

A. COVER PAGE

Project Title: Documenting the True Cost of Occupational Injury Burden in Agriculture: A Mixed Methods Effort to Improve Injury Surveillance Methods	
Grant Number: 5K01OH011812-03	Project/Grant Period: 09/01/2019 - 08/31/2022
Reporting Period: 09/01/2021 - 08/31/2022	Requested Budget Period: 09/01/2021 - 08/31/2022
Report Term Frequency: Final	Date Submitted: 11/30/2023
Program Director/Principal Investigator Information: ERIKA ELISABETH SCOTT , MS PHD BS Phone Number: (607) 547-6023 ext. 2204 Email: erika.scott@bassett.org	Recipient Organization: MARY IMOGENE BASSETT HOSPITAL ONE ATWELL ROAD COOPERSTOWN, NY 133261301 DUNS: 020672820 UEI: MEENKNXWK6Y5 EIN: 1135596796A1 RECIPIENT ID:
Change of Contact PD/PI: NA	
Administrative Official: STEPHEN CLARK Bassett Medical Center One Atwell Rd. Cooperstown, NY 13326 Phone number: 6075477633 Email: stephen.clark@bassett.org	Signing Official: STEPHEN CLARK Bassett Medical Center One Atwell Rd. Cooperstown, NY 13326 Phone number: 6075477633 Email: stephen.clark@bassett.org
Human Subjects: NA	Vertebrate Animals: NA
hESC: No	Inventions/Patents: No

B. ACCOMPLISHMENTS

B.1 WHAT ARE THE MAJOR GOALS OF THE PROJECT?

Burden: A lack of information concerning the burden of occupational morbidity and mortality has been recognized by researchers and top policy officials as a critical impediment for the adequate prioritization of health and safety needs among US workers. Loss of life, injury, and illness are often enumerated in terms of frequency, rate, and severity. However, these estimates only measure a fraction of the total burden to society.

Need: There is a documented need for more research on the shift of occupational injury and illness costs to social programs and families. It is known that injuries influence productivity, and contribute to lost wages, medical expenses, and disability compensation.

Impact: By creating a framework to identify key gaps in injury surveillance, it will be possible to provide a more complete picture of injury burden. Sharing this information on key gaps with policy makers and industry groups could improve investments in more robust injury surveillance systems and in overall occupational safety and health. Because of a need for more accurate and persuasive evidence, the field of surveillance research is greatly in need of young investigators and innovative injury capture methods.

My short-term goal is to create a framework to characterize vital data sources and variables that will provide more accurate and comprehensive estimations of agricultural injury burden in the Northeast. In conjunction with stakeholders and policy-makers, this information will then be used to inform policy revisions that will enhance ongoing injury surveillance. The overarching objective (long-term goal) of this three-year Mentored Research Scientist Development Award (K01) is to address this critical gap in progress by developing a more comprehensive understanding of occupational injury surveillance and associated economic impacts, while providing crucial support for my efforts to become a fully independent researcher. Additionally, my research will greatly inform the development of more complete calculations of injury burden in other high-risk industries and sectors.

Specific Aim 1: Conduct a scoping literature review of the critical gaps in burden and surveillance of occupational injury in general, and for agriculture specifically.

Information from the scoping review will be used to map key considerations for calculating the burden of occupational injury (generally and specifically in agriculture) and the primary sources and types of evidence available. The review will also serve to identify knowledge gaps in the existing literature, specifically as they relate to identifying important factors and variables for complete injury burden calculations. Although scoping reviews do not permit assessments of the quality of the research, they permit flexibility for iterative change as the process moves forward and the review will be more than sufficient to assess gaps in the literature, and to assist in framing questions for Aim 2 of the proposed research.

Specific Aim 2: Use mixed methods to understand events and impacts relating to an agricultural injury

SA 2.1 Key informant interviews with injured agricultural workers, and those impacted by agricultural injury (family members, co-workers, social workers, insurers, healthcare professionals, agribusiness, first responders etc.) to understand how the injury occurred, what occurred during and after the event, and the health, economic, and social impacts of the injury. SA 2.2 Identify important factors and variables and determine which (including health, economic, and social impacts) are most significant and this need to be included in the framework, how data on such impacts can be collected, and document the chronology and distribution of these impacts across the different stakeholders.

Specific Aim 3: Provide recommendations on additional variables and datasets to supplement existing injury surveillance systems, and suggest improvements to enhance burden calculations.

SA 3.1 Create a framework for developing more complete estimates of agricultural injury (MA, ME, NH, NY, and VT). SA 3.2

Identify the availability of relevant variables and datasets in each state, and systematically document barriers to data acquisition and potential alternative sources of data. SA 3.3 Develop a list of administrative/health policy recommendations for creating comprehensive and accurate estimates of occupational injury in agriculture and for improving agricultural injury surveillance.

NORA priorities addressed - Objective AG-03 Improve reporting and surveillance of injury and illness in the agriculture subsector.

B.1.a Have the major goals changed since the initial competing award or previous report?

No

B.2 WHAT WAS ACCOMPLISHED UNDER THESE GOALS?

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B.3 COMPETITIVE REVISIONS/ADMINISTRATIVE SUPPLEMENTS

For this reporting period, is there one or more Revision/Supplement associated with this award for which reporting is required?

No

B.4 WHAT OPPORTUNITIES FOR TRAINING AND PROFESSIONAL DEVELOPMENT HAS THE PROJECT PROVIDED?

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B.5 HOW HAVE THE RESULTS BEEN DISSEMINATED TO COMMUNITIES OF INTEREST?

While this project is not entirely aimed to disseminate information to the general public, there have been ways that information learned through this research has been passed along to those outside of the project. One such example is that through key informant interviews. We learned about significant administrative barriers with state programs meant to assist disabled workers. Along with our case manager, we have engaged with the Deputy Commissioner of Agriculture and Markets, as well as our state senator, and we are getting word that new protocols are being developed to include farm equipment modifications in the state disabled worker program, which have never been the case before. It is wonderful to see that data collected through the K01 grant are already having a tangible impact on the farmers we interviewed.

In addition, this work has been presented 1) during hospital research grand rounds, a forum that engages with healthcare and research staff, medical students, and beyond and 2) internationally in Ireland with researchers engaged in similar work in their country [travel supported by non-NIOSH funds]. From this, I have been invited by Dr. David Meredith of Teagasc, the Irish Agriculture and Food Development Authority, to join as a co-supervisor for an application to Teagasc's PhD funding initiative (The Walsh Scholarship Programme). The proposed research is closely related to the work I have been doing to understand the burden of illness and injury amongst farmers. The motivation for this work comes from a number of sources including a charity (EmbraceFarm) and the links to Task 3.2 in the SafeHabitus Project. Given the overlaps with my research interests, I was invited to guide the research and support the future student.

Lastly, information from this research has been disseminated more broadly amongst occupational health surveillance professionals through the Council of State and Territorial Epidemiologists (CSTE) Occupational Health Subcommittee, of which I am a member. I am engaging often with this group, as well as with fellow NIOSH surveillance researchers at the intersection of this K01 grant and the IPA work the Office of Agriculture Safety and Health.

B.6 WHAT DO YOU PLAN TO DO DURING THE NEXT REPORTING PERIOD TO ACCOMPLISH THE GOALS?

Not Applicable

5K01OH011812-03 | Documenting the True Cost of Occupational Injury Burden in Agriculture

1. Major Activities

The first major activity of this K01 grant was undertaking the scoping review to understand how the burden of agricultural injury had been described in the English language literature. This began by working closely with the NEC information specialist on creating the proper search schema within many literature databases. Once the search strategy was set, both the information specialist and I reviewed the returned title and abstracts for inclusion in the next step. Full text reviews were conducted and this process was tracked using NVivo. Themes were documented in NVivo, which facilitated aggregation and analysis once all were reviewed. This work culminated in writing a manuscript, which is under review at *New Solutions: A Journal of Occupational and Environmental Health Policy*.

Next, an interview protocol was developed to conduct key informant interviews, among a variety of people impacted by agricultural injury. Two separate interview guides were developed, one for farmers, family members/employers, and agribusiness, and another for emergency services, healthcare providers, disability experts, etc. Interviews were conducted both in-person and virtually around the Northeast. On several occasions, the NEC case manager accompanied me on interviews with injured farmers. This was an added comfort for these farmers as they discussed the difficult aspects of their injury and recovery process.

Transcription was completed for all the interviews, and themes emerged. Themes echoed some found in the scoping review, and several new themes emerged. A comprehensive review of surveillance systems nationally was completed understanding various sources of injury surveillance data, and identify what may be missing from calculations. Throughout the process, I worked closely with my primary mentor, and consulted the remaining mentorship team as appropriate.

During the course of this Mentored Career Development Award, I earned a graduate certificate in health policy and economics, which will be outlined elsewhere.

2. Specific Objectives

My short-term goal was to create a framework to characterize vital data sources and variables that will provide more accurate and comprehensive estimations of agricultural injury burden in the Northeast. In conjunction with stakeholders and policy-makers, this information can then be used to inform policy revisions that will enhance ongoing injury surveillance. The overarching objective of this three-year Mentored Research Scientist Development Award (K01) was to address this critical gap in progress by developing a more comprehensive understanding of occupational injury surveillance and associated economic impacts, while providing crucial support in becoming a fully independent researcher.

3. Significant results (including) major findings, developments, or conclusions (both positive and negative)

The scoping review process ultimately identified 116 full-text papers meeting eligibility criteria. Results from this scoping review indicate the true burden of agricultural injury is more expansive and complex than previous narratives on injury burden would imply, especially in the areas of mental and emotional health impacts. Future research and prevention efforts should consider collecting more expansive injury burden data, as well as methods to incorporate them into standard injury surveillance efforts for agriculture.

Interviews echoed these sentiments but also highlighted the incredible impact that bureaucratic processes and roadblocks had on the lives of those who experienced agricultural injury. Many found that assistance for farmers was difficult to come by, and that established routes to help disabled workers are not always amiable to farmer's needs.

4. Key outcomes or other achievements

Key outcomes of this work include a focus on the mental and emotional health impacts of agricultural injury. Further, bureaucracy often contributed negatively to a farmer's ability to not only get well again but work to the best of their ability. In the policy realm, we identified issues with the state vocational rehabilitation program that prevented farm equipment from getting adaptations. In working with the NEC case manager and Deputy Commissioner for Ag & Markets, conversations are now focusing on improving processes for farm equipment modifications, which will provide necessary adaptations for injured farmers within state assistance programs. This has already led to vehicle modification experts inspecting farm equipment for the first time, and connecting with agriculture equipment specialists to ensure that injured farmers can continue to work safely.

This work has also contributed to national surveillance research. Beginning in the summer of 2022, I've been working with NIOSH on recommendations for improving national agricultural injury surveillance efforts, and collaborating closely with other agricultural surveillance experts, and occupational health surveillance experts through the Council of State and Territorial Epidemiologists (CSTE). Through these forums, the results of this project have been shared widely and can be incorporated in future recommendations.

I have also had the opportunity to share these concepts internationally through an oral presentation at the BeSafe International Farm Safety and Farmer Health Conference 2023: Understanding farm safety and farmer health behaviours, in Dublin, Ireland in August 2023 (travel covered by hospital CME funds). In the long-term, this research provides substantive evidence for persuading industry representatives and business owners to invest in improved health and safety practices and worksite improvements.

B.4 Advisory and Professional Activities

Throughout the course of this reporting period, I have participated in numerous advisory boards, provided professional consultation, and spent a great deal of time involved in administrative activities.

Advisory Boards

Through the project's completion in 2022, I served as an advisory board member to the RISC Fishing research project of Laurel Kincl and Viktor Bovbjerg at Oregon State University in Corvallis, WA. This project focused on enhancing commercial fishing injury surveillance in the Pacific Northwest. In addition, I am a member of the steering committee for the AgInjuryNews project out of the National Farm Medicine Center, in Marshfield, WI. I am also a member of the Northeast Center's Scientific Advisory Panel and the Vermont Farm Health and Safety Task Force. These activities represent fairly low percentage of time.

Professional Consultation

Last year, I was asked to participate in a NIOSH Special Emphasis Panel to provide peer review for the topic "Occupational Safety and Health Education and Research Centers (ERC)". Throughout the review process and two-day panel, I gained valuable experience in grantsmanship, and felt that serving on the panel was a way to serve the collective needs of the occupational health and safety research community. I will be serving on another panel in February 2024, at the request of a NIOSH scientific review officer. This typically involves a few weeks of carefully reviewing applications, and attending a two-day meeting.

In September 2022 I began an Intergovernmental Personnel Act (IPA) with the NIOSH Office of Agriculture Safety and Health (OASH) under the direction of Dr. Jennifer Lincoln. The purpose of this IPA, which has been extended into a second year, is to work closely with the NIOSH project officer and OASH staff to provide technical assistance and consultation on AgFF surveillance initiatives. I have worked with key internal and external working partners to develop a long-term, multi-level, multi-pronged strategy for the Institute to improve AgFF injury and disease surveillance. In the first year, I made strides in connecting with NIOSH funded State-based Occupational Health Programs, NIOSH internal surveillance staff, and Ag Center surveillance partners. I am a member of the CSTE Occupational Health Subcommittee, and assisted in planning for both the winter meeting (2022 & 2023) in Atlanta, and the annual conference occupational health track for the annual CSTE conference in Salt Lake City, June 2023. Agricultural surveillance presentations were made at the winter meeting, during a panel on agricultural injury. A presentation planned for the annual conference will highlight the growing partnerships between NIOSH offices, ag injury researchers, and CSTE. This is currently 25% of my time.

I have continued to provide journal reviews as I am able, and was named the [2023 Peer Reviewer of the Year](#) by the Journal of Agromedicine. Matthew Keifer, MD, editor-in-chief, Journal of Agromedicine said "Dr. Scott is one of our best. She is consistently willing to take on reviews, something we in the editorial office deeply appreciate. When she does accept, she is prompt, thorough, insightful and versatile, always polite and encouraging to the authors. She conducts every review with great care, in both the sense of the word careful and caring. She coaches more than she corrects, and, like the best reviewers, she encourages authors to enhance and improve their scholarly product. Dr. Erika Scott makes the papers we publish better and our journal better, and for that we are grateful." I am very pleased to have been recently asked to join the editorial board of the Journal of Agromedicine as an Associate Editor, as well. In addition, along with my colleagues Drs. Jennifer Lincoln and Bryan Weichelt, I am serving as a Guest Editor of a special surveillance issue of the Journal of Agromedicine, due out in print in 2024. Activities with the journal and guest editing have been taking about 5% of my time as of late.

Administrative Work

My administrative responsibilities have continued to grow over the course of this K01. Serving as Deputy Director, I have taken on an increasingly larger role in grants administration, organizational operation, staff mentorship and conflict resolution, strategic planning, budgeting, regulatory oversight, to name a few areas. I am able to deputize in the Director's absence to ensure the seamless operation of our organization. Time

B.4 (B.4 Administrative Duties.pdf)

spent on administrative activities varies week to week and month to month, however this has grown to a sizable portion of my role within the organization.

C. PRODUCTS

C.1 PUBLICATIONS

Are there publications or manuscripts accepted for publication in a journal or other publication (e.g., book, one-time publication, monograph) during the reporting period resulting directly from this award?

No

C.2 WEBSITE(S) OR OTHER INTERNET SITE(S)

Not Applicable

C.3 TECHNOLOGIES OR TECHNIQUES

Not Applicable

C.4 INVENTIONS, PATENT APPLICATIONS, AND/OR LICENSES

Have inventions, patent applications and/or licenses resulted from the award during the reporting period? No

If yes, has this information been previously provided to the PHS or to the official responsible for patent matters at the grantee organization? No

C.5 OTHER PRODUCTS AND RESOURCE SHARING

Category	Explanation
Protocols	Interview protocols were developed, 1) for farmers, family and agribusiness, and 2) emergency services, health and safety professionals, etc.

D. PARTICIPANTS

D.1 WHAT INDIVIDUALS HAVE WORKED ON THE PROJECT?

Commons ID	S/K	Name	Degree(s)	Role	Cal	Aca	Sum	Foreign Org	Country	SS
ERISCO	Y	Scott, Erika Elisabeth	BS,MS,PHD	PD/PI	5.2	0.0	0.0			NA

<p>Glossary of acronyms: S/K - Senior/Key Cal - Person Months (Calendar) Aca - Person Months (Academic) Sum - Person Months (Summer)</p>	<p>Foreign Org - Foreign Organization Affiliation SS - Supplement Support RS - Reentry Supplement DS - Diversity Supplement OT - Other NA - Not Applicable</p>
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D.2 PERSONNEL UPDATES

D.2.a Level of Effort

Not Applicable

D.2.b New Senior/Key Personnel

Not Applicable

D.2.c Changes in Other Support

Not Applicable

D.2.d New Other Significant Contributors

Not Applicable

D.2.e Multi-PI (MPI) Leadership Plan

Not Applicable

E. IMPACT**E.1 WHAT IS THE IMPACT ON THE DEVELOPMENT OF HUMAN RESOURCES?**

Not Applicable

E.2 WHAT IS THE IMPACT ON PHYSICAL, INSTITUTIONAL, OR INFORMATION RESOURCES THAT FORM INFRASTRUCTURE?

Not Applicable

E.3 WHAT IS THE IMPACT ON TECHNOLOGY TRANSFER?

Not Applicable

E.4 WHAT DOLLAR AMOUNT OF THE AWARD'S BUDGET IS BEING SPENT IN FOREIGN COUNTRY(IES)?

NOTHING TO REPORT

G. SPECIAL REPORTING REQUIREMENTS SPECIAL REPORTING REQUIREMENTS

G.1 SPECIAL NOTICE OF AWARD TERMS AND FUNDING OPPORTUNITIES ANNOUNCEMENT REPORTING REQUIREMENTS

NOTHING TO REPORT

G.2 RESPONSIBLE CONDUCT OF RESEARCH

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G.3 MENTOR'S REPORT[CDA]

File uploaded: Mentor's Report.pdf

G.4 HUMAN SUBJECTS

G.4.a Does the project involve human subjects?

NA

G.4.b Inclusion Enrollment Data

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CumulativeInclusionEnrollmentReport.pdf

G.4.c ClinicalTrials.gov

Does this project include one or more applicable clinical trials that must be registered in ClinicalTrials.gov under FDAAA?

G.5 HUMAN SUBJECTS EDUCATION REQUIREMENT

Are there personnel on this project who are newly involved in the design or conduct of human subjects research?

G.6 HUMAN EMBRYONIC STEM CELLS (HESCS)

Does this project involve human embryonic stem cells (only hESC lines listed as approved in the NIH Registry may be used in NIH funded research)?

No

G.7 VERTEBRATE ANIMALS

Does this project involve vertebrate animals?

G.8 PROJECT/PERFORMANCE SITES Not Applicable
G.9 FOREIGN COMPONENT No foreign component
G.10 ESTIMATED UNOBLIGATED BALANCE G.10.a Is it anticipated that an estimated unobligated balance (including prior year carryover) will be greater than 25% of the current year's total approved budget?
G.11 PROGRAM INCOME Not Applicable
G.12 F&A COSTS Not Applicable

G. 2 Responsible Conduct of Research

Training throughout the duration of the K01 award involved substantial face-to-face discussions among the research staff at NEC, facilitated through research meetings, where participants discussed research ethics. Dr. Scott also mentored new staff in research ethics when they joined our institution. These in-depth research conduct discussions were supplemented with online training through Collaborative Institutional Training Initiative (CITI Program): <https://about.citiprogram.org/en/series/human-subjects-research-hsr/>. Topics included not only human subjects, but include animal ethics topics, since our research focuses work with farmers.

Substantial reading on the topics of data acquisition; management, sharing and ownership was undertaken by the awardee, guided by Dr. Sorensen, since these topics were central to this proposal. Lastly, the training and discussion of research ethics was incorporated into quarterly research meetings with the faculty at the Bassett Research Institute, further broadening the scope of study. This allowed other scientists to add to the conversation. Overall, Dr. Scott had over 20 contact hours of content, training, and discussion.



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November 10, 2023

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Re: Mentor's Report - K01OH011812
Documenting the True Cost of Occupational Injury Burden in Agriculture: A Mixed Methods Effort to
Improve Injury Surveillance Methods

Dear Dr. Chiou and Ms. Mobley,

As the primary mentor to Dr. Erika Scott during her K01 Mentored Career Development Award, I would like to provide an update on her progress and professional development. She has continued to be a productive researcher and has developed into a capable leader both within our organization, and among surveillance researchers nationwide.

In terms of professional development, Dr. Scott completed a Graduate Certificate in Public Sector Management with a focus on Economics and Health Policy at the Rockefeller College of Public Affairs and Policy, University at Albany. In addition, Dr. Scott completed qualitative research training through the Qualitative Research Summer Intensive, a partnership between ResearchTalk, Inc. and UNC's Odum Institute for Research in Social Science.

Throughout the course of this award, Dr. Scott utilized her newly gained skills to work through the aims of the study, completing a scoping review, conducting key informant interviews and suggesting improvements for injury surveillance research. In fact, during this period, Dr. Scott was recognized by NIOSH as a leader in this field, and assigned to an Intergovernmental Personnel Act (IPA) with the Office of Agriculture Safety and Health (OASH) to help improve national agricultural injury surveillance.

In closing, Dr. Scott continues to enjoy high levels of administrative support through the Northeast Center to continue pursuing advancements in surveillance and burden research.

Sincerely,

Julie Sorensen, PhD
Director

Cumulative Inclusion Enrollment Report

This report format should NOT be used for collecting data from study participants.

Study Title:

Comments:

Racial Categories	Ethnic Categories									Total
	Not Hispanic or Latino			Hispanic or Latino			Unknown/Not Reported Ethnicity			
	Female	Male	Unknown/Not Reported	Female	Male	Unknown/Not Reported	Female	Male	Unknown/Not Reported	
American Indian/Alaska Native										
Asian										
Native Hawaiian or Other Pacific Islander										
Black or African American										
White										
More Than One Race										
Unknown or Not Reported										
Total										

I. OUTCOMES

I.1 What were the outcomes of the award?

The study "Documenting the True Cost of Occupational Injury Burden in Agriculture" investigated data sources and variables that provide more accurate and comprehensive estimations of agricultural injury burden in the Northeast. Ultimately, results will be used to inform policy revisions that will enhance ongoing injury surveillance. The research consisted of several components including a scoping review of burden literature, key informant interviews on the topic of agricultural injury and its aftermath, and evaluation of potential data sources and variables to complete the burden evaluation. Key informant interviews were conducted with injured farmers, family members, emergency medical technicians, agricultural lenders, disability advocates, workers' compensation specialists, and industry specialists, to name a few.

The scoping review identified 116 examples of burden in the English language literature between 1980 to 2021. Most of the literature focused on disability, productivity costs, and financial considerations. Less common, though mentioned, were the emotional impacts of agricultural injury and the burdens those produced. Key informant interviews highlighted many topics, but notably the mental and emotional burden of farm injury and the difficulty in navigating bureaucratic processes, such as applying for assistance programs. It is recommended that estimates of injury on the impact of mental health be incorporated in injury burden calculations.