

Developing a Framework to Identify and Address Job Hazards Unique to Women Mine Workers

CDC/ATSDR Formative Research and Tool Development
0920-1154

Supporting Statement A
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Goal of the study: The goal of this qualitative study is to document the experiences of women mine workers in the U.S. to identify and understand the occupational safety and health (OSH) disparities and inequities they face in the workplace when performing job tasks. We will conduct focus group interviews to (1a) learn about women mine workers' experiences with job-related hazards and risks and gather their input on how work systems can be designed or modified to be safer and more supportive for women in mining and (1b) identify any discrepancies between the recommendations of women mine workers and the perceptions of mine managers and health and safety professionals (H&S) on what changes are needed to make the mining work system safer and more supportive for women.

Intended use of the resulting data: Data will be used to develop a framework for mine operators and H&S professionals to use to guide the planning, designing, or re-designing of the work system (tools, equipment, task, work environment, and organization) to address the specific needs of women mine workers.

Methods to be used to collect data: The study is qualitative in nature, using primarily focus group interviews to collect feedback from participants. We will conduct between 5 and 10 focus groups with 4 to 10 women mine workers per group for Specific Aim 1a. No more than 100 women mine workers will be sampled. During Specific Aim 1b, we will conduct between 3 and 5 focus groups with 4 to 6 mine managers and H&S professionals per group. No more than 30 mine managers and H&S professionals will be sampled. Focus groups will last approximately 60-90 minutes. Immediately after a focus group interview ends, participants will be asked to take a brief 5- to 7-minute paper or electronic survey that asks demographic and work history questions.

Subpopulation to be studied: Data collection will focus on two subpopulations:

- (1) Women mine workers in the U.S. mining industry (machinery/equipment operators, haul truck drivers, engineers, geologists, etc.)
- (2) Mine managers and health and safety professionals

How data will be analyzed: Qualitative methods, namely thematic analysis, will be used to analyze the focus group interview data to identify prioritized work tasks and the hazards and solutions associated with each work system element. MAXQDA (qualitative data analysis software program) will be used to inductively identify major themes and organize data. This study will follow the principles of inductive thematic saturation, whereby saturation will be reached when no new themes are identified from the data. The research team will then interpret the identified themes and ideas in context, comparing and contrasting responses between the women mine workers and the mine managers/H&S professionals. The themes that inductively emerge based on these comparisons will be drafted in detail for publication. Findings will summarize what changes are needed to make mining work systems more supportive for women mine workers while also identifying any discrepancies that exist between the perceptions of women mine workers and those of mine managers and H&S professionals in terms of what changes are needed to make the mining work system more supportive for women mine workers. Quantitative data collected from all focus group participants via the Demographics and Work History Survey will be analyzed using statistical software like Stata 18 (StataCorp LLC) or SPSS 26 (IBM Corp). Demographic and work history information will be collected to accurately describe the study's sample and to place study results in context, highlighting which groups are represented and documenting demographic diversity in perspectives or experiences related to the topic of study. Collecting demographic information also helps others replicate results.

Supporting Statement A

A. JUSTIFICATION

1. Circumstances Making the Collection of Information Necessary

The Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH) requests OMB approval of a new generic information collection (GenIC) under the *Generic Clearance for CDC/ATSDR Formative Research and Tool Development* (OMB No. 0920-1154). The purpose of this GenIC is to enable CDC/ATSDR to conduct formative research for developing new tools and methodologies supporting CDC/ATSDR's research, surveillance, and program evaluation activities. NIOSH seeks approval to conduct a study to document the experiences of women mine workers in the U.S. to identify and understand the occupational safety and health (OSH) disparities and inequities they face in the workplace when performing job tasks. This study consists of facilitating focus group interviews and administering a short demographic survey to women mine workers and mine managers and health and safety (H&S) professionals. This study is being conducted by the National Institute for Occupational Safety and Health. NIOSH, under P.L. 91-173 as amended by P.L. 95-164 (Federal Mine Safety and Health Act of 1977, Appendix A), has the responsibility to conduct research to improve working conditions and to prevent accidents and occupational diseases in underground coal and metal/nonmetal mines in the U.S.

To effectively support the OSH needs of current and future women mine workers, and to foster their retention and recruitment, it is imperative to identify and address both the existing and emerging challenges they face. Historically, mining has been a male-dominated industry, with men comprising approximately 85% of the workforce (BLS, 2021). As a result, OSH research in mining has largely centered on the male experience, leaving women underrepresented and underserved. This oversight has often led to women facing disproportionate exposure to work-related hazards and risks (Landau & Lewis, 2019). However, as companies implement strategic efforts to expand their workforce and ensure sustainability amidst an anticipated wave of retirements, the number of women in mining is expected to rise in the coming years.

To better understand the OSH hazards and risks faced by women mine workers—including those in roles such as operators, laborers, mining engineers, and geologists—researchers from the Spokane Mining Research Division (SMRD) recently published a paper that highlights both known general OSH risks in mining as well as those that are unique to women. The paper also emphasizes critical gaps in the existing literature that must be addressed to adequately serve the needs of this under-represented population (Eiter et al., 2023). As the mining workforce changes, it is essential to conduct research that identifies strategies to mitigate these risks to protect the health, safety, and well-being of women mine workers.

2. Purpose and Use of Information Collection

The goal of this formative research is to document the experiences of women mine workers in the U.S. to identify and understand the OSH hazards and risks they face in the workplace when performing job tasks. We are particularly interested in learning about the OSH hazards that are uniquely affecting women mine workers, as these may lead to increased health and safety risks and the potential for health disparities. This information will be used to develop a framework for mine managers and H&S professionals to use to guide the planning, designing, or re-designing of

the work system (tools, equipment, task, work environment, and organization) to address worker-specific needs.

Specific Aim 1: This study's aims are to (1a) learn about women mine workers' experiences with job-related hazards and risks and gather their input on how work systems can be designed or modified to be safer and more supportive for women in mining and (1b) identify any discrepancies between the recommendations of women mine workers and the perceptions of mine managers and H&S professionals on what changes are needed to make the mining work system safer and more supportive for women.

To accomplish Specific Aims 1a and 1b, NIOSH personnel will conduct a qualitative study where focus group interviews will be conducted to obtain feedback from women mine workers and mine managers and H&S professionals. Demographic and work history information will be collected from all participants via a brief survey. Two focus group conversation guides have been developed by the NIOSH research team—one designed for women mine workers (Attachment B), and the other for the mine managers and H&S professionals (Attachment C). Both focus group conversation guides include a series of open ended and probing questions that aim to identify what changes are needed to make mining work systems safer, healthier, and more supportive for women in mining and to identify any discrepancies between the perceptions of women mine workers and mine managers and health and safety professionals in this regard. The short demographic and work history survey (Attachment D) captures demographic information, such as age, education, race/ethnicity, gender, sexual orientation, household income, marital status, and number of dependents; the survey also captures certain work-related information, such as mine site location (state), mined commodity, operation type, job title, number of years in current job/mine, and number of years in mining, overall.

The primary population of focus for this research is U.S. women mine workers. There are no restrictions based on geographic region, mining commodity, sector, or occupation as the goal is to capture a broad perspective of the experiences of women mine workers (Specific Aim 1a). NIOSH personnel will also recruit mine managers and mine H&S professionals from the general U.S. mining workforce to address Specific Aim 1b.

- 1) To participate in the Specific Aim 1a focus groups with women mine workers, individuals must be:
 - a. A woman
 - b. Working as a miner at a mine site (current position or held position within the last 5 years)
 - i. Can be independent contractor or employee of an independent contractor
 - c. Be 18 years of age or older
- 2) To participate in the Specific Aim 1b focus groups with mine managers/H&S professionals, individuals must:
 - a. Hold a current management or health and safety position at a mine
 - b. Be 18 years of age or older

Focus groups will be conducted in person in a private room at a NIOSH campus, a mine site, or a conference location, or virtually (using Zoom.gov). One researcher will facilitate the discussion

while the other(s) co-facilitates and takes notes. We aim to recruit 4-10 participants per focus group.

For Specific Aim 1a, NIOSH personnel will conduct 5-10 focus groups with women mine workers until saturation of themes across focus groups is reached (Kerr, Nixon, & Wild, 2010). Before a focus group begins, the facilitator will walk participants through the informed consent document to confirm participants are aware of potential risks and benefits. To begin a focus group session, the facilitator will pose a few brief introductory questions to the group to capture mine site and work history information (e.g., what kind of mine do you work at, what's your role). After this brief introduction where participants get an understanding of who is in the room, the group will begin to identify and prioritize a list of job tasks that women mine workers currently perform or would like to perform but that may pose a hazard or risk to their health and/or safety. Participants will then be asked to share their experiences with these work-related hazards and risks, how they affect or impact their work, whether some hazards preclude women from performing certain job tasks, and how the work system element(s) (e.g., tools, equipment, task, work environment, and organization) can be designed or re-designed to eliminate hazards or make it safer for women to perform the task(s).

For Specific Aim 1b, NIOSH personnel will conduct 3-5 focus groups with mine managers and mine H&S professionals. These focus groups will be like those with the women mine workers. Participants in these focus groups will be asked to provide details about their mine site and their job history and work experience; identify hazards and risks that may be posing additional risk or burden on women mine workers, relevant to the different job tasks performed; and discuss potential mitigation strategies.

If participants want to introduce themselves, we will ask that they use a pseudonym to maintain privacy. In addition, participants will be requested to not mention the name of any individuals or name/s of companies. All focus groups will be audio recorded and then transcribed verbatim by an audio transcription service. Prior to analysis, project team members will de-identify data of any personally identifiable information. Closed captioning will be enabled for virtual focus groups and the auto-generated transcript will be saved and reviewed against the audio file for accuracy. Any artifacts (such as charts, posterboards, virtual white boards, etc. to list tasks, hazards, or solutions) used during the focus groups will also be saved for later thematic analysis. At the conclusion of the focus group discussion, participants will be asked to complete a short Demographic and Work History Survey (Attachment D). The survey will either be printed and handed out or provided electronically (via CDC's REDCap) to participants and should take approximately 5-7 minutes to complete.

Data from all the focus groups interviews (Specific Aims 1a and 1b), along with the results of the Demographic and Work History Survey, will be compared during data analysis.

In sum, this formative study will provide NIOSH with important feedback from women mine workers on the OSH hazards and risks they face and will further NIOSH understanding of how work systems can be designed or modified to be safer and more supportive for women in mining, as well as what additional research and resources are needed in these areas.

3. Use of Information Technology and Burden Reduction

To minimize respondent burden, focus group interviews with women mine workers and OSH managers will be audio recorded to ensure accurate data collection, minimizing the need of NIOSH investigators to hand-document responses, which would considerably slow down the interviews. Recording the focus group interviews will also allow respondents to speak freely without the risk of comments being missed if investigators were to try taking notes manually. The demographic and work history survey will be brief, with 8 multiple choice questions and 9 questions with short free text responses. Participants will be offered two mechanisms for completing the demographic survey—either paper-based or online. Having multiple options provides participants with flexibility and allows them to choose the method that is easiest for them to complete. The brief survey will be completed by participants at the end of the focus group interview, which will eliminate the need to identify a time or location for future data collection. We will work with women mine workers and mine managers and H&S professionals to develop a focus group participation plan that minimizes burden on workers and employers (i.e., due to operational related needs).

4. Efforts to Identify Duplication and Use of Similar Information

This is a novel pilot project. No similar information has been gathered by or maintained by NIOSH or other federal agencies on this topic. Information is also not available from other sources.

5. Impact on Small Businesses or Other Small Entities

Workers from small businesses or other small entities may be involved in this effort, but NIOSH will minimize the burden on them by scheduling focus group interviews on dates and times that are convenient for participants and minimizing the time required for participation.

6. Consequences of Collecting the Information Less Frequently

The proposed data collection protocol provides an opportunity for workers to voice their opinions while minimizing respondent burden. Focus groups are designed to last between 60-90 minutes in length, followed by a brief demographic and work history survey that will take <7 minutes to complete. We will conduct no more than the permitted number of focus group interviews to reasonably reach saturation, as stipulated in our exempt IRB protocol. Collecting less data may result in a narrower range of job tasks performed by women mine workers being discussed, potentially leading to study outcomes and subsequent resources and interventions that are not as widely applicable across the entire mining community. Furthermore, fewer focus group interviews will be held with mine managers and H&S professionals, given the anticipated homogeneity in their job roles.

7. Special Circumstances Relating to the Guidelines of 5 CFR 1320.5

We've modified the race/ethnicity question in our survey to follow the format in Figure 3 of the SPD-15 guidance. Our rationale for selecting Figure 3 over Figure 1 is to maintain a concise and direct survey design, thereby reducing participant burden by minimizing response time and

cognitive load. This approach also ensures alignment with the standards set forth in the OMB's revised Directive No. 15.

There are no other special circumstances with this information collection package. This request fully complies with the regulation 5 CFR 1320.5.

8. Comments in Response to the Federal Register Notice and Efforts to Consult Outside the Agency

N/A

9. Explanation of Any Payment or Gift to Respondents

Participants will not be provided with payments or gifts.

10. Protection of the Privacy and Confidentiality of Information Provided by Respondents

SSPO determined in conjunction with the CDC Privacy Office that the Privacy Act is **not** applicable. This data collection was determined to be research involving human subjects that is exempt from human subjects regulations by the CDC Human Research Protection Office.

During data collection, the current study will collect some indirectly identifying information (e.g., race/ethnicity, age, geographic region), but will not capture any direct identifiers (e.g., participant name, social security number, address). The purpose of collecting the information in the Demographic and Work History Survey (Attachment D) is to accurately describe the study's sample at a high level, to place study results in context. None of the information collected via the Survey (Attachment D) will be tied to focus group participants or their responses within that setting. During analysis and synthesis of the focus group data, participants will be distinguished and described only by the broad demographic information that they share in that forum (e.g., site size, commodity, surface/underground mine, general US geographic quadrant location), their role within their company, and the content of the focus group itself. Names of participants as well as participant workplaces will not be logged or recorded on the informed consent documents or anywhere in the data collected (focus groups or survey) as part of the study. The only written record may be from recruitment activities (i.e., email exchanges to set up a date/time for the focus group) and in the event a participant requests a copy of the publication once it is in press.

In-person focus group interviews will take place in a designated private office or classroom setting where participants will be comfortable answering questions. The virtual focus groups will take place only on Zoom for Government (Zoom.Gov), a FedRAMP Authorized Software-as-a-Service (SaaS). Zoom.Gov is similar to the "regular" commercial Zoom platform, but operates in a dedicated, secure infrastructure designed to meet the requirements of the FedRAMP Moderate baseline and DoD Impact Level 2. Zoom.Gov utilizes Amazon Web Services (AWS) GovCloud and U.S.-based co-located data centers and is managed by U.S. personnel only. The platform leverages FIPS 140-2 validated cryptographic solutions and 256-bit AES-GCM encryption. Focus group interviews will be audio recorded and then transcribed. Directly identifying

information will not be asked in the focus groups; however, if any is inadvertently shared, it will be removed from the transcripts. After transcription of the focus group audio recordings, recordings will be destroyed.

All study participants will be informed that participation is voluntary and that they can decline to answer any questions. Participants in focus group interviews will be provided with an informed consent form prior to activities and will be allowed to ask questions, but a waiver of documentation of informed consent for interviews has been approved. The consent form provides information on purpose of the project, how the information will be used and protected, and that the information is voluntary, and they can stop participating at any time. Given the brief post-focus group interview demographic/work history survey request, a waiver of informed consent for workers taking the survey has been approved. Data will be kept private to the extent allowed by law.

11. Justification for Sensitive Questions

During focus groups, depending on the nature of the conversation and the hazards and risks discussed, there is the potential for conversations to result in psychological distress for some participants. Before each focus group begins, NIOSH researchers will inform participants that taking part in the focus group is completely voluntary and that they are free to cease their participation and leave the focus group whenever they would like. Participants will also be informed that they do not have to respond to any questions that may cause them discomfort, and researchers will remind participants of this throughout data collection. All risks are identified in the informed consent, which participants will receive a copy of at the beginning of their focus group. Additionally, NIOSH researchers have included a list of resources for participants to access in Section 15 of each Informed Consent document (Attachments G and H).

The proposed project was determined by the CDC Human Research Protections Office to be exempt from human subjects regulations. Please see the attached CDC Human Research Protections Office approval of exempt research protocol memo (Attachment F).

12. Estimates of Annualized Burden Hours and Costs

Response burden and cost for each type of data collection (focus group interviews and demographic surveys) are summarized in Table A12A and A12B. We will conduct between 5 and 10 focus groups with 4 to 10 women mine workers per group for Specific Aim 1a. No more than 100 women mine workers will be sampled. For Specific Aim 1b, we will conduct between 3 and 5 focus groups with 4 to 6 mine managers and H&S professionals per group. No more than 30 mine managers and H&S professionals will be sampled. Focus group interviews will last approximately 60-90 minutes.

The United States Department of Labor, Bureau of Labor Statistics, May, 2023 ([May 2023 National Occupational Employment and Wage Estimates \(bls.gov\)](#)) data were used to estimate the median hourly wage rate for mine workers. The United States Department of Labor, Bureau

of Labor Statistics, May 2019 ([Occupational Health and Safety Specialists \(bls.gov\)](https://www.bls.gov/occupational-health-and-safety-specialists)) data were used to estimate median hourly wage for mine managers and H&S specialists.

Table A12A. Estimated Annualized Burden Hours

Type of Respondents	Form Name	No. of Respondents per Method	No. of Responses per Respondent	Average Burden per Response (hours)	Total Burden Hours
Women mine workers	Focus Group Conversation Guide for Women Mine Workers	100	1	1.5	150
Women mine workers	Demographics and Work History Survey	100	1	10/60	17
Mine managers	Focus Group Conversation Guide for Mine Managers and H&S Professionals	30	1	1.5	45
Mine managers	Demographics and Work History Survey	30	1	10/60	5
Total		260	-	-	217

Table A12A. Estimated Annualized Cost Hours

Data collection methods	No. of Respondents per Method	No. of Responses per Respondent	Average Burden per Response (hours)	Total Burden Hours	Hourly Wage Rate	Total Respondents Cost

Focus group interview (women mine workers)	100	1	1.5	150	\$29.86	\$4,479
Demographic survey (women mine workers)	100	1	10/60	17	\$29.86	\$507.62
Focus group interview (mine managers)	30	1	1.5	45	\$36.68	\$1,650.60
Demographic survey (Mine managers)	30	1	10/60	5	\$36.68	\$183.40
Total	260	-	-	217	-	\$6,820

13. Estimates of Other Total Annual Cost Burden to Respondents or Record Keepers

There are no other cost burden to respondents.

14. Annualized Cost to the Government

Data collection activities will be completed by 36 months after OMB approval, and data analysis and report writing are expected to be completed within three years after OMB approval. Table A13 shows the estimated annualized costs to the government. Hourly rates for CDC/NIOSH employees were obtained from the 2024 General Schedule Pay Table ([Pay & Leave : Salaries & Wages - OPM.gov](#)) and an average hourly rate is referenced. Transcription costs were estimated using mean rates for North America.

Table A13. Estimated Annualized Cost to the Government

Personnel	Hours	Hourly Rate	Data Collection, Analysis, and Writing Costs	Travel Costs	Total
Federal Government Employees	200	\$50.12	\$10,024	\$11,666	\$21,690
Transcription	17	\$240			\$4,080
Total Annual Cost		--			\$25,770
Total Project Cost (3 years)	--	--			\$77,310

15. Explanation for Program Changes or Adjustments

This is a new data/information collection.

16. Plans for Tabulation and Publication and Project Time Schedule

Data collected from both women mine workers and mine managers/H&S professionals will be primarily qualitative in nature; however, demographic and some work history information will be collected via a short survey (Attachment D).

NIOSH personnel will use various methods to analyze study data. Qualitative methods, namely thematic analysis, will be used to analyze the focus group data to identify prioritized work tasks and the hazards and solutions associated with each work system element (Braun and Clarke, 2006, Pollard, et al., 2019). Structuring the qualitative analysis around the work system elements will not only yield useful information to design or re-design specific work system elements but provide vital information on interactions that are often neglected. To delineate our approach, the audio recordings from each focus group session will be transcribed after each focus group and each transcript will be assigned two coders to ensure completeness and agreement. Coders will use the qualitative data analysis software program, MAXQDA (NIOSH Level 3 approved) to inductively identify major themes and organize the data from the de-identified transcripts. This study will follow the principles of inductive thematic saturation described in Saunders et al.

(2018), whereby saturation will be reached when no new themes are identified from the data. The research team will then interpret the identified themes and ideas in context, comparing and contrasting responses between the women mine workers and the mine managers/H&S professionals. The themes that inductively emerge based on these comparisons will be drafted in detail for publication. Findings will summarize what changes are needed to make mining work systems more supportive for women mine workers while also identifying any discrepancies that exist between the perceptions of women mine workers and those of mine managers and mine H&S professionals in terms of what changes are needed to make the mining work system more supportive for women mine workers.

The quantitative data collected from all focus group participants via the Demographics and Work History Survey (Attachment D) will be analyzed using statistical software like Stata 18 (StataCorp LLC) or SPSS 26 (IBM Corp) (both Level 2 approved). Demographic and work history information will be collected to accurately describe the study's sample and to place study results in context, highlighting which groups are represented and documenting demographic diversity in perspectives or experiences related to the topic of study. Collecting demographic information also helps others replicate results.

All reports derived from this study will emphasize that the findings cannot be generalized beyond the participant sample.

Data collection activities for this study will be completed within 30 months of OMB approval, so 30 months of clearance is being requested for research activities. Table A15 outlines the project schedule.

Table A15 Project Timeline

Project Time Schedule	
Activity	Time Schedule
Recruit mines to participate	1-2 months after OMB approval
Conduct data collection (focus groups interviews and surveys)	1-30 months after OMB approval (ongoing process)
Analyze data & generate interim and summary reports of findings	2-36 months after OMB approval

17. Reason(s) Display of OMB Expiration is Inappropriate

The OMB expiration date will be displayed on all data collection instruments.

18. Exceptions to Certification for Paperwork Reduction Act Submissions

There are no exceptions to the certification.