire fighters. To conduct the study, NIOSH DSR will use work-related injury data collected as part of the CDC All Injury Program within the National Electronic Injury Surveillance system (NEISS-Work, Consumer Product Safety Commission OMB # 3041-0029). This will allow the reporting of weighted estimates to describe fire fighter ED-treated injuries and exposures nationally. The NEISS-Work data are collected for NIOSH by the Consumer Product Safety Commission (CPSC) through an Interagency Agreement. From the NEISS-Work, fire fighters treated in EDs will be identified for further follow-up through telephone interviews conducted from 2018 through 2021. The interview survey (Attachment C) will collect additional details about the fire fighters, the injuries and exposures that were incurred, and the circumstances of the injuries and exposures directly from the injured/exposed worker. Many of these details have not been captured in other fire fighter studies but are necessary to focus and

inform prevention efforts. This information will offer detailed insight into events that lead to the largest number of nonfatal injuries and exposures among fire fighters. The data will be used to produce publications (both peer reviewed and non-peer reviewed), presentations, fact sheets, and infographics that will be disseminated among fire fighter stakeholders, including the fire fighters themselves, fire fighter employers, and persons tasked with protecting the safety and health of fire fighters. Dissemination of these results is expected to provide justification and direction for further research and for the development and improvement of injury prevention efforts for this critical workforce.

While contact information, including name, address and phone number, will be collected by CPSC from medical records, this information will only be used to mail the initial study letter (Attachment D) and to contact the individual for the telephone interview. This information will never be released to NIOSH. Please refer to section A.10 (Protection of the Privacy and Confidentiality of Information Provided by Respondents) for further details as to how individual contact information will be protected. No case-specific records will be released to the public and all aggregate data results will follow NIOSH DSR reporting requirements that were established to insure protection and the reporting of stable estimates.

Data collected for this project will have several positive outcomes and impacts:

1. NIOSH is invested in improving fire fighter safety and health. Thus, we must understand the injuries and exposures occurring to fire fighters and the surrounding circumstances.
2. One of the primary duties of fire fighters is to protect the safety and health of the public. It follows that it is necessary to take steps to reduce injuries and exposures among fire fighters, enabling them to continue to perform their duties. Following a public health model, these steps begin with surveillance and risk factor identification, both of which are addressed by this project.
3. Existing data describing fire fighters' nonfatal injuries and exposures are limited. While attempting to address some of the limitations, the proposed study offers a piece to an otherwise complex puzzle by using data from an ongoing collection of occupational injuries and exposures from a stratified national sample of U.S. EDs.
4. NEISS-Work provides an opportunity to collect data on nonfatal fire fighter injuries and exposures and has the unique ability to collect extensive detail on a sample of fire fighters, regardless of the fire fighter's type of employment (i.e., career versus volunteer).
5. Data dissemination will occur via publications (both peer reviewed and non-peer reviewed), presentations, fact sheets, and infographics. These methods will target those concerned with fire fighter safety and health, enabling them to improve and develop targeted prevention methods. Dissemination will also target fire fighters to raise their awareness of nonfatal injury and exposure risks on the job.

There are at least two negative consequences to not collecting and disseminating these data:

1. Prevention efforts to reduce fire fighter injuries and exposures lack the nonfatal injury and exposure data to be effectively targeted.
2. Being unable to use data to develop targeted and needed prevention interventions could result in minimal to no reduction in fire fighter injuries and exposures. Consequently, injured fire fighters will continue to be lost from the workforce, which could mean fewer available workers to protect and address the safety and health of the public.

A.3 Use of improved information technology and burden reduction

NEISS-Work
Routine NEISS-Work data are reported electronically. Hospital coders who abstract information for NEISS submit NEISS records to CPSC through a secure file-transfer internet site on CPSC-provided laptops.

Telephone Interview Survey
CPSC collects follow-back study data via telephone interview surveys. A Computer Assisted Telephone Interview (CATI) system will be used for data collection. Use of the CATI will facilitate questionnaire administration for the proposed study as skip patterns will be automated, lessening the time the respondent will need to wait for the interviewer to find the correct question and eliminating concerns with inaccuracy due to incorrectly followed skip patterns.

Prior to initiating data collection, NIOSH will provide training to the telephone interviewers participating in the study. Collection of the telephone interview data will be monitored by both CPSC and NIOSH. If concerns arise during the data collection process, CPSC will address the issues with the telephone interviewers. CPSC maintains regular contact with the contracted telephone interviewers. In turn, NIOSH maintains regular contact with CPSC staff responsible for these activities. This contact includes, but is not limited to, attendance at biennial coding meetings hosted by CPSC and periodic conference calls with CPSC staff.

A.4 Efforts to identify duplication and use of similar information

The study will be the first to use a worker survey (Attachment C) to collect information, including in-depth data on injuries and exposures resulting from fires, motor-vehicle incidents, and the use of personal protective equipment (PPE) and issues related to PPE that may have contributed to the injury or exposure, from a national sample of fire fighters treated in EDs. The questionnaire was developed to focus on fire fighters identified from NEISS-Work data. NEISS-Work is unique from other surveillance systems in that it has the option to collect data directly from workers using telephone interviews, providing greater detail and insight than can be obtained from abstracting data from written records (e.g. medical records) alone. Consequently, much of the data proposed for collection is available only through the proposed interviews.

A.5 Impact on small businesses or other small entities

This collection of information is voluntary. It involves talking directly to workers and does not have a disproportionate impact on small businesses.

A.6 Consequences of collecting the information less frequently

Respondents will only be asked to complete the questionnaire one time for an ED-treated injury or exposure. If interviews were not conducted or were conducted less frequently, NIOSH would not capture enough data to accurately improve our understanding of fire fighter injuries and exposures. These data are needed to raise awareness on the contributing factors to these injuries and exposures. The lack of data would negatively impact development and improvement of targeted and effective interventions. NIOSH and others concerned with improving fire fighter safety and health will be resigned to relying on broad level data and data collected from limited samples of fire fighters to assess the causes of these injuries and exposures. Consequently, fire fighter stakeholders will continue to lack the data needed to inform and justify effective injury and exposure prevention efforts.

A.7 Special circumstances relating to the guidelines of 5 CFR 1320.5

Having reviewed all special circumstances related to the guidelines of 5 CFR 1320.5, we believe that this request fully complies with the guidance described in 5 CFR 1320.5.

There is a small possibility that a fire fighter could incur two work-related injuries or exposures and be treated in an ED on two separate dates within one quarter of the year within the NEISS-Work sample. Should this happen, they would be offered the chance to complete the telephone interview for each of the separate injuries or exposures, but they would not be required to do so as the respondent will always maintain the right to refuse participation. We suspect that the likelihood of a respondent being identified twice, especially within the same quarter of a year, is small given that NEISS-Work does not capture cases seen in the ED that are deemed to be re-injuries or follow-up ED visits related to the original injury or exposure.

A.8 Comments in response to the Federal Register notice and efforts to consult outside the agency

A. The 60-Day Federal Register Notice (Attachment B) was published on February 13, 2018, vol. 83, No.30, pp 6185-6186 .One comment was received (Attachment G). Because the comment did not directly relate to the proposed data collection effort, the standard CDC response was sent to the commenter.

B. The study protocol, including the survey, was externally peer reviewed in 2017. Three external peer reviewers who are knowledgeable about fire fighter safety and health and have previously conducted research studies in this area reviewed the protocol. The reviewers were asked to provide critical feedback, including comments related to the data source, content of the survey, and methodology. Comments from the external reviewers were addressed. The external peer reviewers were:

- Jeanne Sears, PhD, RN, Research Associate Professor, Department of Health Services, Adjunct Faculty, Department of Environmental & Occupational Health Services, University of Washington; Phone: (206)543-1360; E-mail: jeannes@uw.edu
- Andrew Levinson, Deputy Director, Directorate of Standards & Guidance, Occupational Safety and Health Administration; Phone: (202) 693-2048; E-mail: Levinson.andrew@dol.gov
- Natasha Schaefer-Solle, PhD, RN, Research Assistant Professor, Director Behavioral and Community Shared Resource Sylvester Comprehensive Cancer Center, University of Miami; Phone: (305)243-7191; E-mail: n.schaefer@umiami.edu

A.9 Explanation of any payment or gift to respondents

This study does not provide a payment or gift to the respondents.

A.10 Protection of the privacy and confidentiality of information provided by respondents

For this submission, the Privacy Act is applicable. The data are also protected by the Consumer Product Safety Act. PII will be collected by CPSC to contact potential respondents for interview purposes and will be stored in data files separate from the survey interview data, as referenced in the CPSC PIA (Attachment H). Besides a unique identifier that NIOSH receives from CPSC

with the NEISS-Work data, no personally identifiable information (PII) will be collected by or for NIOSH. PII will not be provided to NIOSH. Once the patient is contacted or attempts to contact the patient fail, all PII will be destroyed.

For the proposed study, verbal informed consent will be requested. A waiver of written informed consent has been granted by the NIOSH Institutional Review Board (IRB) as collecting written informed consent would likely be detrimental to the response rate of the study. It would also increase the study cost and the time lapse between the treatment date and interview data. Upon being selected for the study, CPSC will mail each potential respondent a letter that contains the required elements of informed consent (Attachment D). The letter will further provide the potential participant instructions on opting out of the telephone interview study by calling a toll-free number. During the opening script of the interview, a verbal informed consent will be read to participants (Attachment C). Participants will be told that they should have received a letter explaining the research study and how their privacy will be protected. They will then be informed that there are four key elements of informed consent that must be reviewed with them. Potential respondents will be informed of their rights and any possible effects of the study on their welfare. The telephone script then confirms their willingness to participate by asking, "Would you please help us by answering some questions?" A positive response to this question will be deemed the subject's verbal consent to participate. Both the letter and verbal consent script emphasize that participation is voluntary.

Participation in this study has no more than minimal risk to participants as extensive precautions are taken to protect the privacy of the participants. The largest risk is an inadvertent release of the data that could lead to a loss of privacy and, consequently, lead to mental stress of the respondent. However, given this has never occurred during multiple follow-back studies that we have conducted using the same methodology, we anticipate that it is very unlikely to occur at any point during this study.

To manage and protect the data collected through the proposed study, we will implement many safeguards. First, as noted above, the routine NEISS-Work data are protected under the Consumer Product Safety Act and the Privacy Act and are not customarily released to the public, to other government agencies, to non-NIOSH researchers, or to unauthorized NIOSH staff because of potential indirect identification of injured/exposed workers. To become an authorized NEISS-Work data user, interested individuals must follow certain steps. Data users must have a demonstrated need for NEISS-Work data access, receive appropriate supervisory approvals, sign a data use agreement, participate in annual privacy training, and submit all NEISS-Work draft publications and presentations to the NEISS-Work project officer for a security review prior to product release. Security of the NEISS-Work data are also protected by multi-layered CDC firewall and server protections with user authentication.

Data collected via telephone interviews will be protected throughout the life of the project. NIOSH and CPSC will identify potential cases for interview, CPSC will contact hospitals to obtain patient contact information, and contact information will be provided by CPSC to their contract telephone interviewers. Data transfers between CPSC and CPSC telephone interview contractors and between CPSC and NIOSH will occur using secure file transfer protocol locations. Once received by NIOSH, data will be stored in restricted-access directories that will only be accessible using password-protected computers. The interview survey data will be maintained as a restricted access data set in compliance with the CDC, NIOSH, DSR sensitive data handling policies and in accordance with federal recordkeeping requirements. Only DSR researchers and staff directly involved in the project will be given access to these data. The interview contact information, maintained by CPSC and never shared with NIOSH, will be

destroyed at the completion of the interview study. Once all products are completed, all resulting datasets will be archived for potential future use. As required, a data management plan will be developed.

Due to the highly secure nature of the telephone interview data and the need to maintain the data under the control of NIOSH, the interview dataset will only be shared with restrictions through a special-use agreement. Should the telephone interview dataset be of interest to an individual external to NIOSH, a data sharing agreement specific to the dataset and the proposed use will be developed. The agreement would address all specifications as listed in the CDC/ATSDR Policy on Releasing and Sharing Data in the sub-section titled "Data shared with restrictions" as well as any additional specifications prescribed by DSR security requirements. Data shared with an individual external to NIOSH will be de-identified to the extent possible to further safeguard respondent identities.

A.11 Institutional Review Board and Justification for sensitive questions

A.11.A Institutional Review Board approval

The NIOSH IRB reviewed and approved the proposed study for the maximum allowable period of one year (Attachment F). NIOSH IRB approval will expire on December 14, 2018. The protocol was reviewed in accordance with the expedited review process outlined in 45 CFR 46.110(b)(1), category (7). The IRB determined the study poses minimal risk to subjects.

A.11.B Sensitive questions

During the telephone interviews, respondents will be asked to provide primary and additional diagnoses resultant of their injury or exposure. This information is necessary for understanding the nature of injuries and exposures occurring to fire fighters. Other questions that may be sensitive are those pertaining to personal protective equipment (PPE) use at the time of the incident. This information is needed to assess whether there are potential issues related to fire fighters not using PPE and/or PPE not being effective in preventing injuries and exposures. Because the survey is voluntary, respondents may refuse to answer any questions. Respondents are informed of their right to refuse participation and their right to refuse to answer individual questions in the introductory letter (Attachment D) and in the script that is read at the beginning of the interview (Attachment C). Verbal consent will be obtained at the time of interview.

A.12 Estimates of annualized burden hours and costs

A.12.A Estimates of annualized burden hours

Potential respondents will be identified from the routinely collected NEISS-Work data. Based on the number of fire fighters identified in previous years of NEISS-Work data and a 30 to 40% response rate based on similar follow-back studies, it is estimated that we will complete approximately 240 telephone interviews of fire fighters 18 year of age or older per year and that data collection will span three years. The response rate accounts for hospitals that decline to provide contact information and cases for which incorrect contact information is provided. A pilot test was completed with nine fire fighters to assess the length of time needed to complete the questionnaire. Based on the pilot test, we found that it should take approximately 30 minutes to complete the questionnaire and respondents will be asked to complete the survey only once. Thus, it is estimated that the annualized burden will be approximately 120 hours.

Estimated Annualized Burden Hours

Respondents	No. of Respondents	No. of Responses per Respondent	Average Burden per Response (in hours)	Total Burden (in hours)
Fire fighters	**240**	**1**	**30/60**	**120**

A.12.B Estimates of annualized burden costs

Based on the U.S. Department of Labor's Occupational Employment Statistics survey, the annual average wage for career fire fighters is $50,520 and their mean hourly wage is $24.29. In addition to the paid fire fighters, there are a large number of volunteer fire fighters. The National Fire Protection Association (NFPA) estimated that between 2003 and 2014 there were an average of 1,127,000 fire fighters. Approximately 30% were career fire fighters while 70% were volunteers. To simplify the estimation of annual burden hours, we assumed the burden for career and volunteer fire fighters is equivalent in terms of the value of their time.

Estimated Annualized Burden Hours

Type of Respondent	Total Burden Hours	Hourly Wage Rate	Total Respondent Costs
Fire fighters	**120**	**$24.29**	**$2,914.80**

A.13 Estimates of other total annual cost burden to respondents or record keepers

The only costs to respondents are described in item 12 above. All record keepers are federal government contractors. Thus, estimated cost burden to them is included in item 14 below.

A.14 Annualized cost to the government

The annualized cost to the government for this study is estimated to be $91,471. The table below provides a breakdown of the expenses. To arrive at this estimate, annual project costs were estimated, totaled, and divided by five. After data collection ends, project staff will continue to analyze data and finalize study products. Labor costs included staff salary and benefit costs, as well as promotions and an annual 1% cost of living increases. Cost of interviews is inclusive of all money given to CPSC to hire contracted telephone interviewers who will perform the telephone interviews, enter data, and submit data to CPSC.

The annualized cost includes the cost of capturing the telephone interview data, conducting analyses on the final interview data, and producing both peer reviewed and non-peer reviewed products. The cost of collecting NEISS-Work data is not included as those data are not collected exclusively for this study. They are historically collected and maintained under their own project allocation within NIOSH.

	Annual cost
Labor	$56,704
Interviews	$33,000
Travel and miscellaneous	$1,767

A.15 Explanation for program changes or adjustments

This is a new data collection.

A.16 Plans for tabulation and publication and project time schedule

We plan to publish study results in both peer reviewed and non-peer reviewed journals. It is estimated that at least three years of data collection will be needed to produce large enough numbers to allow detailed reporting of results. Our projected timeline for the project is detailed in the able A.16-1 below.

A.16.1 Project Time Schedule	
Activity	**Time Schedule**
Telephone interviewer training	1-2 months after OMB approval
Begin data collection	2-3 months after OMB approval
Begin regular monitoring/quality assurance of incoming data	5-8 months after OMB approval
Renew OMB package	36 months after OMB approval
Finalize dataset	52-53 months after OMB approval
Analyses	54-59 months after OMB approval
Publication ready for submission to peer-review journal	64-65 months after OMB approval
Product ready for dissemination to fire fighter stakeholders	67-68 months after OMB approval

Data analysis for this study will include quantitative and qualitative data analysis. Quantitative analysis will involve computing weighted results to describe nonfatal injuries and exposures among fire fighters treated in EDs. To assess the stability of the results, coefficients of variation and confidence intervals will be calculated. Quantitative results will be presented in frequency tables for important outcomes such as demographics, diagnoses, affected body parts, events, outcomes, and training.

Qualitative data analysis will involve identifying themes within the data based on the narrative information collected during the interviews. National estimates will be calculated where feasible. However, if it is not possible to calculate national estimates, qualitative results will be reported using non-numerical quantifiers such as typically used in qualitative research (e.g., many, most, some, few).

The weighting process will involve calculation of a patient base weight, nonresponse adjustment to account for patient interview nonresponse, and post stratification to NEISS-Work frame totals. It is important that adjusted weights be used in the analysis of the data to account for variations in selection probability. Weights are critical for producing national estimates and for reducing biases due to nonresponse and undercoverage.

Standard errors for weighted estimates will be calculated using Taylor series linearization in SAS. With Taylor series linearization, the hospital stratum, PSU, and final patient weight are specified to the software. A two-stage stratified "with replacement" design can be assumed for variance estimation, with hospitals sampled at the first stage and ED patients within hospitals at the second stage. Variances will correctly reflect the stratification, unequal probabilities of selection, and clustering in the sample design.

A.17 Reason(s) display of OMB expiration date is inappropriate

The OMB expiration date will be displayed.

A.18 Exceptions to certification for Paperwork Reduction Act submissions

There are no exceptions to the certification.