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 B

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B.1 Respondent universe and sampling methods

The respondent universe of interest for the proposed study includes all fire fighters treated for occupational injuries and exposures in a national probability based sample of U.S. hospital emergency departments (EDs). Potential telephone interview respondents will be identified through the occupational supplement to the National Electronic Injury Surveillance System (NEISS-Work). The telephone interviews will be a new data collection effort, enhancing the information available through NEISS-Work.

Through a collaboration between the Consumer Product Safety Commission (CPSC) and the National Institute for Occupational Safety and Health (NIOSH), NEISS-Work data are collected through a national stratified probability sample of approximately 5,400 rural and urban hospitals in the U.S. and its territories. To be included, hospitals must have a minimum of six beds and operate a 24-hour ED. General, specialty care, and military hospitals are included in the sample population. Prison, psychiatric, rehabilitation and long-term care facilities, and Veterans Administration hospitals are excluded. While selection of the current hospital sample was based on a 1995 census of U.S. hospitals, weights are adjusted annually to account for changes to the sampling frame. The sample is stratified by hospital size based on the number of annual ED visits. In addition, the sample is stratified geographically. Data collection of work-related cases using the current hospital sample began in 1997 at approximately 67 hospitals.

NEISS-Work includes all work-related injuries, illnesses, and exposures treated in EDs and is based on standardized information abstracted from emergency medical records. Since medical record data are limited, it is often necessary to collect additional information to better understand a population of interest. This has successfully been done through follow-back interviews using cases identified in NEISS-Work as potential respondents. For the proposed study, our goal is to conduct telephone follow-back interviews with fire fighters to gain a detailed understanding of their injuries and exposures. Potential fire fighter respondents for the telephone interviews will be identified from the NEISS-Work data. Selection of cases will be restricted to injured or exposed fire fighters who are 18 years of age or older, due to the added complication of obtaining parental or guardian consent, interviews from those younger than 18. Less than 1% of the fire fighter workforce from NEISS-Work fall below this threshold. As most fire fighter-related illnesses in NEISS-Work involve potential contact with heat or smoke, or harmful substances such as chemicals or bloodborne pathogens, the term “exposures” will be used to refer to illnesses and exposures combined. Common on-duty functions that will be targeted include fighting fire; salvage and overhaul; responding to/returning from an incident; training; equipment and building maintenance; public education; and fundraising. FFs are often cross-trained as emergency medical services (EMS) workers so fire fighters providing patient care will be included. We will exclude occupations such as administrator, EMS worker with no indication of concurrent fire fighter employment, clerk, communications operator, dispatcher, mechanic, fire investigator, forest service ranger, lifeguard, maintenance worker, cook, and ambulance driver. Given that almost 70% of the fire fighters in the U.S. are volunteer, this study will seek to include both paid (i.e., career) and volunteer fire fighters. Since we do not plan to translate the questionnaire into a language other than English, non-English speaking fire fighters will be excluded from the study if they are reached and unable to communicate. Prescreening using the basic NEISS-Work data elements will be used to restrict potential respondents to individuals most likely to meet the respondent definition.

Based on a review of 12 years of NEISS-Work data, we estimate that an annual average of 600 unweighted fire fighters 18 years of age or older from NEISS-Work will be identified. Fire fighters meeting the criteria above will be eligible for inclusion. The response rate for a similar follow-back study on EMS workers was between 30 and 40%. Therefore, it is estimated that we will complete approximately 240 telephone interviews annually. 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. A case series study will be considered if the number of completed interviews is not large enough to permit estimates that meet reporting requirements.

B.2 Procedures for the collection of information

As described above, NEISS-Work is based on a national stratified probability sample of U.S. EDs. For telephone interviews proposed in this study, all fire fighters captured in the NEISS-Work data will be considered potential participants. NEISS-Work data will be used by CPSC and DSR to identify all fire fighters treated in the sampled hospitals during the three-year study (2018 through 2021). Every fire fighter identified in NEISS-Work meeting our case criteria will be offered an opportunity to participate in a telephone interview given initial contact is made.

Once cases are identified, CPSC will contact participating hospitals and request contact information. Potential respondents will be sent a pre-interview letter notifying them of the study and giving them an opportunity to opt out by calling a toll-free number within 10 days of receiving the letter. The letter describes the study and measures that will be taken to protect confidentiality should they choose to participate. The letter also contains the elements required in an informed consent although a waiver of written informed consent has been granted by the NIOSH Institutional Review Board (IRB). For fire fighters who do not opt out initially, CPSC will conduct interviews through contracts with trained interviewers. The interview script will ask each fire fighter to provide verbal consent prior to proceeding. Once consent is given, the interview will proceed. Data will be collected on the fire fighters themselves, their injury or exposure, and injury or exposure outcomes. NIOSH will not receive contact information or request any personal identifiers during the interview.

Weighted estimates from NEISS-Work as well as the telephone interview data will be calculated by assigning each case a statistical weight based on the inverse probability of selection. National estimates (i.e., the number of injuries and illnesses) are obtained by summing weights for all cases or particular cases of interest. The basic case weight is the inverse probability of selection for the hospitals in each stratum. The inverse probability of selection is the number of hospitals in the stratum universe divided by the number of hospitals in the NEISS sample for the stratum.

Weights assigned to cases within the telephone interview data will be based on the normally adjusted NEISS-Work weights with additional adjustments for non-response to the telephone interview using a procedure known as raking. Weights assigned to cases with completed interviews will be adjusted to be representative of all cases within the stratum, including adjustments for significant biases detected among interview respondents (e.g., sex or age) versus all cases treated during the year.

B.2.1 Collection of Telephone Interview Data

Experienced telephone interviewers are contracted through CPSC to complete the follow-back interviews. These interviewers will receive additional training specific to the fire fighter questionnaire to be used for this study.

Prior to being contacted by telephone, potential participants will receive a letter describing the study and their protections as a participant should they choose to participate (Attachment D). This letter also provides them with the opportunity to opt out of participating in the study by calling a toll-free number. While the time for the telephone interview is not initially scheduled with the participant, participants do have the option at the time of contact to state that it is not a good time and to schedule a better time to complete the interview. Also, if the potential participant initially declines to participate, the telephone interview script includes text that gently encourages them to reconsider.

B.2.2 Data Quality Control

Quality control of the data will not involve any additional contact with participants. Rather, data within the telephone interview dataset will be reviewed for logical consistency and continuity. Data from NEISS-Work and the telephone interview dataset will also be broadly compared to check for consistency and accuracy. Finally, an assessment of the non-participants versus the participants in the telephone interview portion of the study will be made to determine potential non-response bias.

B.3 Methods to maximize response rates and deal with nonresponse

We acknowledge that our projected response rate of 30 to 40% based on a recent follow-back study of EMS workers is low. However, it must be noted that this overall response rate includes hospitals that will not release contact information and respondents whose correct contact information is unavailable. These insurmountable barriers drive the response rate down prior to us beginning to contact potential participants. It should be noted that in the EMS study, the response rate increased to 74% among those who we were able to contact by telephone.

Given a potentially low response rate, we plan to take several steps to help access potential participants and facilitate their willingness to participate. These steps include:

1. Sending a letter describing the study to potential participants in advance of the initial phone call. This letter will alert and prepare potential participants for the phone call requesting their participation.

2. Using the support of several partners and stakeholders that have interest in this area, including the National Fire Protection Association (NFPA), the U.S. Fire Administration (USFA), National Fallen Fire Fighters Foundation (NFFF), the National Volunteer Fire Council (NVFC), and the U.S. Department of Interior. It is expected that NIOSH staff will approach many of our stakeholders to garner support among the members of their organizations to encourage them to participate if contacted.

3. Making at least ten attempts to reach potential respondents. The contact attempts will be made at varying, but reasonable, hours of the day and on varying days of the week. When no personal contact is made after a number of attempts, the contact information will be set aside and contact attempts are made at a later date as time permits to maximize the response rate.

Interviewers are trained to be considerate of respondents and their families, leaving a minimal number of messages or speaking with the respondent or another individual of the residence to arrange a convenient interview time. Messages include a toll-free response number so that the respondent may call at their convenience. When personal contact is not made or a message system is available, the interviewer typically spreads their call attempts over a longer time period and commonly makes more than 10 contact attempts over the initial contact attempt period and the subsequent missed interview follow-ups.

4. Using trained telephone interviewers who are experienced at conducting interviews. This will facilitate ease of survey participation for the respondent, increasing the likelihood that they will complete the survey in its entirety.

5. Emphasizing the importance of participation if the participant refuses the initial offer. The interviewer will inquire as to whether they would be willing to participate at another time of their choosing. The training and experience of the telephone interviewers will be a key factor to understanding the reactions of potential participants and appropriately encouraging their participation in cases of refusal.

6. Using a questionnaire that has been designed to be as easy and non-burdensome as possible. This includes ordering the questions in a logical sequence and asking only those questions that are needed for analysis purposes.

Despite a potentially low response rate, one of the benefits of this study is that we capture basic demographic and injury information on all potential participants. Ultimately, we will compare the information we have on respondents and non-respondents using the NEISS-Work dataset to provide insight on any potential response bias. At a minimum, case weights are adjusted for non-response within each stratum so that the completed interviews within each stratum truly represent that stratum. If other factors are determined to influence answers, statistical raking will be performed so that the analysis weights for each variable of interest are equal to the corresponding national estimate.

B.4 Tests of procedures or methods to be undertaken

The questionnaire to be used in this study was designed based on information gathered from published literature and input from fire fighter professionals. It was pilot tested on nine fire fighters that were identified through a convenience sample. Pilot tests were performed by NIOSH project staff. In addition to these pilot tests, the questionnaire was reviewed by researchers both internal and external to NIOSH with expertise in fire fighter safety and health and/or survey administration. Revisions were made to the questionnaire as a result of the pilot test results and reviewer comments.

B.5 Individuals consulted on statistical aspects and individuals collecting and/or analyzing data

Contact information for those responsible for collection and analysis of the NEISS-Work data and NEISS-Work follow-back interviews:

<u>Individuals who designed the data collection</u>

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