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TITLE: Mental Health Disorders, Suicide Risk, and Treatment Seeking Among Formerly Deployed National Guard and Reserve Service Member Seen in Non-VA Facilities

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14. ABSTRACT The focus of this study was to assess the prevalence of and risk factors for mental health disorders, variations in service use among National Guard and Reserve service members seen in non-VA facilities following deployments, compared to other era service members. Of the 1,730 veterans surveyed, 95% were male, 44% were under 64 years old, 96% were white race, 40% reported multiple deployments, and 38% (n=665) had served as National Guard/Reserve service members. In addition, 23% (n=396) serviced in Iraq, Afghanistan, or Global War on Terrorism. The prevalence of current PTSD was 5.4% and current probable PTSD was 7.6%. In addition, current depression was 8%, 23% had used mental health services in the past year, and 50% had used the VA in the past 12 months. The most common current disorder was related to alcohol misuse, with 24% screening positive on the AUDIT-c scale. In addition, 28% reported a history of concussion during military service. Analyses indicated that PTSD, depression, mental health service use, alcohol misuse, suicidality, and stressful life events were more common among National Guard/Reserve veterans, compared to other era veterans (p-values < 0.05). However, other era veterans were more likely to rate themselves in "fair" or "poor" health and to report a service-connected disability (p-values < 0.05). Nevertheless, multivariable analyses that adjusted for demographic differences, level of combat exposure, current life stressors, and current social support, found no differences in mental health status and mental health service use among the veteran groups. Analyses suggested that while deployed National Guard/Reserve service members tended to have a higher prevalence of mental health disorders and mental health service use, when the data were adjusted for demographic difference and potential confounders, there were few differences in outcomes between the veteran groups.					
15. SUBJECT TERMS PTSD, Depression, Service Use, Suicidality, Alcohol Misuse, Concussion, Deployment, VA Service Use, National Guard/Reserve					
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Table of Contents

	<u>Page</u>
1. Introduction.....	4
2. Keywords.....	4
3. Accomplishments.....	4
4. Impact.....	10
5. Changes/Problems.....	11
6. Products.....	12
7. Participants & Other Collaborating Organizations.....	17
8. Special Reporting Requirements.....	20
9. Appendices.....	20

INTRODUCTION:

The focus of the study was to assess the prevalence of and risk factors for mental health disorders, variations in service use, and outcomes among National Guard and Reserve service members following warzone deployments. This study was important because most veterans have private and/or other health insurance coverage and often receive their care from non-VA institutions. The knowledge gained from studying National Guard and Reserve veterans in non-VA healthcare systems is highly relevant. The availability of healthcare options for veterans has increased in recent years through changes in VA policy and insurance coverage. Today many veterans are not seen in VA facilities, but in non-VA healthcare systems. Geisinger, the community partner for this study, is a large, non-profit integrated healthcare organization located in central and northeastern Pennsylvania. This system serves more than 3 million residents throughout more than 44 counties in Pennsylvania. Geisinger has more than 30,000 employees, including a 1,600-member multi-specialty group practice, 8 hospital campuses, a 551,000-member health plan, and a medical school (Geisinger Commonwealth Medical School), and is one of the largest employers in the state (see: www.geisinger.org). The knowledge gained from studying veterans in non-VA healthcare systems is important for the monitoring the quality of care, diagnostic screening, and for outcomes research. Currently, Geisinger has about 40,000 current and former service members who use this system for their healthcare. Many of these patients currently are or were former members of the National Guard or the Reserves.

▪ KEYWORDS:

Mental Health Disorders, Service Use, Substance Misuse, Deployment, Treatment Outcomes, Posttraumatic Stress Disorder, Traumatic Brain Injury, Concussion, National Guard, Reserves.

▪ ACCOMPLISHMENTS:

- What were the major goals of the project?**

YEAR 1

Major Goal 1: Study Start, Instrument/Protocol Finalization, Local IRB, DoD IRB Approval

Subtask 1: Convene initial study meetings with study group (+1 month)

Subtask 2: Review and update study instruments and protocol from pilot study, pilot test revised protocol (+1/2 months)

Subtask 3: Submit revised protocol to Geisinger's IRB and obtain approval (+2 months)

Subtask 4: Submit protocol for DoD's IRB review (+3 months)

Milestone: Finalize study protocol/instruments received required IRB approvals (+3/4 months)

Major Goal 2: Survey Data Collection, Baseline EHR Data Collection, DNA Collection, Data Cleaning, Preliminary Data Analyses

Subtask 1: Pull baseline electronic health record (EHR) data from Geisinger's Information Technology (IT) Systems, including veteran status data, outpatient, inpatient, emergency department, and laboratory data

Subtask 2: Conduct survey data collection

Subtask 3: Collect DNA Samples by Mail

Subtask 4: Conduct preliminary data analyses

Milestones Achieved: Survey data collected, baseline EHR data collected, DNA collected, preliminary analyses being completed

YEAR 2

Major Goal 3: Bio-bank DNA, Complete Genotyping, Merge Survey, EHR, and Genotype Data, Complete Analyses for Study Aim 1 (Prevalence Study) and for Aim 2 (PTSD Study), Prepare Manuscripts for Review

Subtask 1: Complete genotyping of selected study SNPs

Subtask 2: Merge genotype data into survey and EHR datasets

Subtask 3: Continue analyses related to study Aims 1 and 2

Subtask 4: Convene study team conference to review study results
 Subtask 4: Prepare and submit posters/manuscripts for peer review
 Subtask 5: Complete and review preliminary genetic analyses
 Subtask 6: Prepare additional posters/manuscripts for internal review and peer review submission
 Milestones Achieved: DNA Bio-banked, complete genotyping, merge survey, EHR, and genotype data, complete additional analyses for study Aims 1 and 2, prepared & submit year 2 posters/manuscripts for peer review

YEAR 3

Major Goal 4: Complete Follow-up EHR data pull from Geisinger IT Systems, Merge Follow-up Data, Complete Analyses for Study Aim 3 (Effectiveness) and for Aim 4 (Genetics), Prepare Final Manuscripts for Review and Submission, Convene Final Conferences and meetings

Subtask 1: Conduct Follow-up data pull from Geisinger's EHR Systems, using outpatient, inpatient, emergency department and laboratory data
 Subtask 2: Merge and clean/code data/ and run preliminary analyses
 Subtask 3: Complete analyses for Aims 3 and 4
 Subtask 4: Prepare final manuscripts for review and submission
 Subtask 5: Prepare and submit proposals for additional genetic and follow-up research funding
 Subtask 6: Prepare documentation/datasets for bio-banking and data-sharing of study data
 Subtask 6: Complete follow-up EHR data pull from Geisinger EHR/IT Systems, merge follow-up data, completed analyses for Aims 3 and 4, Prepare Final manuscripts for review and submission, convene final conference meeting, prepare documentation and datasets for data sharing.

Yearly Patient Enrollment

Table 1. (planned)	Year 1*			
Target Survey Enrollment (per quarter)	Q1	Q2	Q3	Q4
Geisinger Site	1500	200	100	0
Target/Planned Enrollment (cumulative)	1500	1700	1800	1800

***Due to recruitment difficulties, only 1,289 veterans were recruited in Year 1.**

- **What was accomplished under these goals?**

Year 1

Major Goal 1:

Quarter 1 –

- Hired 2 personnel essential to the execution of the study. Conducted initial meetings with the study team via in person and phone conferences.
- Updated the current veteran registry database, preparing for the data pull to recruit potential participants via mail for study survey phase.
- Revised the phone survey, correcting issues identified in the original pilot conducted in 2012. Submitted protocol and supporting documents to Geisinger Clinic and Department of Defense (DoD) for Institutional Review Board (IRB) approval.
- Prepared and submitted the application for a National Institute of Mental Health (NIMH) certificate of confidentiality (CoC), providing additional protection for the information collected, while also enhancing the likeliness of a service member participating.
- Worked with Kent State's and Tulane's IRB staffs to allow them to cede to Geisinger's IRB as the lead IRB on the study.

Major Goal 2:

Quarter 2 –

- Convened on-site study meeting with all investigators to discuss the study objectives, design, statistical analysis, timetable, anticipated 6 issues, and publications planned.
- Baseline EHR veteran status data was pulled from Geisinger's IT systems.
- Identified shortage in cohort of Guard and Reserve service members and implemented additional recruitment strategy within Geisinger patient population to increase sample size.
- Commenced survey data collections.
- Sent out DNA collection kits via mail.
- Began preliminary survey data analyses
- Completed pilot data survey analyses

Quarter 3-

- Held monthly meetings with all investigators to discuss preliminary data, status of recruitment efforts, and publications planned.
- Implemented additional recruitment strategy within Geisinger patient population to increase sample size of Guard and Reserve service members whereby we directly contacted patients via a study-specific email directing them to the MyGeisinger.org survey. This additional step was approved by DoD. Continued survey data collection.
- Began receiving DNA samples which have been sent to lab to be genotyped and bio banked.
- Continued preliminary data analyses.
- Had poster accepted for the Society of Federal Health Professionals conference. Submitted two posters to the Health Care Research Network (HCSRN) annual conference.
- Began preparing several manuscripts that will be submitted during the next quarter.

YEAR 2

Major Goal 3:

Quarter 1-

- Received 718 saliva samples, isolated 600 DNA and completed 22 SNP on over 500 samples.
- The study team worked on drafting several manuscripts for the data received.
- Presented a poster entitled ***Mental Health Disorders and Treatment seeking among Formerly Deployed National Guard and Reserve Service Members*** at the Annual Meeting of the Society of Federal Health Professionals Annual Meeting on November 29, 2016 in National Harbor, MD. Several other posters were prepared for presentation in the coming months.

Quarter 2-

- Received 1,005 saliva samples, isolated 950 DNA samples, and genotyped 752 DNA samples using 28 SNP assays.
- Began to merge available DNA results with survey data and started to analyze the results.
- Prepared for Town Hall meeting with patients who participated in the study. The purpose of the meeting was to present preliminary results to veterans and receive their feedback to help guide study analyses.
- An oral presentation was given by Dr. Adams at the Military Sociology Session of the 2017 Eastern Sociological Society Annual Meeting in Philadelphia, PA, on February 23rd. The presentation was entitled ***Social support and coping resources, mental health problems, and treatment seeking among veterans in non-VA facilities: Results from the Veterans' Health Study.***
- An abstract was submitted by Dr. Urosevich to the Annual Meeting of the American Optometric Association (AOA) in 2017 entitled ***Concussive effects (mTBI) in veterans from the Iraq and Afghanistan conflict era in relation to other physical and psychological health problems.***
- Two posters were presented at the Health Care Systems Research (HCSRN) conference in San Diego, CA on March 21st, 2017. The posters were entitled ***Alcohol Misuse among Formerly Deployed U.S. Service Members seen Non-VA Facilities: Results from the Veterans' Cohort Study*** (Dr. Boscarino) and ***Post-Deployment Mental Health Status and Obesity among a Multi-Generational Sample of U.S. Veterans*** (Ms. Hyacinthe).

Finally, due to recruitment difficulties, only 1,730 total veterans were recruited by end of Q2 in Year 2, after which study recruitment was stopped.

Quarter 3-

- Received 1,116 saliva samples, isolated 1,110 DNA samples and genotyped 920 DNA samples using 30 SNP assays.
- Continued to merge available DNA results with survey data and started to analyze these results. This allowed for the preparation and review of the planned manuscripts by the study team.
- The study team also held a “Town Meeting” on May 20, 2017 at Geisinger’s Henry Hood Center in Danville, PA with ~90 patients who participated in the survey study. Preliminary study results were presented to the veterans and the study team administered an anonymous survey to obtain veterans' feedback to guide future study analyses.
- A poster submitted by Dr. Urosevich was accepted for the Annual Meeting of the American Optometric Association. The poster is entitled ***Concussive Effects (mTBI) in Veterans from the Iraq and Afghanistan Conflict Era in Relation to Other Physical and Psychological Health Problems***, which was chosen as one of the top 5 posters submitted to the conference.
- In addition, a brief (IRB approved) telephone survey was administered to 265 Iraq and Afghanistan veterans included in main baseline survey, to provide additional TBI data on this key study population. These data are being analyzed by the study team and a research paper is currently being prepared.

YEAR 3

Major Goal 4:

Quarter 1-

- Received 1140 saliva samples and have genotyped the DNA samples using 39 SNP assays.
- Continued to merge DNA results survey data and started to analyze these results.
- Three posters were presented at the International Society for Traumatic Stress Studies, Chicago, Illinois on November 9-11, 2017; 1.) ***Female Military Veterans’ Risk and Protective Factors in Predicting Overall Functioning: A Biomedical Sample of Outpatients from Geisinger Clinic*** (Figley, et al.); 2.) ***Mental Health Impact of Homecoming Experience among Deployed Veterans from the Vietnam War to Current Warzone Conflicts: Results from the Veterans’ Health Study*** (Boscarino, et al.); 3.) ***Risk and Protective Factors for Suicide among Formerly Deployed U.S. Service Members: Results from the Veterans’ Health Study*** (Boscarino, et al.)
- Response to formal comments submitted to DoD on November 21, 2017, based on Research Command Presentation & Review; Fort Detrick, MD, September 12-14, 2017.

Quarter 2-

- We received usable saliva samples from the veterans, isolated the DNA, and genotyped the genetic variants using SNP assay kits for these samples. The quality of the DNA was good. Generally, less than 2% of samples did not amplify properly. Genotype analyses continued on the remaining SNPs
- We then merged these DNA results with the survey data and started analyzing these results.
- We completed our follow-up data pull from Geisinger’s EHR system, using outpatient, inpatient and ED data. The data then began merging with the main survey data and the analyses began. A summary report of 40 different EHR health outcomes were previously sent to DoD.
- One poster was accepted for presentation at HCSRN Conference, Minneapolis, MN April 11-13, 2018: Hoffman, et al., ***Grapheme-color Synesthesia is Associated with PTSD: A Confirmation of Previous Findings and Research***.
- Three manuscripts were submitted to medical Journals: (1) Boscarino et al., ***Mental Health Impact of Homecoming Experience among 1,730 Formerly Deployed Veterans from the Vietnam War to Current Conflicts: Results from the Veterans’ Health Study***, *Journal of Nervous and Mental Disease*; (2) Urosevich et al. ***Visual Dysfunction and Associated Co-Morbidities as Predictors of Mild Traumatic Brain***, *Military Medicine*; (3) Adams et al., ***Veteran Identity as a Protective Factor against Suicide Ideation: Implications for Theory and Intervention***, *Journal of Traumatic Stress*.

- IRB approval was granted for administration of a supplemental survey that included questions omitted in the original survey due to length. This survey provides additional data related to mental health treatment outcomes, sleep disorders, and the effects of “burn pit” exposures during deployment.
- Data Analyses related to completion of Aims 3 and 4 begun.
- Year 3 Subtasks 3-6 were started.

Quarter 3-

- We continued to merge these DNA results with survey data and analyzing these results.
- One poster was presented at HCSRN Conference, Minneapolis, MN April 11-13, 2018: Hoffman, et al., *Grapheme-color Synesthesia is Associated with PTSD: A Confirmation of Previous Findings and Research*.
- Two manuscripts were resubmitted to the medical Journals: (1) Boscarino et al., *Mental Health Impact of Homecoming Experience among 1,730 Formerly Deployed Veterans from the Vietnam War to Current Conflicts: Results from the Veterans’ Health Study*, *Journal of Nervous and Mental Disease*; (2) Adams et al., *Veteran Identity as a Protective Factor against Suicide Ideation: Implications for Theory and Intervention*, *Traumatology*.
- One manuscript has been published: Urosevich et al. *Visual Dysfunction and associated comorbidities as predictors of mild Traumatic Brain*, *Military Medicine* and another one was accepted for publication: Boscarino et al., *Mental Health Impact of Homecoming Experience among 1,730 Formerly Deployed Veterans from the Vietnam War to Current Conflicts: Results from the Veterans’ Health Study*, *Journal of Nervous and Mental Disease*.
- National Guard Outcomes, Suicide, Substance Use, and Treatment Outcome papers were currently in progress
- IRB approval was granted for administration of a supplemental survey that included questions omitted in the original survey due to length. The supplemental survey provided additional data related to mental health treatments, sleep disorders, and the health effects of “burn pit” exposures during deployment.
- Data Analyses related to completion of Aims 3 and 4 continued.
- Annual US Army Research Command Presentation & Review; Fort Detrick, MD, was completed by Dr. Boscarino on September 28, 2018.

YEAR 4

Major Goal 4:

Quarter 1-

- DNA results have been merged with survey data and we are analyzing these results.
- Two abstracts were submitted for the HCSRN Conference, Portland, OR on April 8-10, 2019: Hu, et al., *Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors* and Boscarino, et al., *Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in non-VA Facilities*
- Data Analyses related to completion of Aims 3 and 4 continued.
- Year 3 Subtasks 3-6 continued.
- A No Cost Extension (NCE) for the final study year was approved.

Quarter 2-

- DNA results have been merged with survey data and we are analyzing these results.
- Two posters were accepted for the HCSRN Conference, Portland, OR on April 8-10, 2019: Hu, et al., *Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors* and Boscarino JJ, et al., *Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in non-VA Facilities*
- Three papers were submitted for peer review during this period:

Adams, et al, *Social and Psychological Risk and Protective Factors for Veteran Well-Being: The Role of Veteran Identity and Its Implications for Intervention*, Military Behavioral Health (accepted).

Boscarino et. al, *Guard/Reserve Service Members and Mental Health Outcomes following Deployment: Results from the Veterans' Health Study*, Hospital General Psychiatry (accepted).
Adams et al., *Risk and Protective Factors Associated Mental Health among Female Military Veterans: Results from the Veterans' Health Study*. Psychological Trauma (BMC Women's Health).

- Data Analyses related to completion of Aims 3 and 4 processed.
- Year 3 Subtasks 3-6 are currently progressed.

Quarter 3-

- DNA results have been merged with survey data and we are analyzing these results.
- Two posters were presented at the HCSRN Conference, Portland, OR on April 8-10, 2019: Hu, et al., *Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors*. Boscarino, et al., *Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in non-VA Facilities*.
- Two papers were submitted for peer review during this period:
Adams, et al., *Social and Psychological Risk and Protective Factors for Veteran Well-Being: The Role of Veteran Identity and Its Implications for Intervention*, Military Behavioral Health (accepted).
Boscarino, et al., *Guard/Reserve Service Members and Mental Health Outcomes following Deployment: Results from the Veterans' Health Study*, Hospital General Psychiatry (accepted).

Year 5

Quarter 1-

- DNA results have been merged with survey data and we are analyzing these results.
- Three papers were submitted for peer review during this period:
Predictors of Current DSM-5 PTSD diagnosis and Symptom Severity among Deployed Veterans: Significance of Predisposition, Stress Exposure, and Genetics, Neuropsychiatric Disease and Treatment (accepted)
Differences in Mental Health Outcomes for Rural Versus Non-Rural Veterans: Results from the Veterans' Health Study (resubmitted to *Military Medical Research*) and *Risk and Protective Factors associated with Mental Health among Female Military Veterans* (Submitted to *BMC Women's Health* and under review)
- Currently, treatment, burn-pit exposure, and suicide papers are being drafted and finalized for submission to medical journals next month (in progress).

Quarter 2-

- DNA results have been merged with survey data and we are analyzing these results.
- Four papers were submitted for peer review during this period:
Risk and Protective Factors for Suicide among Veterans Seen in Non-VA Hospitals: Results from the Veterans' Health Study (submitted to *Journal of Nervous and Mental Disease* for peer review)
Differences in Mental Health Outcomes for Rural Versus Non-Rural Veterans: Results from the Veterans' Health Study (submitted to *Military Medical Research*)
Risk and Protective Factors Associated Mental Health among Female Military Veterans: Results from the Veterans' Health Study (resubmitted to *BMC Women's Health*)
- Alcohol and Misuse paper being prepared for submission and peer review
- PTSD treatment paper being prepared for submission and peer review
- Data Analyses related to completion of Aims 3 and 4 in process.

Quarter 3-

- **Risk and Protective Factors for Suicide among Veterans Seen in Non-VA Hospitals: Results from the Veterans' Health Study** was submitted to Journal of Nervous and Mental Disease for peer review
- **Differences in Mental Health Outcomes for Rural Versus Non-Rural Veterans: Results from the Veterans' Health Study** was submitted to Journal of Nervous and Mental Disease for peer review
- **Differences in Mental Health Outcomes for Rural Versus Non-Rural Veterans: Results from the Veterans' Health Study** was resubmitted to Military Medical Research
- **Risk and Protective Factors Associated Mental Health among Female Military Veterans: Results from the Veterans' Health Study** was resubmitted for peer review to BMC Women's Health
- **Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans** was submitted to The Permanente Journal
- Alcohol misuse and Comorbidity papers in preparation for peer review submission.

Yearly Patient Enrollment

Table 1. (actual)	Year 2*			
Target Survey Enrollment (per quarter)	Q1	Q2	Q3	Q4
Target Enrollment (cumulative)	1600	1800	1800	1800

*Due to recruitment difficulties, only 1,730 total veterans were recruited by end of Q2 in Year 2, after which recruitment was stopped.

▪ **What opportunities for training and professional development has the project provided?**

2017:

- Junior staff members and students were able to participate in poster presentations and manuscript preparations. A total of 8 posters were submitted and 3 manuscripts from the pilot study were submitted for peer review. A graduate student (Joseph J Boscarino) also assisted with manuscript preparation.

2018:

- Dr. Hoffman and Dr. Figley participated in poster presentations, as well as junior staff

▪ **How were the results disseminated to communities of interest?**

2017:

- The study team held a "Town Hall" meeting on May 20th, 2017 at Geisinger's Henry Hood Center in Danville, PA with patients who participated in the study. The purpose of this meeting was to present preliminary results to veterans and to receive their feedback. A Veterans' Health Study website was established but no longer supported by the organization.
- 8 posters were presented

2018:

- Two publications were accepted for publication
- Four posters were presented

2019:

- Two posters were presented

▪ **What do you plan to do during the next reporting period to accomplish the goals?**

The study is complete; Final DoD Study report is in progress.

4. IMPACT:

▪ **What was the impact on the development of the principal discipline(s) of the project?**

Nothing to Report.

▪ **What was the impact on other disciplines?**

Nothing to Report.

▪ **What was the impact on technology transfer?**

Nothing to Report.

▪ **What was the impact on society beyond science and technology?**

2017:

- Through a local-town hall meeting held in May 2017, at Geisinger's Center for Health Research in Danville, PA, Veterans within the Geisinger's service area were made aware of the study, as were the offices of Pennsylvania's Department of Veterans Affairs and local VA services representatives.
- Media coverage related to the study was also disseminated in the local and regional press.

5. CHANGES/PROBLEMS: There were no substantive changes through Years 1-5. However, the main problem faced related recruitment of Guard/Reserve service members.

▪ **Changes in approach and reasons for change:**

2016:

- After conducting the EHR data pull screening by phone, it was discovered that the sample size for veterans who have served in the National Guard or Reserves during or after 2001 in the Global War on Terror and were actually deployed, was smaller than anticipated. To address this issue, we directly contacted patients utilizing a study specific email that directed them to a brief online eligibility survey for patients with Geisinger who may have been missed in the veteran's database. The eligibility survey was also available on mygeisinger.org. Patients could voluntarily take the survey which would screen them for study eligibility. The eligible sample was reviewed to avoid duplication and new patients were then enrolled into the study. The additional recruitment step was approved by the Geisinger IRB. We also recruited additional National Guard/Reserve veterans by emailing patients in the top 20 populated veteran zip codes to direct them the mygeisinger.org survey. Both of the additional recruitment steps were sent to the HRPO contact and determined that additional approval was not needed by the DoD.

2017:

- With Geisinger IRB approval, we posted Guard/Reserve recruitment notifications on the mygeisinger.org portal and contacted local veterans' service representatives at local colleges in order to identify additional Guard/Reserve service members. These efforts resulted in the identification of several hundred additional Guard/Reserve service members.

2018:

- With DoD and Geisinger IRB approval, we administered an additional survey asking patients questions we omitted from the original survey due to survey length. We will continue analyses of these data and the dissemination of findings through conference presentations and research publications.

2019:

- With DoD and Geisinger IRB approval, we administered an additional telephone survey asking patients questions we omitted from the original survey due to length. We will continue the collection of remaining DNA samples via US mail. We also plan to continue genotyping of SNPs and to begin our biomedical data pulls from the EHR for this study. We will continue analyses of these data and the dissemination findings through conference presentations and research publications.

▪ **Actual or anticipated problems or delays and actions or plans to resolve them.**

2016:

- Recruiting additional National Guard/reserve veterans to reach our originally planned sample size.

Action taken:

1. Reached out to leaders of student veteran organizations at over 30 colleges and universities in the central and northeastern PA areas to help with recruitment of the National Guard/Reserve cohort. They were then directed to the mygeisinger.org website and were screened for enrollment in the study
 2. A Town Hall was planned and executed to increase the community awareness about the study and facilitate recruitment.
- Poor quality DNA samples submitted by participants or DNA samples not returned

Action taken:

1. Re-contacted participants via phone and mail with additional instructions to request another sample.

2017-2019:

- The difficulty in the recruitment of Guard/Reserve service members has delayed our data analyses. We planned on adding additional data analysis staff and were granted two no cost extensions.

2020:

- The outbreak of COVID-19 disease in early 2020 within Geisinger Clinic (we have over 17,000 positive cases to date) prevented us from holding our final “Town-hall” veterans meeting in the Spring of 2020, so this meeting was cancelled. In addition, all research staff were sent home to work remotely.

▪ **Changes that had a significant impact on expenditures**

2017-2019:

- Due to data collection delays, our budget was underspent and we were able to extend the grant time with two no cost extensions.

2020:

- The cancellation of the Town-hall meeting in 2020 resulted in a reduction in study cost, but this was offset by a drop in productivity due to transferring all research staff to work remotely. In addition, due to COVID-19, our final papers submitted for peer review took much longer to be reviewed, resulting in reduction of publication productivity. Consequently, we have several final papers currently in production.

▪ **Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents:**

Nothing to Report

▪ **Significant changes in use or care of human subjects:**

Nothing to Report

▪ **Significant changes in use or care of vertebrate animals:**

Nothing to Report

▪ **Significant changes in use of biohazards and/or select agents:**

Nothing to Report

6. PRODUCTS:

▪ **Publications, conference papers, and presentations**

Journal publications.

2016:

Posters Presented:

- Boscarino, et al., “Mental Health Disorders and Treatment seeking among Veterans in Non-VA Facilities: Results and Implications from the Veterans’ Health Study.” Annual Meeting of the International Society of Traumatic Stress Studies, New Orleans, LA, November, 5, 2015.
- Boscarino, et al., “Mental Health Disorders and Treatment seeking among Formerly Deployed National Guard and Reserve Service Members.” Annual Meeting of the Society of Federal Health Professionals Annual Meeting, National Harbor, MD, November 29, 2016.

2017:

Posters Presented:

- Boscarino, et al., “Alcohol Misuse among Formerly Deployed U.S. Service Members seen Non-VA Facilities: Results from the Veterans’ Cohort Study”. Annual Meeting of the Health Care Systems Research conference in San Diego, CA, March 21, 2017.

- Hyacinthe, et al., “Post-Deployment Mental Health Status and Obesity among a Multi-Generational Sample of U.S. Veterans”. Annual Meeting of the Health Care Systems Research Conference in San Diego, CA, March 21, 2017.
- Figley, et al., “Is Living in Rural Areas a Risk Factor for Veteran’s Mental Health Status?” 2017 Annual Meeting of the American Psychological Association in Washington, D.C., August 3, 2017.
- Urosevich, et al., “Concussive Effects (mTBI) in Veterans from the Iraq and Afghanistan Conflict Era in Relation to Other Physical and Psychological Health Problems” Annual Meeting of the American Optometric Association in Washington, D.C., June 23, 2017. (chosen as one of the top 5 posters submitted to the conference)
- Figley, et al., “Female Military Veterans’ Risk and Protective Factors in Predicting Overall Functioning: A Biomedical Sample of Outpatients from Geisinger Clinic” Annual Meeting of the International Society for Traumatic Stress Studies in Chicago, IL, November 9, 2017.
- Boscarino, et al., “Risk and Protective Factors for Suicide among Deployed Veterans from the Vietnam War to Current Warzone Conflicts: Results from the Veterans’ Health Study” Annual Meeting of the International Society for Traumatic Stress Studies in Chicago, IL, November 10, 2017.

Publications:

- Adams, et al., Social Support, Coping Resources, Mental Health Problems, and Treatment Seeking among Veterans in Non-VA Facilities: Results from the Veteran’s Health Study. *Military Behavioral Health*, 2017
- Lent, et al., Attitudes about Future Genetic Testing for Posttraumatic Stress Disorder and Addiction and among Community-based Veterans. *Frontiers in Psychiatry: Behavioral and Psychiatry Genetics*, 2017.

2018:

Posters Presented:

- Hoffman, et al., “Grapheme-color Synesthesia is Associated with PTSD: A Confirmation of Previous Findings and Research”. Annual Meeting of the HCSRN Conference in Minneapolis, MN, April 11-13, 2018.

Publications:

- Urosevich, et al., Visual Dysfunction and associated co-morbidities as predictors of mild Traumatic Brain Injury seen among Veterans in Non-VA Facilities: Implications for Clinical Practice *Military Medicine*, 2018
- Boscarino, et al., Mental Health Impact of Homecoming Experience among 1,730 Deployed Veterans from the Vietnam War to Current Conflicts: Results from the Veterans’ Health Study *Journal of Nervous of Mental Disease*, 2018

2019:

Posters Presented:

- Hu, et al., “Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors” Annual Meeting of the HCSRN in Portland, OR, April 8-10, 2019.
- Boscarino, et al., “Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in Non-VA Facilities” Annual Meeting of HCSRN in Portland, OR, April 8-10, 2019.

Publications:

- Hoffman, et al., Grapheme-Color Synesthesia is Associated with PTSD Among Deployed Veterans: Confirmation of Previous Findings and Need for Additional Research, *International Journal of Emergency Mental Health*, 2019
- Adams, et al., Social and Psychological Risk and Protective Factors for Veteran Well-Being: The Role of Veteran Identity and Its Implications for Intervention, *Military Behavioral Health*, 2019
- Boscarino, et al., Guard/Reserve Service Members and Mental Health Outcomes following Deployment: Results from the Veterans’ Health Study, *Hospital General Psychiatry*, 2019

2020:

Publications:

- Predictors of Current DSM-5 PTSD diagnosis and Symptom Severity among Deployed Veterans Significance of Predisposition, Stress Exposure, and Genetics, *Neuropsychiatric Disease and Treatment*, 2020
 - Boscarino, et al., Mental Health Status in Veterans residing in Rural Versus Non-Rural Areas: Results from the Veterans' Health Study, *Military Medical Research*, 2020
 - Boscarino, et al., Guard/Reserve service members and mental health outcomes following deployment: Results from the Veterans' Health Study, *General Hospital Psychiatry*, 2020
- **Books or other non-periodical, one-time publications.**
Nothing to Report
 - **Other publications, conference papers, and presentations.**
2016:
Posters Presented:
 - Boscarino, et al., "Mental Health Disorders and Treatment seeking among Veterans in Non-VA Facilities: Results and Implications from the Veterans' Health Study". Annual Meeting of the International Society of Traumatic Stress Studies, New Orleans, LA, November, 5, 2015.
 - Boscarino, et al., "Mental Health Disorders and Treatment seeking among Formerly Deployed National Guard and Reserve Service Members". Annual Meeting of the Society of Federal Health Professionals Annual Meeting, National Harbor, MD, November 29, 2016.
 2017:
Posters Presented:
 - Boscarino, et al., "Alcohol Misuse among Formerly Deployed U.S. Service Members seen Non-VA Facilities: Results from the Veterans' Cohort Study". Annual Health Care Systems Research conference in San Diego, CA, March 21, 2017.
 - Hyacinthe, et al., "Post-Deployment Mental Health Status and Obesity among a Multi-Generational Sample of U.S. Veterans". Annual Health Care Systems Research Conference in San Diego, CA, March 21, 2017.
 - Figley, et al., "Is Living in Rural Areas a Risk Factor for Veteran's Mental Health Status?" American Psychological Association Annual Convention in Washington, D.C., August 3, 2017.
 - Urosevich, et al., "Concussive Effects (mTBI) in Veterans from the Iraq and Afghanistan Conflict Era in Relation to Other Physical and Psychological Health Problems" Annual Meeting of the American Optometric Association in Washington, D.C., June 23, 2017. (chosen as one of the top 5 posters submitted to the conference)
 - Figley, et al., "Female Military Veterans' Risk and Protective Factors in Predicting Overall Functioning: A Biomedical Sample of Outpatients from Geisinger Clinic" International Society for Traumatic Stress Studies in Chicago, IL, November 9, 2017.
 - Boscarino, et al., "Risk and Protective Factors for Suicide among Deployed Veterans from the Vietnam War to Current Warzone Conflicts: Results from the Veterans' Health Study" Annual meeting of International Society for Traumatic Stress Studies in Chicago, IL, November 10, 2017.
 Publications:
 - Adams, et al., Social Support, Coping Resources, Mental Health Problems, and Treatment Seeking among Veterans in Non-VA Facilities: Results from the Veteran's Health Study. *Military Behavioral Health*, 2017
 - Lent, et al., Attitudes about Future Genetic Testing for Posttraumatic Stress Disorder and Addiction and among Community-based Veterans. *Frontiers in Psychiatry: Behavioral and Psychiatry Genetics*, 2017
 2018:
Posters Presented:
 - Hoffman, et al., "Grapheme-color Synesthesia is Associated with PTSD: A Confirmation of Previous Findings and Research". Annual HCSRN Conference in Minneapolis, MN, April 11-13, 2018.
 Publications:
 - Urosevich, et al., Visual Dysfunction and associated co-morbidities as predictors of mild Traumatic Brain Injury seen among Veterans in Non-VA Facilities: Implications for Clinical Practice Military Medicine *Military Medicine*, 2018
 - Boscarino, et al., Mental Health Impact of Homecoming Experience among 1,730 Deployed

2019:

Posters Presented:

- Hu, et al., "Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors" Annual HCSRN Conf in Portland, OR, April 18-10, 2019.
- Boscarino, et al., "Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in Non-VA Facilities" HCSRN Conference in Portland, OR, April 8-10, 2019.

Publications:

- Hoffman, et al., Grapheme-Color Synesthesia is Associated with PTSD Among Deployed Veterans: Confirmation of Previous Findings and Need for Additional Research, *International Journal of Emergency Mental Health and Human Resilience*, 2019.
- Adams, et al., Social and Psychological Risk and Protective Factors for Veteran Well-Being: The Role of Veteran Identity and Its Implications for Intervention, *Military Behavioral Health*, 2019
- Boscarino, et al., Guard/Reserve Service Members and Mental Health Outcomes following Deployment: Results from the Veterans' Health Study, *Hospital General Psychiatry*, 2019

2020:

Publications:

- Predictors of Current DSM-5 PTSD diagnosis and Symptom Severity among Deployed Veterans Significance of Predisposition, Stress Exposure, and Genetics, *Neuropsychiatric Disease and Treatment*, 2020
- Boscarino, et al., Mental Health Status in Veterans residing in Rural Versus Non-Rural Areas: Results from the Veterans' Health Study, *Military Medical Research*, 2020
- Boscarino, et al., Guard/Reserve service members and mental health outcomes following deployment: Results from the Veterans' Health Study, *General Hospital Psychiatry*, 2020

▪ **Final journal publications that were *in-direct* DoD products from Geisinger's pilot study**

Publications:

2015-2017

- Lent MR, Hoffman SN, Kirchner HL, Urosevich TG, Boscarino JJ, Boscarino JA. Attitudes about Future Genetic Testing for Posttraumatic Stress Disorder and Addiction among Community-Based Veterans. *Front Psychiatry*. 2017 May 15; 8:76. doi: 10.3389/fpsy.2017.00076. PMID: 28555114; PMCID: PMC5430945.
- Adams RE, Urosevich TG, Hoffman SN, Kirchner HL, Hyacinthe JC, Figley CR, Boscarino JJ, Boscarino JA. Social Support, Help-Seeking, and Mental Health Outcomes Among Veterans in Non-VA Facilities: Results from the Veterans' Health Study. *Mil Behav Health*. 2017;5(4):393-405. doi: 10.1080/21635781.2017.1333067. Epub 2017 May 19. PMID: 29098116; PMCID: PMC5663244.
- Boscarino JA, Hoffman SN, Pitcavage JM, Urosevich TG. Mental Health Disorders and Treatment Seeking Among Veterans in Non-VA Facilities: Results and Implications from the Veterans' Health Study. *Mil Behav Health*. 2015;3(4):244-254. doi: 10.1080/21635781.2015.1077179. PMID: 26640743; PMCID: PMC4669573.
- Boscarino JA, Boscarino JJ. Conceptualization of PTSD from the Vietnam War to Current Conflicts and Beyond. *Int J Emerg Ment Health*. 2015;17(3):661-663. doi: 10.4172/1522-4821.1000278. PMID: 26568701 Free PMC article.

▪ **Final journal publications that were *direct* products from Geisinger's DoD study**

Publications:

2015-2020

- Boscarino JJ, Figley CR, Adams RE, Urosevich TG, Kirchner HL, Boscarino JA. Mental health status in veterans residing in rural versus non-rural areas: results from the veterans' health study. *Mil Med Res*. 2020 Sep 21;7(1):44. doi: 10.1186/s40779-020-00272-6. PMID: 32951600; PMCID: PMC7504679.

- Hu Y, Chu X, Urosevich TG, Hoffman SN, Kirchner HL, Adams RE, Dugan RJ, Boscarino JJ, Shi W, Withey CA, Figley CR, Boscarino JA. Predictors of Current DSM-5 PTSD Diagnosis and Symptom Severity Among Deployed Veterans: Significance of Predisposition, Stress Exposure, and Genetics. *Neuropsychiatry Dis Treat*. 2020 Jan 8; 16:43-54. doi: 10.2147/NDT.S228802. PMID: 32021198; PMCID: PMC6956712.
- Boscarino JA, Adams RE, Urosevich TG, Hoffman SN, Kirchner HL, Dugan RJ, Boscarino JJ, Withey CA, Figley CR. Guard/Reserve service members and mental health outcomes following deployment: Results from the Veterans' Health Study. *Gen Hosp Psychiatry*. 2020 Jan-Feb; 62:102-103. doi: 10.1016/j.genhosppsy.2019.03.002. Epub 2019 Mar 15. PMID: 30910352.
- Adams RE, Urosevich TG, Hoffman SN, Kirchner HL, Figley CR, Withey CA, Boscarino JJ, Dugan RJ, Boscarino JA. Social and Psychological Risk and Protective Factors for Veteran Well-Being: The Role of Veteran Identity and Its Implications for Intervention. *Mil Behav Health*. 2019;7(3):304-314. doi: 10.1080/21635781.2019.1580642. Epub 2019 Mar 12. PMID: 31363423; PMCID: PMC6666406.
- Hoffman SN, Urosevich TG, Kirchner HL, Boscarino JJ, Dugan RJ, Withey CA, Adams RE, Figley CR, Boscarino JA. Grapheme-Color Synesthesia is Associated with PTSD Among Deployed Veterans: Confirmation of Previous Findings and Need for Additional Research. *Int J Emerg Ment Health*. 2019;21(1): <https://www.omicsonline.org/open-access/graphemecolor-synesthesia-is-associated-with-ptsd-among-deployed-veterans-confirmation-of-previous-findings-and-need-for-additiona-1522-4821-108513.html>. PMID: 31285710; PMCID: PMC6613655.
- Urosevich TG, Boscarino JJ, Hoffman SN, Kirchner HL, Figley CR, Adams RE, Withey CA, Boscarino JA. Visual Dysfunction and Associated Co-morbidities as Predictors of Mild Traumatic Brain Injury Seen Among Veterans in Non-VA Facilities: Implications for Clinical Practice. *Mil Med*. 2018 Nov 1;183(11-12): e564-e570. doi: 10.1093/milmed/usy102. PMID: 29800265; PMCID: PMC6262209.
- Boscarino JA, Adams RE, Urosevich TG, Hoffman SN, Kirchner HL, Boscarino JJ, Withey CA, Dugan RJ, Figley CR. Mental Health Impact of Homecoming Experience Among 1730 Formerly Deployed Veterans from the Vietnam War to Current Conflicts: Results from the Veterans' Health Study. *J Nerv Ment Dis*. 2018 Oct;206(10):757-764. doi: 10.1097/NMD.0000000000000879. PMID: 30273271; PMCID: PMC6171364.

▪ **Final posters that were direct products from Geisinger's DoD study**

Posters:

2015-2020

- Boscarino, et al., "Mental Health Disorders and Treatment seeking among Veterans in Non-VA Facilities: Results and Implications from the Veterans' Health Study." Annual Meeting of the International Society of Traumatic Stress Studies, New Orleans, LA, November 5, 2015.
- Boscarino, et al., "Mental Health Disorders and Treatment seeking among Formerly Deployed National Guard and Reserve Service Members." Annual Meeting of the Society of Federal Health Professionals Annual Meeting, National Harbor, MD, November 29, 2016.
- Boscarino, et al., "Alcohol Misuse among Formerly Deployed U.S. Service Members seen Non-VA Facilities: Results from the Veterans' Cohort Study". Annual Health Care Systems Research conference in San Diego, CA, March 21, 2017.
- Hyacinthe, et al., "Post-Deployment Mental Health Status and Obesity among a Multi-Generational Sample of U.S. Veterans". Annual Health Care Systems Research Conference in San Diego, CA, March 21, 2017.
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- Boscarino, et al., “Risk and Protective Factors for Suicide among Deployed Veterans from the Vietnam War to Current Warzone Conflicts: Results from the Veterans’ Health Study” Annual meeting of International Society for Traumatic Stress Studies in Chicago, IL, November 10, 2017.
 - Hoffman, et al., “Grapheme-color Synesthesia is Associated with PTSD: A Confirmation of Previous Findings and Research”. Annual HCSRN Conference in Minneapolis, MN, April 11-13, 2018.
 - Hu, et al., “Predictors of Current PTSD among Deployed Veterans: Significance of Predisposition, Stress Exposures, and Genetic Factors” Annual HCSRN Conference in Portland, OR, April8-10, 2019.
 - Boscarino, et al., “Predictors of Post-deployment Mental Health Treatment-seeking among Iraq and Afghanistan Veterans Seen in Non-VA Facilities” HCSRN Conference in Portland, OR, April8-10, 2019.
- **Temporary Website for DoD/Veteran Study Findings:** <https://www.geisinger.edu/research/research-and-innovation/find-an-investigator/2018/04/04/13/27/joe-boscarino>
(Final website for final DoD research products is currently being explored.)
 - **Technologies or techniques**
Nothing to Report
 - **Inventions, patent applications, and/or licenses**
Nothing to Report
 - **Other Products**
See in-direct product publications from pilot study listed above. Additional DoD/NIH Grants are being planned to continue this research.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

- **Individuals have worked on the project***

Name:	Joseph A. Boscarino
Project Role:	<i>Principle Investigator, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	60
Contribution to Project:	<i>Wrote study application, secured study funding, directed overall study execution, monitored study progress and budget, prepared and reviews study presentations and manuscripts for dissemination. Traveled to regional/national professional meeting to present study results.</i>
Name:	Charles Figley
Project Role:	<i>Co-Investigator, Tulane University</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	59
Contribution to Project:	<i>Participated in conference calls and personal meetings with PI to discuss study measurements, data analysis, conceptual focus, coordination of IRB approval with Tulane University's IRB, and review of data collection instruments for current study. Prepared and reviews draft manuscripts and presentations related to study. Traveled to regional/national professional meetings to present study results.</i>
Name:	Richard Adams
Project Role:	<i>Co-Investigator, Kent State University</i>
Researcher Identifier (e.g. ORCID ID):	N/A

Nearest person month worked:	59
Contribution to Project:	Participated in conference calls and personal meetings with Study PI to discuss planned study measurements, data analysis, conceptual focus of study, coordination of IRB approval with Kent State's IRB, and review of data collection instruments planned for current study. Prepared and reviewed draft manuscripts and presentations related to study findings. <i>Traveled to regional/national professional meetings to present study results.</i>
Name:	Thomas Urosevich
Project Role:	<i>Co-Investigator, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	59
Contribution to Project:	Participated in conference calls and personal meetings with PI to discuss planned study measurements, data analysis, conceptual focus of study, identification genotypes for study, and identification of key TBI measures to be used in study. Prepared and reviewed draft manuscripts and presentations related to study findings. <i>Traveled to regional/national professional meetings to present study results.</i>
Name:	Stuart Hoffman
Project Role:	<i>Co-Investigator/Neuroscience Consultant</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	59
Contribution to Project:	Participated in conference calls and personal meetings with PI to discuss planned study measurements, data analysis, conceptual focus of study, identification of key genotypes for study, and identification of key neurological and sleep disturbance measures to be used in study. Prepared and reviewed draft manuscripts and presentations related to study findings.
Name:	H. Lester Kirchner
Project Role:	<i>Co-Investigator, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	59
Contribution to Project:	Contribution to Project: Consulted with Study PI regarding biostatistics, study database, and data dictionary planned for study, and met with his study staff assigned to the project. Prepared and reviewed draft manuscripts and presentations related to study findings.
Name:	Xin Chu
Project Role:	<i>Genetic Consultant, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	46
Contribution to Project:	Ordered Inventory of needed supplies and assays for study and oversaw the genotyping and bio-banking of DNA being collected for study. Reviewed draft manuscripts and presentations related to study findings.
Name:	Carrie Withey
Project Role:	<i>Project Manager, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	37

Contribution to Project:	Application and document preparation, regulatory compliance, budgeting, and operational management of study. Prepared and reviewed draft manuscripts and presentations related to study findings.
Name:	Yirui Hu
Project Role:	<i>Biostatistician</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	28
Contribution to Project:	Conducted biostatistical analyses for this study, prepares and reviews draft manuscripts, and presentations related to study findings.
Name:	Johanna Hyacinthe
Project Role:	<i>Former Project Manager, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	18
Contribution to Project:	Application and document preparation, regulatory compliance, budgeting, and operational management of study. Prepares and reviews draft manuscripts and presentations related to study findings. Traveled to regional/national professional meetings to present study results.
Name:	James Pitcavage
Project Role:	<i>Former Project Manager, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	3
Contribution to Project:	Completed study IRB application and document preparation, regulatory compliance, budgeting, and operational management of study.
Name:	Eric Snover
Project Role:	<i>Former Research Assistant, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	6
Contribution to Project:	Did study mailings, mailed and tracks study incentives, DNA kits, consent forms, etc. and was responsible for overall tracking of patient participation. Assisted with the daily operations of study.
Name:	Brielle Evans
Project Role:	<i>Former Research Assistant, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID):	N/A
Nearest person month worked:	4
Contribution to Project:	Mailed of incentives, DNA kits, consent forms, etc. and was responsible for overall tracking of patient participation. Assisted with the daily operations of study.
Name:	Melinda Hatt
Project Role:	<i>Former Research Assistant, Geisinger Clinic</i>

Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	4
Contribution to Project:	Mailed incentives, DNA kits, consent forms, etc. and was responsible for overall tracking of patient participation. Assisted with the daily operations of study.
Name:	Jared Pajovich
Project Role:	<i>Former Research Assistant, Geisinger Clinic</i>
Researcher Identifier (e.g. ORCID ID)	N/A
Nearest person month worked:	11
Contribution to Project:	Completed Certificate of Confidentiality application, mailed incentives, DNA kits, consent forms, etc. and was responsible for overall tracking of patient participation. Assisted with the daily operations of study.

***Joseph J. Boscarino, Doctoral Student, William James College, Newton, MA, also served as a Graduate Student volunteer on this project and assisted in proofing, editing and submission of final manuscripts.**

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?

Nothing to Report

- **What other organizations were involved as partners?**

Nothing to Report

- **Future research planned?**

Future research studies planned include COVID-19 outcomes studies and additional genetic research studies among study veterans. Applications have been submitted in 2020 and others are planned.

8. SPECIAL REPORTING REQUIREMENTS

- **QUAD CHART:** *Submitted as an attachment*

9. APPENDICES

- **Final Research Products:** *Submitted as attachments*