

AWARD NUMBER: W81XWH-07-1-0409

TITLE: Risk and Resilience Factors for Combat-Related
Posttraumatic Psychopathology and Post Combat Adjustment

PRINCIPAL INVESTIGATOR: Joseph R. Calabrese, MD

CONTRACTING ORGANIZATION:
University Hospitals of Cleveland
Cleveland, Ohio 44106

REPORT DATE: June 2010

TYPE OF REPORT: Annual

PREPARED FOR:
U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

DISTRIBUTION STATEMENT:

Approved for public release; distribution unlimited



The views, opinions and/or findings contained in this report are
☐ those of the author(s) and should not be construed as an official
Department of the Army position, policy or decision unless so
designated by other documentation.

REPORT DOCUMENTATION PAGE				<i>Form Approved</i> OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.					
1. REPORT DATE (DD-MM-YYYY) 01 June 2010		2. REPORT TYPE Annual		3. DATES COVERED (From - To) 7 MAY 2009 - 6 MAY 2010	
4. TITLE AND SUBTITLE Risk and Resilience Factors for Combat-Related Posttraumatic Psychopathology and Post Combat Adjustment				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER W81XWH-07-1-0409	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Calabrese, Joseph, R., M.D. email: joseph.calabrese@uhhs.com Tamburrino, Marijo, M.D. Galea, Sandro, M.D., DrPH				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University Hospitals of Cleveland Cleveland, OH 44106-5000				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research And Materiel Command Fort Detrick, MD 21702-5012				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT The general objective of the Kaptur Combat Mental Health Initiative is to support a series of projects that evaluate the relationships between resilience and risk factors, both cross-sectionally and longitudinally, before, during, and after deployment in the Ohio Army National Guard. The primary project collects long-term data on a random representative sample of up to 3,000 service members of the OANG, both treatment seeking and non-treatment seeking. Research visits are conducted at study entry and every 12 months for 10 years. In clinical re-appraisal, we found that the telephone assessments have good validity and reliability with excellent specificity (range 0.97 to 0.72). Analyses on the baseline data are currently being conducted with the primary goal of 7 publications. The key accomplishments of this project over the past year include finishing the first year of data collection in November 2009 and immediately starting Year 2. During the first year, 2,616 participants were enrolled in the Telephone Survey, and 500 were enrolled in the In-Person Survey. As of 5/6/2010, 1119 Year 2 Telephone Surveys have been completed, and 155 In-Person Surveys. The Genetics Repository component collects a saliva sample from consenting participants in the main project, and obtained final regulatory approval on 3/16/2010. Recruitment began May 3, 2010, with an 84% acceptance rate. .					
15. SUBJECT TERMS Risk, Resilience, Combat, Posttraumatic Stress Disorder, Ohio National Guard, Mental Health, Genetics					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 123	19a. NAME OF RESPONSIBLE PERSON USAMRMC
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U			19b. TELEPHONE NUMBER (include area code)

Kaptur Combat Mental Health Initiative

Risk and Resilience Factors for Combat-Related Posttraumatic Psychopathology and Post Combat Adjustment

Annual Report, June 2010

Table of Contents

	<u>Page</u>
Introduction.....	4
Body.....	4 - 12
Key Research Accomplishments.....	12
Reportable Outcomes.....	12 - 14
Conclusion.....	14
References.....	14
Appendices.....	15 - 123

Kaptur Combat Mental Health Initiative

Risk and Resilience Factors for Combat-Related Posttraumatic Psychopathology and Post Combat Adjustment

Annual Report, June 2010

INTRODUCTION

Previously conducted research has demonstrated that deployment accompanied by combat experience results in increased risk of posttraumatic psychopathology and other mental health conditions. The general objective of the Kaptur Combat Mental Health Initiative is to create a research infrastructure capable of supporting a series of projects that evaluate the relationships between resilience and risk factors, both cross-sectionally and longitudinally, before, during, and after deployment. The primary project will collect long-term data on a random representative sample of up to 3,000 service members of the Ohio Army National Guard, both treatment seeking and non-treatment seeking. Research visits will be conducted at study entry and every 12 months for a minimum of 10 years. The Telephone Survey will be completed on all main project participants, and 500 of these participants will also have an in-depth In-Person Survey on an annual basis for the duration of the study. The Genetics Repository component collects a DNA saliva sample from consenting participants in the main project. The Initiative is overseen by the leadership of the Ohio National Guard, the Office of Congresswoman Marcy Kaptur, the Military Operational Medicine Research Program, and the Telemedicine and Advanced Technologies Research Center.

BODY

The Initiative is designed to study the relationships between 1) pre-existing mental illness/substance use disorders, 2) deployment to Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF), and 3) post-deployment related mental health and overall psychosocial adjustment and functioning. The study will evaluate several groups of the Ohio Army National Guard: those deployed to OIF (Iraq, Kuwait, or Qatar), those deployed OEF (Afghanistan), those deployed to other theaters (Bosnia, Turkey, Uzbekistan, Kosovo, on a ship, or other), those deployed domestically, and those not deployed.

Project #1 (main cohort – Telephone Survey and In-Person Survey) and Project #2 (Genetics component) are currently ongoing. Future projects, dependent upon outside funding being awarded, may include a study focusing on the neuroanatomical determinants of resilience using neuroimaging methodology, and a family study focusing on barriers to access to mental health care for service members, their families, and survivors.

Sites

The team of individuals and infrastructures committed to this project is extensive and has a reporting relationship to the leadership of the Ohio National Guard, Adjutant General Wayt and COL John Harris, through the Guard's OHIOCARES Workgroup. The Principal Investigator (PI) of the Kaptur Combat Mental Health Initiative is Joseph R. Calabrese, M.D. and the Co-PI is Marijo Tamburrino, M.D. The Initiative includes a

Coordinating Center based out of University Hospitals Case Medical Center (UHCMC) (Dr. Calabrese), and six operating research sites including University Hospitals Case Medical Center, the University of Toledo (Dr. Tamburrino), Columbia University Department of Epidemiology (Dr. Galea), a prestigious research survey firm, Abt SRBI, Inc. with a very long history of military research, the Ann Arbor VAMC Department of Psychiatry at the University of Michigan (Dr Liberzon), and Michigan State University's Biomedical Research and Informatics Center - BRIC (Dr Reed).

With Dr. Calabrese as the coordinating principal investigator, the UHCMC Coordinating Center is responsible for all aspects of project coordination (scientific, administrative, and fiscal) and the conduct of in-person assessments of 250 service members in their local communities. With Dr. Tamburrino as project Co-PI, the University of Toledo provides leadership and also conducts in-person assessments of 250 service members in their local communities. The Columbia University Department of Epidemiology responsibilities include, but are not be limited to, the design of the project's field procedures, including the annual Telephone Survey and In-Person Survey, scientific manuscript preparation, NIMH grant application, etc. Dr. Galea also serves as the primary interface between the project and the survey firm, Abt SRBI, which carries out the telephone surveys. The University of Michigan Ann Arbor VA Department of Psychiatry is responsible for the design, implementation, and oversight of the Genetics Repository, including laboratory and field procedures for biological sample collection, processing, storage, association analyses, etc. The Michigan State University Biomedical Research Informatics Center will provide all aspects of informatics needs for the In-Person Survey assessments, including data entry and management privileges, enrollment privileges, survey building privileges, etc.

Project #1

The primary study (Project #1) within this Initiative is a clinical epidemiology and health services project and is designed to function as the template upon which other projects, including but not limited to those of a translational research nature, will be superimposed. The first three specific aims of the primary research project were designed to build support and stimulate additional interest in the study of the role of resilience and risk in combat-related posttraumatic psychopathology and other similar adjustment problems.

Specific Aims of Project #1:

1. To study the relationship between deployment-related experiences and the development and trajectory of DSM-IV Axis I diagnoses
2. To document the factors across the life-course that are associated with resilience to DSM-IV Axis I diagnoses and with better post-deployment functioning
3. To study the relationship between National Guard-specific pre-deployment and post-deployment factors and the risk of development of DSM-IV Axis I disorders

Project #1 will enroll up to 3,000 members of the Ohio National Guard, who will be selected at random from the entire population of the Guard. All individuals who participate will be interviewed for 1 hour by telephone which began in November 2008 (telephone survey) and proceeded through November 2009.

A validation sub-sample of 500 participants of the telephone survey group was invited to participate in an in-person interview, which on average last 2-3 hours. This sub-sample allows both for validation of key domains employed in the phone interviews and for

further in-depth study of trajectory of psychopathology in this sample. Study personnel recommend that participants bring a family member, friend, or significant other for support and assistance during the interview. Family support often facilitates participant retention throughout the life of the project.

Research visits will be conducted at study entry and every 12 months for a minimum of 10 years for both the telephone survey and in person survey. We anticipate that we will sample National Guard service members that have variable lengths of involvement and variable combat exposures, allowing us to suitably address the specific aims.

Research Accomplishments from the Statement of Work for Project #1:

Tasks #1 - #5 from the Statement of Work delineate the critical events that must be accomplished in order for the project to be successful in terms of cost, schedule, and performance. Task #1 has been completed, with Tasks #2 through #5 currently in progress.

Task #1 – Baseline enrollment of up to 3,000 Ohio National Guard Members in the Telephone Survey, and 500 for the validation In-Person Survey, in order to be able to test Specific Aims #1 -3 with associated hypotheses. Enrollment for the Telephone Survey began 11/18/2008 after the recruitment period. Enrollment for the In-Person Survey began 12/10/2008. Baseline enrollment into both samples was completed on 11/17/2009 and 12/9/2009 respectively. The Telephone Survey enrolled N=2616, and the In-Person Survey enrolled N=500.

Task #2 – Annual participant follow-up to test Specific Aims #1 -3 with associated hypotheses. Year 2 interviews promptly began after Baseline ended in late 2009 and are currently ongoing. As of 5/10/2010, the Y2 Telephone Survey has been completed with N=1119 participants, and N=115 for the Y2 In-Person Survey.

Task #3 – Performance of a descriptive analysis of the data collected from the primary and sub-sample group including the prevalence of current mental illness and voluntary triage to OhioCares. At least one peer-reviewed publication per year will be derived from the study data.

We have performed several analyses of the data collected from the baseline sample of participants. For baseline analyses, we have examined the broad range of characteristics that are hypothesized to be associated with mental health conditions, as well as potential mediators of these associations. As analyses are completed, we will work on conference submissions and manuscripts to submit for publication. We believe this task and analyses sets the foundation for completion of the specific aims #1 - #3. While each of the aims will be completed with longitudinal or multiple waves of data, the following cross-sectional analyses on the baseline data are integral for laying the groundwork for future analyses.

These analyses are entitled:

- The Kaptur Combat Mental Health Initiative: Baseline collection of a ten-year longitudinal study sample
- Determinants of co-occurring psychopathology among National Guard soldiers
- Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among National Guard soldiers

- Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers
- Alcohol abuse and dependence in the Ohio National Guard
- Utilization of mental health care among guard soldiers
- Risky behaviors and substance use among guard soldiers

The goal of these seven analyses is publication; the first four analyses have been completed, with the final three currently in process. The first paper is described in detail followed by the abstracts for the following three. At the end of these updates we explain an analysis conducted at the request of the Ohio National Guard in reference to suicidal ideation and deployment.

Please see **Appendix A** for all tables and figures referenced.

Kaptur Combat Mental Health Initiative: Baseline collection of a ten-year longitudinal study sample

This paper outlines the methods by which the data was collected and describes the sample in comparison the sub-sample. Most importantly, as the prevalence of conditions determine the validation and reliability of standardized assessments, we examined the validation and reliability of our telephone assessments using the sub-sample as a clinical re-appraisal.

Data description:

Table 1 reports the distribution of characteristics between the telephone and in-person sample. There were no significant differences between the two samples. For both samples, the majority of participants were male (85% telephone and 88% in-person), white (88% telephone and 89% in-person) and non-officers including enlisted soldiers, cadets or civilian employees (87% telephone and 89% in-person). The majority have had some form of deployment/mobilization experience (36% never deployed in telephone and 35% never deployed in in-person) and 30% of the telephone and 29% of the in-person were most recently deployed to a conflict setting.

Table 2 lists the comparison of the baseline sample and the national profile of National Guard soldiers. The Ohio National Guard sample of 2616 participants is comparable to the National profile of National Guard personnel. The majority of participants are male (85.2%) and white (87.7%) and the modal age is 17-24 (33.6%). The vast majority of participants (96.9%) are non-Hispanic. 86.2% of the sample are enlisted personnel, 64.1% have been deployed or mobilized in some capacity and 54.2% of the sample has been deployed overseas for their most recent deployment.

Overall, nearly the entire sample has had at least one type of traumatic event in their lifetime (94.7%). Sixty nine percent have experienced an assaultive event (50.9% related to the most recent deployment and 54.3% occurred in civilian life), 75.0% have experienced a shocking event such as a transportation accident or serious injury, 72.3% have experienced trauma based on when they learned about events to others and 39% have experienced some form of combat. Figure 1 lists the frequency of specific combat experiences, among participants who had been deployed overseas, more than 60% report experiencing some form of combat with a unit receiving hostile fire being the most common and injured or wounded during combat being the least (see Figure 1).

Table 3 describes the prevalence of psychopathologies in the telephone as compared to the in-person survey. The most commonly reported condition for both the in-person subsample and the telephone was alcohol abuse (39% in the telephone and 42% in the subsample). Alcohol dependence also was high as 25% of individuals in the entire study were classified with the disorder while 20% were classified in the subsample. Ten percent of the telephone sample had major depressive disorder and 21% were classified as having any form of depression using the PHQ. In comparison, in the subsample nearly 22% were diagnosed with major depressive disorder using the SCID. The prevalence of all other conditions were comparable between the telephone and in-person subsample with 11% of the phone ever having PTSD in their lifetime compared to 7% in the subsample. Both generalized anxiety disorder and suicide risk were rare.

Clinical re-appraisal

Table 4 lists the statistics for a clinical re-appraisal of the telephone psychopathologies. Examining first the kappa statistic, all the tests had relatively moderate kappa (ranging from 0.39 for PTSD to 0.23 for alcohol dependence). The lowest kappa reported was for generalized anxiety disorder (0.03). The majority of the McNemar's tests failed to reject the null of no marginal heterogeneity. The three that rejected the null of marginal homogeneity between the telephone and in-person subsample were major depressive disorder, generalized anxiety disorder and alcohol dependence. As the final measure of reliability and internal agreement on the telephone scales, the cronbach's alpha ranged from 0.95 for deployment related PTSD to 0.57 for alcohol abuse. For the measures of validity, our measures of specificity and negative predictive value were higher than the values for sensitivity and positive predictive value for all diagnoses. The telephone diagnosis was most sensitive to diagnose alcohol abuse (0.60) and lowest for generalized anxiety disorder (0.04). The telephone diagnosis was most specific for major depressive disorder (0.97) and least specific to alcohol abuse (0.72). The positive predictive values varied but were moderate to low for all conditions with the highest being major depressive disorder (0.64). The negative predictive value for the telephone was very high for all conditions with the lowest for alcohol abuse at 0.70.

Determinants of co-occurring psychopathology among National Guard soldiers

Research suggests that psychopathologies increase for military personnel after deployment and that National Guard personnel – who have a unique set of stressors, training and experiences – are at an even higher risk of developing mental health conditions. Therefore, for the baseline data for the Kaptur Mental Health Initiative we wanted to document the prevalence and correlates of certain psychopathologies within the Ohio National Guard including posttraumatic stress disorder, depression, and generalized anxiety disorder. In addition, we wanted to examine the factors associated with the co-morbidity of these conditions. To examine the factors associated with individual psychopathologies we first performed bivariable analyses and then multivariable logistic models to adjust for possible confounders. To examine correlates of co-morbidities we carried out both bivariable and multivariable multinomial logistic models. In bivariable analyses as well as multivariable analysis gender was the main predictor where women were more likely than men to have either posttraumatic stress disorder ($\beta=1.1$, $p<0.01$) or depression ($\beta= 0.9$, $p<0.01$). Besides gender, the number of traumatic events experienced over the life course was the only other significant predictor ($p\text{-value}<0.01$) with more traumas increasing ones risk of posttraumatic stress disorder and depression. Overall, the results for analyses examining the co-occurrence of

conditions suggest that 71.7% of individuals have never had any of the three conditions in their lifetime, 17.0% have had at least one condition in their lifetime (12.7% in the past year) and 11.4% of participants have had at least two of the conditions in their lifetime (7.8% in the past year.) In multivariable multinomial analysis adjusting for demographics, women were more likely than men to have at least one disorder ($\beta=1.2$, $p<0.01$) or two disorders ($\beta=0.5$, $p<0.01$) compared to no disorders in their lifetime. Those who were married as compared to being divorced, separated or single were less likely to have at least one disorder ($\beta=-0.5$, $p<0.01$) or two disorders ($\beta=-0.5$, $p<0.01$) compared to no disorders over their lifetimes. The results also suggest that those with higher amount of lifetime traumatic events (+12) have a higher risk of at least one disorder ($\beta=2.0$, $p<0.01$) or two disorders ($\beta=1.2$, $p<0.01$) compared to having no disorder. These results confirm that there are certain common factors that are not only associated with increased risk of psychopathology but that these factors also are associated with the co-morbid presence of posttraumatic stress disorder, depression and generalized anxiety disorder. These results suggest that those who enter the military with previous traumatic event experiences may be at higher risk for having as well as developing mental health conditions while serving in the National Guard. Moreover, there are certain common factors that are not only associated with increased risk of psychopathology but that these factors also are associated with the co-morbid presence of posttraumatic stress disorder, depression and generalized anxiety disorder.

Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among National Guard soldiers

Increasingly, studies have demonstrated that the type of trauma matters for the risk of developing posttraumatic stress disorder symptoms. Therefore, the purpose of this analysis was to examine if the type of traumatic event experienced may be associated with differential risks of developing posttraumatic stress disorder in a military sample with a diverse range of trauma experience. To examine this we calculated the conditional risk (probability of developing posttraumatic stress disorder given everyone has experienced a certain trauma) of various types of traumatic events within our sample. With respect to conditional risk, those who experienced assaultive traumas have the highest risk of developing posttraumatic stress disorder (11.4%) both if they were related to deployment (9.8%) and non-military related (13.7%). Those who experienced the sudden unexpected death of a loved one were had the second highest conditional risk of PTSD overall (8.9%.) Preliminary results also suggest that while the prevalence of posttraumatic stress disorder associated with certain traumas may differ, the risk factors associated with posttraumatic stress disorder remain constant regardless of the index trauma. Overall, these results suggest that within the Ohio National Guard the conditional risk of posttraumatic stress disorder does in fact depend on the type of traumatic event experienced and the context within which it occurs.

Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers

Based on the possibility that the military environment may drive deployment related posttraumatic stress disorder, we examined whether support received during and after deployment influences psychological sequelae of deployment, specifically the risk of PTSD from a deployment-related traumatic event experience.

Of the 2616 individuals surveyed, 1677 (64.1%) had been deployed, the majority of whom had been deployment most recently overseas (84.6% overseas vs. 14.7% to U.S.

locations). Deployment-related support included participants' perception of how prepared they had been for their most recent deployment (e.g. given training, information about the deployment, and necessary equipment), the relationships they had with other members of their unit, and how much support they received from others after their deployment. We found that all three deployment-related support factors were significantly associated with risk of PTSD. Of those who developed PTSD after deployment, significantly more participants reported low deployment preparedness (71.9% vs. high preparedness, 28.1%, $p < 0.01$), low unit support (67.8% vs. high unit support, 32.2%, $p < 0.01$), and low post-deployment support (81.8% vs. low post-deployment support, 18.2%, $p < 0.01$), demonstrating the protective influence of deployment support on the development of PTSD.

Suicidal behaviors

Research is inconclusive on how military experience affects the risk of suicidal outcomes including suicidal ideation. The purpose of this analysis to examine the factors associated with suicidal ideation in bivariable analysis. To examine this question we performed preliminary bivariable analysis. The results suggest that suicidal ideation, or thoughts they would be better off dead, or thoughts of killing themselves, for several days in a two week period in the 30 days prior to the interview was reported in 1.9% of participants and 10.1% of participants ever in their lifetime. Certain factors were associated with suicidal ideation in the 30 days before the interview including but not limited to being single ($p < 0.01$), low levels of social support ($p < 0.01$), parents with substance abuse problems ($p < 0.01$), being unemployed for 3 months or more ($p < 0.01$) and having serious financial issues ($p < 0.01$.) Having been deployed in the past was not associated with suicidal ideation in the 30 days before the interview ($p = 0.9$) or deployed within the past 3 years ($p = 0.9$.) While deployment as a whole was not associated with current suicidal ideation certain factors were predictive of suicidal ideation among those who have been deployed: feeling there was a lack of preparedness ($p\text{-value} < 0.01$), reporting low level of unit support ($p\text{-value} < 0.01$), feeling high amount of concern for family ($p\text{-value} < 0.01$), having low levels of post-deployment support ($p\text{-value} < 0.01$), and experience high levels of combat ($p\text{-value} < 0.01$). Among mental health conditions, those with a lifetime history of posttraumatic stress disorder ($p\text{-value} < 0.01$), generalized anxiety disorder ($p\text{-value} < 0.01$), and depression ($p\text{-value} < 0.01$) and alcohol dependence ($p\text{-value} < 0.01$) were more likely to have current suicidal ideation. These results suggest that deployment experience as a whole is not the driving force behind suicidal thoughts in the Ohio National Guard and certain subsets of vulnerable populations including those who experience lifetime stressful events and mental health conditions may benefit from focused suicidal prevention measures.

Other

Please also see **Appendix B** for the descriptive data analysis presentation given to the external Scientific Advisory Board on April 26, 2010. **Appendix C** includes the data analysis progress report submitted to the UHCMC IRB in January 2010 for the annual review application.

Task #4 – Annual oversight meetings for the Initiative.

The *Administrative Advisory Board*, consisting of state and local leaders, administrators, and stakeholders providing guidance on non-scientific issues, will be planned for

autumn, and likewise yearly thereafter. The most recent meeting was held on October 23, 2009 at Beightler Armory in Columbus, Ohio with representatives from the following:

- Leadership of OANG including TAG MG Wayt and JI COL Harris
- Congresswoman Kaptur (unable to attend so presentation videotaped)
- Ohio Dept of Mental Health
- Ohio Dept of Veterans Services
- Ohio Dept of Alcohol & Drug Addiction Services
- Ohio Assoc of County Behavioral Health Authorities
- Veteran's Affairs
- Columbus Veteran Center

The *External Scientific Advisory Board*, consisting of nationally and internationally renowned individuals with strong scientific backgrounds providing critical feedback on the scientific merit of the project, will be held in the spring each year. The most recent meeting was held on April 26, 2010. The primary recommendation resulting from the recent SAB meeting was to open enrollment to a dynamic cohort consisting of the new recruits to the Ohio National Guard on an annual basis, in order to combat attrition and further explore differences between pre- and post-deployment. This recommendation is currently being incorporated into the study protocol for review by the IRBs of note. The study investigators have obtained approval and cooperation by the leadership of the Ohio National Guard for their assistance in operationally carrying out a dynamic cohort.

Task # 5 – Financial Reporting is due quarterly via SF425, and has been submitted regularly and on schedule over the past year. The most recent report was submitted on April 29, 2010 for the first quarter 2010.

Project #2

The Genetics Repository component (Project #2) is a study on genetic determinants of risk and resilience to the development of PTSD and other mental illnesses. This first translational project will involve the creation of a repository of saliva DNA samples, which will be used to perform genetic association studies on selected candidate alleles and potentially genome-wide analyses at multiple levels. These may include cross-sectional genetic association analyses of pre-deployment traits, longitudinal analyses to investigate genetic markers and functional polymorphisms involved in vulnerability to deployment-related psychiatric disorders (i.e. in case-control association analyses), as well as building models incorporating measures of deployment-related and pre-deployment environmental factors for vulnerability (i.e. gene x environment interactions). This will also allow for integrated research utilizing neuroimaging, psychophysiological, and neuroendocrine measures to investigate the effects of genetic variants on cognitive, behavioral, and physiological function at baseline and after deployment stressors.

Research Accomplishments from the Statement of Work for Project #2:

Task #1 – In order to test the 2 hypotheses in the Genetics Protocol, the participants in the Telephone Survey of Project #1 will be approached to participate in the Genetics Repository and will be asked to submit a saliva sample via a kit mailed to them. Final regulatory approval was granted 3/16/2010 by the DoD Office of Research Protections. Recruitment began on May 3, 2010 and will proceed throughout the rest of Year 2 and into subsequent years of Project #1. Recruitment will continue until all main study participants have been approached. During the first week of recruitment, 84% of the telephone survey respondents accepted being sent the Genetics kit.

Task #2 – Upon receipt of saliva samples, the lab at the Ann Arbor VA will process them appropriately to provide genomic DNA preparation of the samples. As recruitment very recently began, no completed kits have been received yet though they are anticipated shortly.

Key Research Accomplishments

1. Completion of Year 1 of data collection
 - Telephone Survey N=2616
 - In-Person Survey N=500
2. Year 2 data collection proceeding (through November 2010). As of May 10, 2010:
 - Telephone Survey N=1119 interviews completed thus far
 - In-Person Survey N=155 interviews completed thus far
3. Genetics Repository data collection
 - Obtained final regulatory approval on March 16, 2010
 - Recruitment began May 3, 2010 with 3rd quarterly group in the Telephone Survey
4. Administrative Advisory Board Meeting on October 23, 2009
5. Scientific Advisory Board Meeting on April 26, 2010
6. TATRC Behavioral Health Product Line Review Meeting on April 27, 2010

Reportable Outcomes

Interface with Ohio National Guard:

1. OhioCares Workgroup and Committee Work ~ 50 meetings since 2006
2. Testimony submitted to the Defense Health Board on “OHARNG Completed Suicides, Preliminary Project Data, and ONG Suicide Prevention Training” in January 2010.

Presentations of study data:

1. Society for Epidemiological Research 2009 annual meeting (poster): Deployment characteristics, combat, and posttraumatic stress disorder among National Guard Members. Prescott, M.
2. Ohio National Guard Annual Commanders Call Meeting on February 27, 2010 presented by Marijo Tamburrino, MD
3. Ohio State University/VA/ONG Conference: “Responding to the Needs of Ohio Veterans: Essential Tools to Address those Facing Deployment and Reintegration” on May 14, 2010 presented by Marijo Tamburrino, MD
4. Operation Reconnect: “Understanding the Needs of Military Service Members & Their Families” on June 11, 2010 presented by Marijo Tamburrino, MD

*Abstracts (see **Appendix D** for reprints):*

1. Society for Epidemiological Research 2009 annual meeting: Deployment characteristics, combat, and posttraumatic stress disorder among National Guard Members. Prescott, M.
2. Society for Epidemiological Research 2010 annual meeting:
 - Context of military and civilian traumatic events and with the risk of posttraumatic stress disorder among National Guard soldiers. Prescott, M.

- Social and military characteristics associated with the co-occurrence of psychopathology among National Guard soldiers. Prescott, M.
 - Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers. Goldmann, E.
3. International Society for Traumatic Stress Studies 26th Annual Conference (November 2010) Symposia presentation proposal: Risk and Resilience in the National Guard
- The Kaptur Combat Mental Health Initiative: baseline collection of a ten-year longitudinal study sample. Tamburrino, M.
 - Determinants of co-occurring psychopathology among National Guard soldiers. Calabrese, J.
 - Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among National Guard soldiers. Prescott, M.
 - Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers. Galea, S.

Manuscripts in Preparation:

- The Kaptur Combat Mental Health Initiative: Baseline collection of a ten-year longitudinal study sample
- Determinants of co-occurring psychopathology among National Guard soldiers
- Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among National Guard soldiers
- Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers
- Alcohol abuse and dependence in the Ohio National Guard
- Utilization of mental health care among guard soldiers
- Risky behaviors and substance use among guard soldiers

Miscellaneous:

1. Genetics Repository at Ann Arbor VA – accepting saliva DNA samples
2. Informatics – Michigan State University's RIX database for the In-Person Survey, Abt SRBI, Inc.'s CATI database

Supplementary Funding

This grant includes funding for start-up equipment costs and personnel support to establish the Genetics Repository but not to complete the analyses. As such, the investigators have been seeking additional grant funding. In addition, we have been seeking funding for additional translational projects in the area of Traumatic Brain Injury and neuroimaging.

Pursuing Funding for Add-On Projects: Genetics & TBI

Date	Title	Funding Mechanism	Outcome
Sep-07	<i>Prospective Study of Genetic, Environmental, and Neural Predictors of Deployment-related PTSD using Emotional fMRI Paradigm (Liberzon)</i>	FY07DOD PTSD/ TBI	Grant reviewed, not funded
Sep-07	<i>Pilot Study for Developing Prospective, Longitudinal Genetic Association Studies of Risk and Resilience (Liberzon)</i>	FY07 DOD PTSD/TBI	Grant reviewed, not funded
Jun-08	<i>Prospective Study of Combat PTSD: Genetics, Development & Neuroimaging Predictors (Liberzon)</i>	NIMH R01	Grant reviewed, not funded

Date	Title	Funding Mechanism	Outcome
May-09	<i>Genetics of Risk for PTSD in OEF/OIF Veterans: GWAS and Targeted Re-sequencing of Genomic Risk Regions (Liberzon)</i>	NIMH RC2 GO Grant	Grant reviewed, not funded
Aug-09	<i>Resiliency Index for Post-deployment PH & TBI in OEF/OIF Soldiers: Genome-wide Association, Childhood Adversity, & Brain Structure (Liberzon)</i>	FY09 DOD PTSD/TBI	LOI submitted, not selected
Sep-09	<i>Longitudinal Symptoms and Military/Civilian Functional Impairments in Ohio National Guard Comorbid for PTSD and TBI (Sajatovic)</i>	FY10 DOD PTSD/TBI	LOI submitted, not selected
Sep-09	<i>Resiliency Index for Post-deployment Psychological Health in OEF/OIF Soldiers (Liberzon)</i>	FY10 DOD PTSD/TBI	Grant submitted, pending

Conclusion

This project will provide the military with novel, landmark long-term, prospective data that will elucidate novel predictors of resilience to combat-related stress. Compared to existing research in this area, this project is unique because it is population-based and does not limit its scope of study to only VA-treatment seeking veterans. Accordingly, this study is likely to uncover rates of PTSD and other mental conditions following combat that differ from those found in previous scientific reports.

Many previous projects have only utilized screening assessments, which can limit generalizability. The Telephone Survey incorporates many scales which go beyond screening in various domains. Additionally, the In-Person Survey methodology permits a more thorough, detailed prospective study of psychopathology and psychosocial factors, resulting in a wealth of data on this important military population.

The Ohio National Guard has expressed interest and commitment in having their programs assessed (i.e. suicide prevention) via the annual surveys in order to adapt and improve their services and training programs. In conjunction with the Guard, the investigators are currently incorporating these questions into the Year 3 surveys, slated to begin in November 2010.

This project also incorporates a genetics repository in conjunction with detailed, and prospectively longitudinal psychosocial data. The genetics component will allow us to study genetic determinants of risk and resilience to the development of PTSD and other mental illnesses.

The study methodology is being adjusted to include a dynamic cohort, enrolling new members of the Ohio National Guard each year, to replenish the samples so that up to 3,000 telephone interviews and 500 in-person interviews are conducted each year regardless of how many participants may be deployed or otherwise lost to follow-up. The dynamic cohort would also allow for an enriched sample of participants who had never been previously deployed upon entry into the study, making the pre-and post-deployment comparisons more robust.

References

Not applicable

Appendix A: Supporting Data

Table 1 Characteristics within the telephone sample and in-person clinical interview sample

Characteristics	Telephone interview		In-person interview		P-value
	Total (N=2616)		Total (N=500)		
	n	%	n	%	
Gender					0.10
Male	2228	85.2	440	88	
Female	388	14.8	60	12	
Age					0.14
17-24	878	33.6	160	32	
25-34	848	32.4	182	36.4	
35-44	634	24.2	103	20.6	
45+	250	9.6	55	11	
Race					0.73
White	2295	87.7	444	88.8	
Black	195	7.5	35	7	
Other	123	4.7	20	4	
Income					
<=\$60,000	1498	57.3	279	55.8	
\$60001+	1038	39.7	205	38	
Education					0.94
High School Graduate/GED or less	727	27.8	137	27.4	
Some college or Technical Training	1234	47.2	240	48	
College/Graduate Degree	655	25.0	123	24.6	
Marital status					0.71
Married	1227	46.9	238	47.6	
Divorced/Separated/Widowed	252	9.6	53	10.6	
Never Married	1134	43.4	209	41.8	
Rank					0.25
Officer	342	13.1	56	11.2	
Enlisted, cadets, and civilian employees	2273	86.9	444	88.8	
Most recent deployment location					0.67
Never deployed	939	35.9	173	34.6	
Non-conflict area	879	33.3	178	35.6	
Conflict area	786	30.3	146	29.2	
Number of lifetime deployments					0.48
0-1	1756	67.1	323	64.6	
2-3	682	26.1	143	28.6	
4+	174	6.3	30	6	
Total number of all traumatic events experienced					0.65
0	141	5.4	23	4.6	
1-5	887	34.0	159	31.8	
6-11	831	31.8	166	33.2	
12+	757	28.9	152	30.4	

Note: Some percentages do not add up to 100 because of missing values. All data was obtained from the telephone survey for comparisons between the those who performed an in-person survey (N=500) and those who performed a telephone survey (N=2616)

Table 2. Kaptur Combat Mental Health Initiative study demographics

	CMHI Population		United States National	
	N	%	N	%
Gender				
Male	2228	85.2	308,130	86.0
Female	388	14.8	50,257	14.0
Age				
17-24	878	33.6	125,556	35.0
25-34	848	32.4	114,557	32.0
35-44	634	24.2	77,275	21.6
45+	250	9.6	40,999	11.4
Race				
White	2295	87.7	287,713	80.3
Black	195	7.5	47,444	13.2
Other	123	4.7	23234	6.5

Fig 1. Combat experiences related to most recent deployment among those deployed

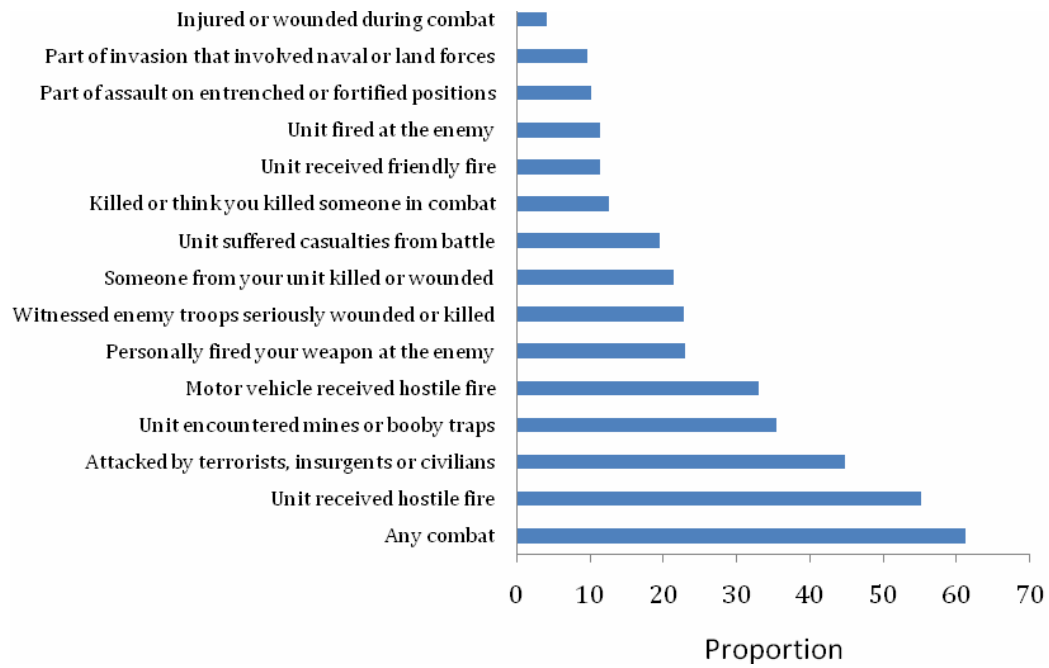


Table 3 Prevalence of mental health conditions within specific interview groups as determined either through telephone assessments or clinical diagnosis

	Telephone interview		In-person interview	
	Total (N=2616)		Total (N=500)	
	n	%	n	%
Deployment related posttraumatic stress disorder ¹	121	9.35	16	7.27
Non deployment related posttraumatic stress disorder ²	154	6.54	19	4.4
Any posttraumatic stress disorder ³	249	10.11	34	7.41
Major depressive disorder ⁴	270	10.32	112	22.4
Any depressive disorder ⁵	560	21.41	-	-
Generalized anxiety disorder ⁶	45	1.72	22	4.4
Alcohol abuse ⁷	965	38.63	208	41.6
Alcohol dependence ⁸	615	24.62	102	20.4
Suicide risk ⁹	49	1.88	19	3.8

*Deployment prevalence calculated among those who experienced self-reported traumatic event during a deployment and were asked PTSD symptoms based on traumatic event

Notes: Telephone diagnoses

- 1 - Presence of Criterion A/A2 based on deployment-related trauma as well as Criteria B - F ever in lifetime
- 2 - Presence of Criterion A/A2 based on trauma not related to most recent deployment as well as Criteria B - F ever in lifetime
- 3 - Either presence of deployment related PTSD or non-deployment related PTSD
- 4 - DSM-IV Criteria, greater or equal to 5 out of 9 on the PHQ-9, either depressed mood or adhedonia and symptoms go together
- 5 - DSM-IV Criteria, greater or equal to 2 out of 9 on the PHQ-9, either depressed mood or adhedonia and symptoms go together
- 6 - Cutoff of 10, at least 6 months and significant impairment, symptoms go together and presence of symptoms in the past month
- 7 - DSM-IV and Mini, Criterion A met at least one symptom of maladaptive pattern of substance use leading to impairment or distress and Criterion B does not meet requirements for substance dependence ever in lifetime
- 8 - DSM-IV and Mini, Criterion A met at least 3 symptoms of maladaptive pattern of substance use, ever in life
- 9 - Thoughts of wanting to hurt themselves in the past 30 days from the PHQ-9.

Clinical diagnoses

- 1 - Presence of Criterion A/A2 based on deployment-related trauma as well as Criteria B - F ever in lifetime. Positive symptom frequency of 1 and Intensity of 2.
- 2 - Presence of Criterion A/A2 based on trauma not related to most recent deployment as well as Criteria B - F ever in lifetime. Positive symptom frequency of 1 and Intensity of 2.
- 3 - Either presence of deployment related PTSD or non-deployment related PTSD. Positive symptom frequency of 1 and Intensity of 2.
- 4, 5, 6, 7 - Diagnosed from SCID as condition ever in lifetime
- 6 - Diagnosed from SCID for past month only
- 9 - Columbia Suicide History. Scored at least moderately (9 points or greater) on question of suicide attempts in the past 6 months

Table 4 Reliability and Validity statistics for the telephone psychopathology assessments.

Disorder	Kappa	McNemar's	Cronbach's	Sensitivity	Specificity	PPV(SE) ^e	NPV(SE)	AUC ^h
Deployment related	0.34	1.2	0.95	0.53 (0.13)	0.92	0.38	0.96	0.70
Non deployment related	0.34	3.3	0.93	0.52 (0.11)	0.95	0.33	0.98	0.71
Any posttraumatic stress	0.39	3.8	-	0.47 (0.09)	0.93	0.36	0.95	-
Major depressive disorder ⁴	0.35	27.4*	0.66	0.35 (0.05)	0.97	0.64	0.83	0.77
Any depressive disorder ⁵	0.33	1.4	0.66	0.52 (0.04)	0.83	0.46	0.86	0.77
Generalized anxiety disorder	0.03	3.9*	0.72	0.05 (0.04)	0.97 (0.1)	0.09	0.96	0.81
Alcohol abuse ⁷	0.32	0.4	0.57	0.60 (0.03)	0.72	0.62	0.70	0.72
Alcohol dependence ⁸	0.23	31.8*	0.75	0.46 (0.04)	0.88	0.60	0.81	0.81
Suicide risk ⁹	0.38	3.6	-	0.54 (0.15)	0.97	0.32	0.99	-

b - Kappa agreement examines the extent that the diagnoses agree on the classification of all individuals; a test of reliability. Standard errors are asymptotic.

c - Marginal heterogeneity tests to see if the diagnoses used different core criteria; a test of reliability. Reported is a test statistic and starred stats are p>0.05 which suggest differences in core criteria between gold standard and screening tool

d - Sensitivity is the True positive/ True positives+ False Positives and Specificity is the True Negatives/ True Negatives+False Negatives. Standard errors are asymptotic.

e - PPV is the positive predictive value (TP/All Positives diagnosed on the telephone) and NPV is the Negative predictive value (TN/All negative diagnoses based on the telephone). Standard errors are asymptotic.

f - Cronbach's alpha examines the internal consistency of the measurement items that make up the diagnosis and is based on the original items from the assessments

g - The AUC is measure of overall accuracy based on the continuous score of a diagnostic test. it is literally the area under the ROC curve. From SAS booklet, "Each point on the ROC curve provides the sensitivity and specificity measures associated with a cutoff on the probability scale which allows classification of each observation as either a predicted event or a predicted nonevent." SAS ROC help

h - The SCID diagnosis of GAD was only for current month

1 - Presence of Criterion A/A2 based on deployment-related trauma as well as Criteria B - F ever in lifetime

2 - Presence of Criterion A/A2 based on trauma not related to most recent deployment as well as Criteria B - F ever in lifetime

3 - Either presence of deployment related PTSD or non-deployment related PTSD

4 - DSM-IV Criteria, greater or equal to 5 out of 9 on the PHQ-9, either depressed mood or anhedonia and high level of functional impairment, symptoms go together

5 - Cutoff of 10, at least 6 months and significant impairment, symptoms go together and presence of symptoms in the past month

6 - DSM-IV and Mini, Criteria A met at least one symptom of maladaptive pattern of substance use leading to impairment or distress and Criterion B does not meet requirements for substance dependence ever in lifetime

7 - DSM-IV and Mini, Criteria A met at least 3 symptoms of maladaptive pattern of substance use, ever in life and symptoms seemed to go together

Appendix B

PowerPoint data presentation from the external Scientific Advisory Board Meeting held on April 26, 2010

Kaptur Combat Mental Health Initiative



“There is no greater priority than the mental health needs of our returning soldiers.”

Adjutant General Wayt (2005)

Outline

- Sampling
- Progress with wave 1 data
- Update on wave 2
- Clinical reappraisal of telephone psychopathologies
- Story from wave 1: pre-, peri- and post-deployment

Wave 1 Sampling

10,778 Men and women in the Ohio Army National Guard



6,700 randomly sampled OANG personnel received alert letter



6,090 personnel do not opt-out of study



2,616 OANG personnel participate in telephone interview



1,043 randomly selected for in-person interviews



2,616 OANG personnel followed annually with telephone interviews



500 sub-sample followed annually with in-person interviews

Wave 2 Sampling

**2616 OANG personnel participate in
baseline telephone interview**

**500 OANG sub-sample participate in
baseline in-person interviews**



**1042 OANG personnel participated wave 2
as of April 19th, 2010**



**125 of sub-sample participated as of
April 19th, 2010**

Wave 2 changes based on feedback from the 2009 Scientific Advisory Board

Telephone Survey:

- Obtaining combat exposure in past deployments
- Include larger section on the mental health services utilization section including stigma and barriers to care

In-person Survey:

- Include post-traumatic growth
- Include spiritual concerns

**How well did we do in assessing
psychopathology on the telephone?**

Used in-person sub-sample to perform clinical reappraisal of telephone diagnosis of lifetime psychopathologies

PTSD:

- CAPS used as gold standard
- All positive symptoms required a frequency of 1 and an intensity of 2
- All DSM-IV criteria met (A,B,C,D) and a severity score of at least 65.

Major Depressive Disorder:

- SCID used as gold standard

PTSD in the telephone survey

Based on DSM-IV criteria:

- A. Traumatic event experience, with response involving intense fear, horror, or helplessness
- B. Re-experiencing of traumatic event
- C. Avoidance of stimuli associated with event and numbing of general responsiveness
- D. Symptoms of increased arousal
- E. Duration of symptoms > 1 month
- F. Symptoms cause significant distress or impairment

Criteria B, C, and D assessed using 17-item PTSD Checklist (PCL):

- cluster scoring : > 1 B symptom, > 3 C symptoms, and > 2 D symptoms, experienced at least “moderately”

Evaluated symptoms from worst event that was deployment related and worst event non-deployment related.

American Psychiatric Association (1994). Diagnostic and Statistical Manual of Mental Disorders (IV). Washington, DC.

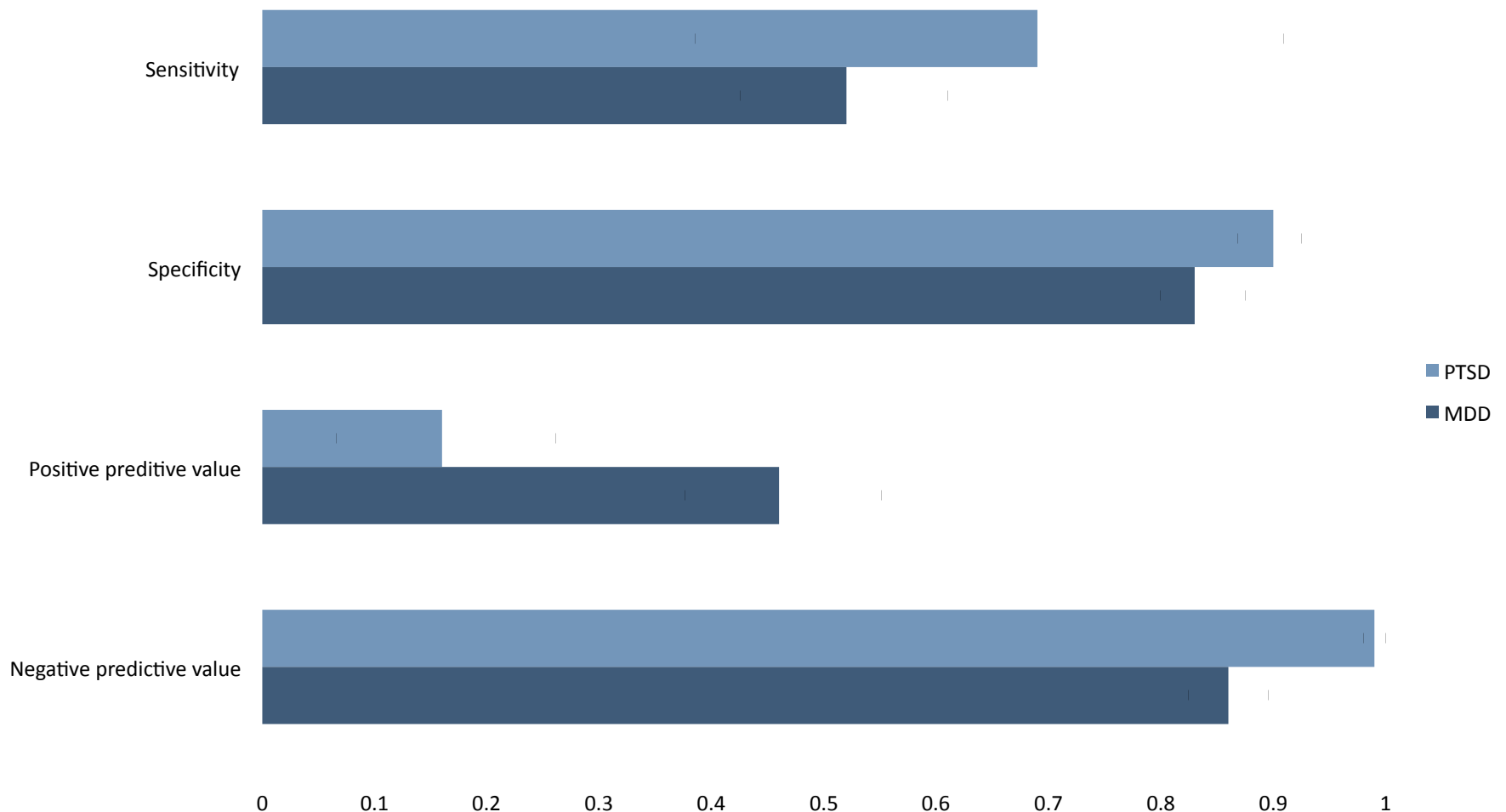
Weathers, F., Litz, B., Herman, D., Huska, J., Kean, T., (1993). The PTSD Checklist (PCL): Reliability, Validity and Diagnostic Utility. Paper presented at the Annual Convention of the International Society for Traumatic Stress Studies, San Antonio (DMS-III-R PCL-M). <http://www.pdhealth.mil/guidelines/appendix3.asp> <http://www.pdhealth.mil/guidelines/appendix3.asp>

Major depression in the telephone survey

Based on DSM-IV criteria:

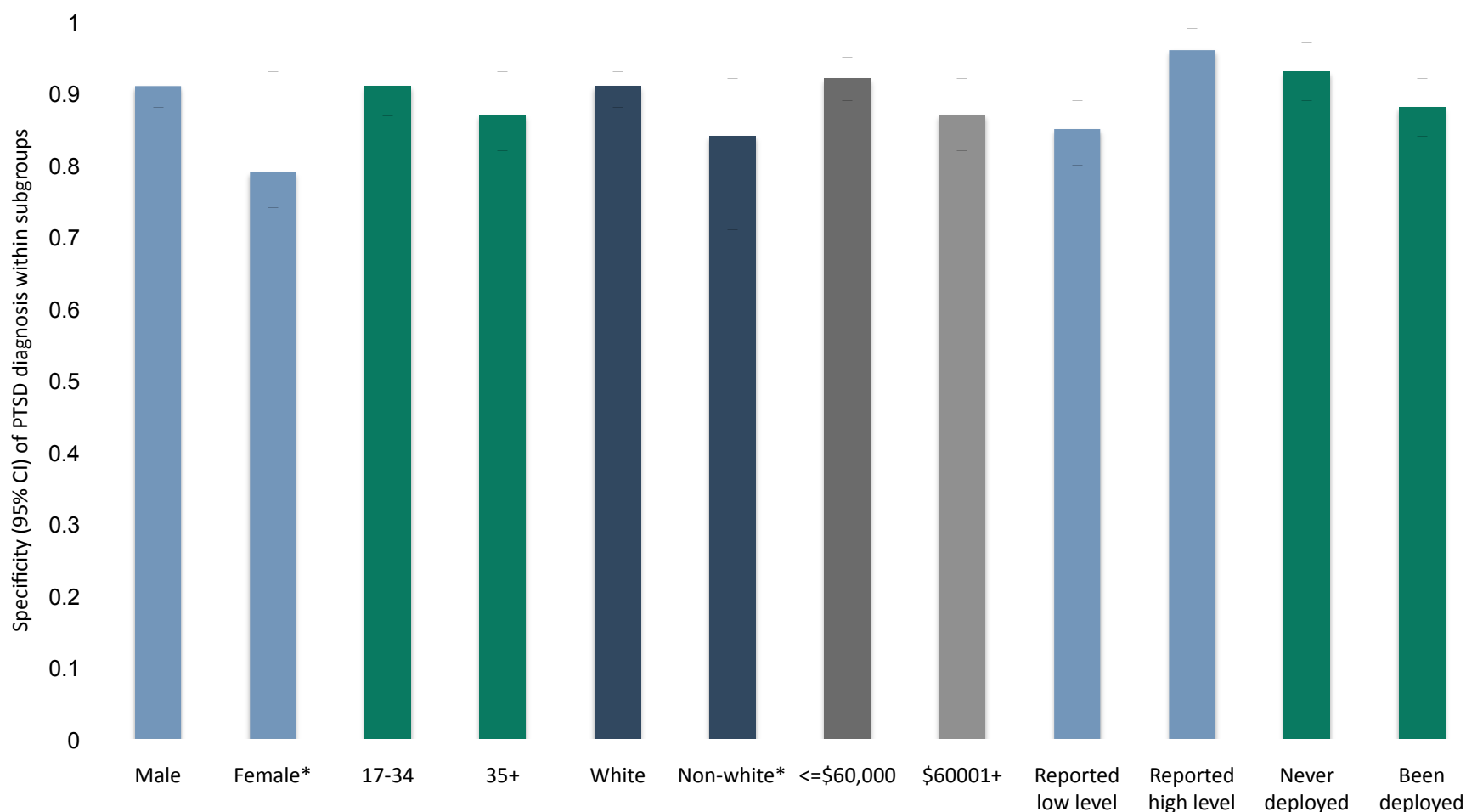
- 9-item Patient Health Questionnaire (PHQ-9)
- Depression cases experienced at least 2 of the 9 symptoms "more than half the days" and 1 of the symptoms was depressed mood or anhedonia for a period of at least 2 weeks

Very specific telephone assessments: a negative diagnosis on the telephone is likely a negative case



These statistics are for the lifetime diagnosis of either PTSD or depression (MDD or other condition). Sensitivity is the fraction of the true positives diagnosed on the telephone over all positives on the telephone, specificity is the fraction of true negatives diagnosed on the telephone over all negatives from the telephone. Positive predictive value is the fraction of true positives over all positives on the telephone. Negative predictive value is the fraction of true negatives over all negative cases determined on the telephone.

Specificity of posttraumatic stress disorder assessment does not depend on different groups



Used exact standard errors to calculate the 95% confidence interval because of small sample size (<50). All other instances the asymptotic standard error was used to calculate the confidence intervals based on the fact that the outcome is rare (<0.05) nor small sample size (<50) when majority of the sample was in the calculation.

**Who are these people and what are the
stories of their lives?**

Who are these people and what are the stories of their lives?

Pre-deployment:

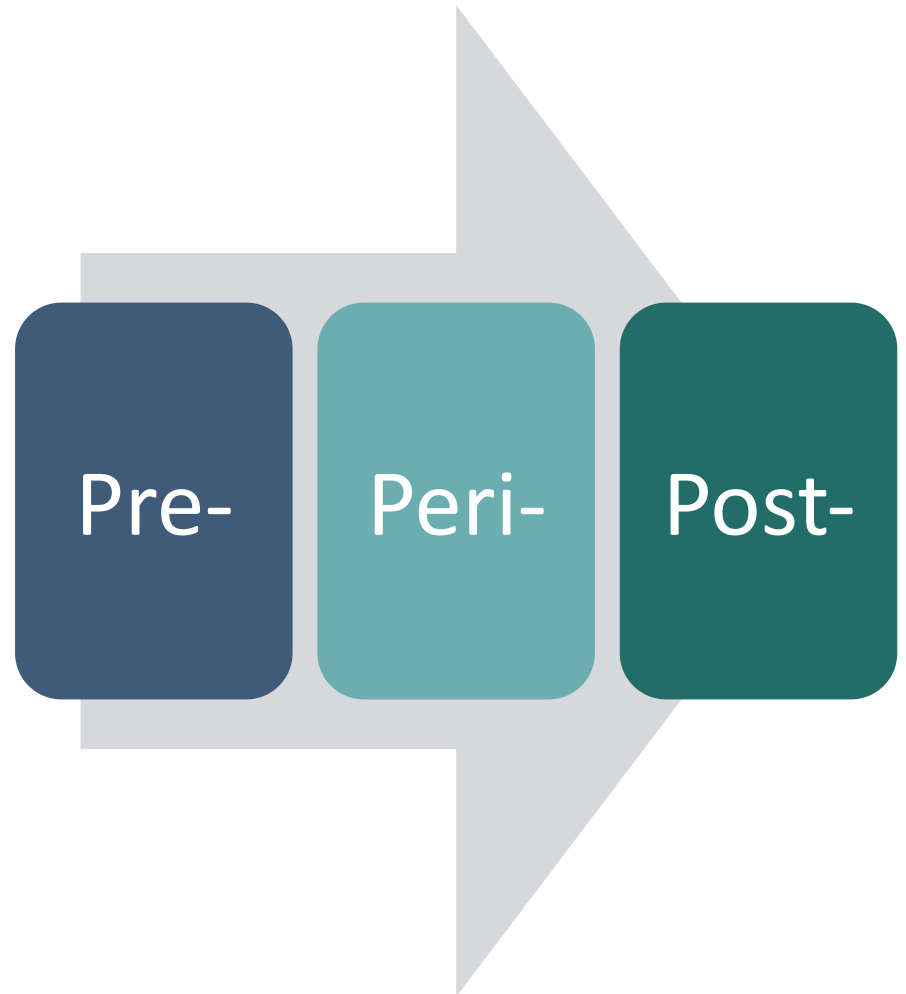
- Demographics
- Presence of trauma
- Stressors

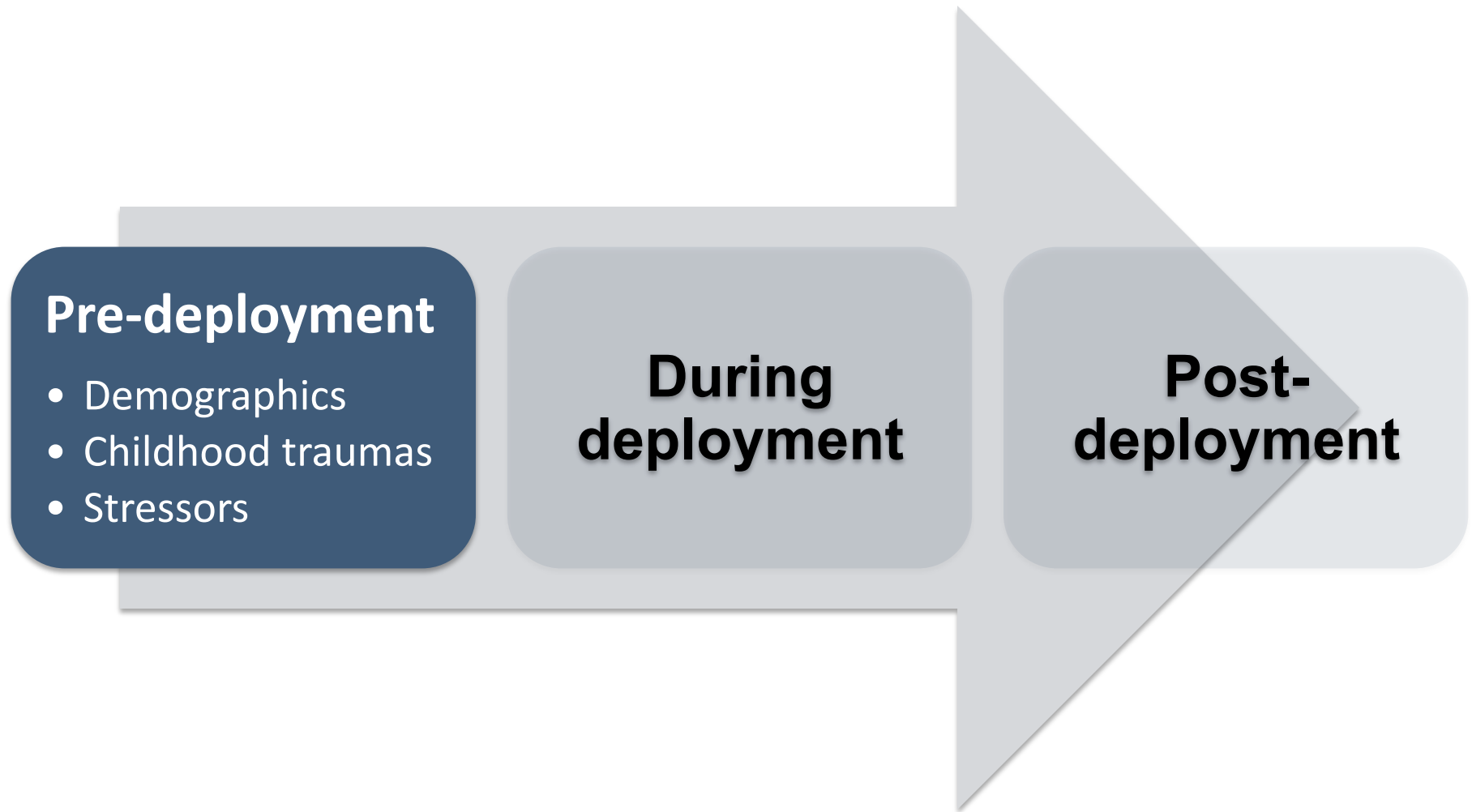
During deployment:

- Experiences and traumas

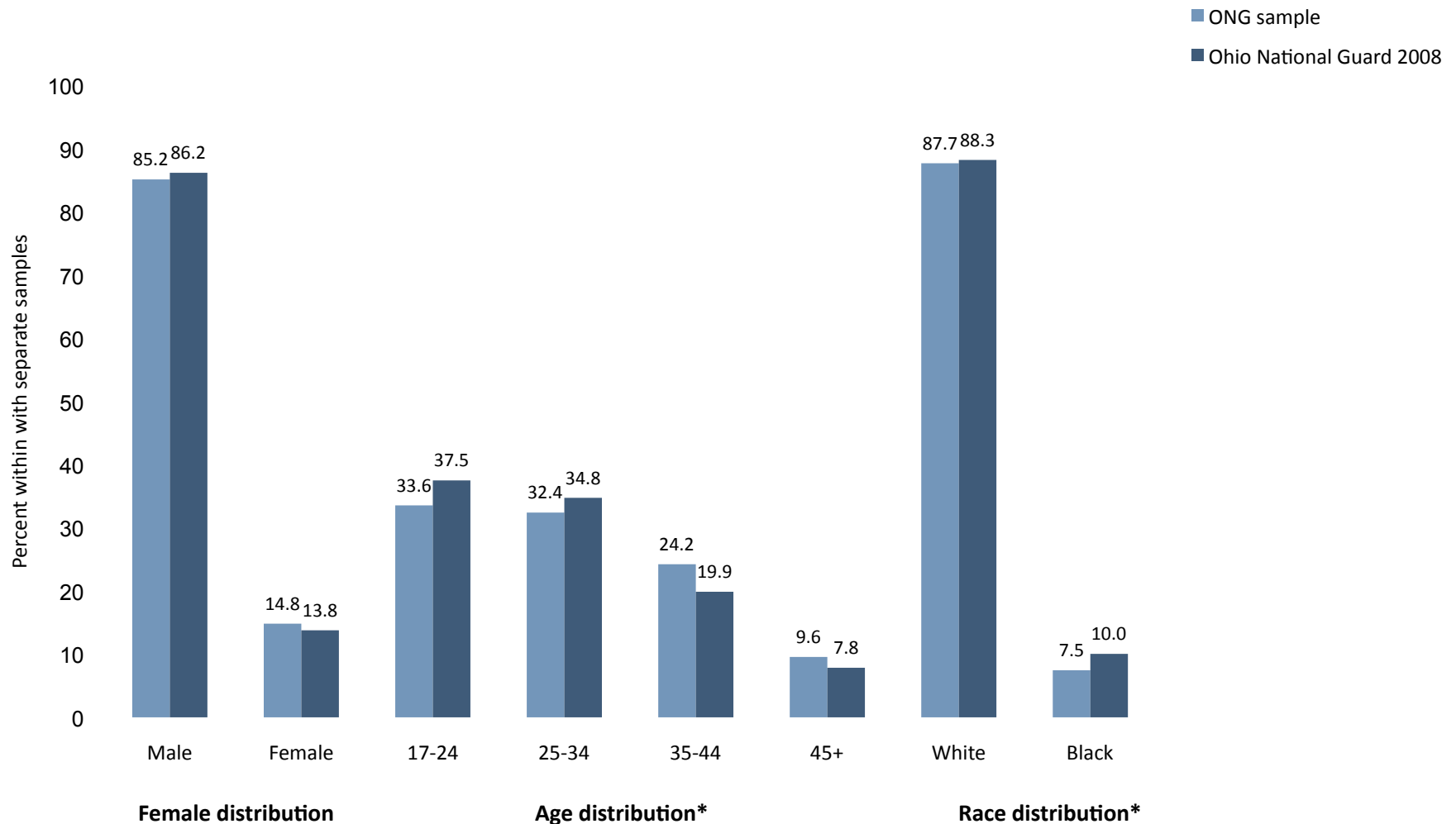
Post-deployment:

- Mental health
- Marital problems
- Mental health services



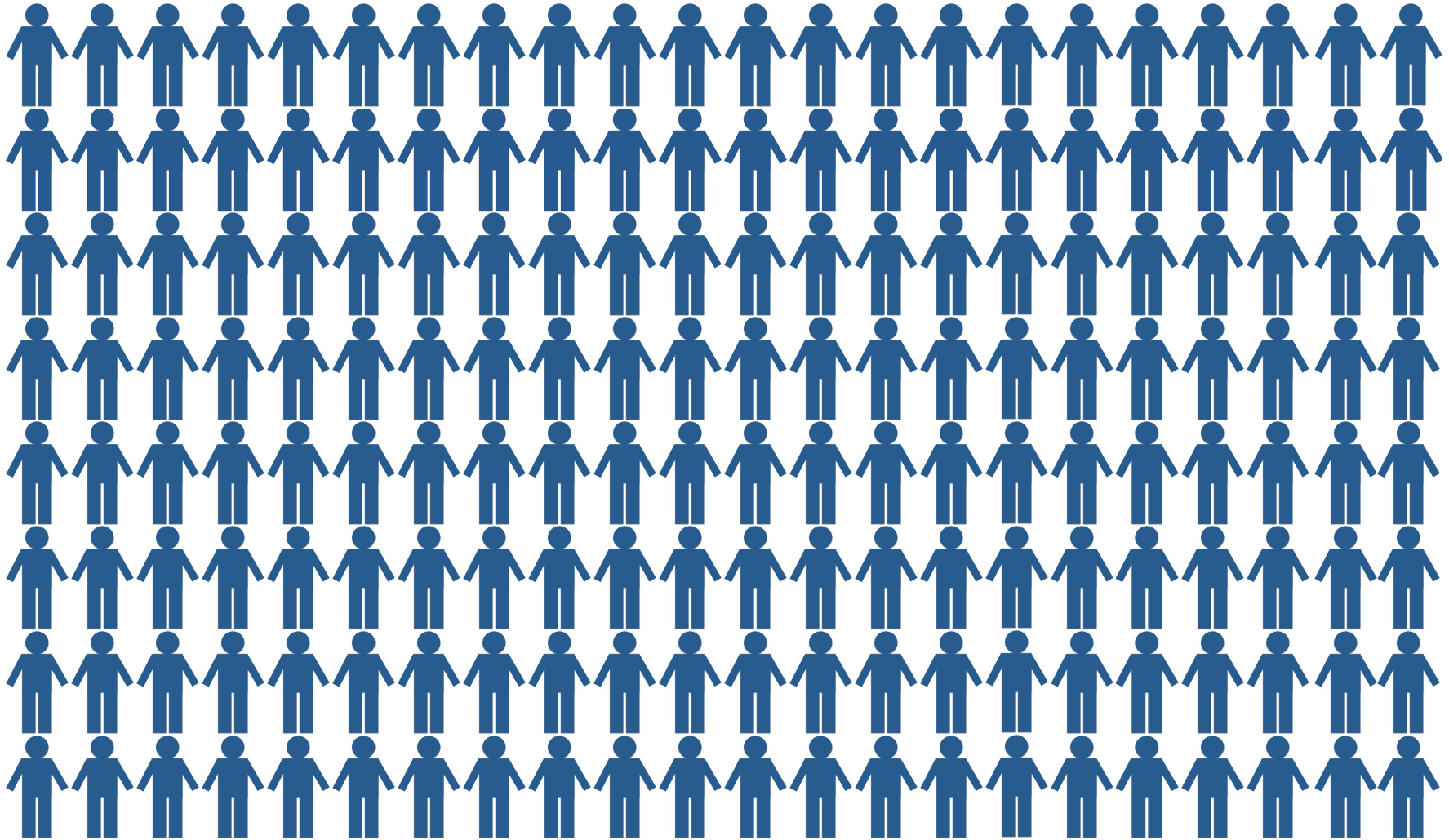


Wave 1 sample is representative of the Ohio Army National Guard



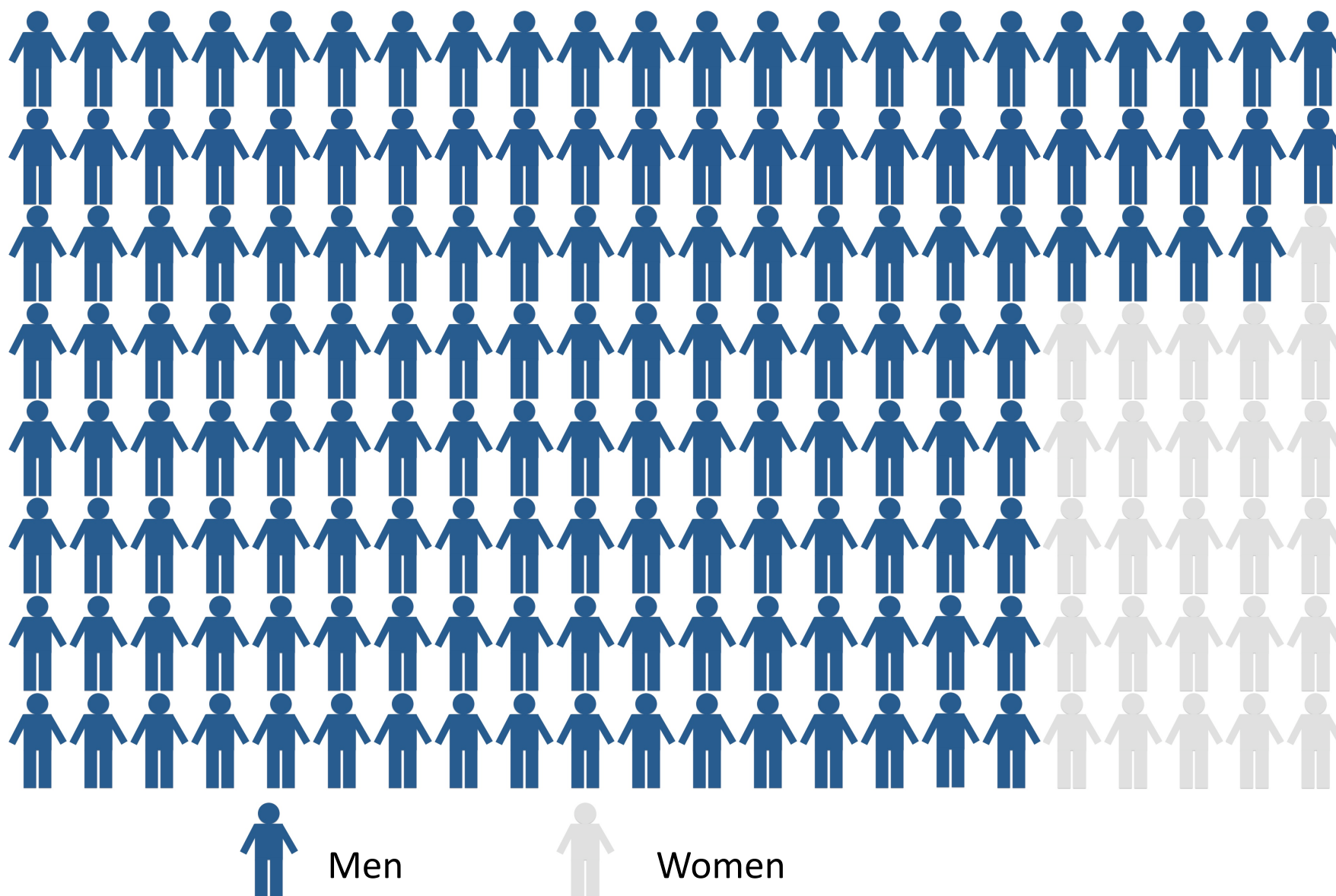
* p-value <0.05. This is calculated from baseline sample (N≈2616). The calculation for race included an other category (Native American and Asian), the baseline sample had 123 individuals (4.7%) compared to 183 (1.7%) in the Ohio National Guard.

Ohio Army National Guard



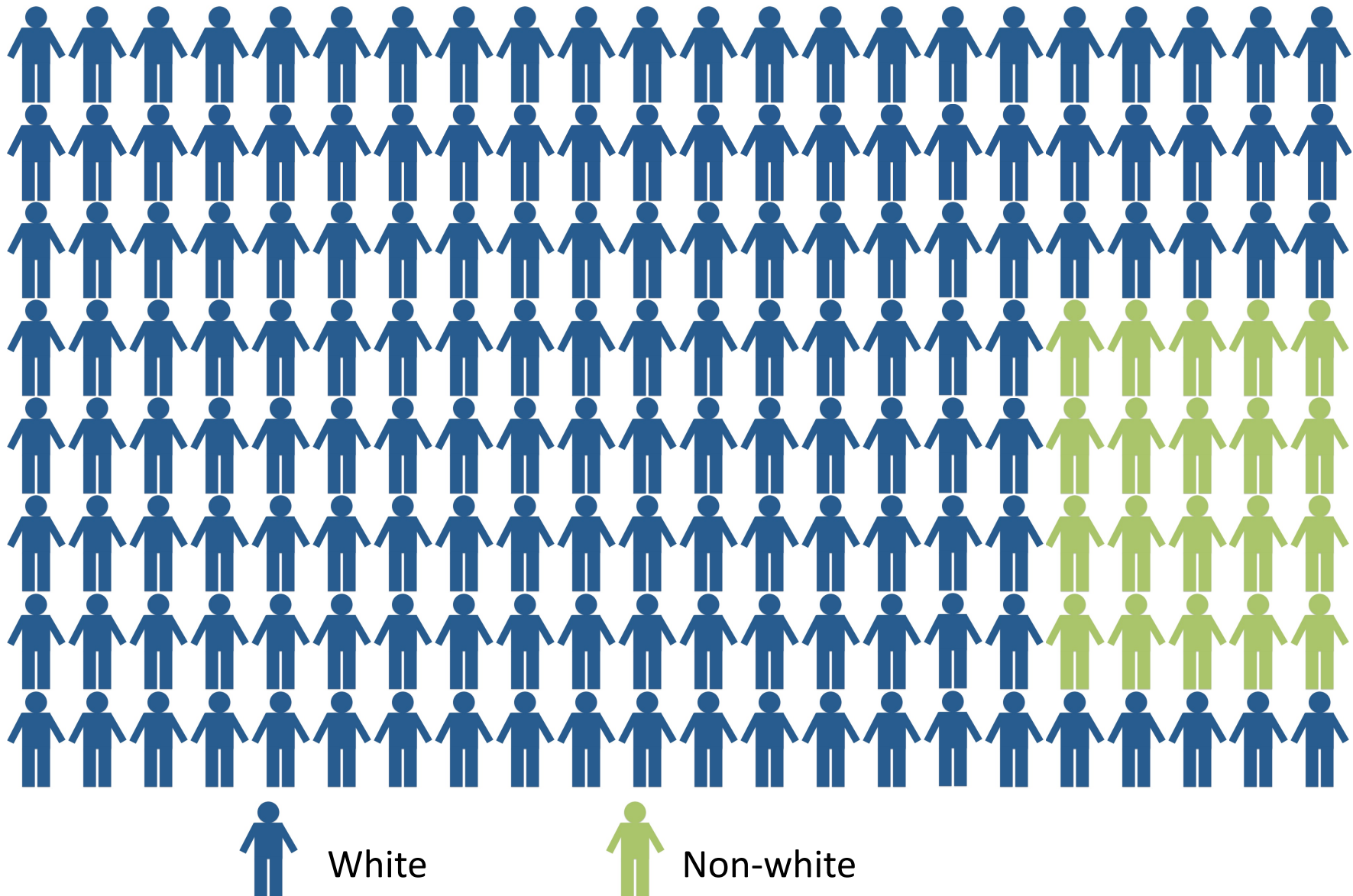
1 man $\approx$ 60 OANG soldiers

Men make up 85.2% of the sample



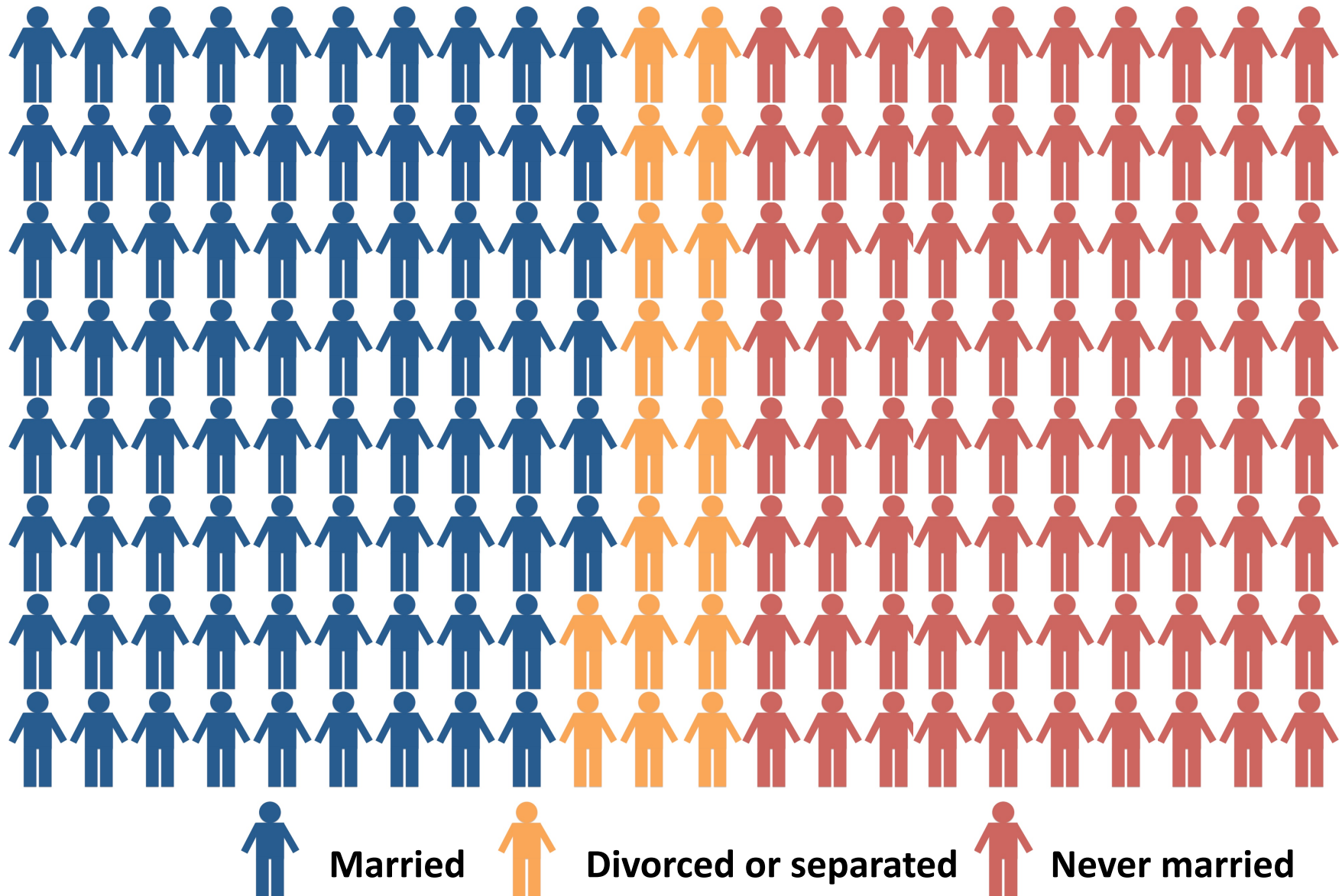
Calculated from baseline (N≈2616). 1 man ≈ 60 OANG soldiers

Majority of the sample is white (87.7%)



Calculated from baseline (N≈2616) . 1 man ≈ 60 OANG soldiers

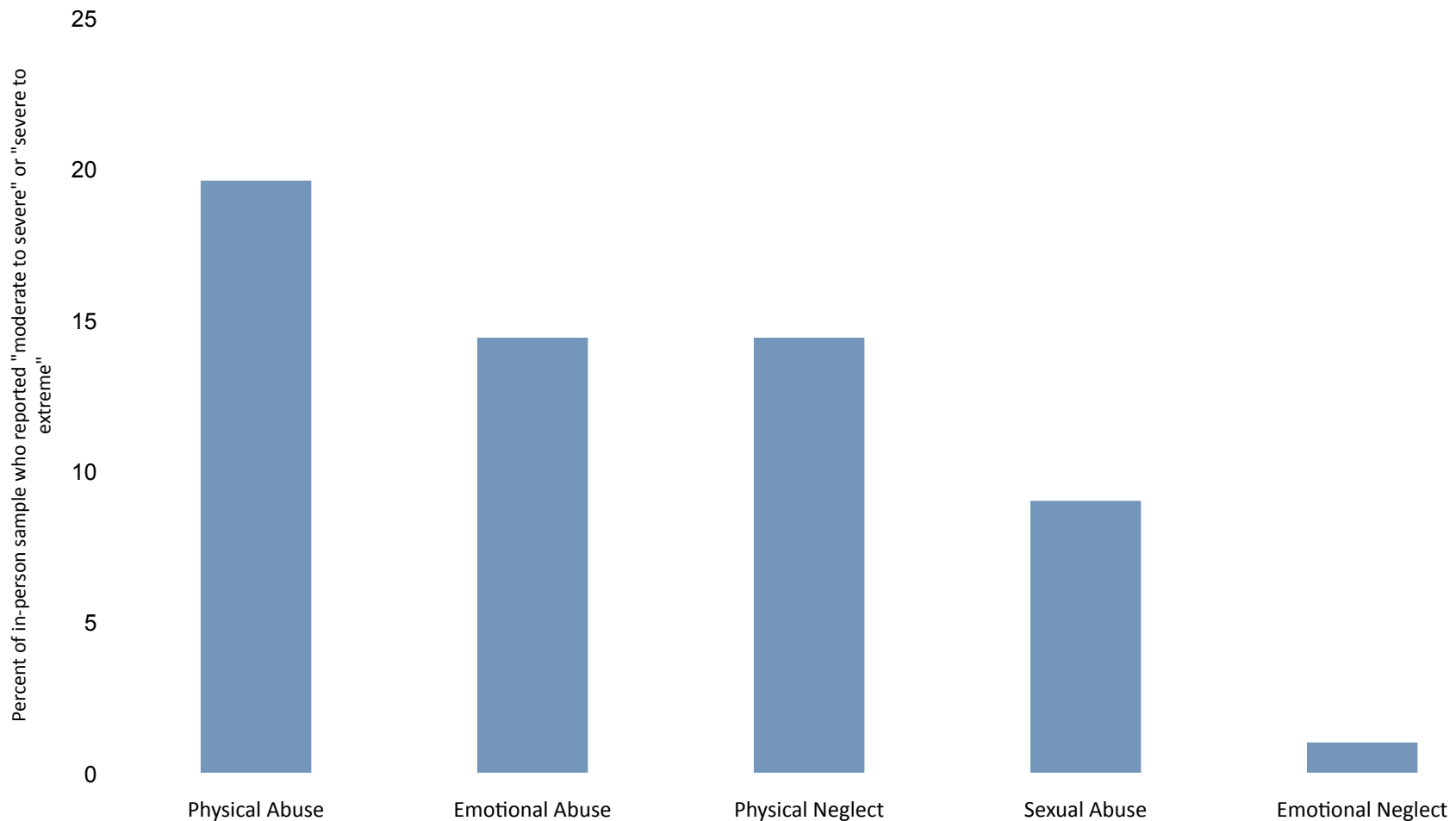
Few are currently divorced, widowed or separated (9.6%)



Calculated from baseline (N≈2616) . . 1 man ≈ 60 OANG soldiers

Soldiers reported facing trauma in childhood

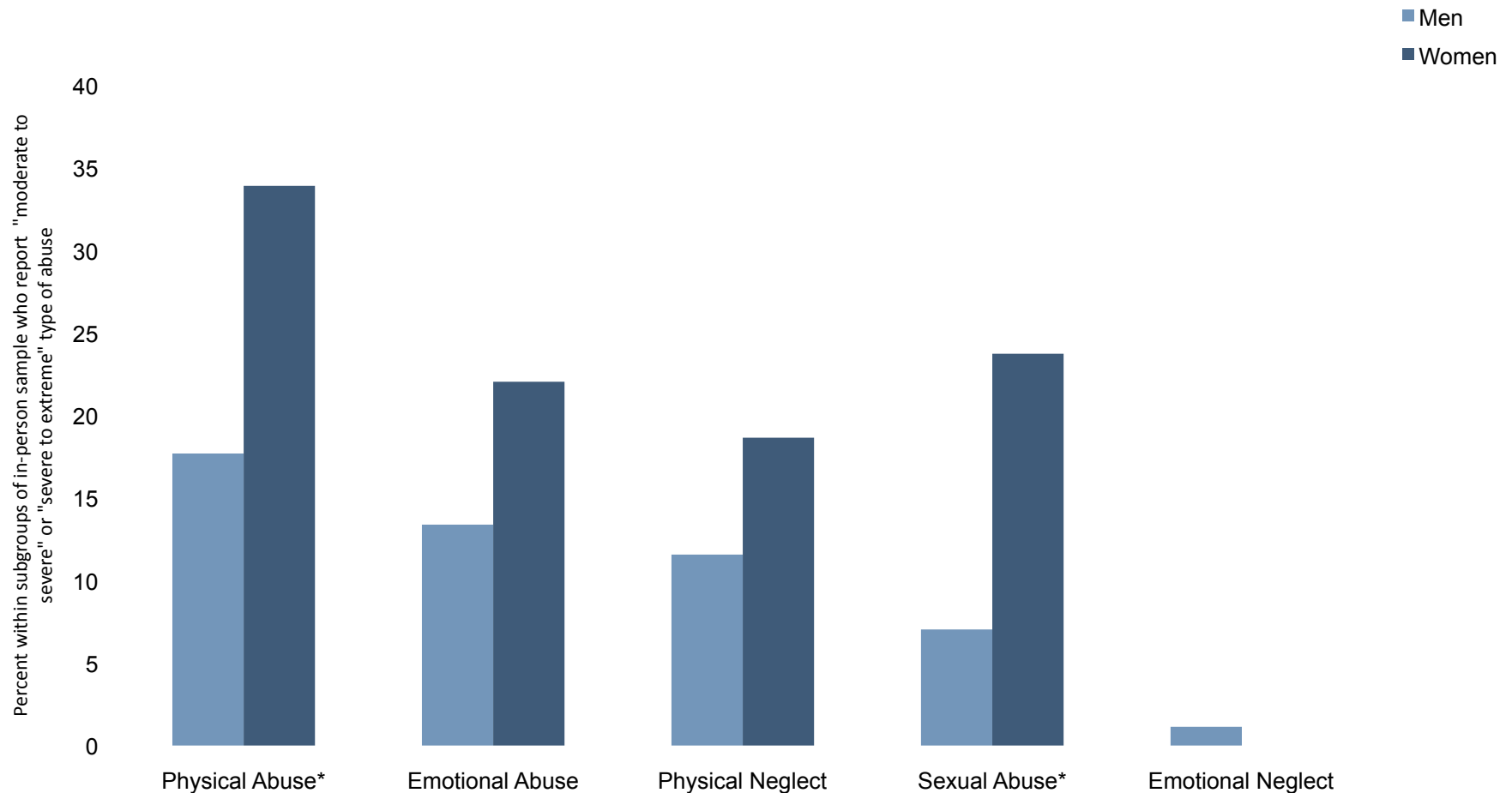
Wave 1: in-person interviews



These values are from the **Childhood Trauma Questionnaire** (Bernstein et al. 1996) from the baseline sample of the in-person surveys (N≈500). Each variable is determined on a 4 –point scale from “none or minimal”, “low to moderate”, “moderate to severe” and “severe to extreme”. Presented are the percentages of those who reported “moderate to severe” and “severe to extreme” occurrences.

Childhood traumas are more frequent in women

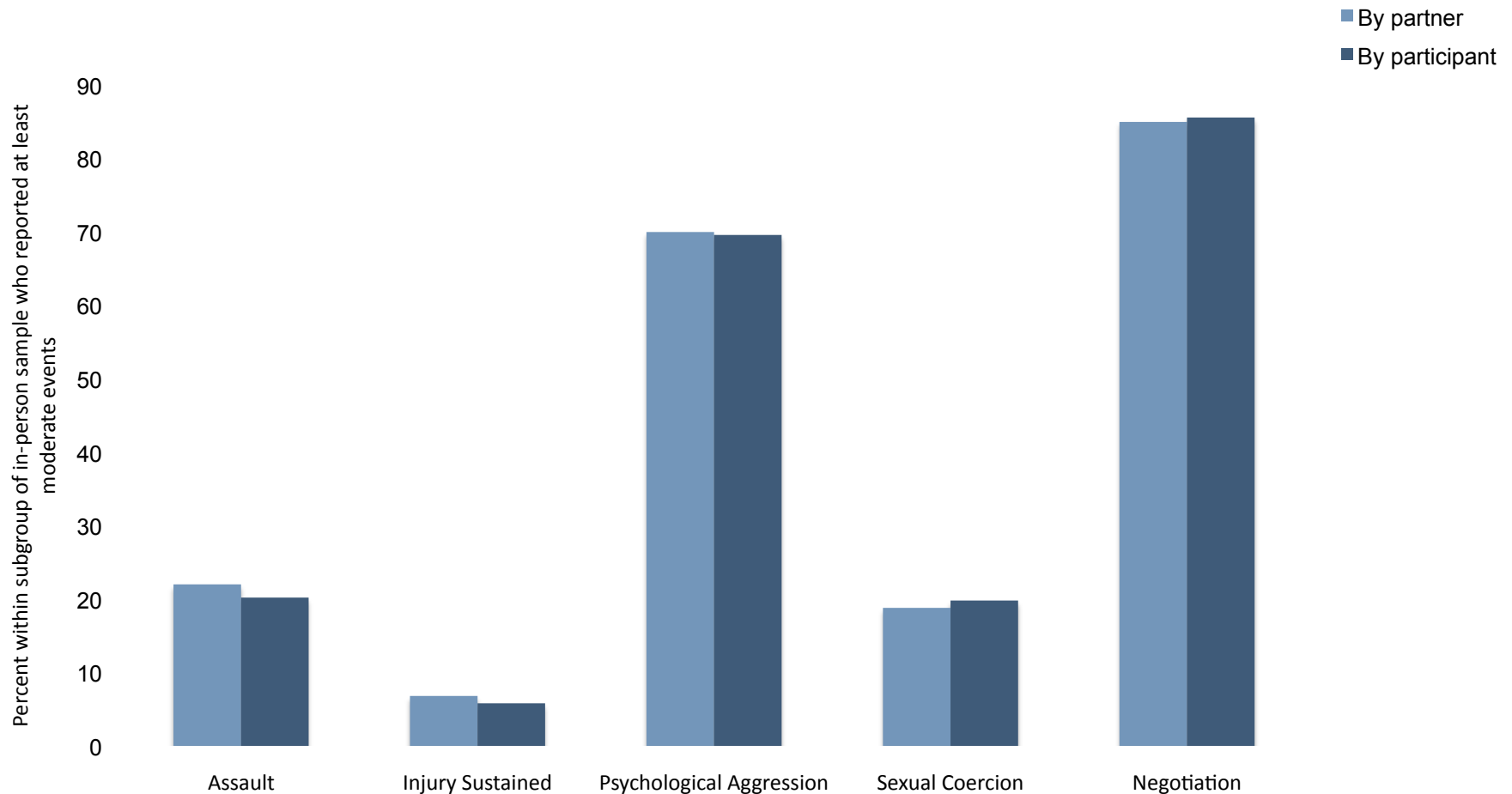
Wave 1: in-person interviews



*p-value<0.05. These values are from the **Childhood Trauma Questionnaire** (Bernstein et al. 1996) from the baseline sample of the in-person surveys (N≈500). Each variable is determined on a 4 –point scale from “none or minimal”, “low to moderate”, “moderate to severe” and “severe to extreme”. Presented are the percentages of those who reported “moderate to severe” and “severe to extreme” occurrences.

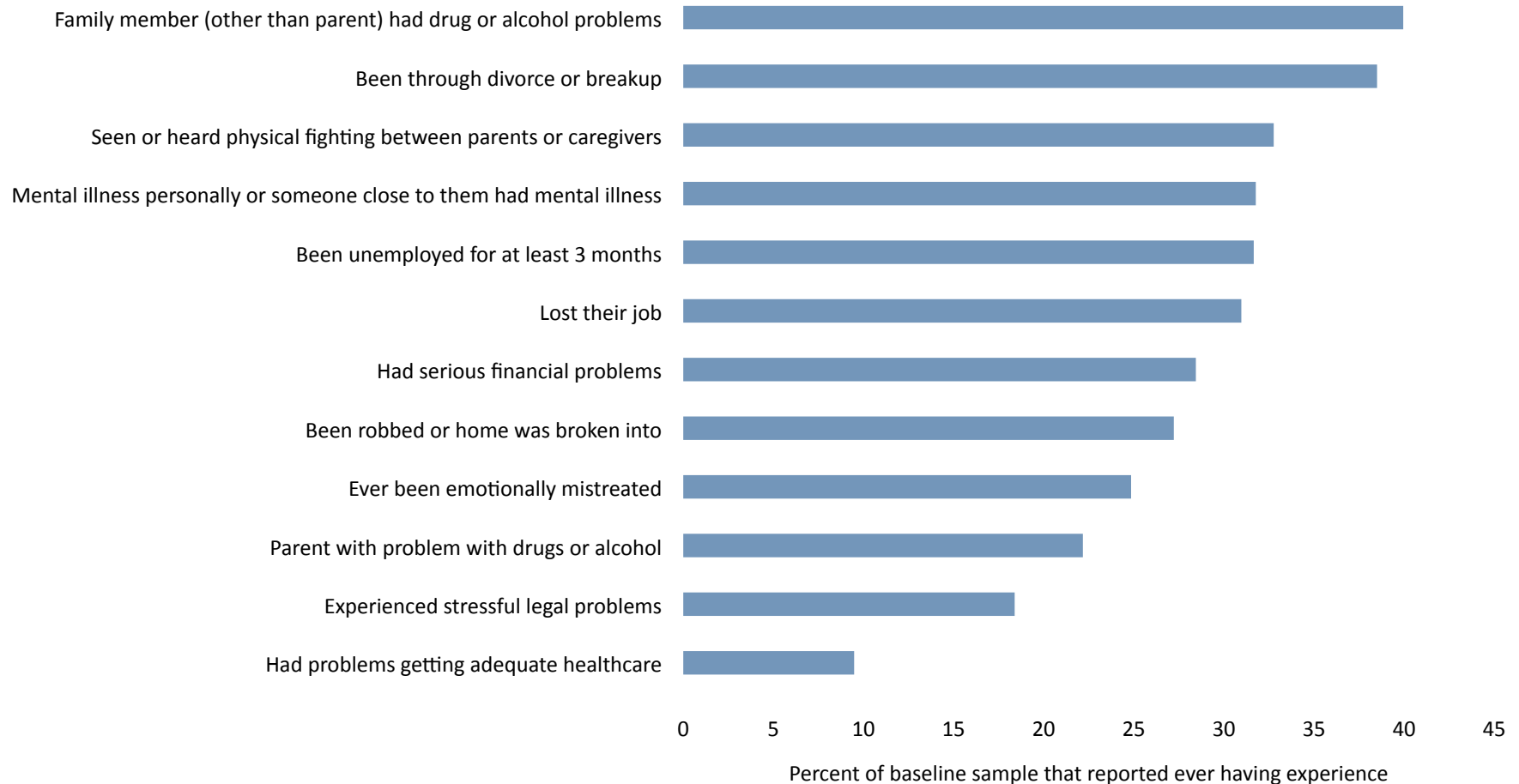
Soldiers also report recent domestic conflict which is done to the same extent by the participant and their partner

Wave 1: in-person interviews



*p-value<0.05. These values are from the **Conflict Tactics Scale** (Straus et al. 1996) from the baseline sample of the in-person surveys (N≈500). The 78 question scale is based upon 5 subscales, response options are “once”, “twice”, “3-5 times”, “6-10 times”, “11-20 times”, “more than 20 times”, “not in the past year, but happened before”, and “never happened”. Presented are the percentages of those who reported one or more instances of the acts in each subscale during the past year. Negotiations are considered actions taken in order to settle a disagreement.

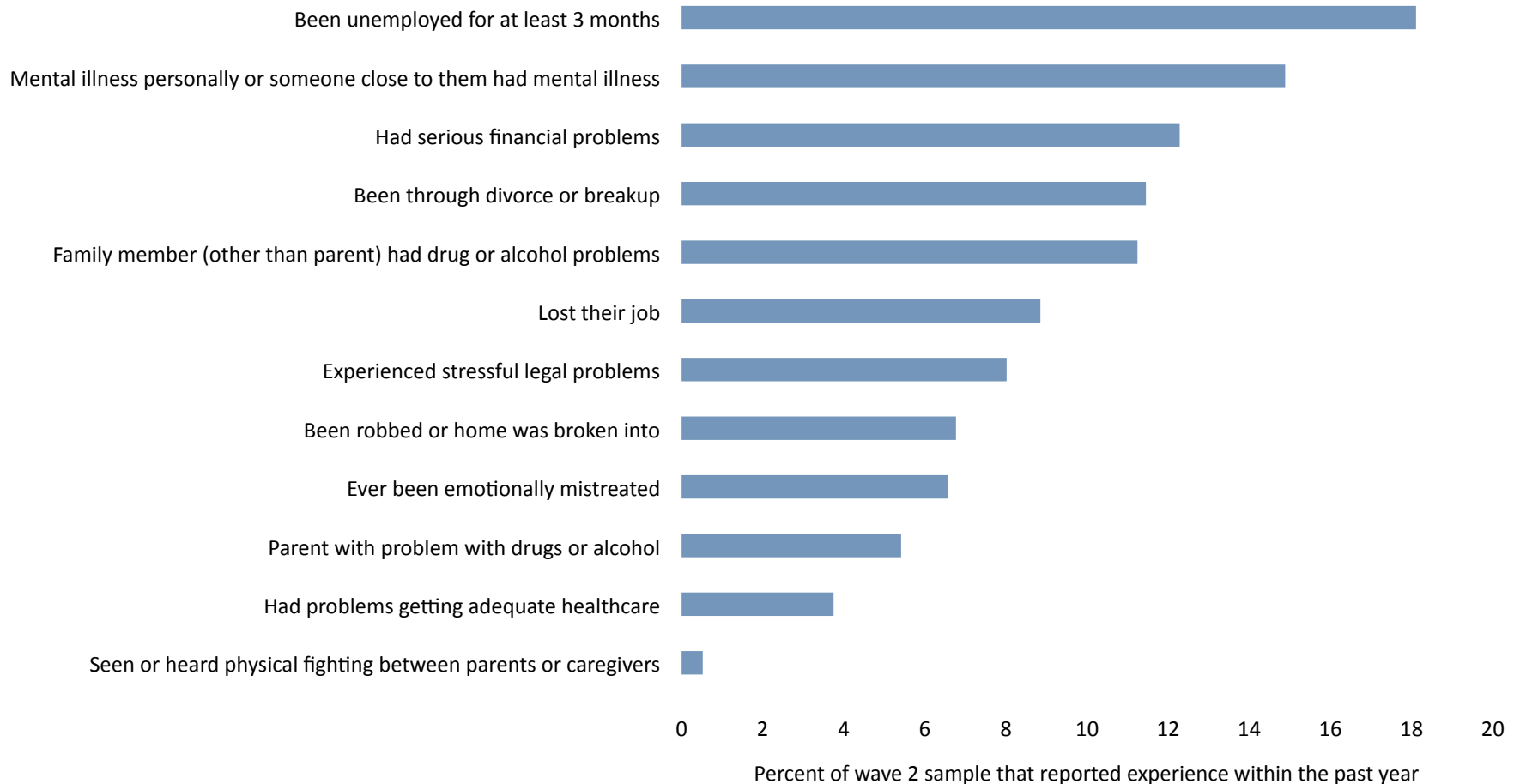
Throughout lifetime, soldiers encounter stressful experiences that can affect deployment and mental health



Wave 1 Telephone Survey. N=2616

Mean number of type of stressors was 3.4 (min=0, max=12). These are the prevalence of occurrences ever reported in the baseline survey

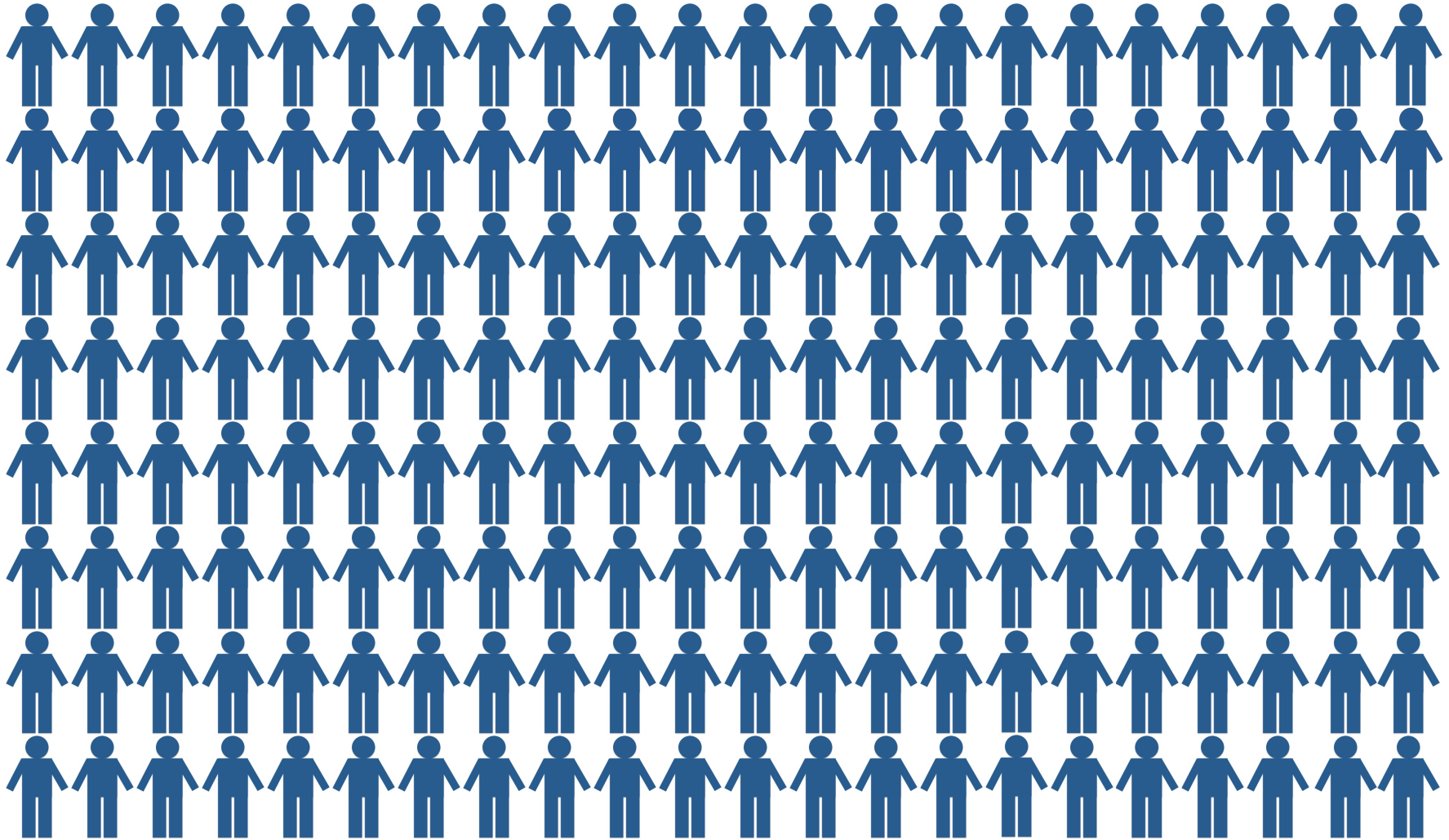
51% of soldiers report stressful experiences within the past year



Wave 2: Telephone Survey. N≈960

Mean number of type of stressor in the past year is 1.1 (min = 0, max = 11).

In addition to lifetime stressors, the guard experience trauma outside of deployment



1 man $\approx$ 60 men

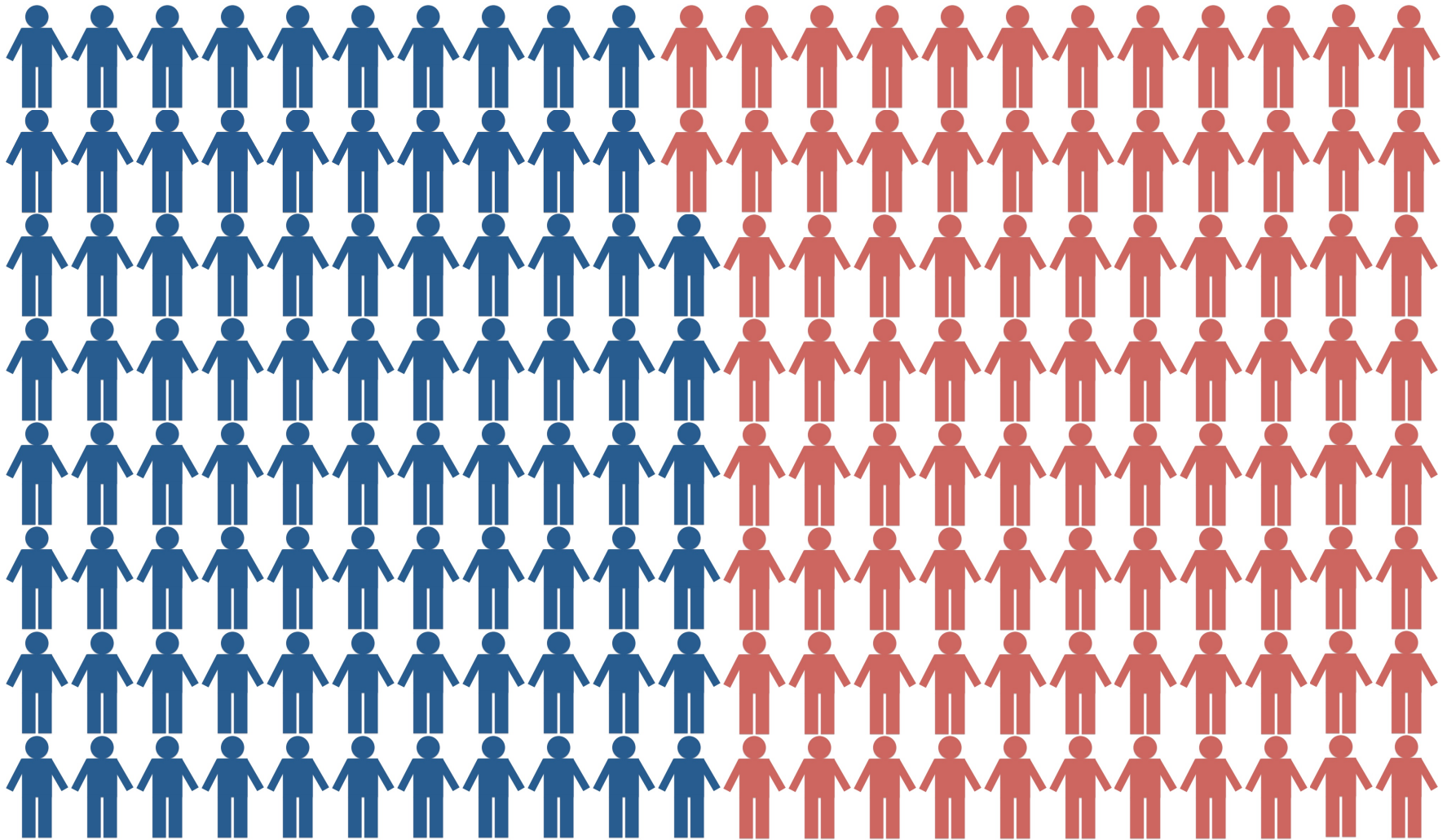
91% have experienced a trauma at some time in their life



Wave 1: Telephone Survey. N≈2616

Traumatic events include assaultive traumatic events as well as shocking events (e.g. car accident, natural disaster), learning about traumatic events to others, the sudden unexpected death of someone close and any other traumatic event the participant considered traumatic. 1 man ≈ 60 men

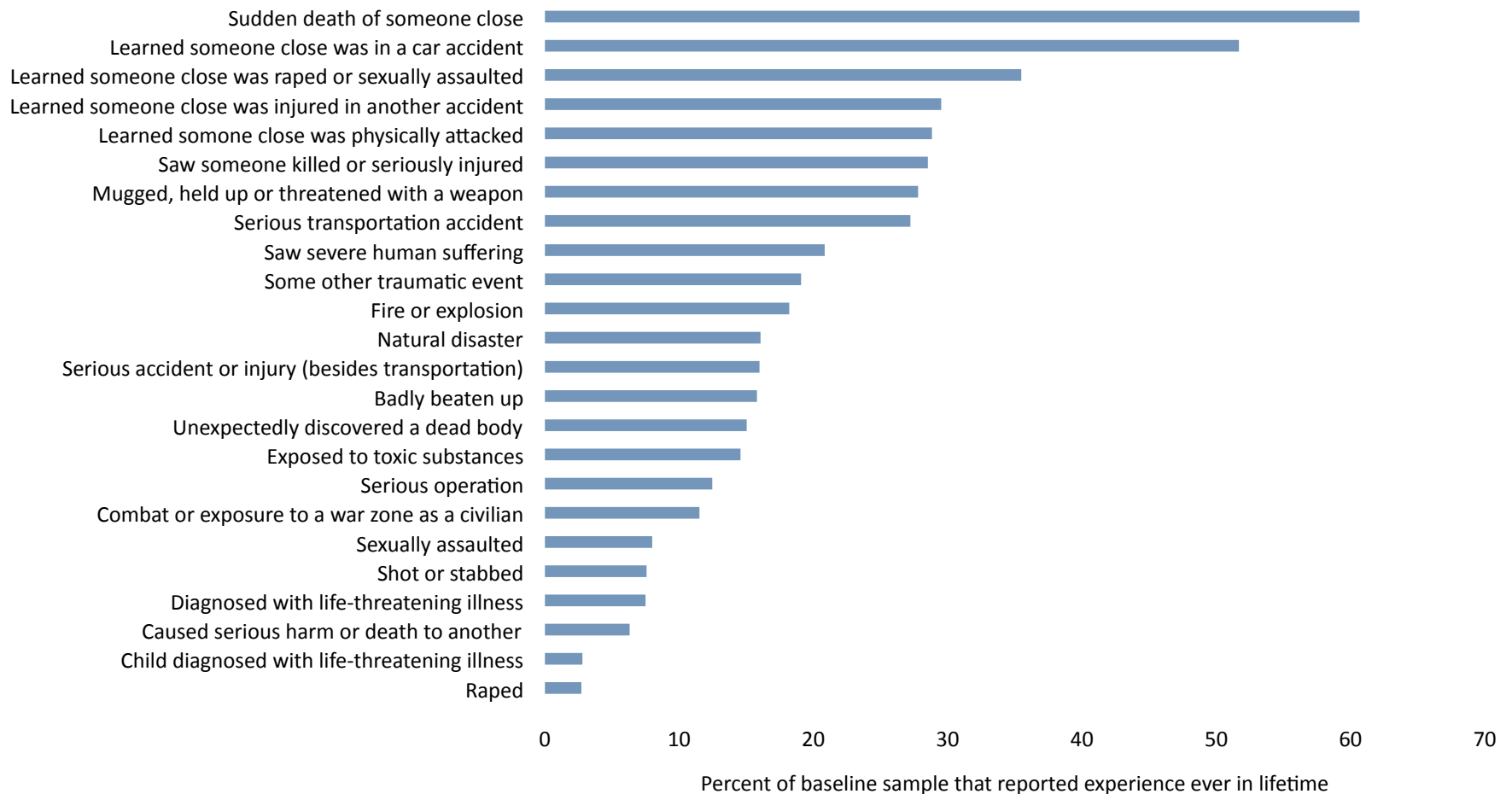
51% have experienced an assaultive traumatic event at some time in their life



Wave 1: Telephone Survey. N≈2616

An assaultive traumatic event is intrapersonal in nature and includes events such as being shot, stabbed, beaten, sexually assaulted, raped or killing someone else. 1 man ≈ 60 men

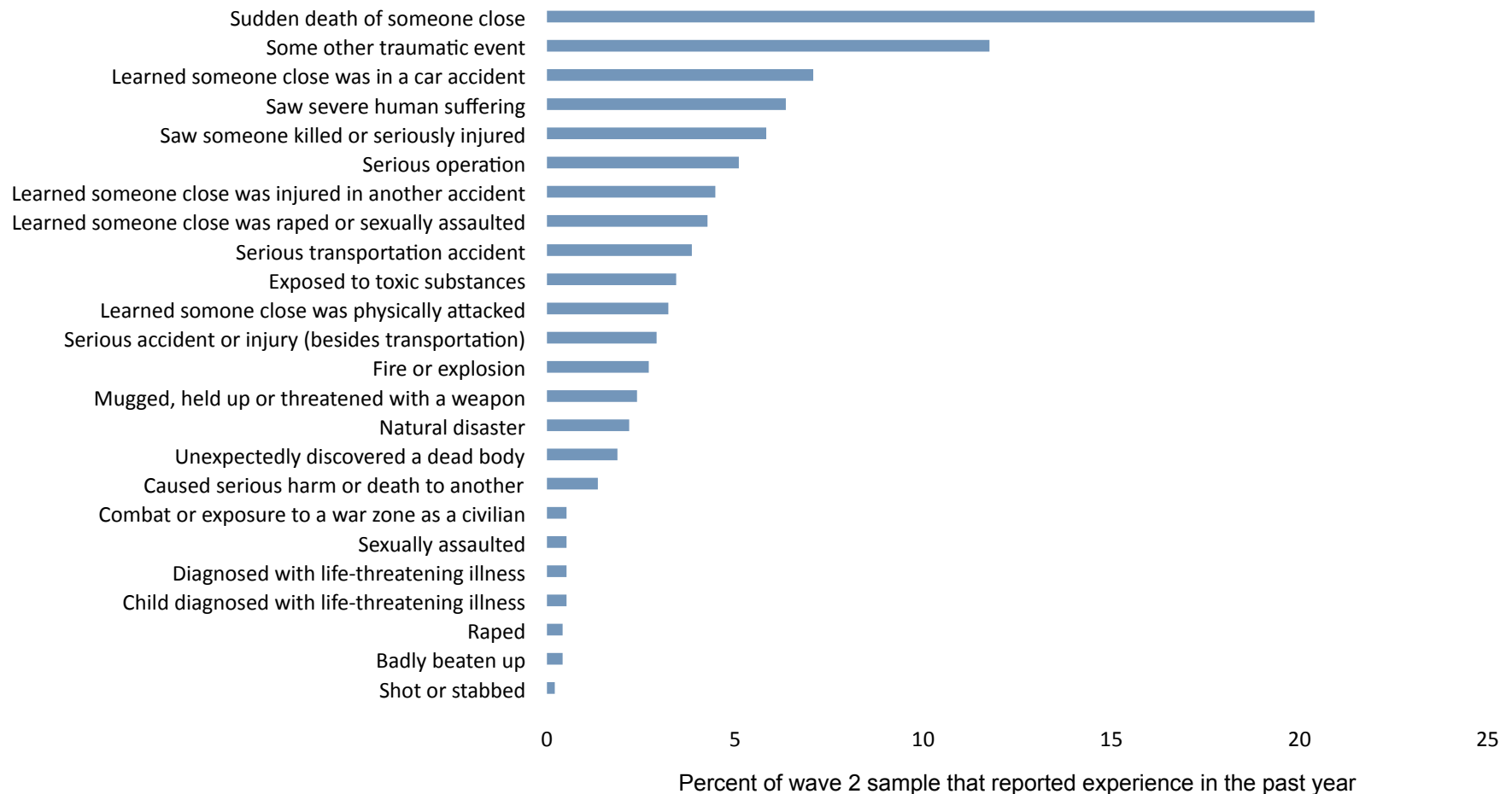
Most common trauma that occurred outside of most-recent deployment was the sudden death of a loved one



Wave 1: Telephone Sample. N≈2616

Mean number of types of traumatic events is 4.89 (min=0 max=19).

21% had someone close die within the past year

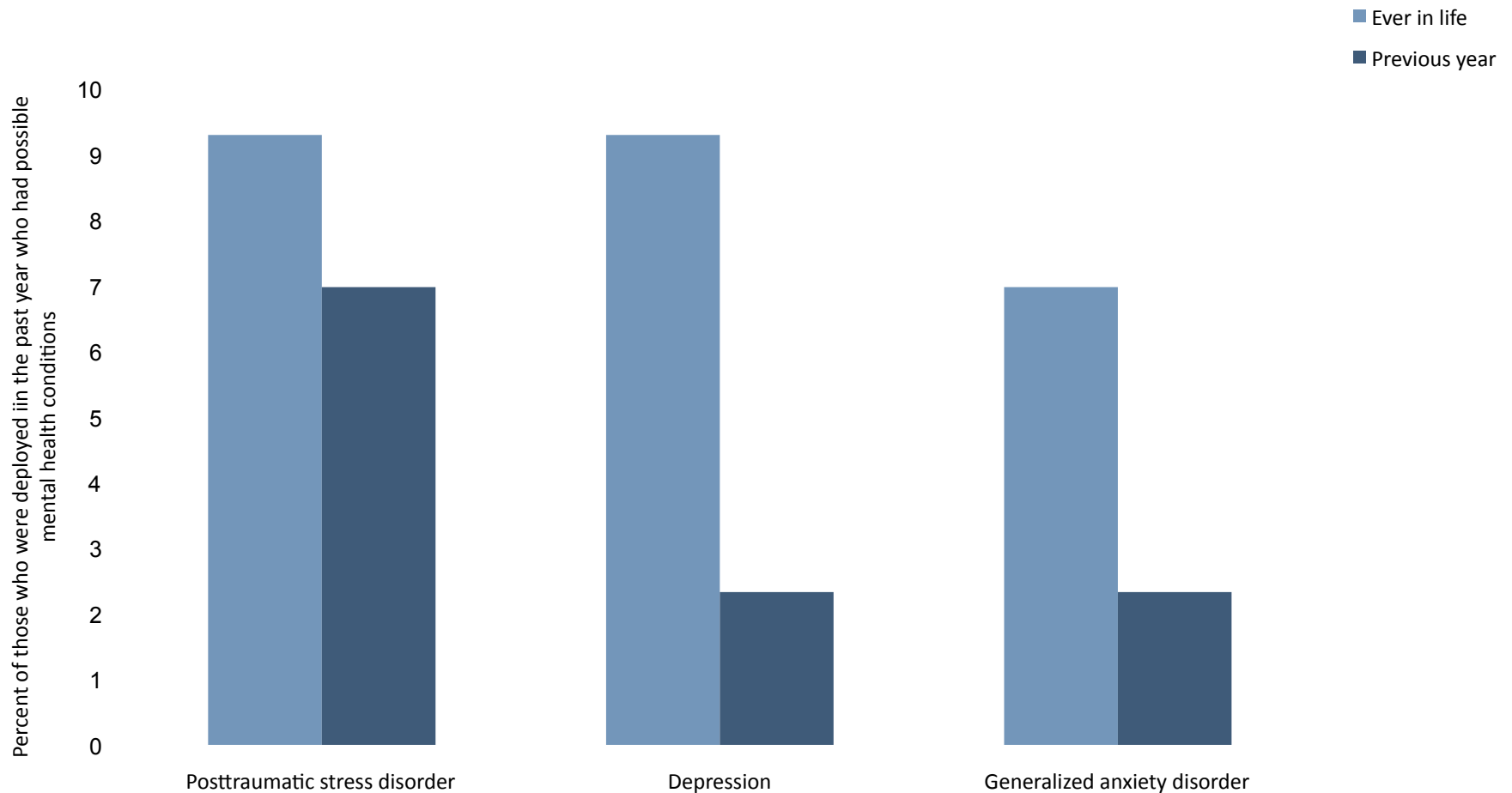


Wave 2: Telephone Survey. N≈960

Mean number of types of traumatic events within the past year 0.93 (min 0, max 16). These traumatic events were not related to deployment.

**What about soldiers' mental health
before their most recent deployment?**

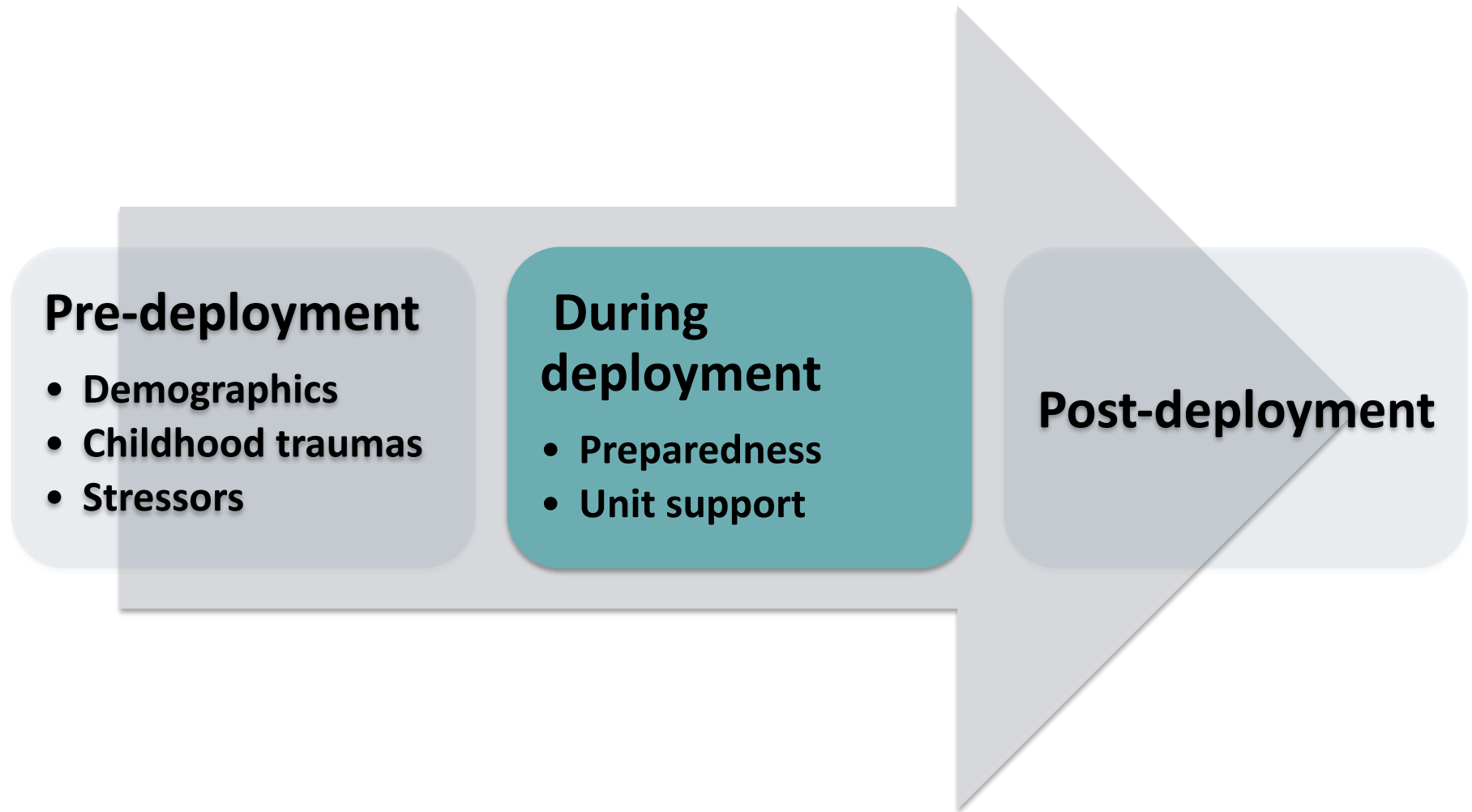
9.3% of those deployed since the baseline interview had a prior history of PTSD



Wave 2 Telephone survey. Calculated among those (n=43) who were deployed since baseline. 20 people had never been deployed before this past year's deployment.

Summary of pre-deployment conditions

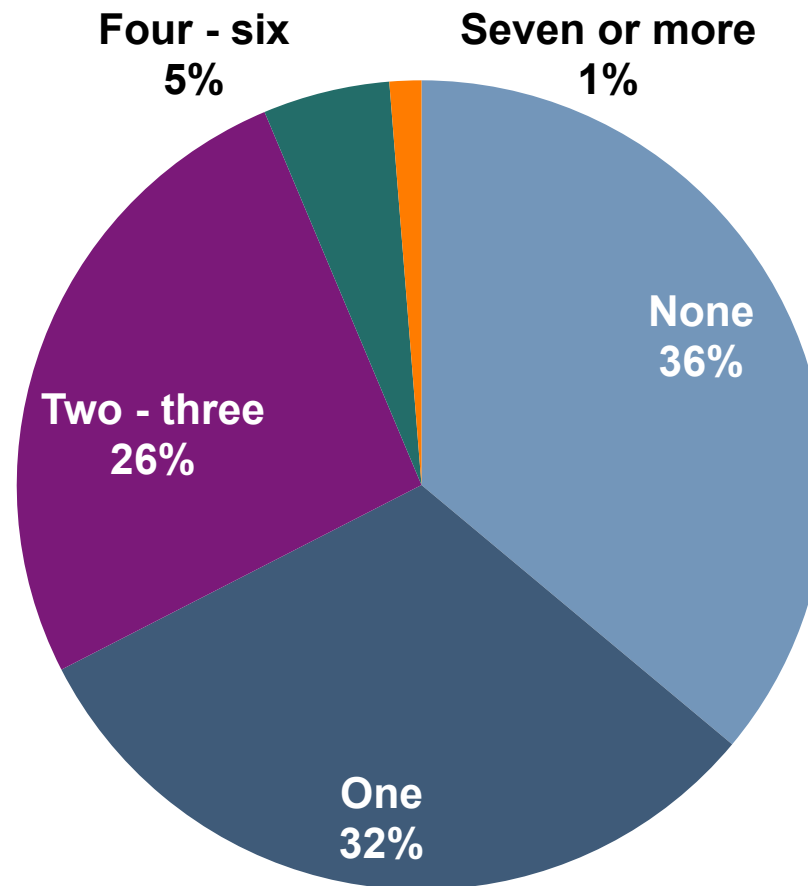
- In the baseline sample, majority of soldiers had been deployed at least once, and the majority of those who had been deployed more than once, had prior combat experience.
- Only 30% of soldiers have never been deployed.
- Overall, soldiers experience stressors, traumas as well as psychopathologies over their lifetime that can play a role in subsequent mental health consequences after deployment.



Measurement of deployment experiences

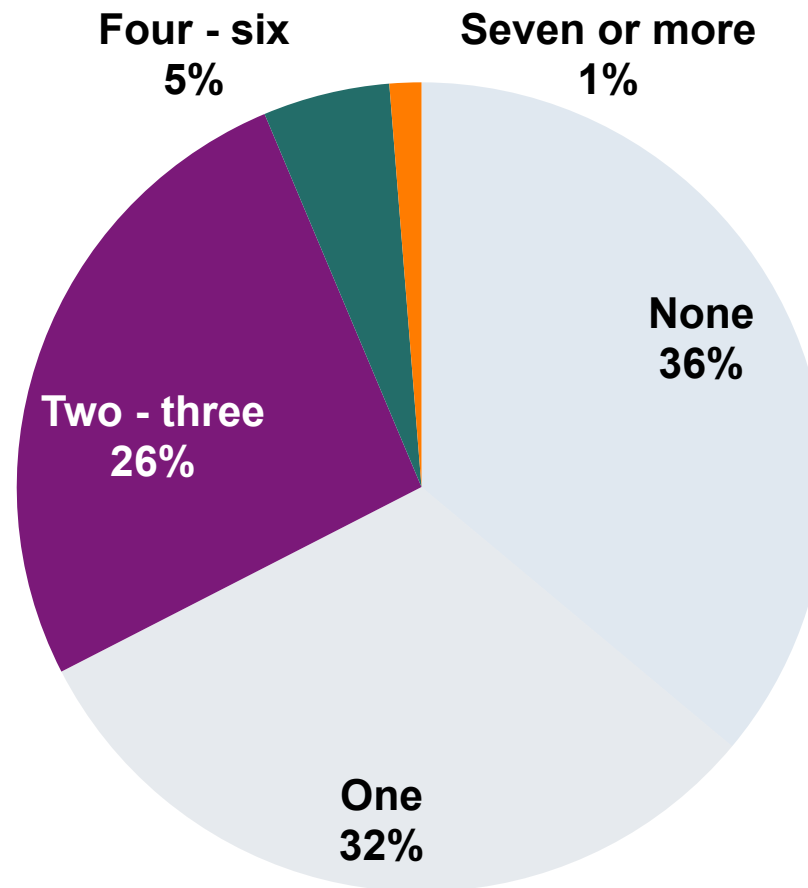
- Collected information on number of deployments and in wave 2 confirmed combat experience during deployments
- Collected in depth information on most recent deployment including stressors, location, self-reported preparedness, perceived threat and unit support
- Measures were collected using the Deployment Risk and Resilience Survey

63% of the baseline sample had deployment experience



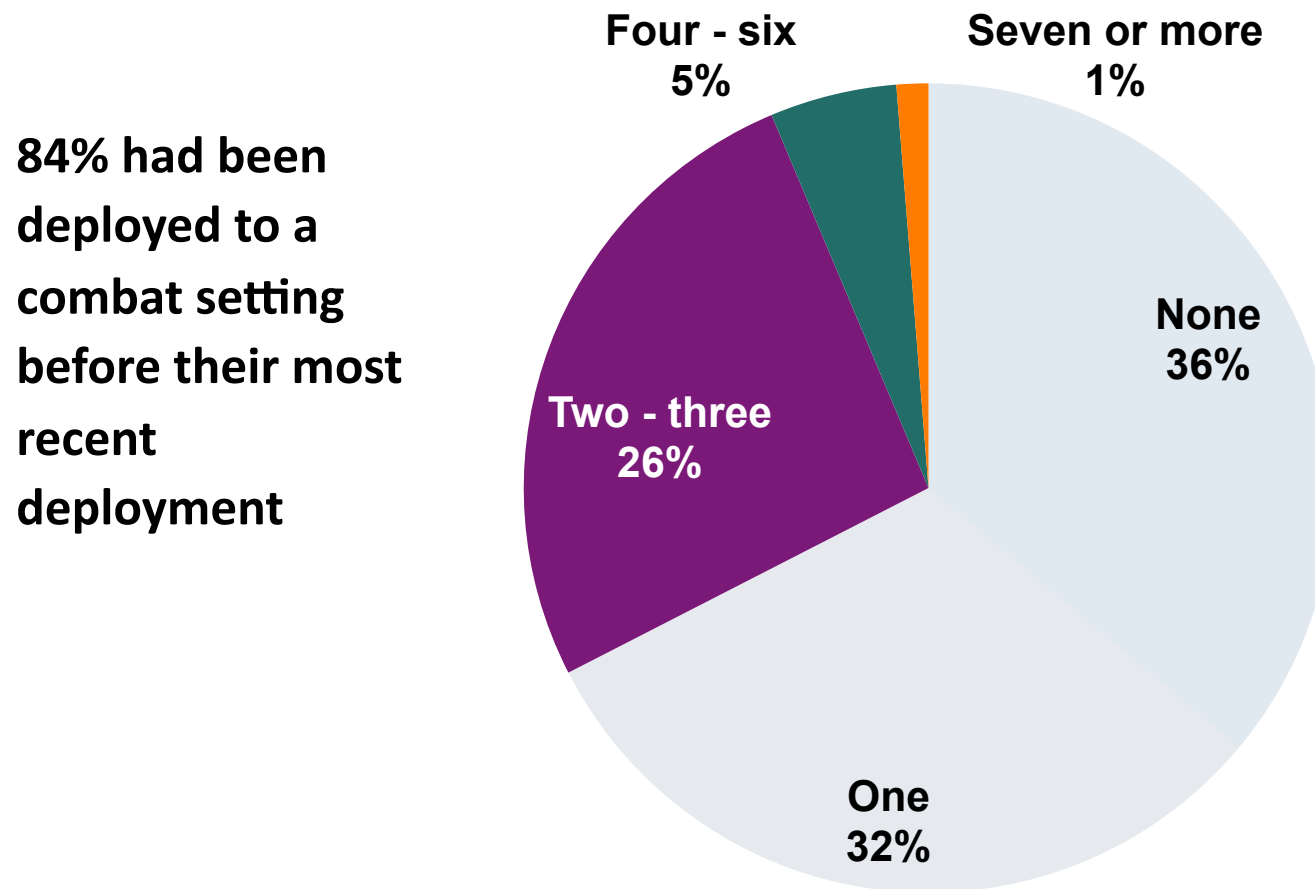
Average number of deployments is 1.3 (min = 0, max = 24). This is the proportion of deployment experience from baseline sample (N≈2616)

32% of the baseline sample had been deployed more than once



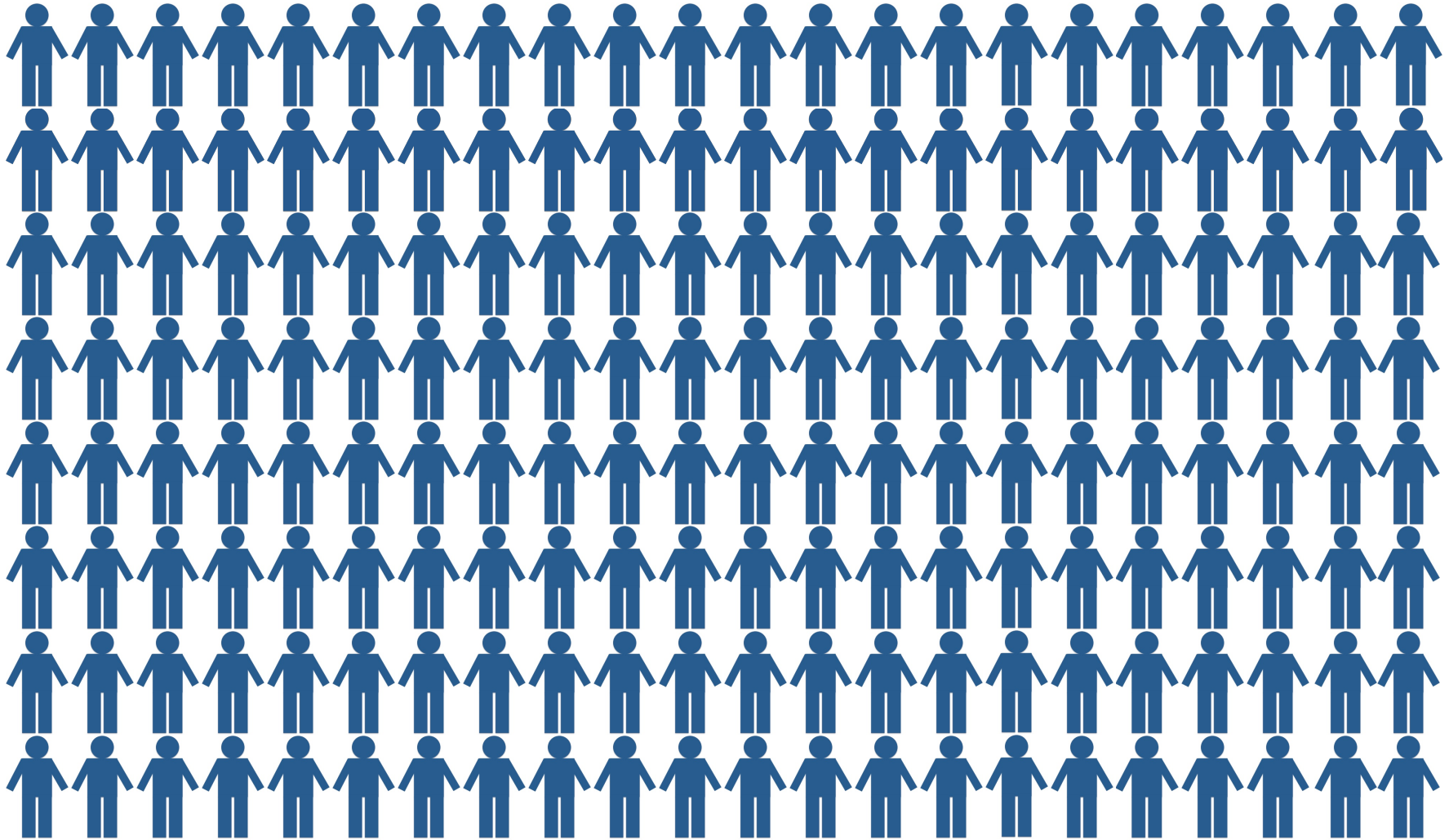
Average number of deployments is 1.3 (min = 0, max = 24). This is the proportion of deployment experience from baseline sample (N≈2616)

Among those who had been deployed more than once, the vast majority had prior combat experience



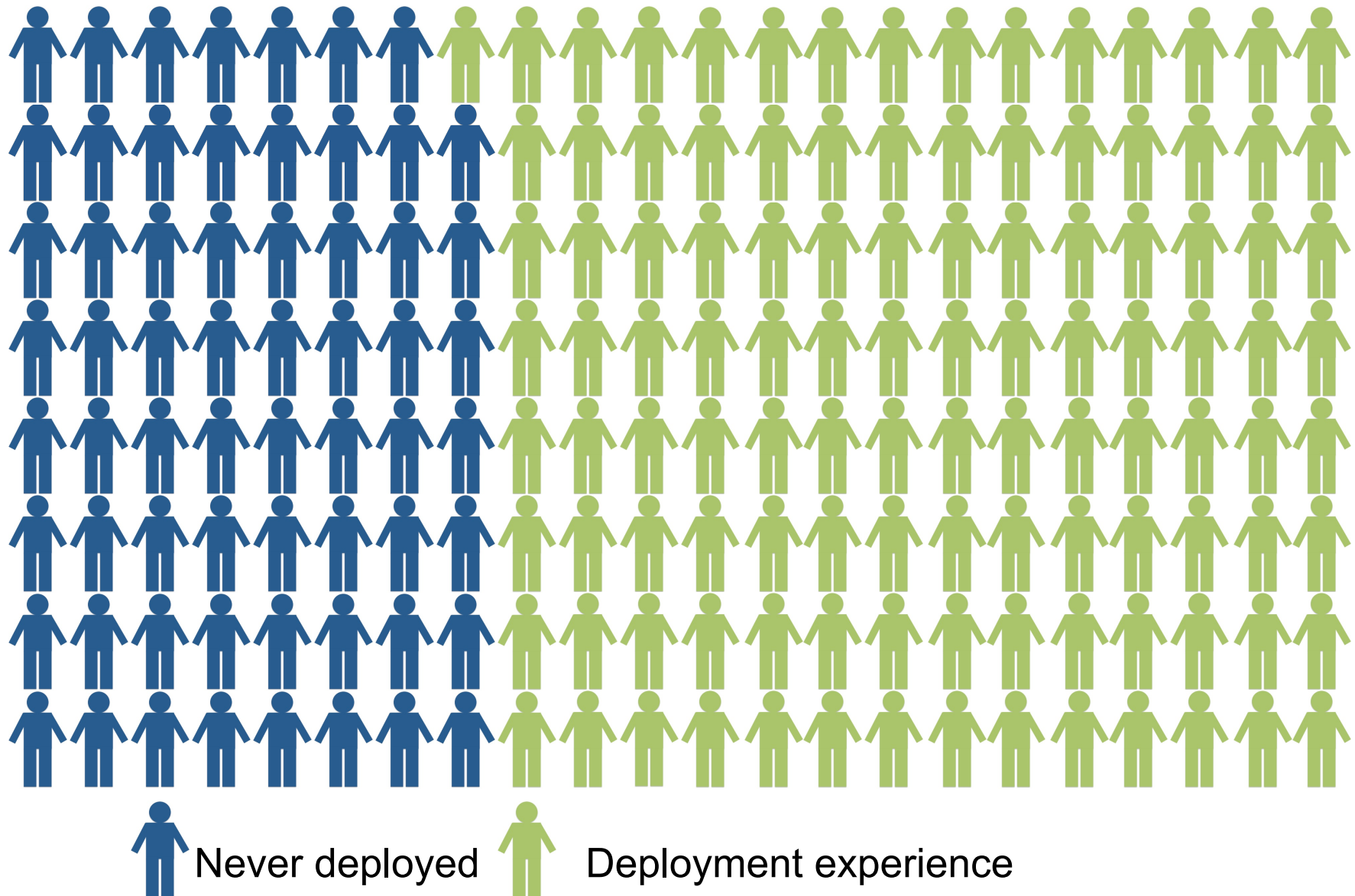
Wave 2: Telephone survey N=960. The proportion of those who had prior deployment experience.
Average number of deployments is 1.3 (min = 0, max = 24).

What were the locations and conditions during the most recent deployment?



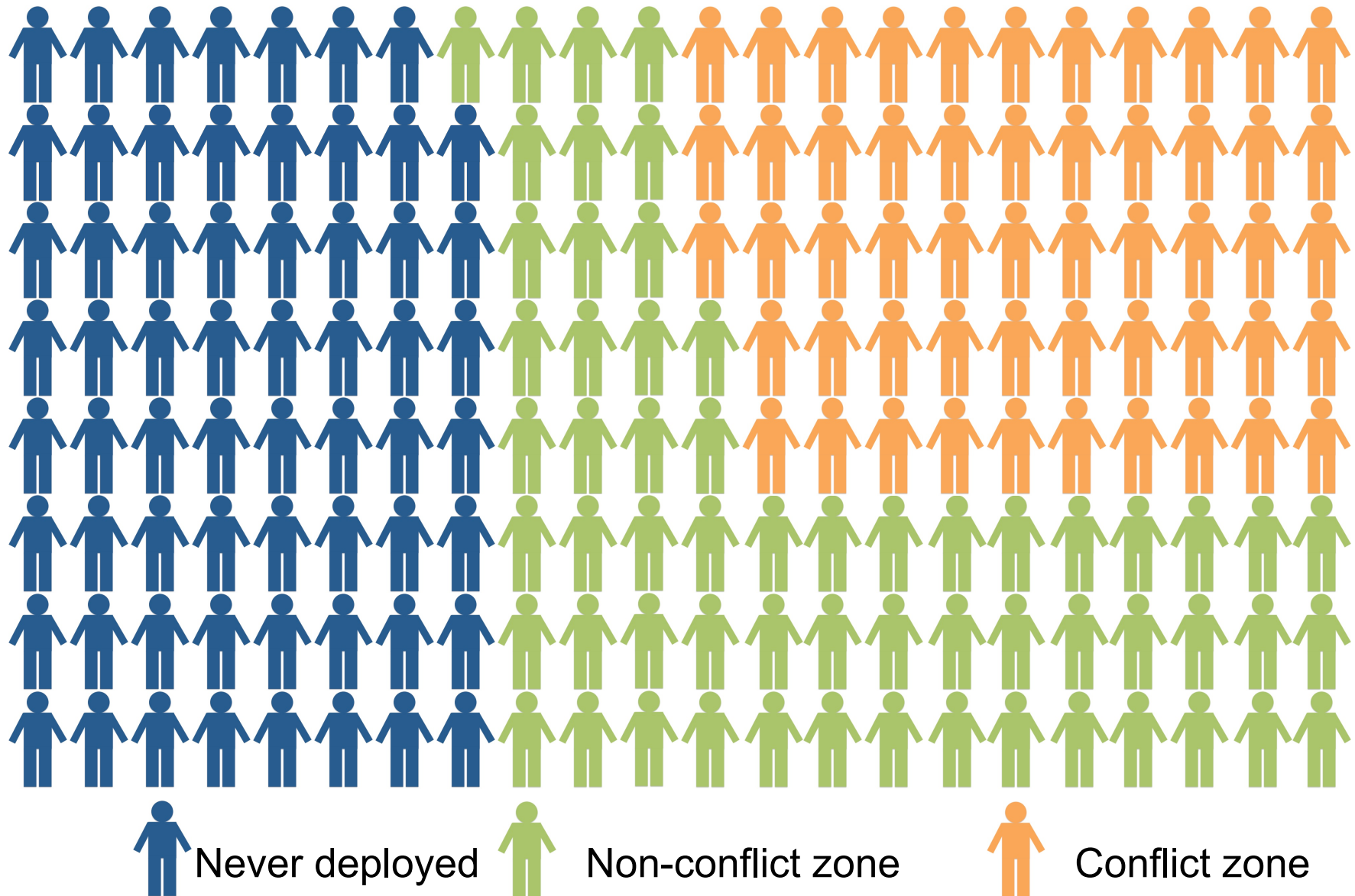
1 man $\approx$ 60 soldiers

Majority of sample (63%) have been deployed



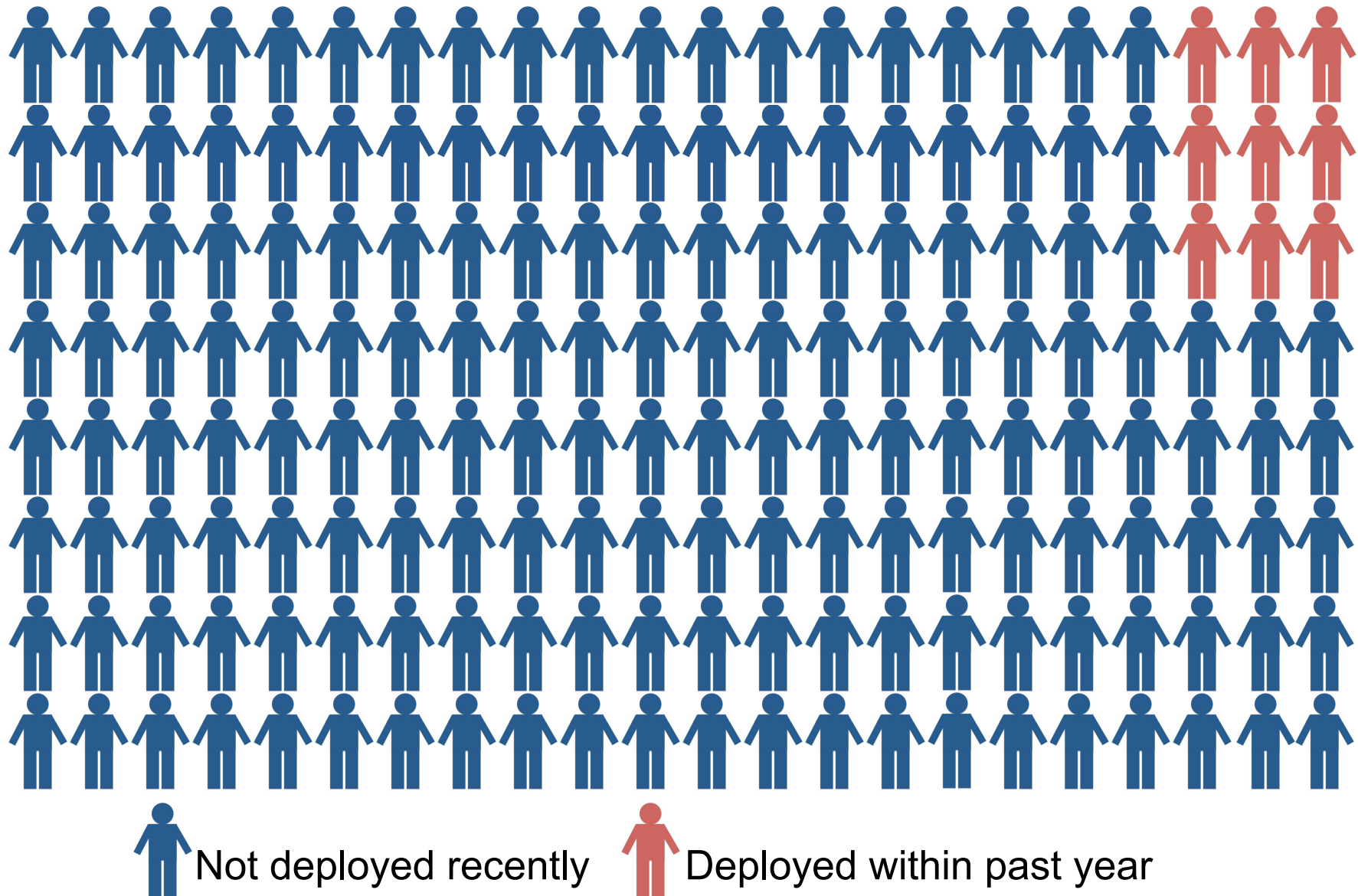
Wave 1: Telephone survey baseline sample N=2616. 1 man ≈ 60 soldiers

Nearly one third have had their most recent deployment to a conflict zone



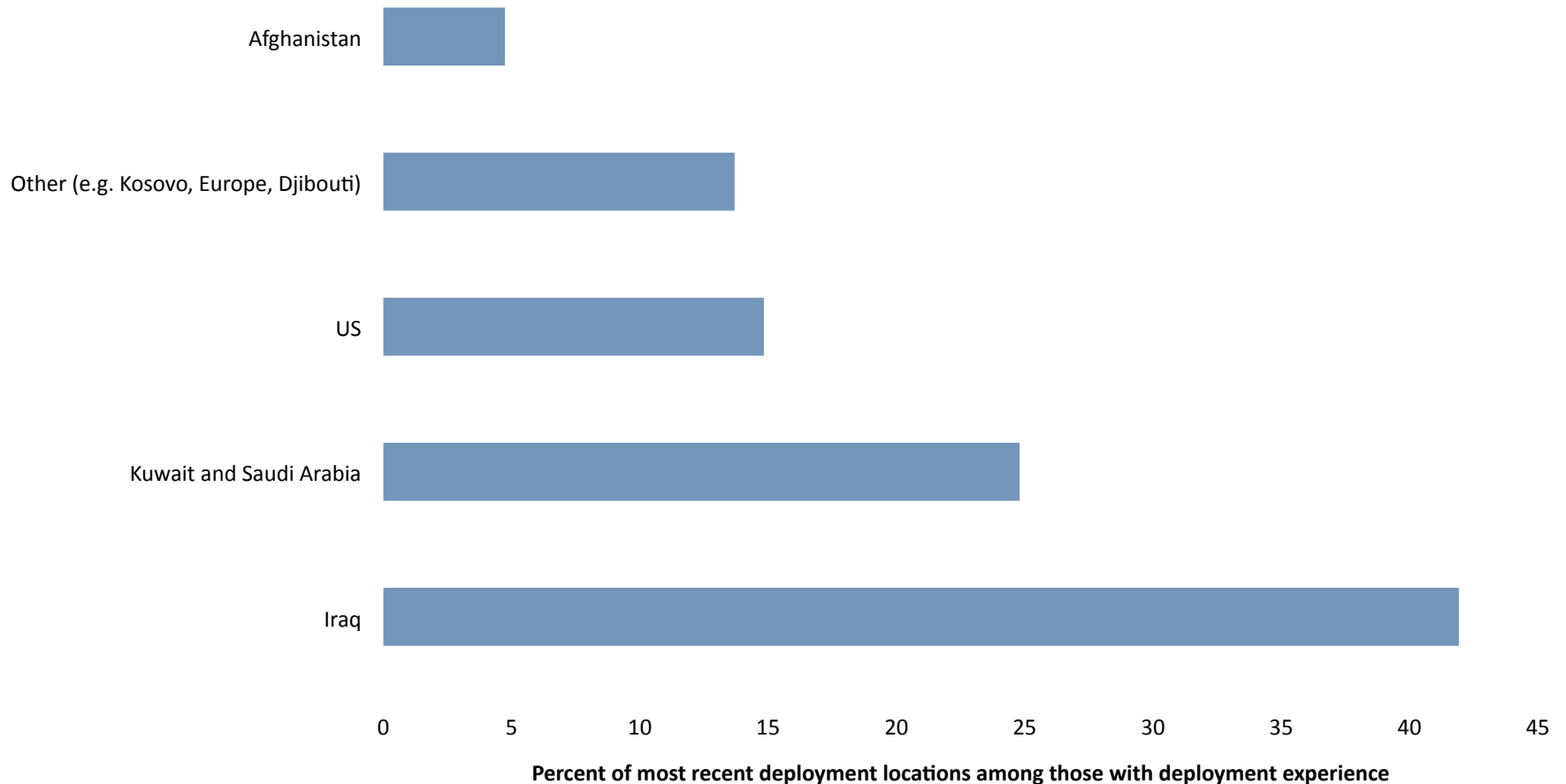
Wave 1: Telephone survey baseline sample N≈2616. 1 man ≈ 60 soldiers

Only 5% (n=43) of Wave 2 have been deployed within the year since Wave 1



Wave 2: Telephone survey N≈960. 1 man ≈ 60 soldiers

The most common location for deployment from baseline was Iraq

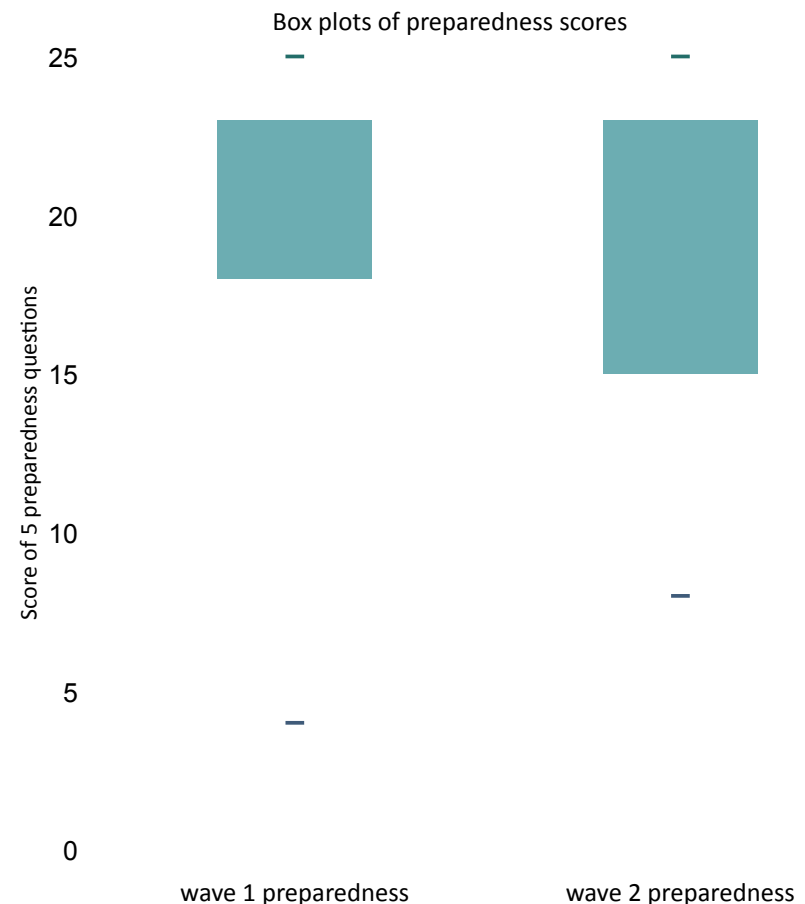


Wave 1: Telephone survey baseline sample N≈2616.

Reports of preparedness were varied but remained constant over time

Answers were scaled from 1 (strongly disagree) to 5 (strongly agree):

- Had supplies and equipment needed to get my job done
- Equipment I was given functioned the way it was supposed to
- Received adequate training on how to use my equipment
- Accurately informed about what to expect from the enemy
- Accurately informed of what daily life would be like during my deployment



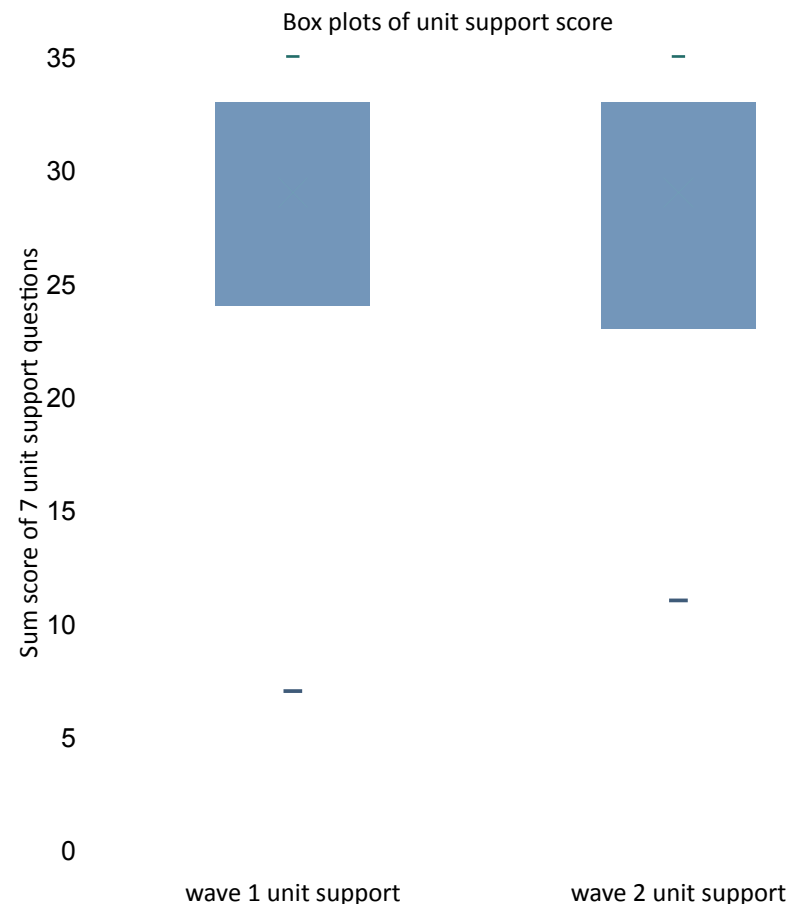
Calculated from deployment risk and resilience inventory (DRRI) among those who were ever deployed at baseline (n=1607) and wave 2 (48). The center point is the median, the top of the box is the 75th percentile and the bottom of the box is the 25th percentile; the top edge of the line is the maximum score given and the bottom is the minimum score given.

King, D.W., King, L.A., Vogt, D., Knight, J., Samper, R.E. (2006) Deployment Risk and Resilience Inventory: A collection of measures for studying deployment related experience among military personnel and veterans. *Military Psychology*; 18(2): 89 - 120

Similar story with reports of unit support during most recent deployment

Answers were scaled from 1 (strongly disagree) to 5 (strongly agree):

- Sense of camaraderie between myself and other soldiers in my unit
- Most people in my unit were trustworthy
- Could go to most people in my unit for help when I had a personal problem
- Commanding officers were interested in what I thought and how I felt about things
- Impressed by the quality of leadership in my unit
- My superiors made a real attempt to treat me as a person
- I felt like my efforts really counted to the military



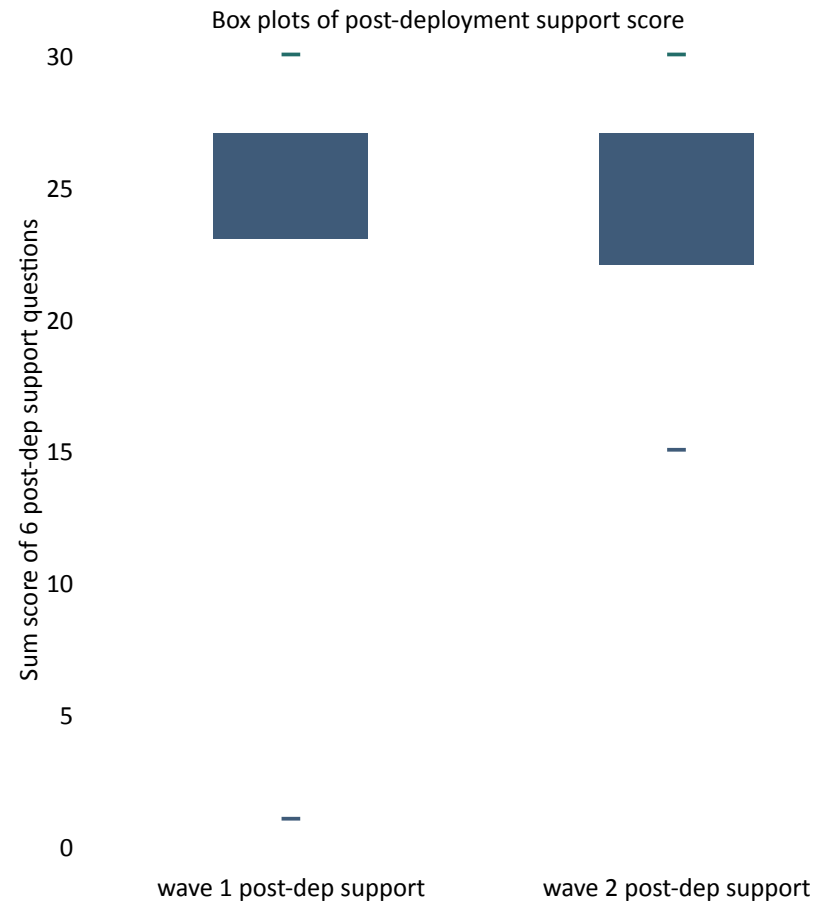
Calculated from deployment risk and resilience inventory (DRRI) among those who were ever deployed at baseline (n=1607) and wave 2 (48). The center point is the median, the top of the box is the 75th percentile and the bottom of the box is the 25th percentile; the top edge of the line is the maximum score given and the bottom is the minimum score given.

King, D.W., King, L.A., Vogt, D., Knight, I., Samper, R.E. (2006) Deployment Risk and Resilience Inventory: A collection of measures for studying deployment related experience among military personnel and veterans. *Military Psychology*; 18(2): 89 - 120

As well as reports of post-deployment support after most recent deployment

Answers were scaled from 1 (strongly disagree) to 5 (strongly agree):

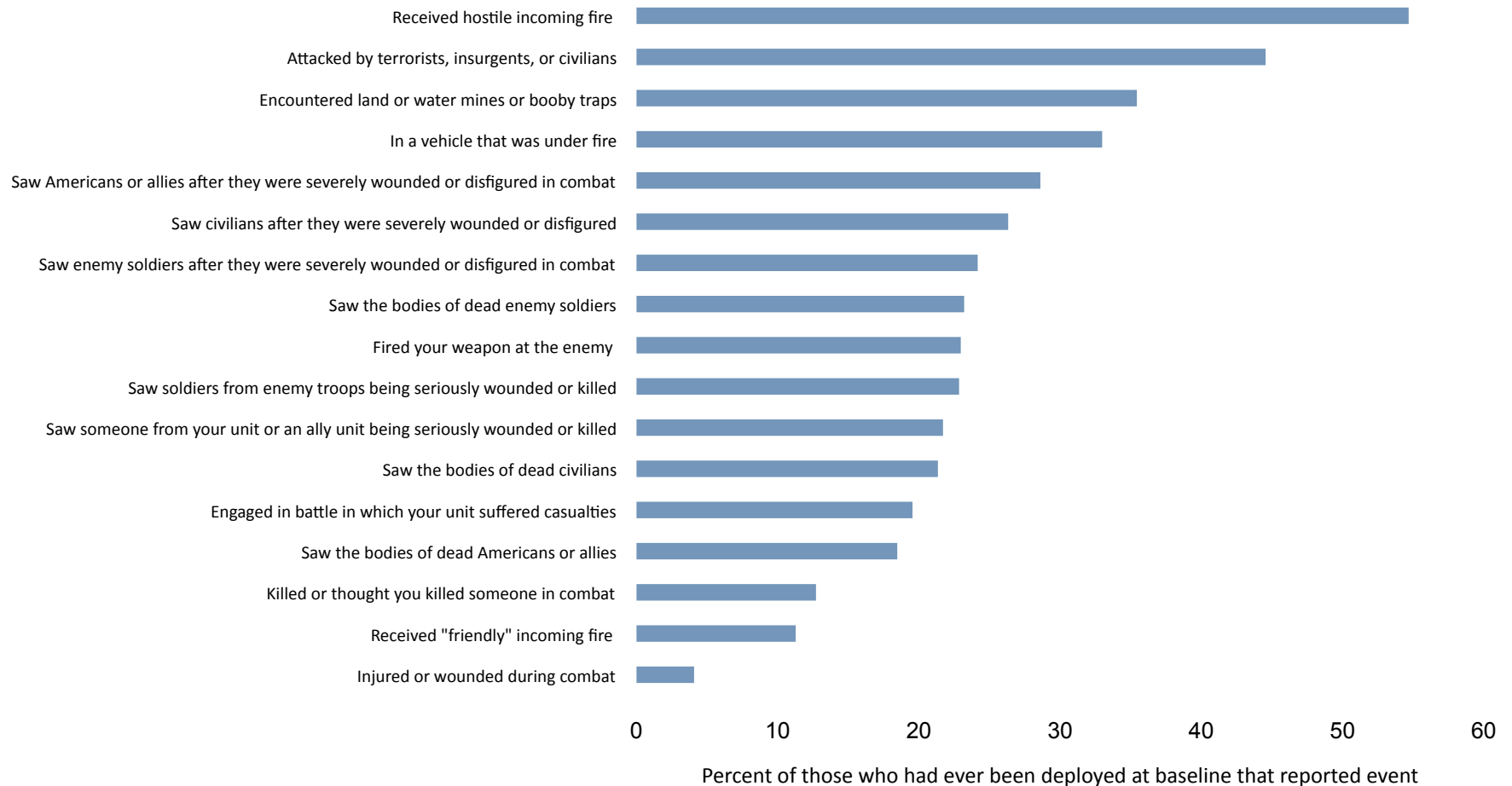
- Reception I received when I returned from my deployment made me feel appreciated for my efforts
- American people made me feel at home when I returned
- When I returned, people made me feel proud to have served my country in the Armed Forces
- People at home understand what I have been through while in the Armed Forces**
- There are people to whom I can talk about my deployment experiences
- The people I work with respect the fact that I am a veteran



Calculated from deployment risk and resilience inventory (DRRI) among those who were ever deployed at baseline (n=1607) and wave 2 (48). The center point is the median, the top of the box is the 75th percentile and the bottom of the box is the 25th percentile; the top edge of the line is the maximum score given and the bottom is the minimum score given.

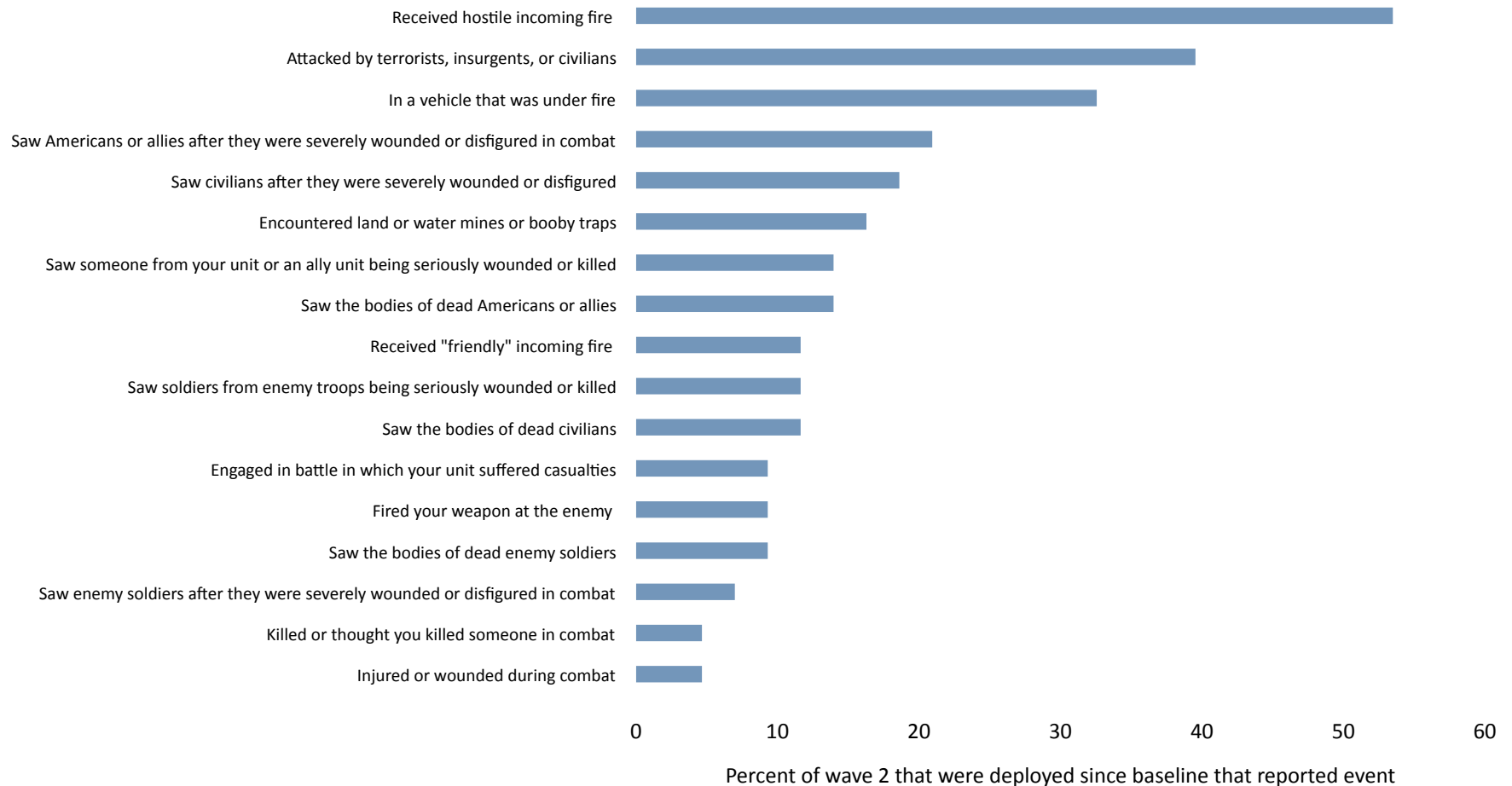
King, D.W., King, L.A., Vogt, D., Knight, I., Samper, R.E. (2006) Deployment Risk and Resilience Inventory: A collection of measures for studying deployment related experience among military personnel and veterans. *Military Psychology*; 18(2): 89 - 120

In addition to stressors, soldiers reported various types of trauma during their most recent deployment (n=1607)



Calculated from baseline sample that had been deployed at some point (N≈1607)

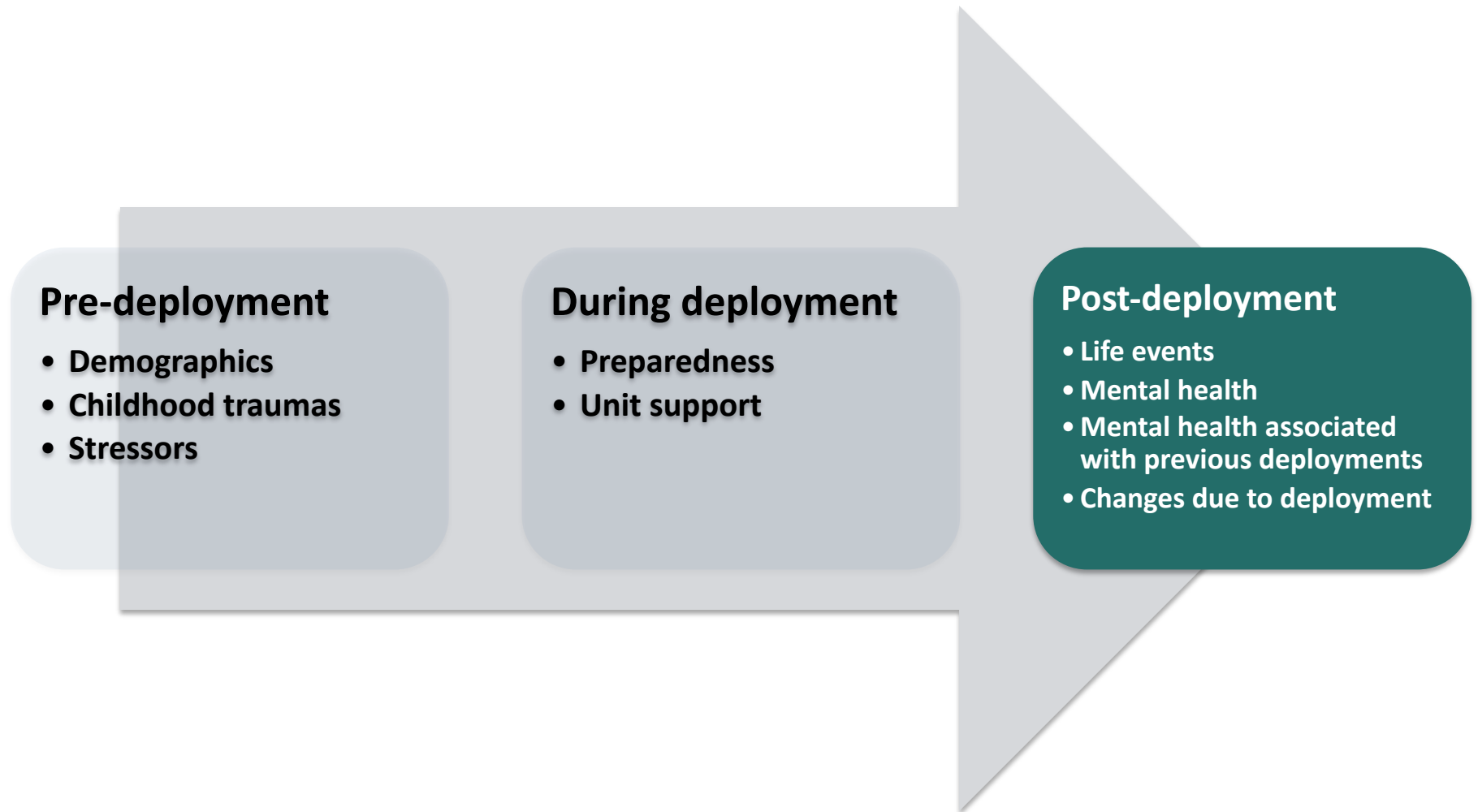
Found similar reports of traumas during deployments that occurred since baseline (n=43)



Wave 2: Calculated from those deployed since baseline, N=43.

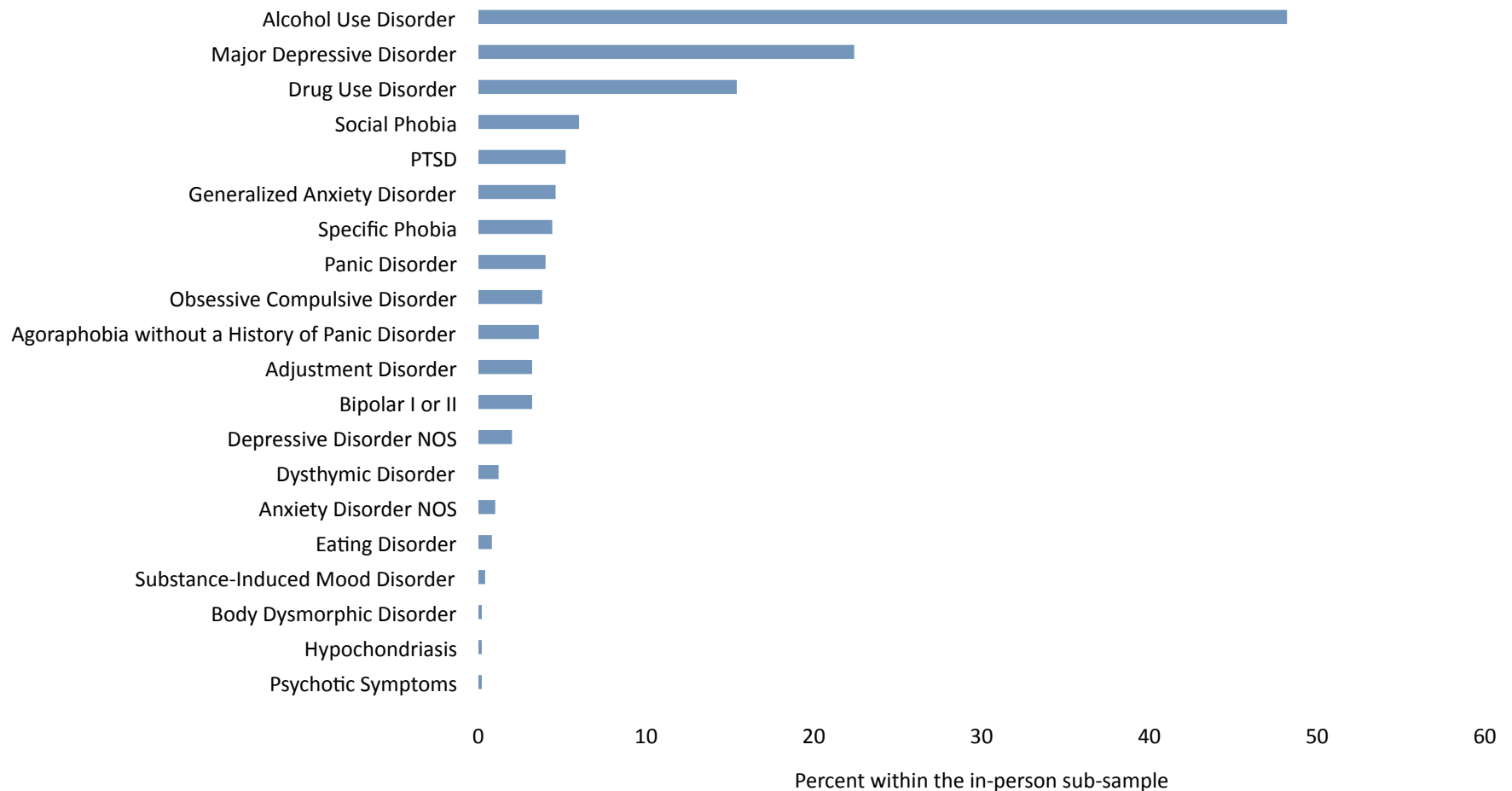
Summary of experiences during deployment

- Most soldiers have deployment experience and many have faced multiple combat situations.
- While self-reports may vary, most reports of preparedness, unit support and post-deployment support were high.



What are the determinants of mental health in this group?

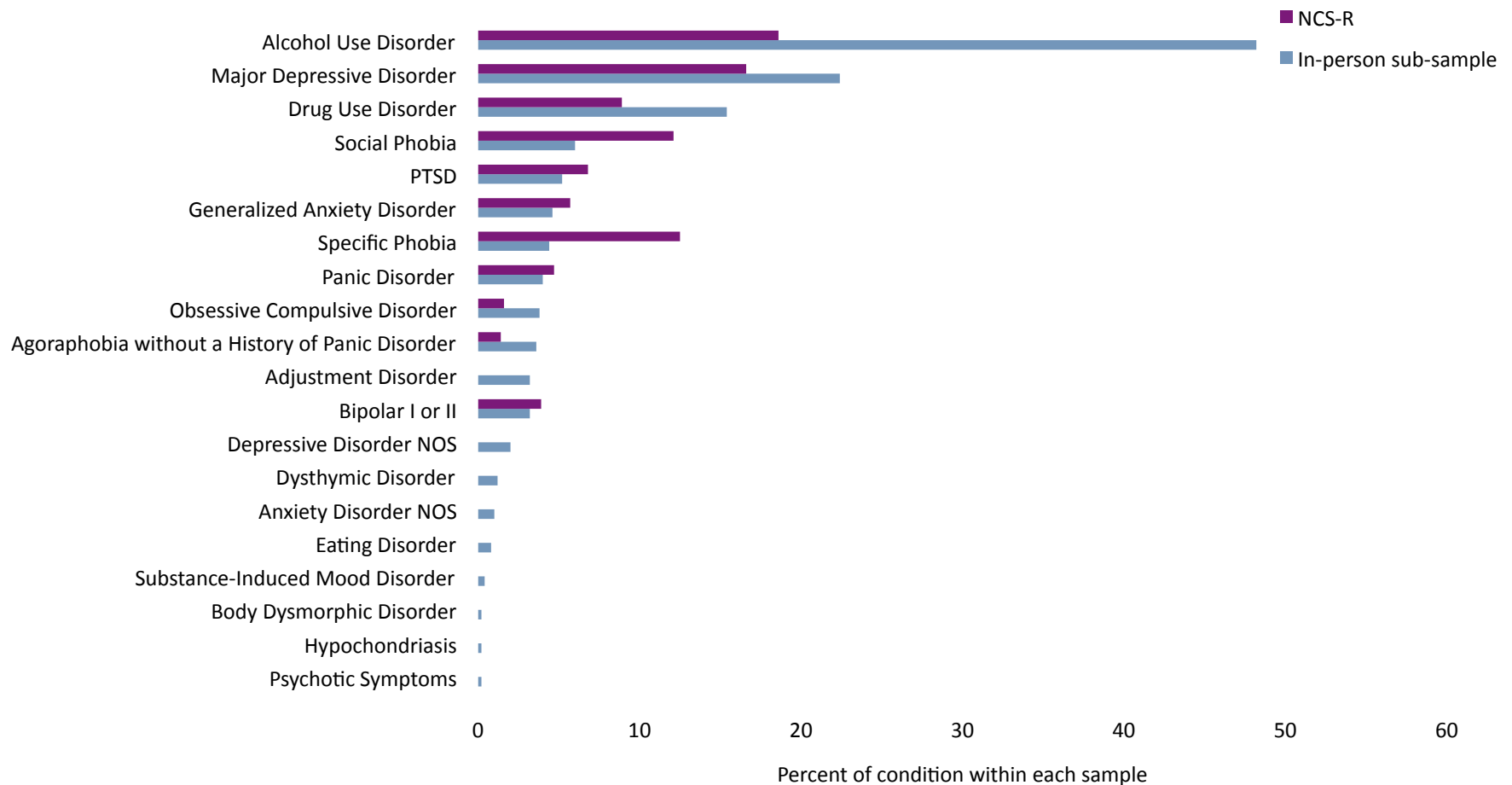
From in-person survey we assess a range of psychopathology: lifetime estimates



Wave 1: In-Person sample N≈500. In-person based interviews on lifetime conditions.

The estimates are not adjusted for age. Calculated using the SCID and CAPS.

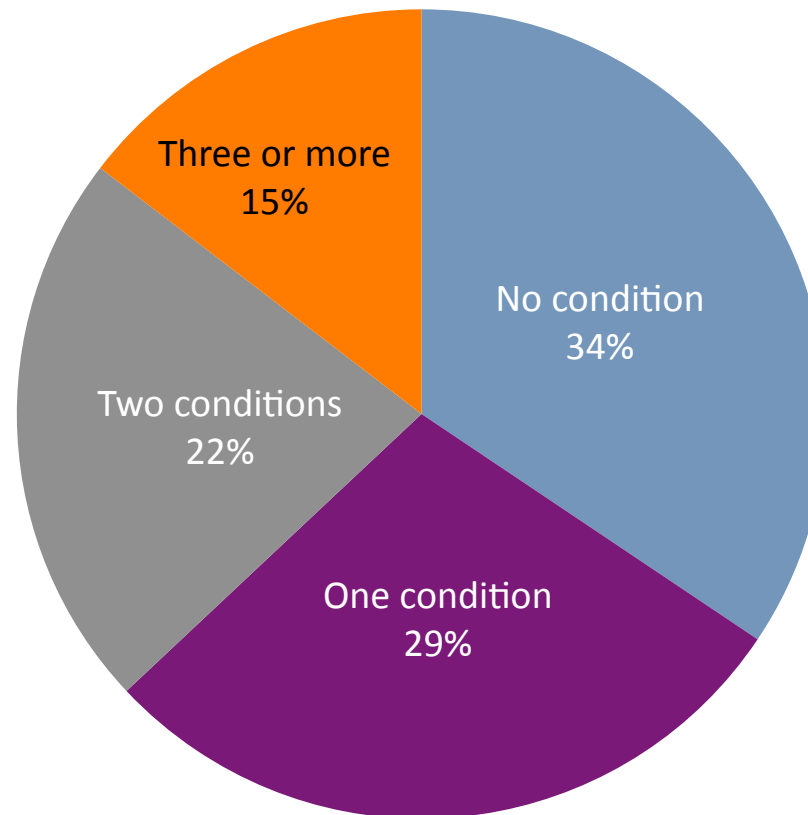
From in-person survey we assess a range of psychopathology: lifetime estimates



Wave 1: In-Person sample N≈500. In-person based interviews. Calculated using the SCID and the CAPS.

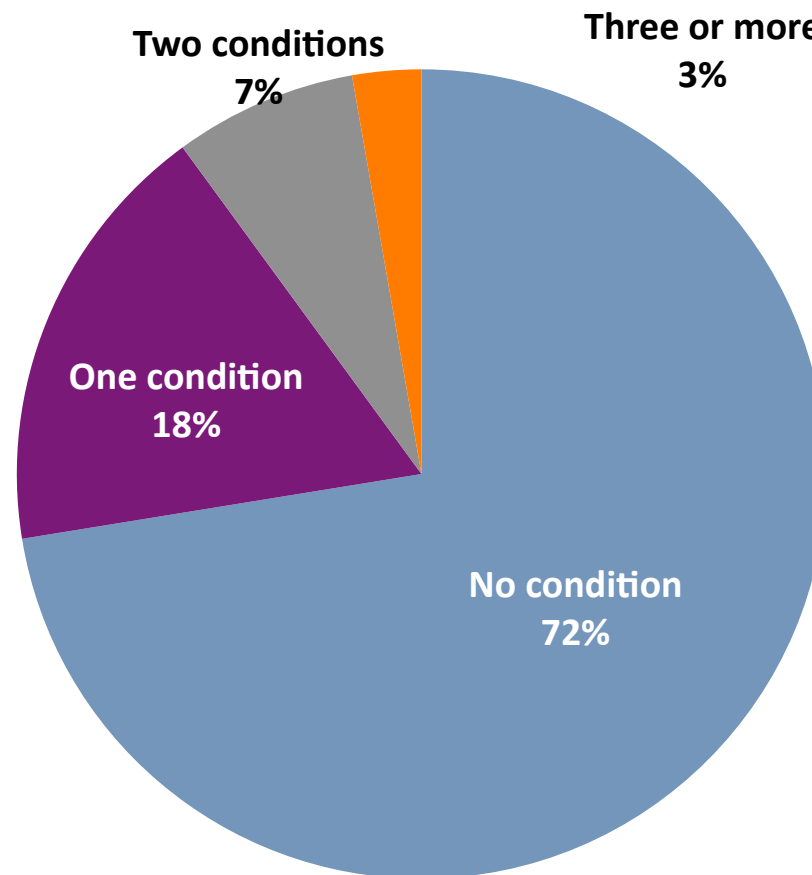
The estimates are not adjusted for age. Kessler R, Berglund P, Demler O, Jin R, Merikangas K, Walters E. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005;62(6):593.

66% of the in-person sample have had at least one condition ever in their lifetime



According to the NCS-R 46.4% of the general US population have had at least one condition and 17.3% have had three or more conditions. These estimates are based on the in-person interview using the SCID, conditions include alcohol disorder, major depressive disorder, drug use disorder, social phobia, PTSD, generalized anxiety disorder, specific phobia, panic disorder, obsessive compulsive disorder, agoraphobia with a history of panic disorder, adjustment disorder, bipolar I and II, depressive disorder NOS, dysthemic disorder, anxiety disorder NOS, eating disorder, substance-induced mood disorder, body dysmorphic disorder, hypochondriasis, psychotic symptoms.

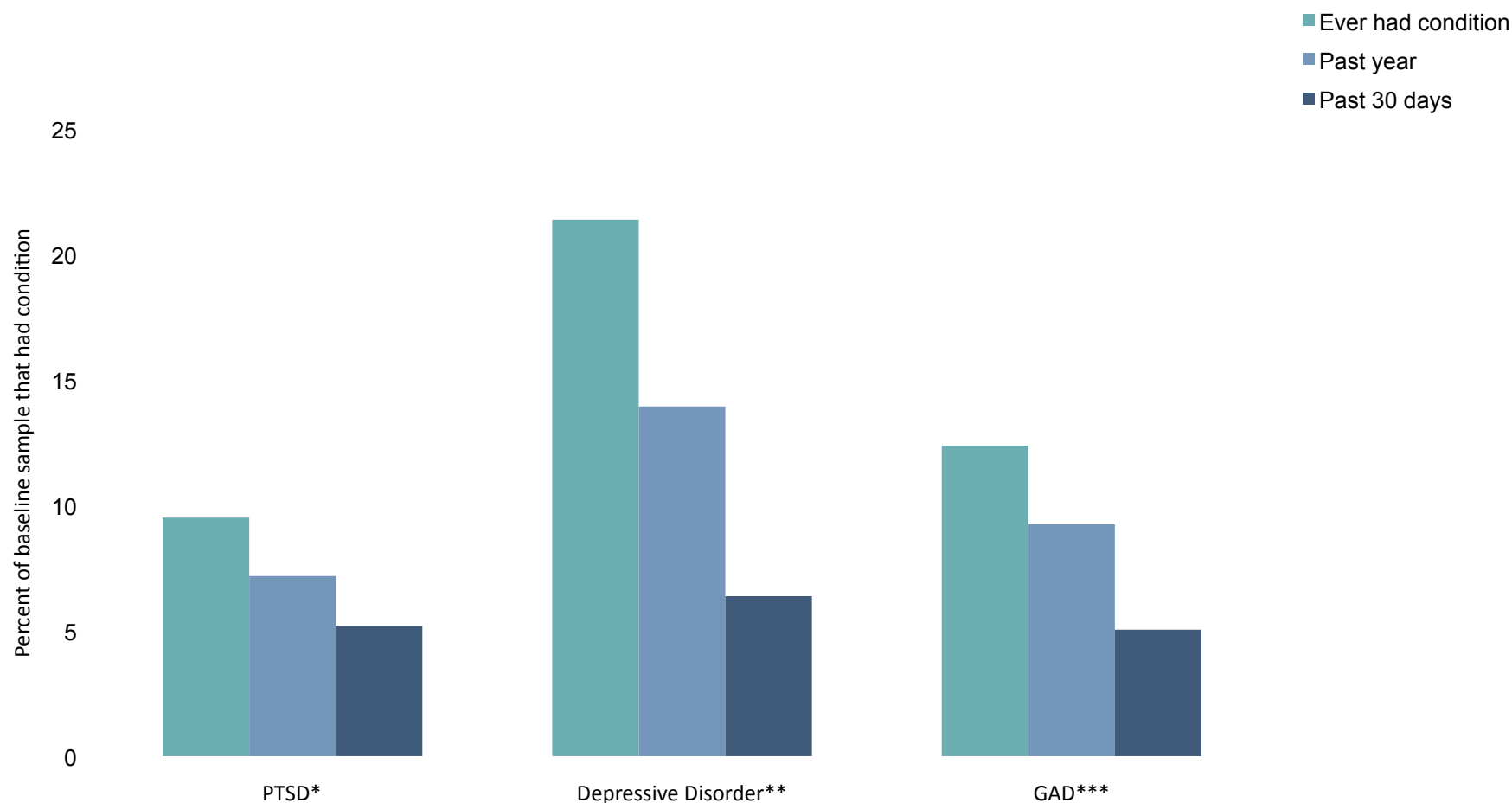
From the telephone survey, majority of soldiers have not had a condition within the past year



Wave 1: Telephone survey baseline sample N≈2616

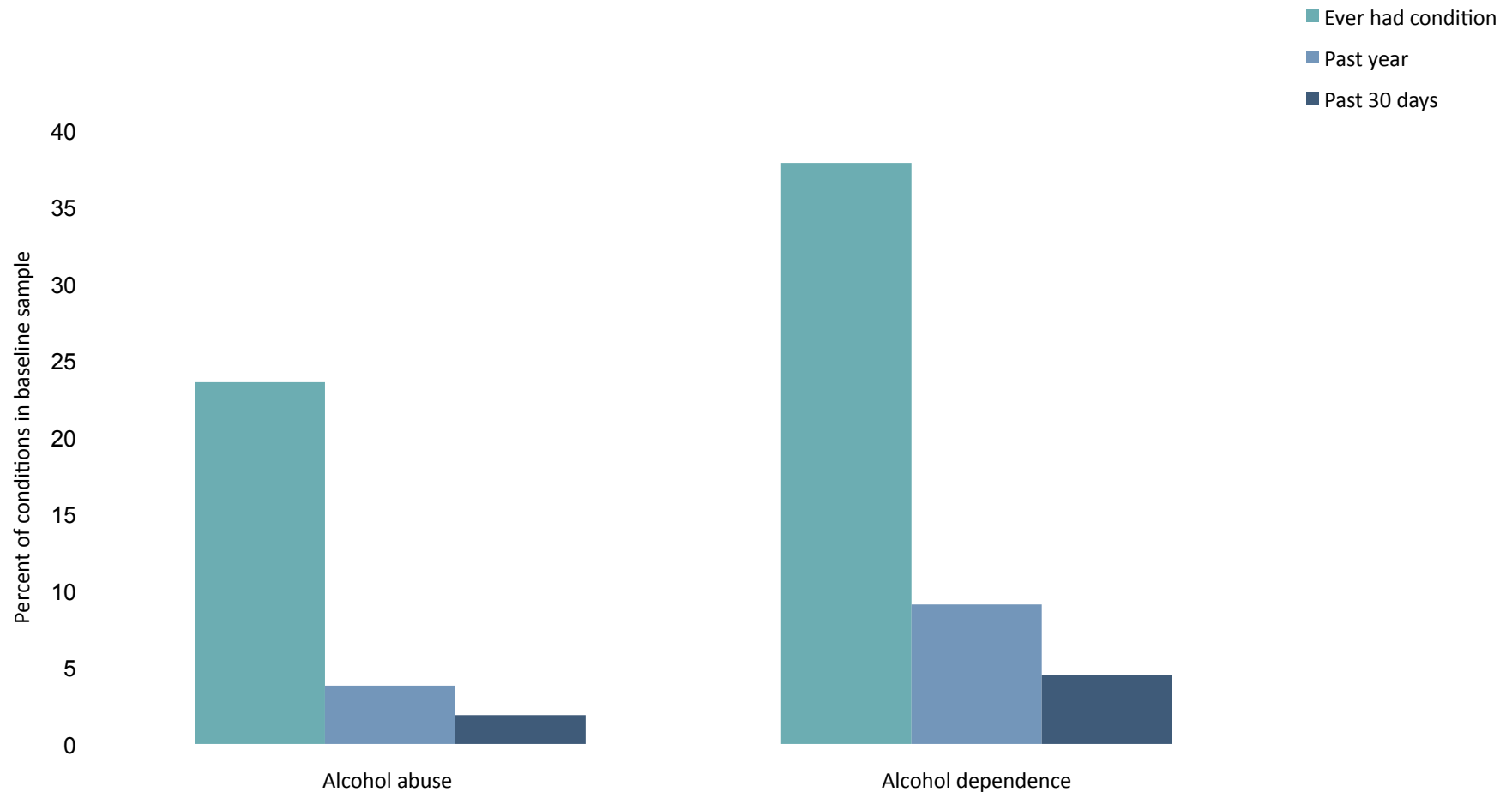
Using PTSD, depression, generalized anxiety disorder, alcohol dependence and alcohol abuse

Prevalence of PTSD, depression and GAD from the telephone survey



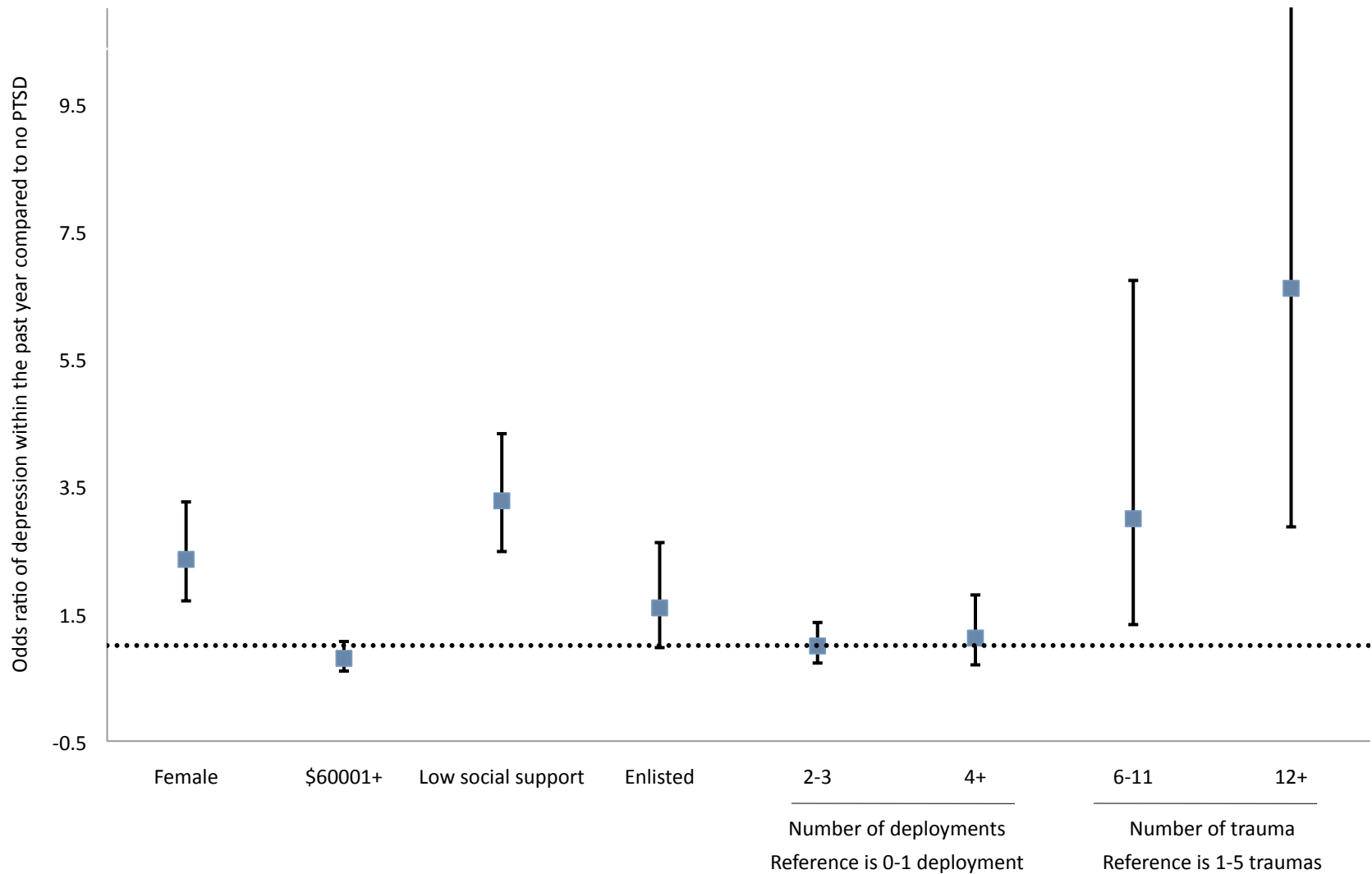
* DSM-IV cluster criteria: meets all criteria A-F ** DSM-IV cluster criteria: for major or other depression, symptoms must go together *** Cutoff ≥ 10 , symptoms must go together . This was calculated from the telephone baseline survey (N $\approx$ 2616). Lifetime prevalence of conditions within the US: PTSD 6.8%, Major depressive disorder (16.6), any mood disorder (20.8) and generalized anxiety disorder (5.7). Kessler R, Berglund P, Demler O, Jin R, Merikangas K, Walters E. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Co-morbidity Survey Replication. *Arch Gen Psychiatry* 2005;62(6):593. Calculated from baseline sample N $\approx$ 2616

Prevalence of alcohol abuse and alcohol dependence from the telephone survey



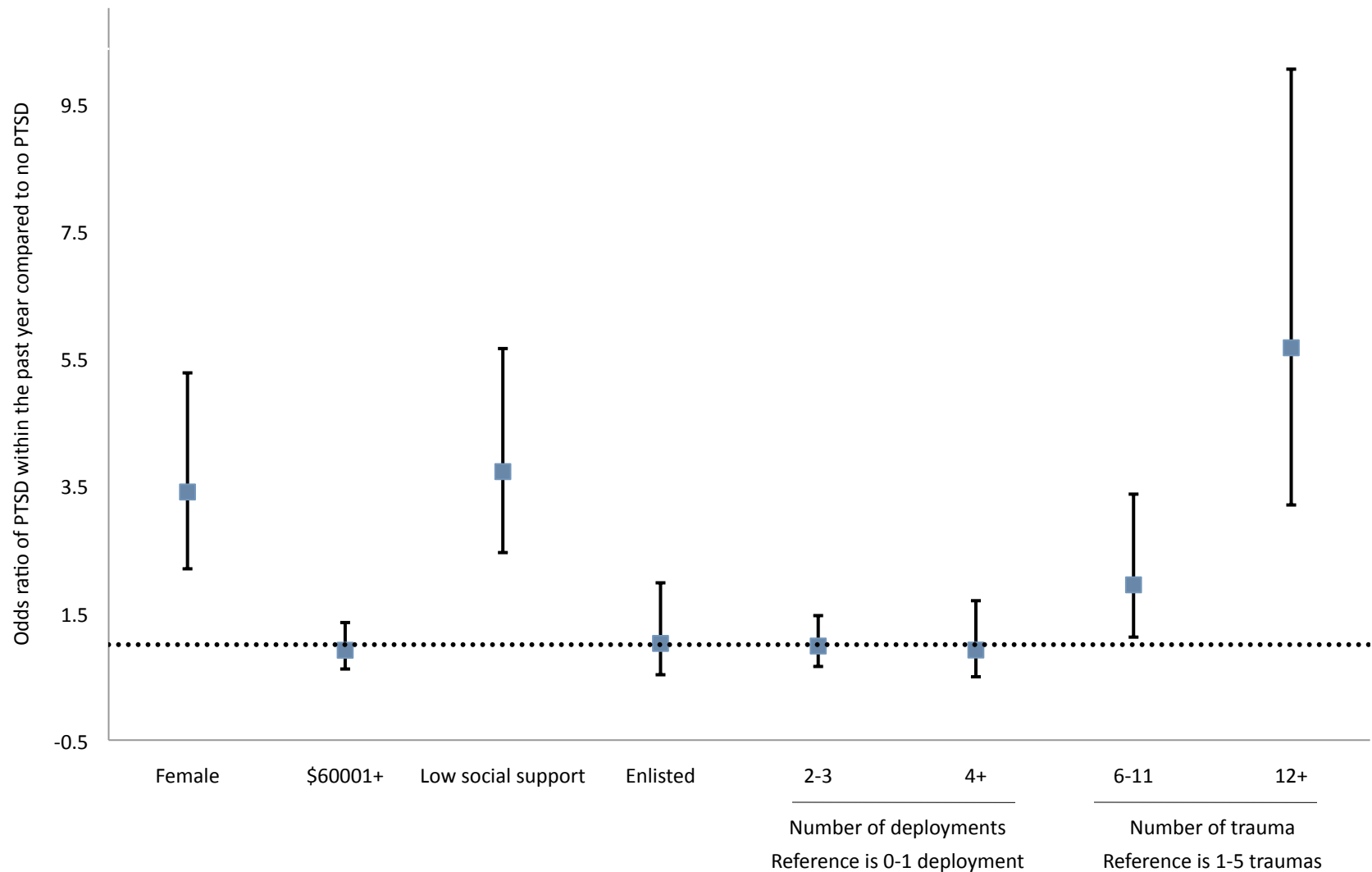
DSM-IV. Measured using the Mini - International Neuropsychiatric Interview. Sheehan DV, Lecrubier Y, Harnett Sheehan K, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (M.I.N.I.): The Development and Validation of a Structured Diagnostic Psychiatric Interview for DSM-IV and ICD-10. *Journal of Clinical Psychology* 1998;59(Supl 20):22-33. Calculated from baseline sample (N≈2616).

History of numerous traumas are positively associated with current cases of depression



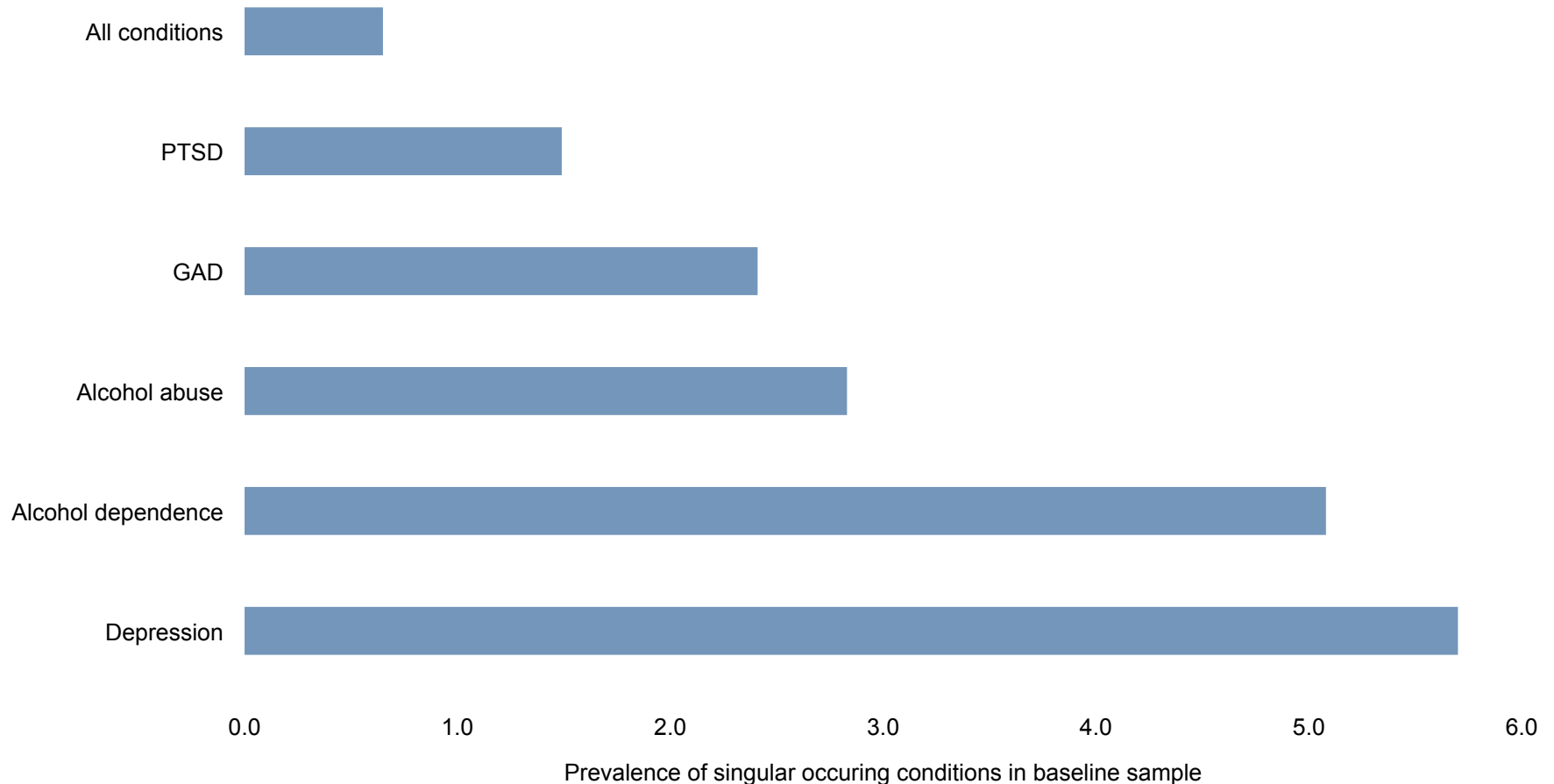
Adjusted for age, education, marital status, and most recent deployment location. Calculated using the baseline sample (N≈2616). Enlisted was compared to any other rank. Current is defined as year before the survey.

Similarly, a history of numerous traumas are positively associated with current cases of PTSD



Adjusted for age, education, marital status, and most recent deployment location. Calculated using the baseline sample (N≈2616). Enlisted was compared to any other rank. Current is defined as year before the survey.

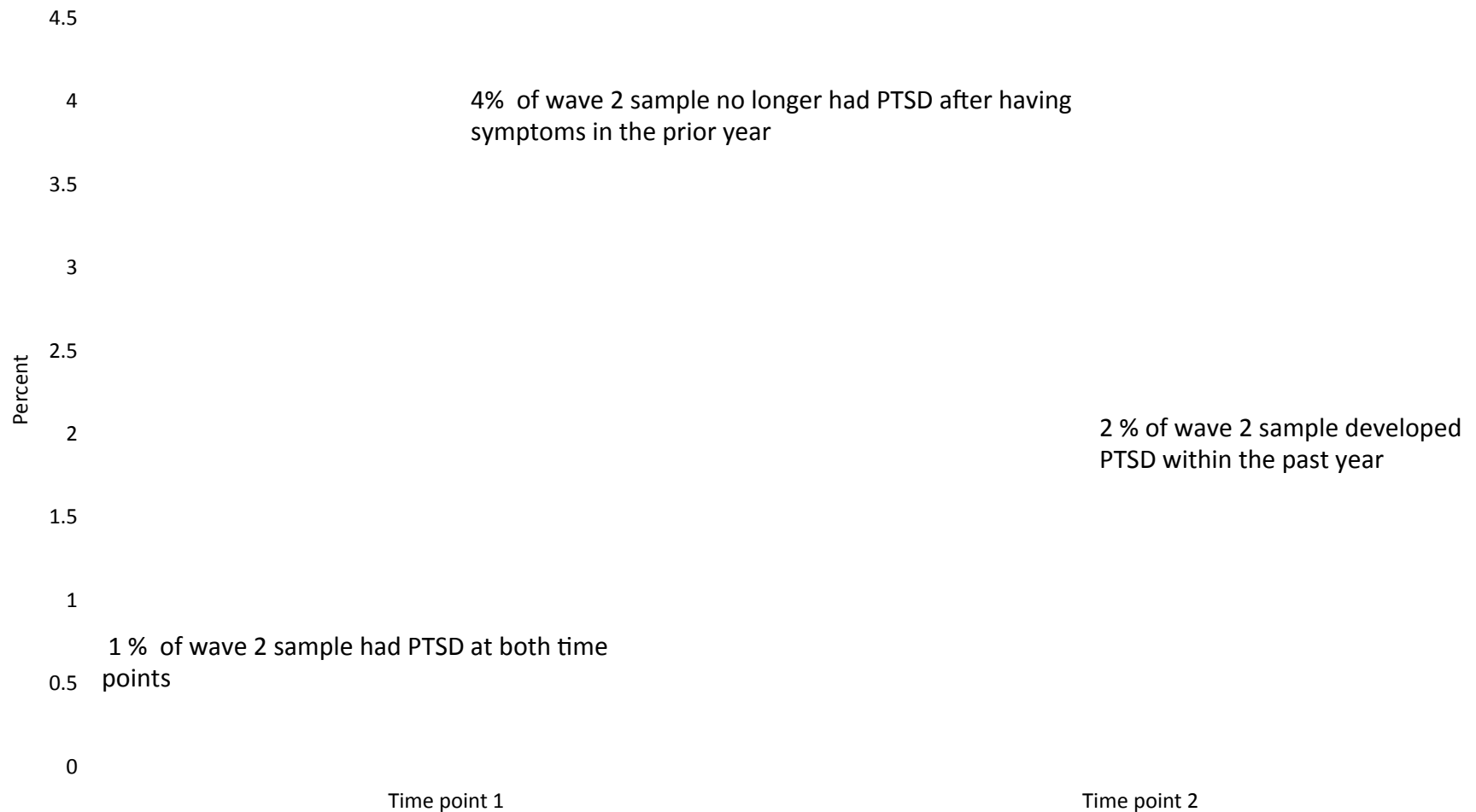
The most common singularly occurring condition within the past year was depression



Wave 1: Telephone survey baseline sample N≈2616

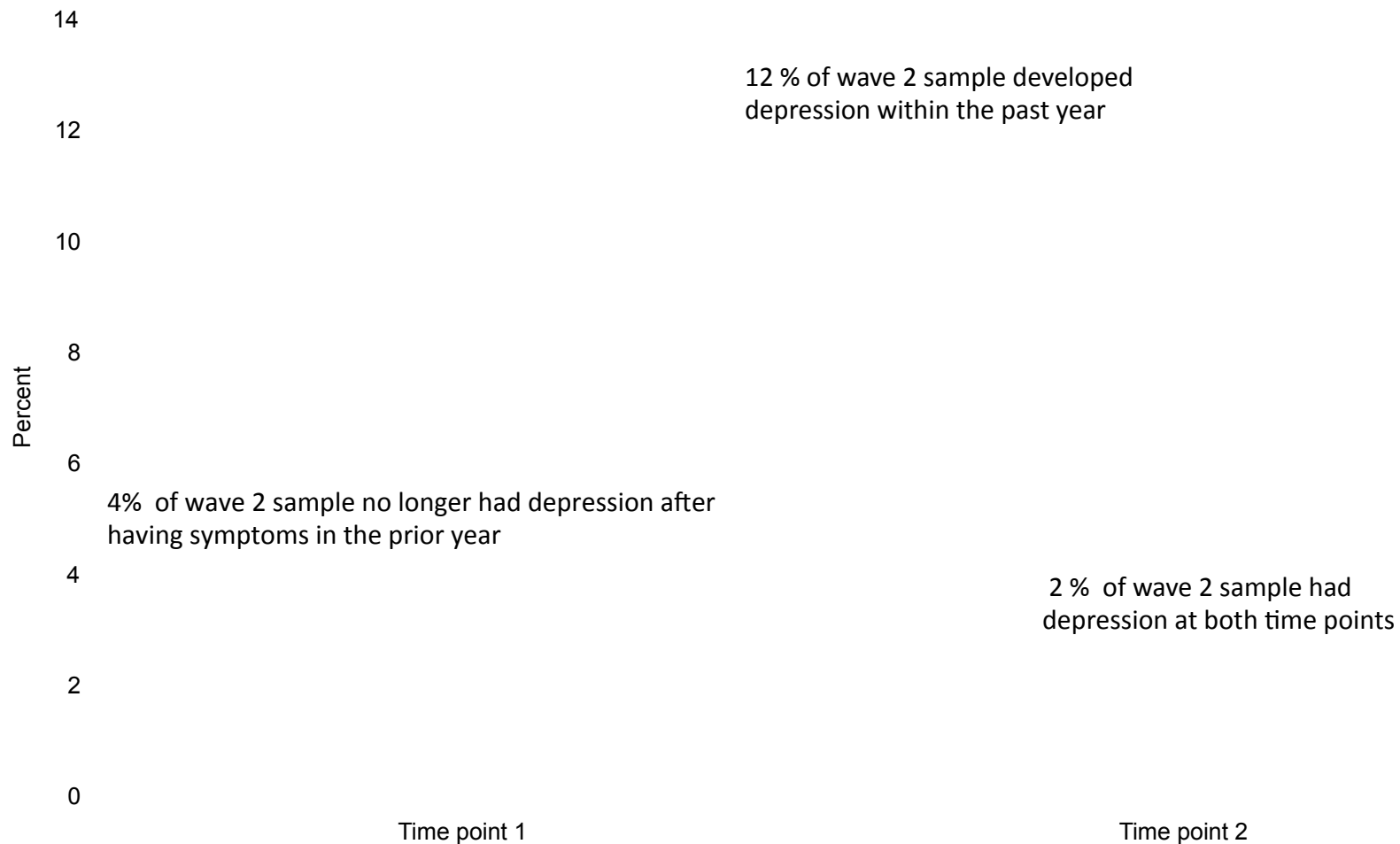
Using PTSD, depression, generalized anxiety disorder, alcohol abuse and alcohol dependence

Between wave 1 and wave 2 surveys only 1% of soldiers had PTSD at both time points



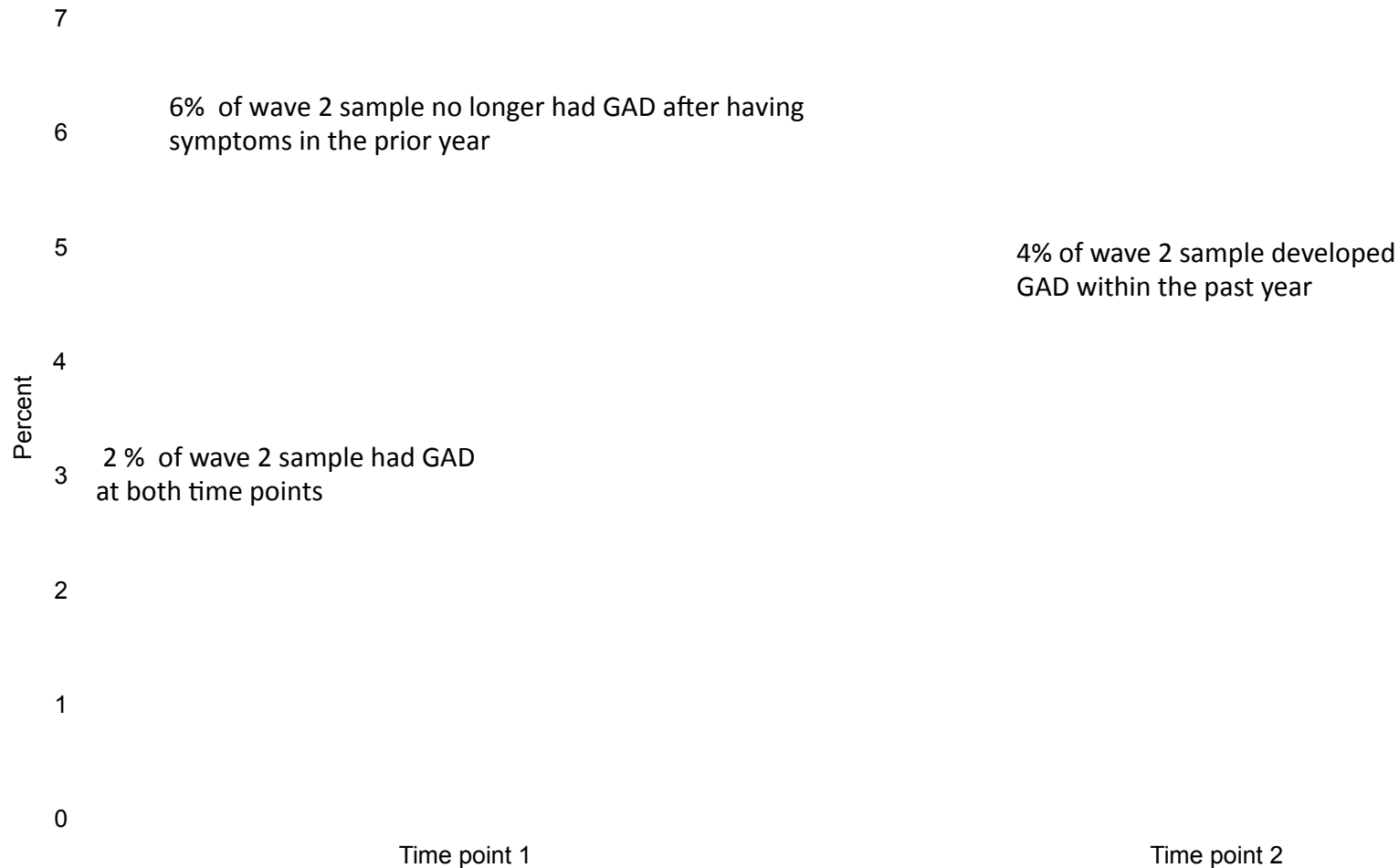
N=961

Between wave 1 and wave 2 surveys 12% of soldiers developed depression



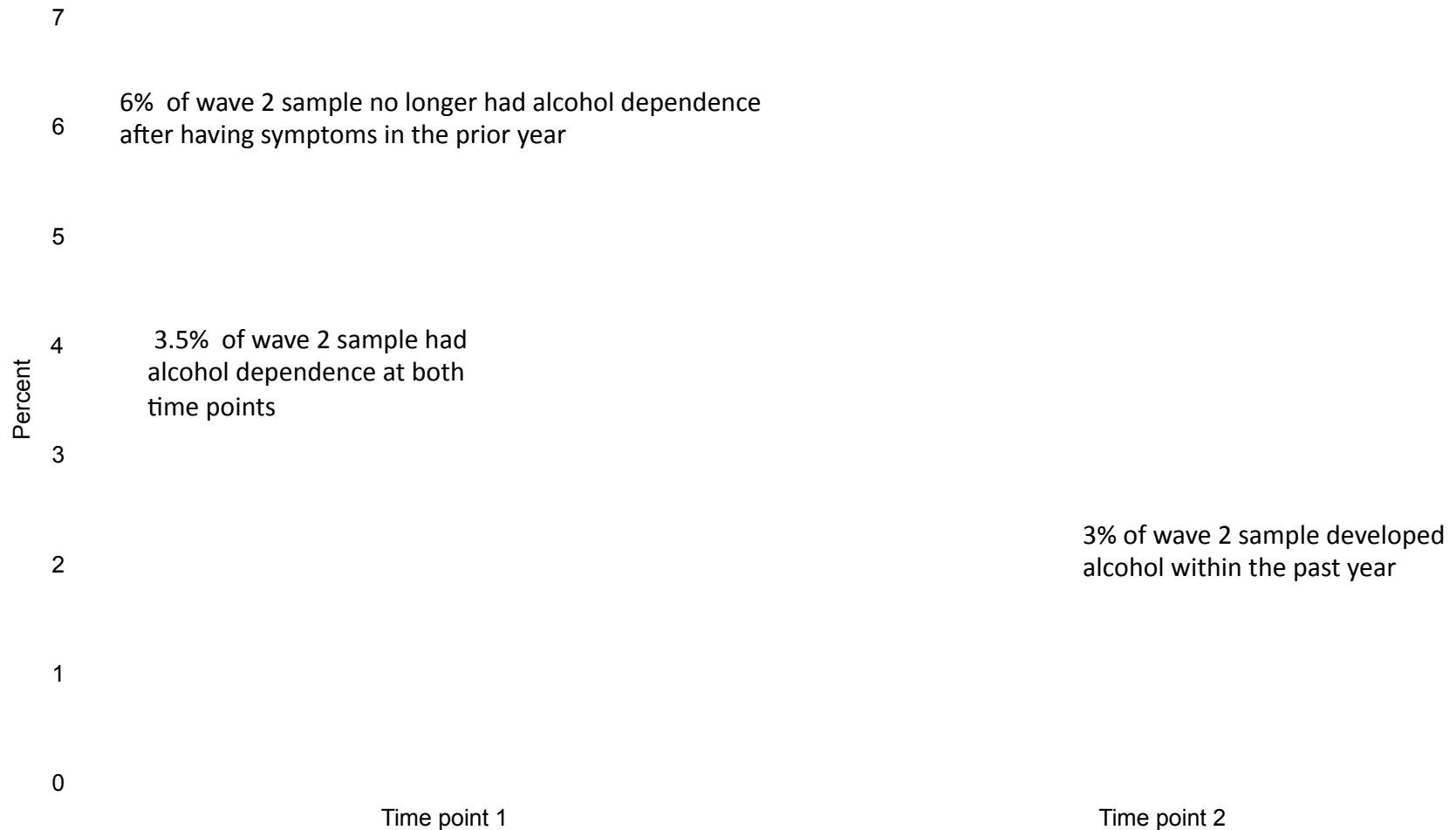
N=961

2.4% of soldiers had generalized anxiety at both waves of the survey



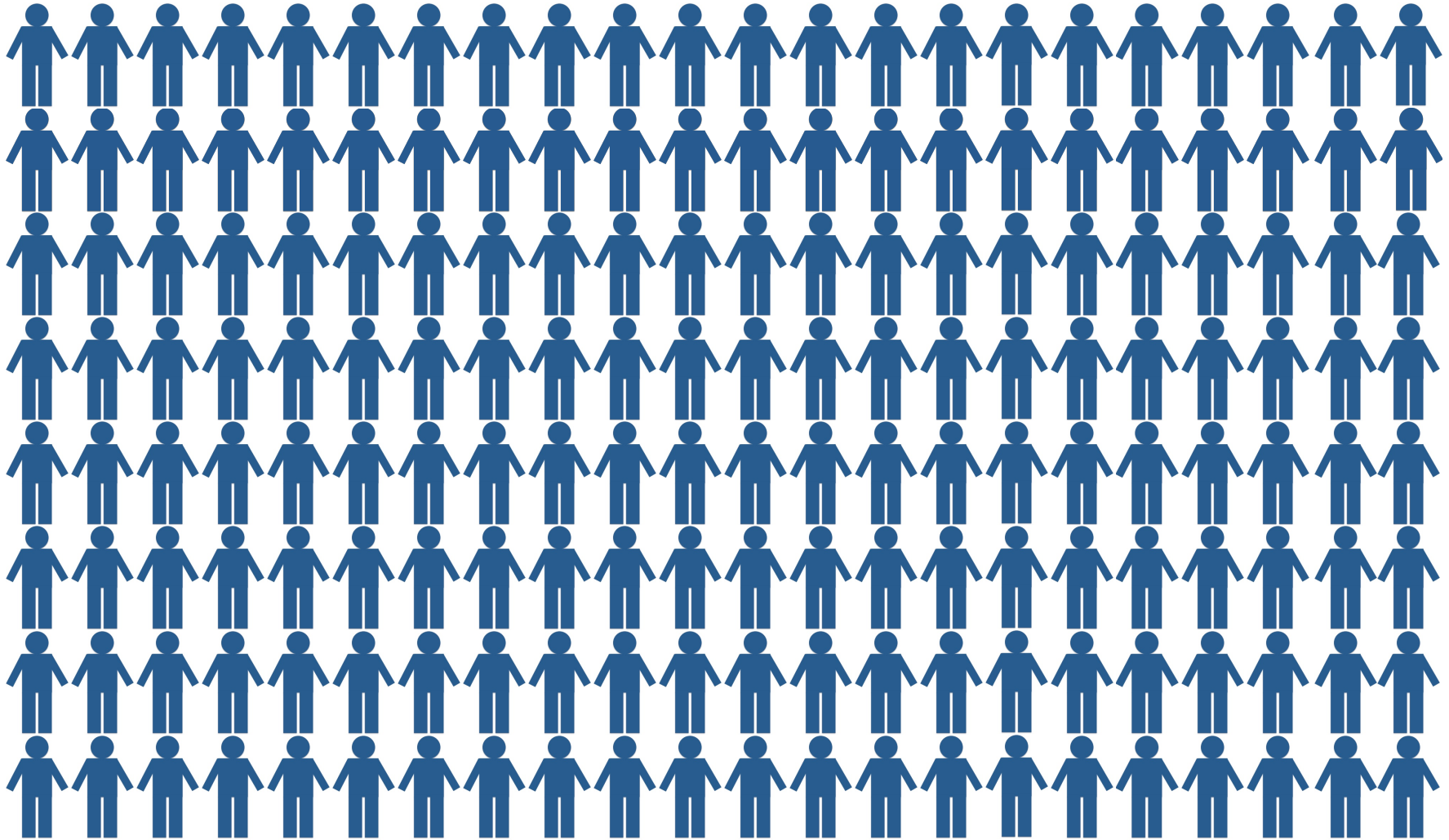
N=961

6% of soldiers resolved alcohol dependence by wave 2 of the survey



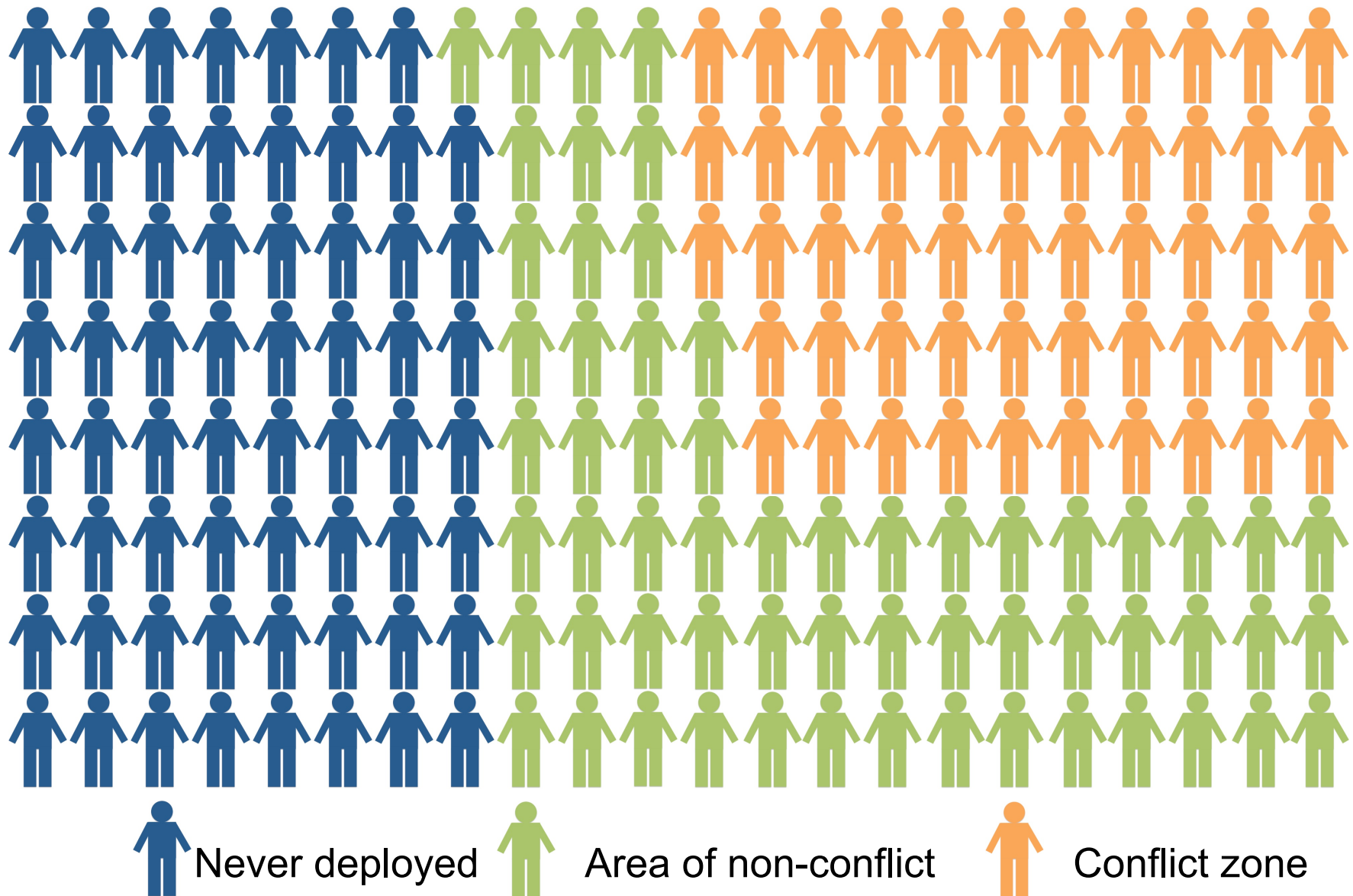
N=961

How does deployment affect mental health?



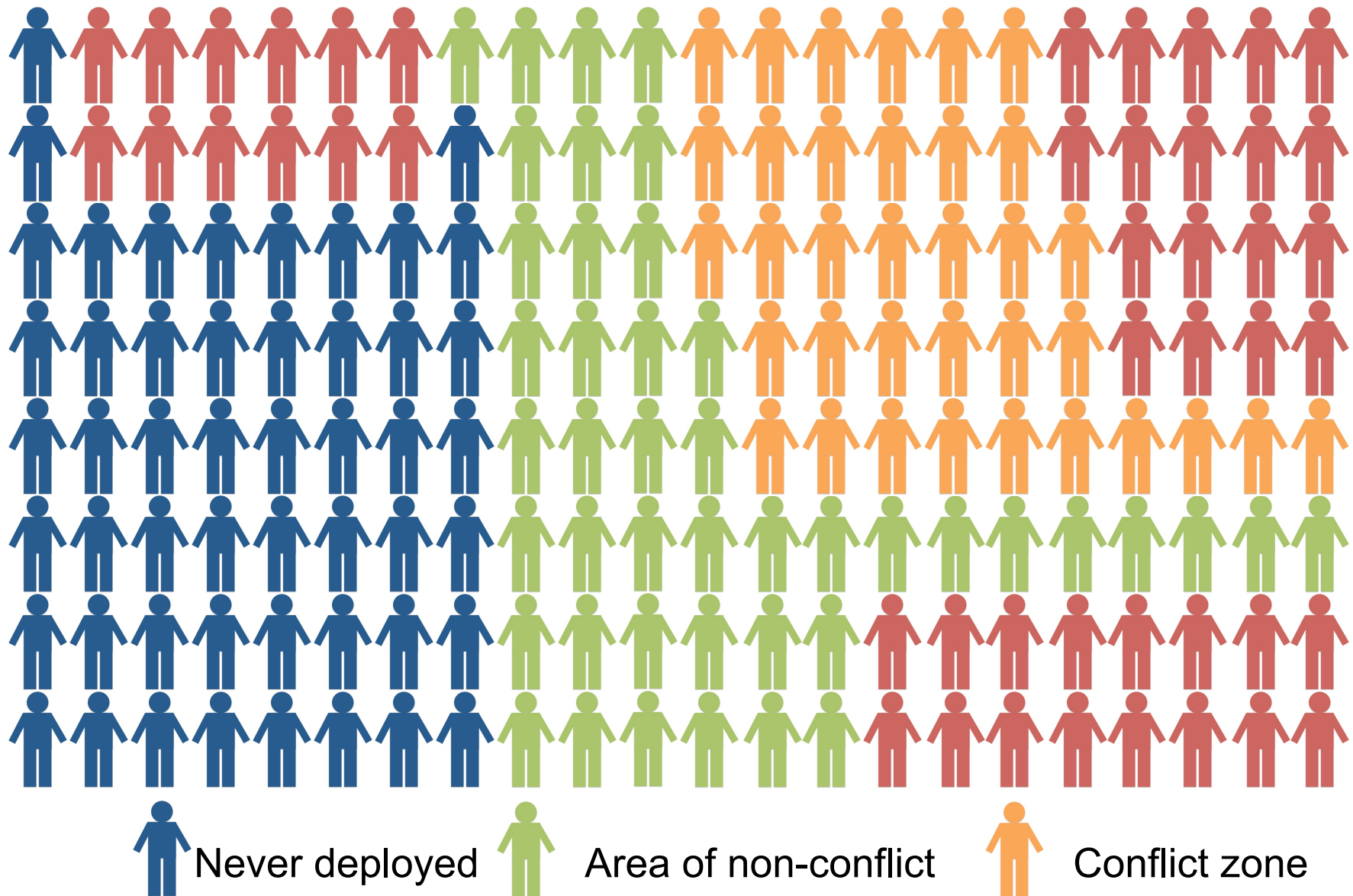
1 man $\approx$ 60 soldiers

Ohio Army Guard: most recent deployment



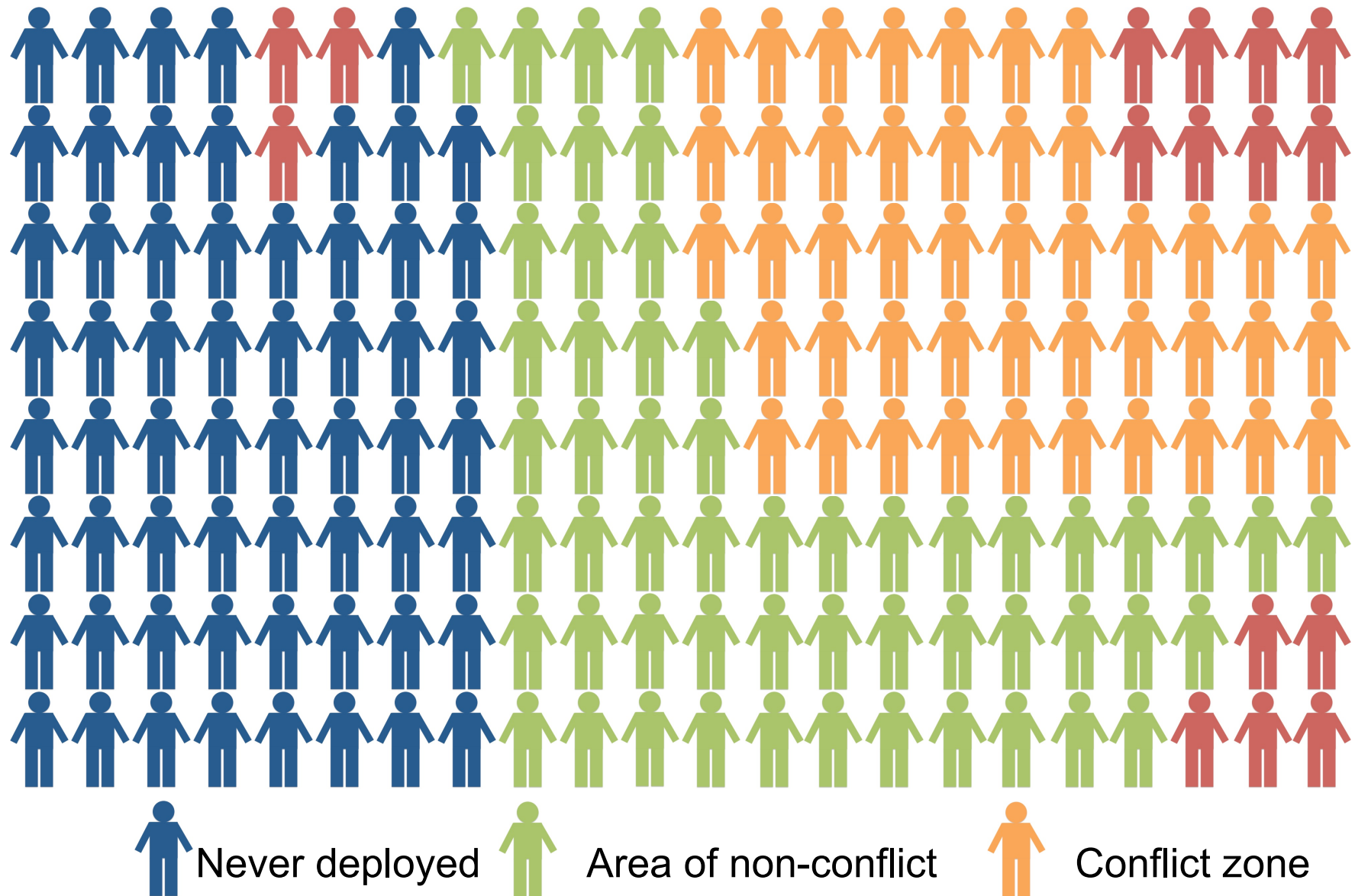
1 man $\approx$ 60 soldiers

34% of those deployed most recently to conflict setting had at least one condition in the past year



Wave I: Telephone survey baseline sample N=2616. P < 0.01. 27% of those deployed to non-conflict and 22% of those never deployed settings have at least one condition.

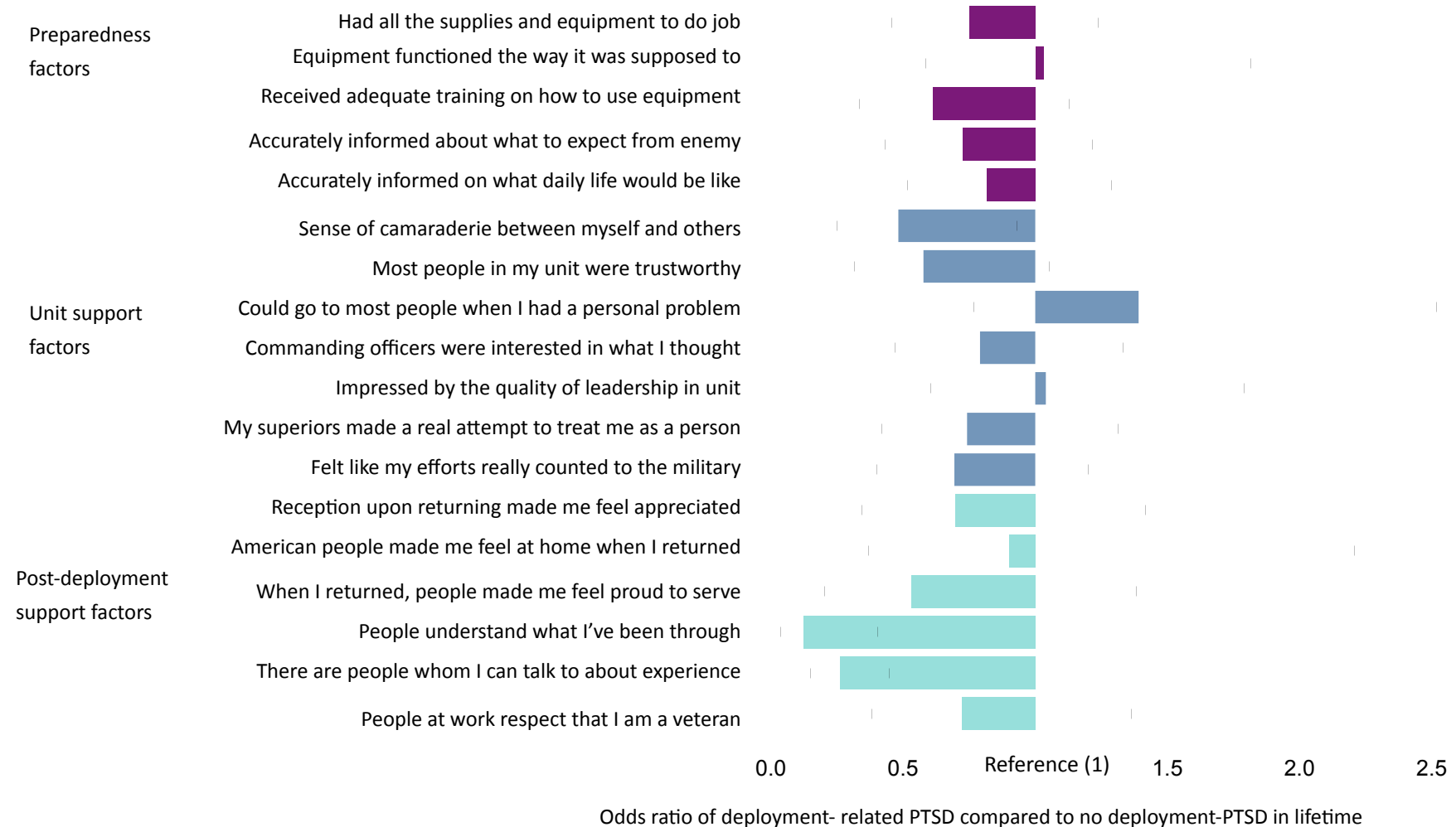
15% most recently deployed to a conflict setting has co-occurring conditions in the past year



Wave 1: Telephone survey baseline sample N=2616). $P < 0.01$. 9.7% of those deployed to non-conflict settings have at least two conditions. 5.9% of those never deployed have at least two conditions.

**How do deployment conditions affect
PTSD?**

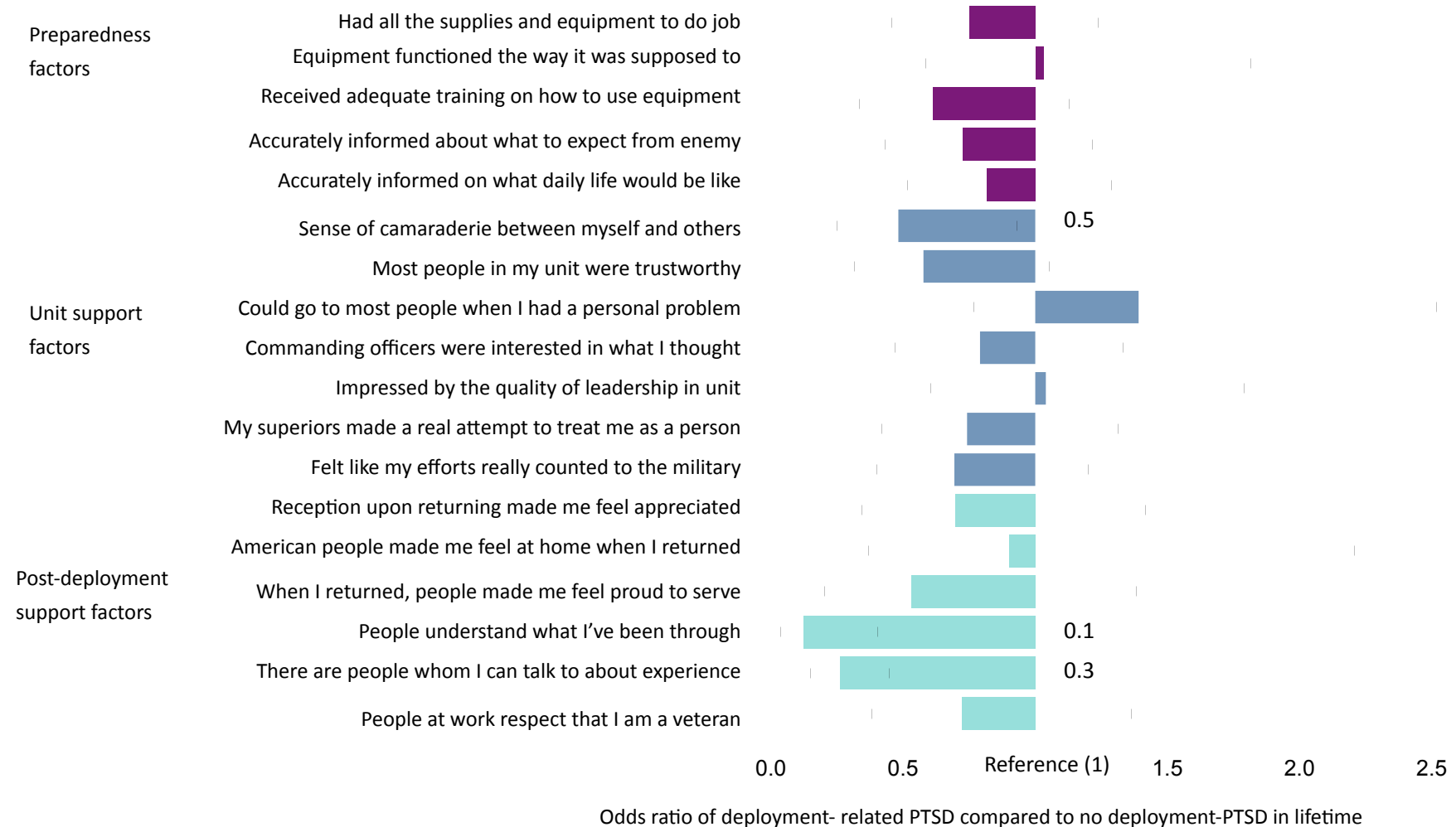
Post-deployment support factors are predictors of deployment-related PTSD



Multivariable model adjusted for age, gender, education status, rank, area of deployment and number of traumas.

Calculated from baseline sample among those who had deployment experience (N≈1607)

Post-deployment support factors are predictors of deployment-related PTSD



Multivariable model adjusted for age, gender, education status, rank, area of deployment and number of traumas.

Calculated from baseline sample among those who had deployment experience (N≈1607)

What are the barriers to mental health services?

Assessed reasons for not obtaining mental health care services when expressed need: 16 questions

Preferences:

- You wanted to solve the problem on your own; You prefer to rely on family and friends; You think it is better to pray or seek spiritual guidance; You didn't think it would help much

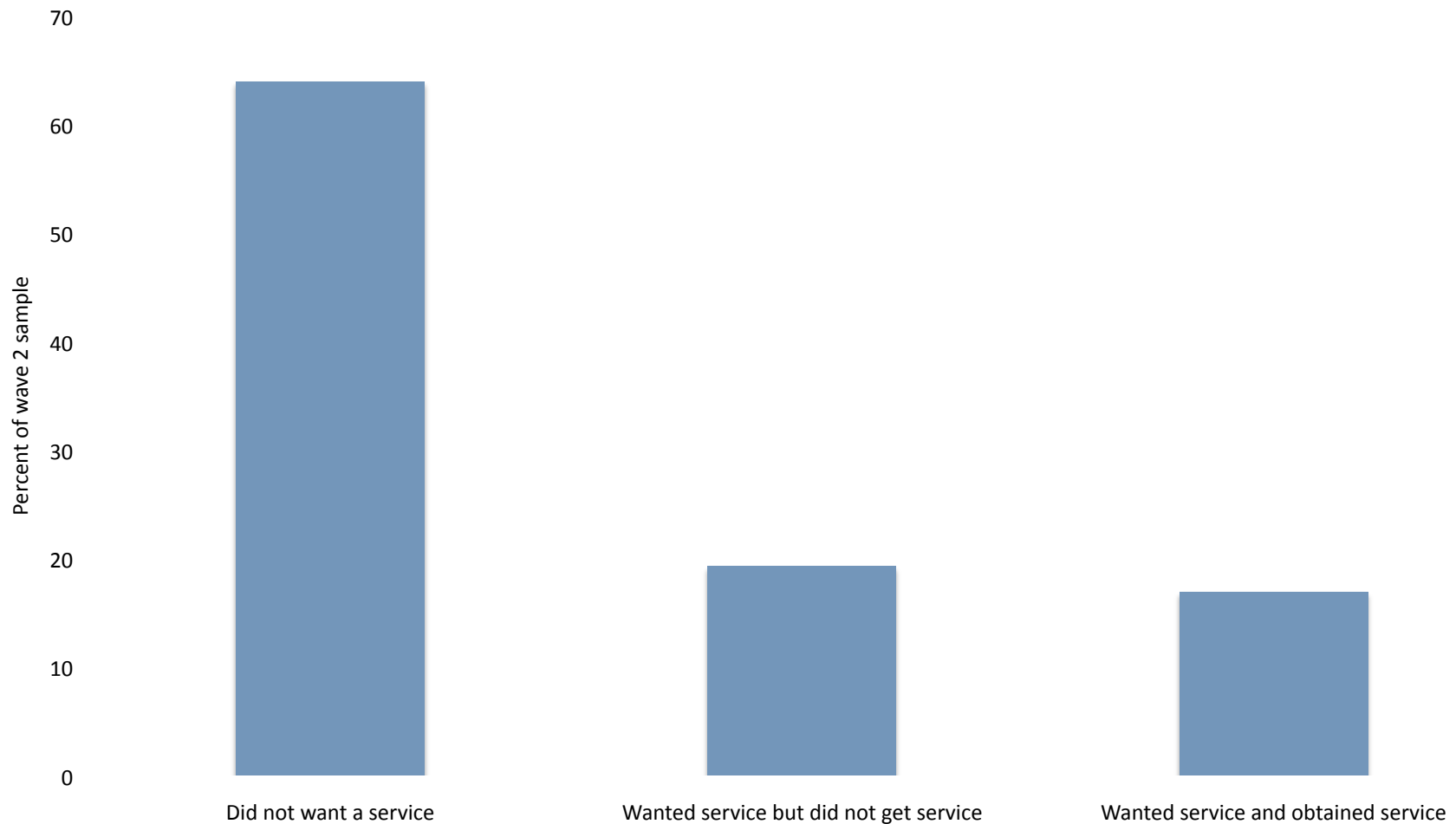
Resource barriers:

- You didn't know where to go; You didn't have transportation to get there; You didn't have the time or energy; You didn't think you could afford it

Stigma concerns:

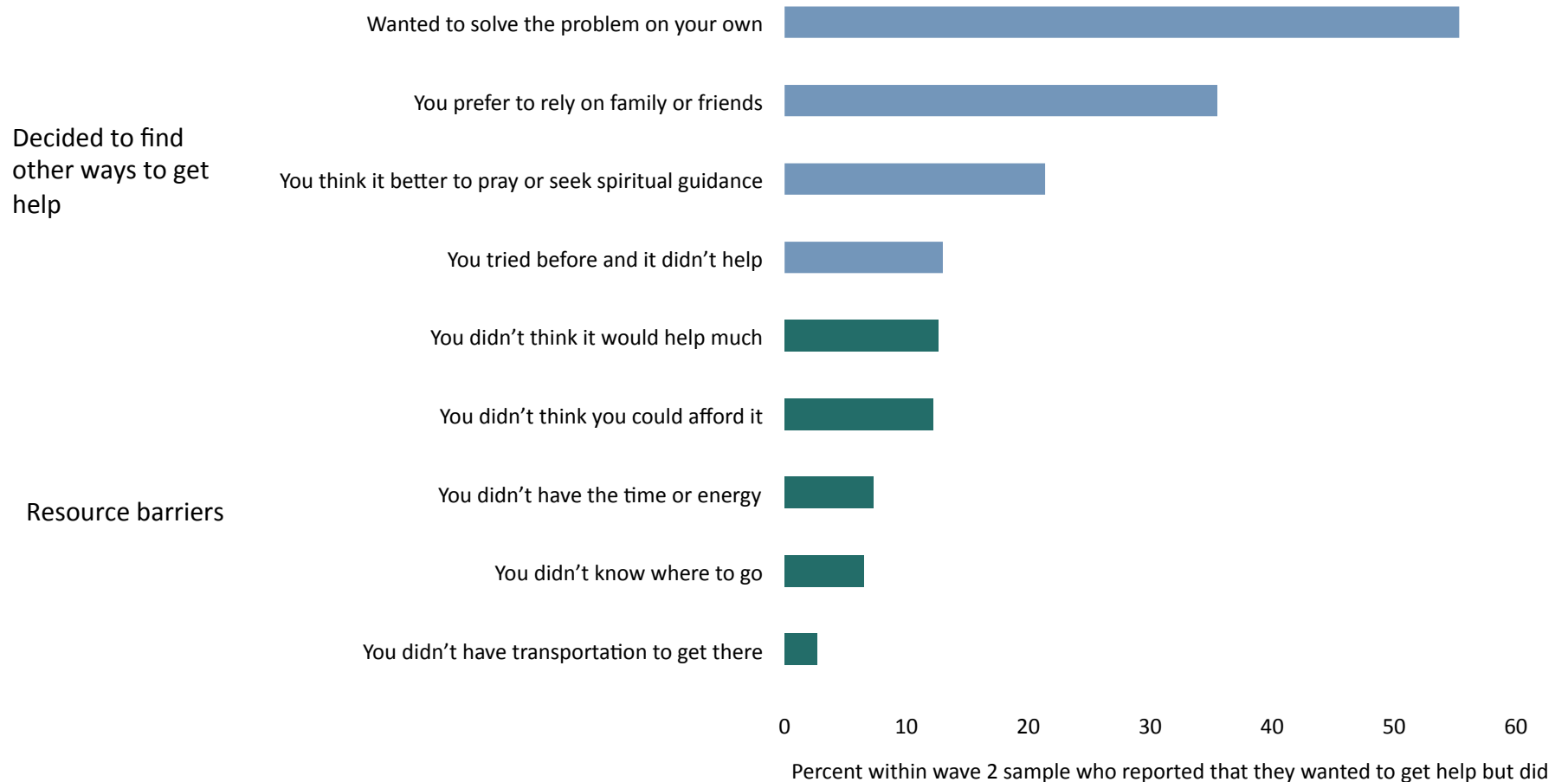
- You were embarrassed or ashamed; You didn't want your family or friends to know; You thought the person or place providing the service would look down on you; You worried that it would hurt your career or business prospects if anyone found out

Thirty-six percent (N=347) wanted to obtain a mental health service within the past year yet only half obtained service



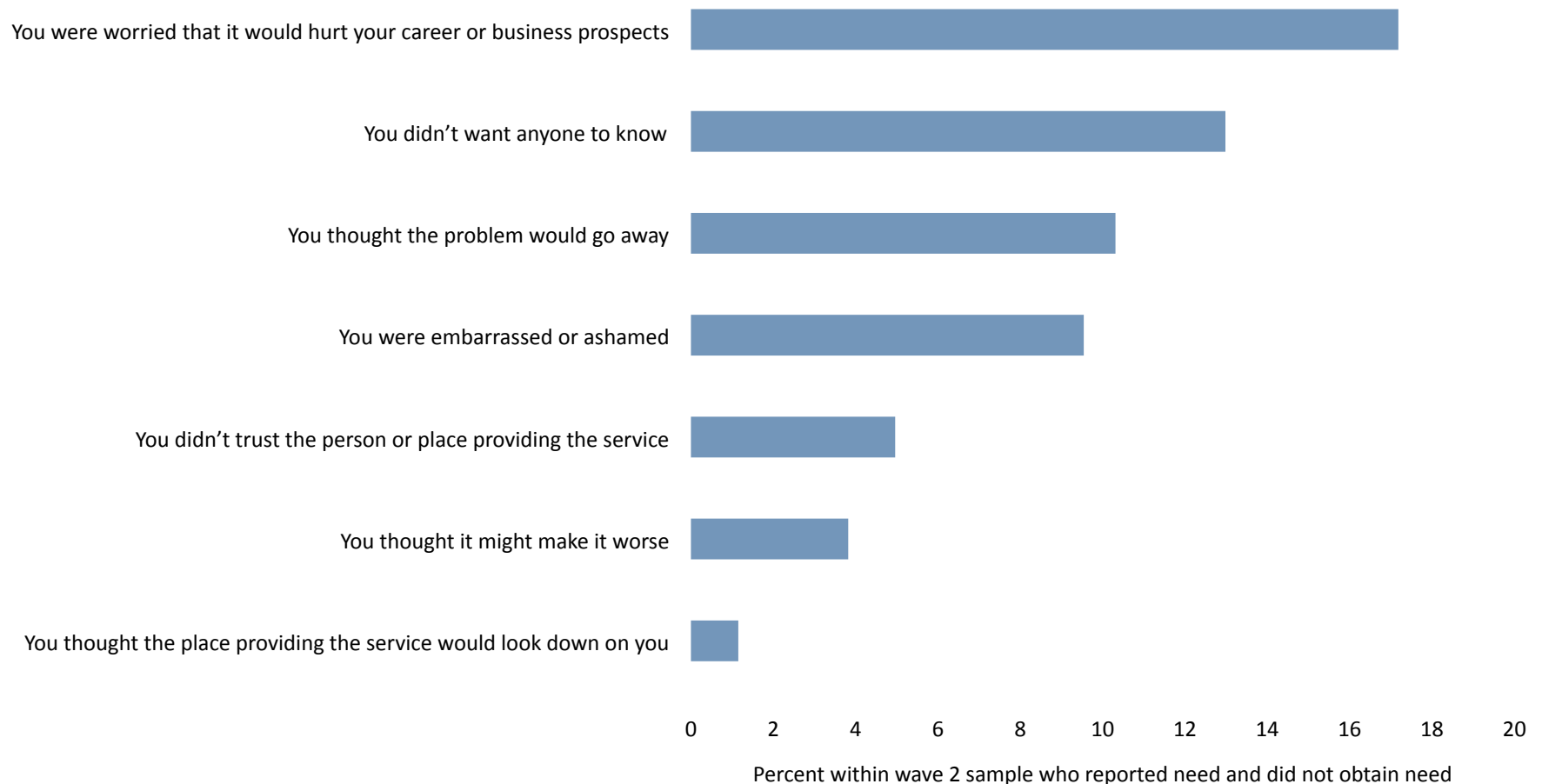
This was calculated in the wave 2 sample (N≈960)

The most common explanation for not obtaining service was that they wanted to solve the problem on their own (55%)



This was calculated in the wave 2 sample who among reported wanting mental health service (N=347)

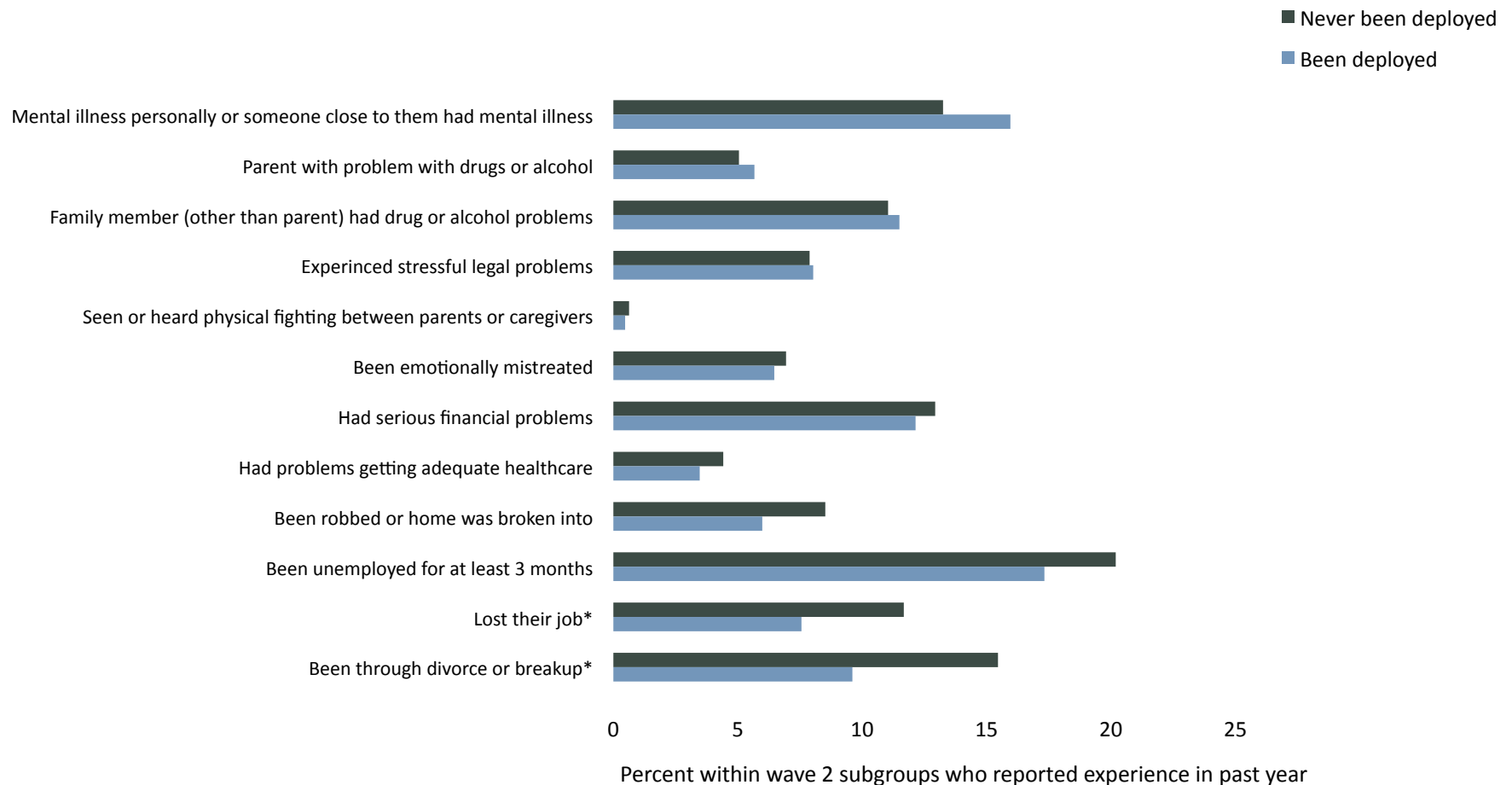
The most common stigma concern associated with why they did not obtain care was that it would hurt their business (17%)



This was calculated in the wave 2 sample who among reported wanting mental health service (N=347)

**Does deployment experience increase
subsequent occurrence of stressful events
and traumatic events?**

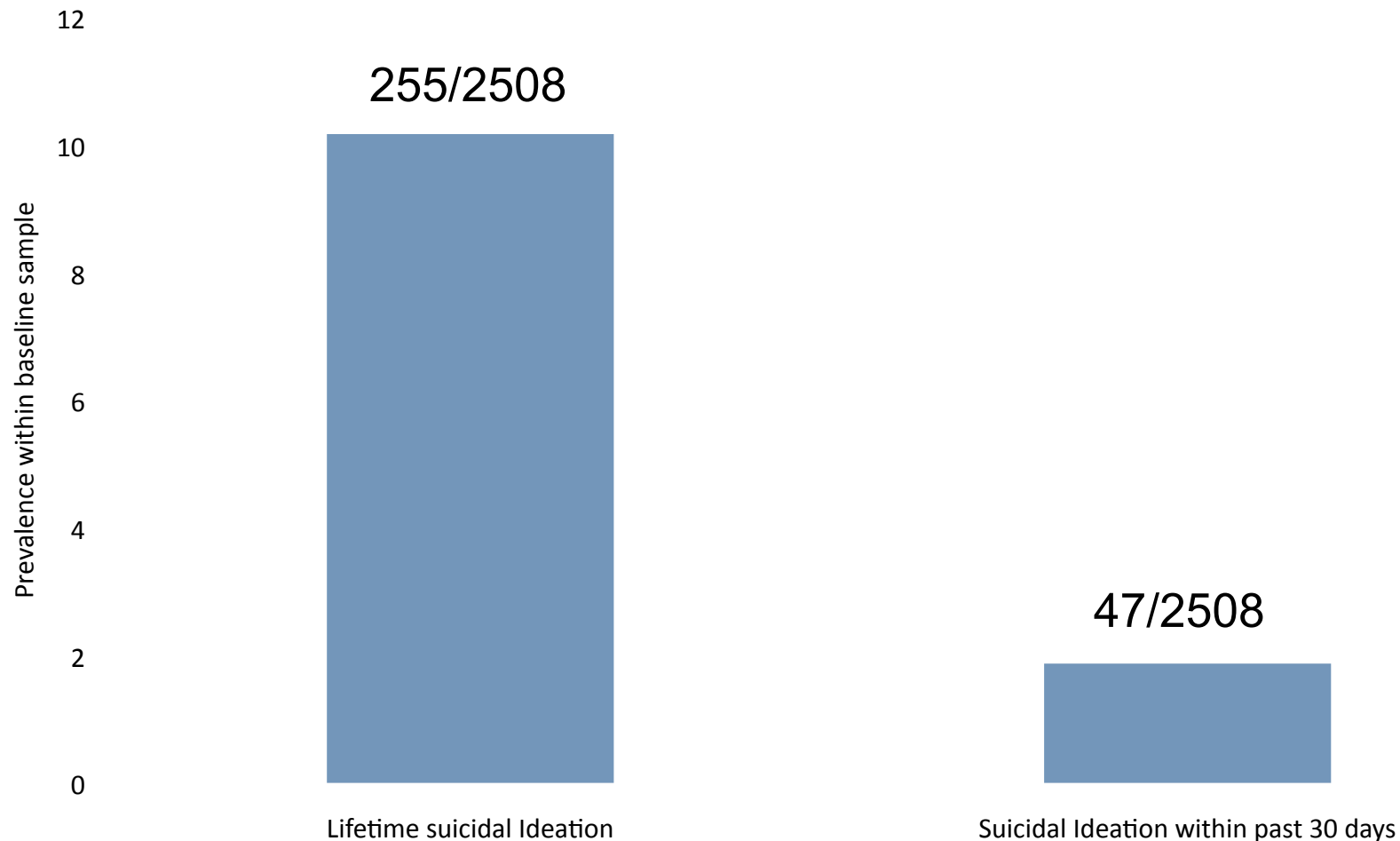
Those with deployment experience in previous year are less likely to have divorce and job loss within the past year



*p-value <0.05. Calculated within the wave 2 sample (N=960)

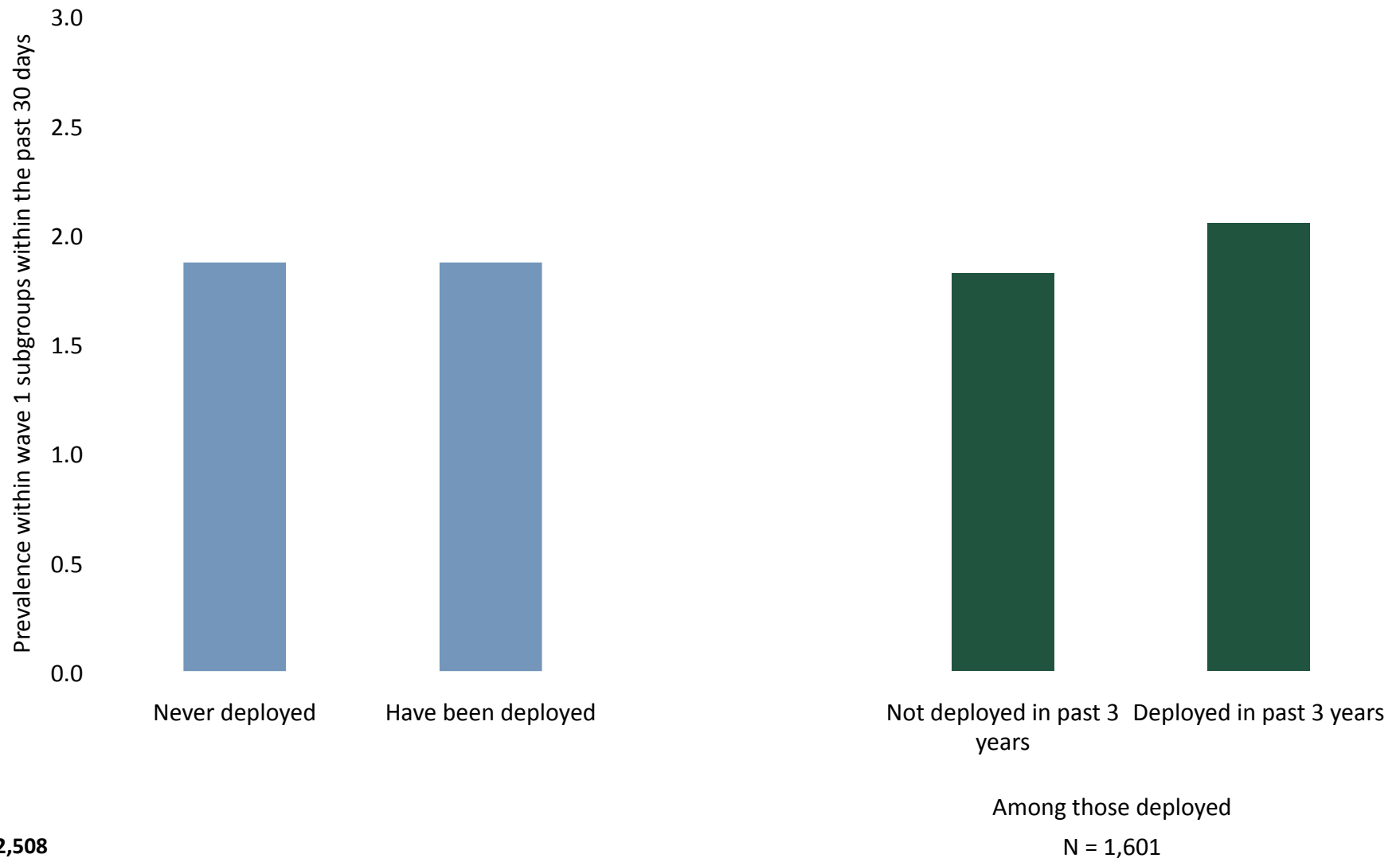
**How do deployment, lifetime stressors
and mental health affect suicidal
ideation?**

Two percent of soldiers reported suicidal thoughts within the past 30 days

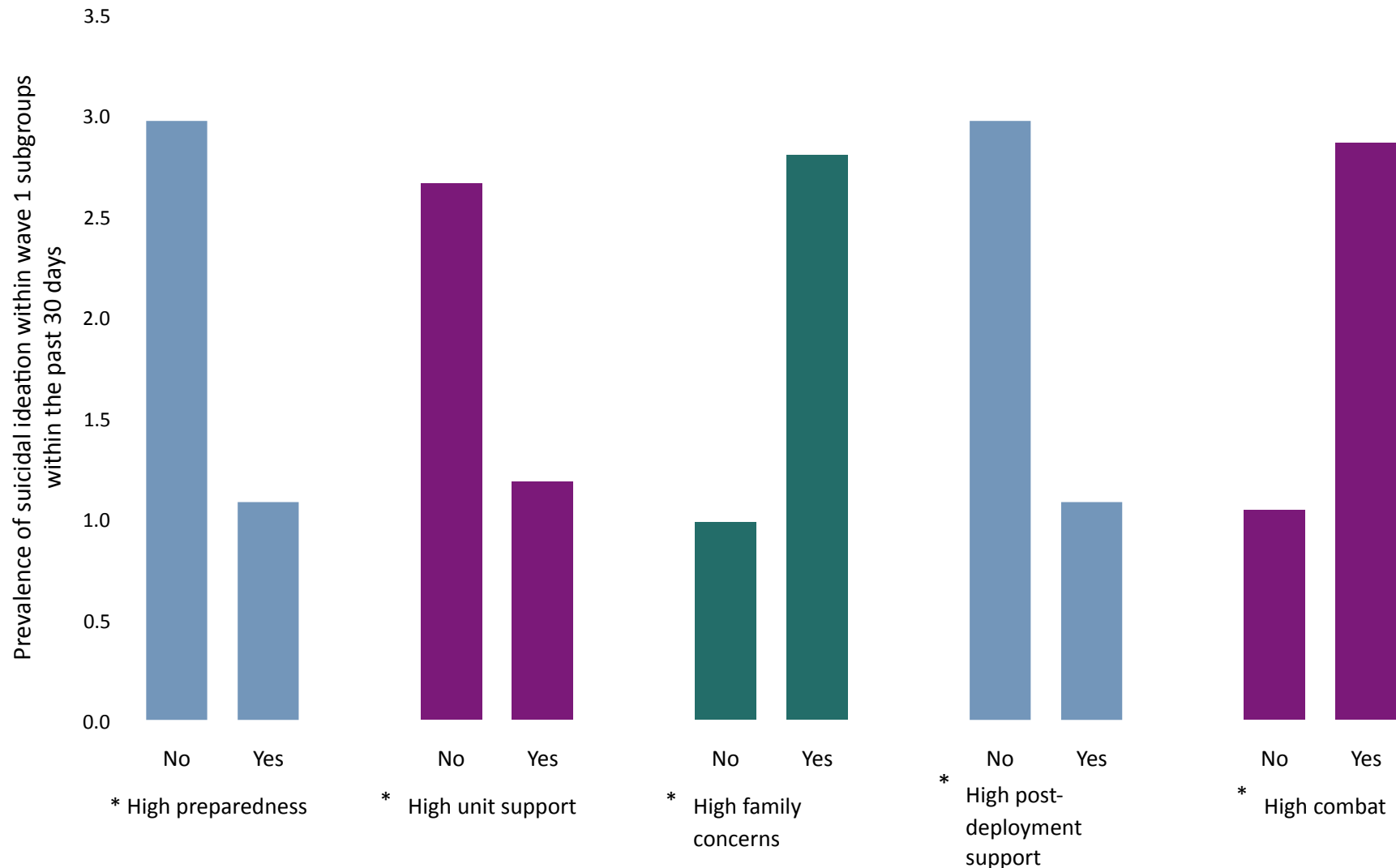


Calculated within baseline sample (N≈2616). This is “thought (they) would be better off dead, or had thoughts of hurting (themselves)” from the Patient Health Questionnaire - 9. Kroenke K, Spitzer R. The PHQ-9: A new depression diagnostic and severity measure. *Psychiatric Annals* 2002;32:1. Compared to general population with a prevalence of lifetime suicidal ideation between 4.8% and 18% (cdc.gov/ncipc/wisqars)

Deployment experience is not associated with current suicidal ideation

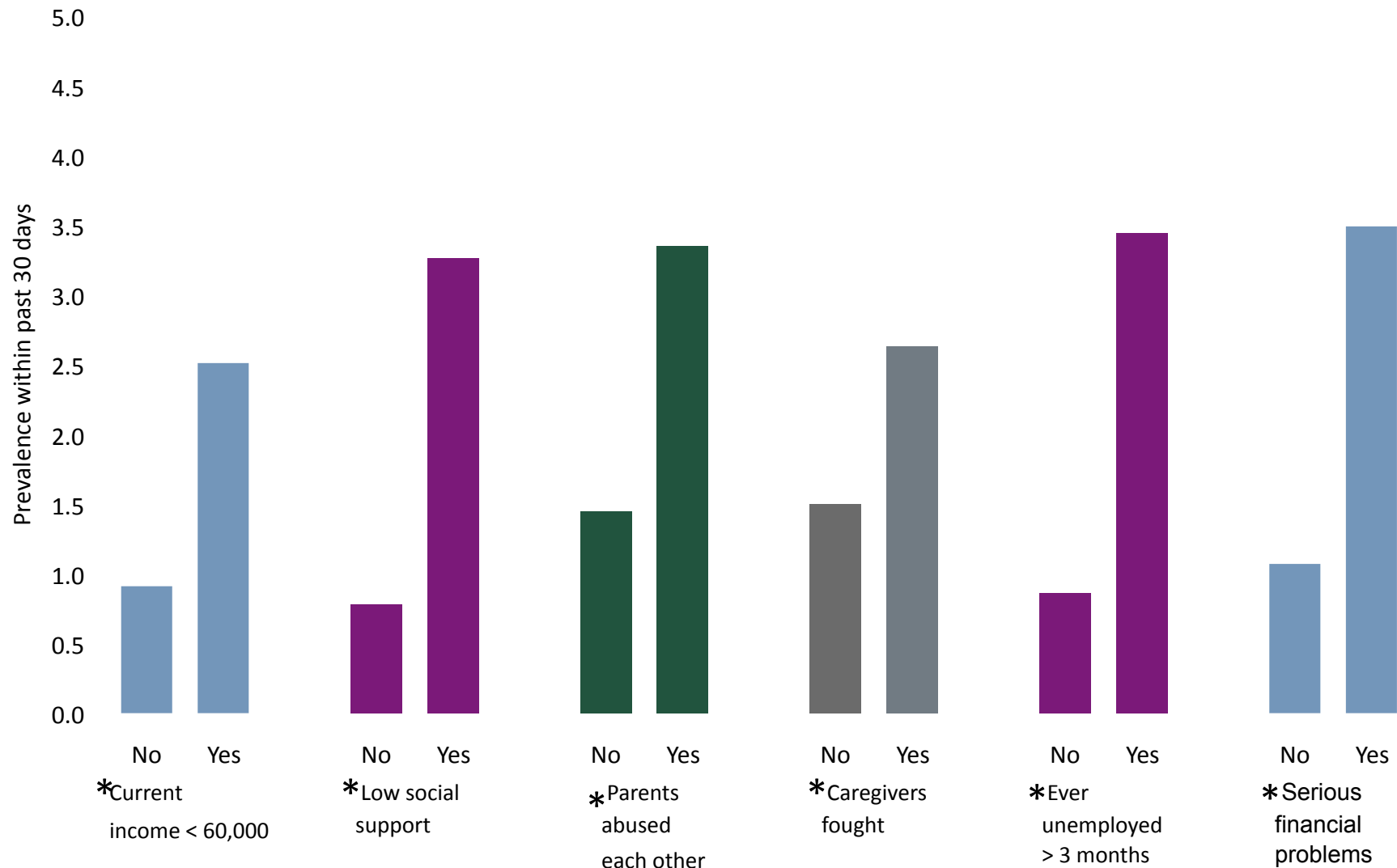


However, within those deployed, certain features of most recent deployment predict current suicidal ideation



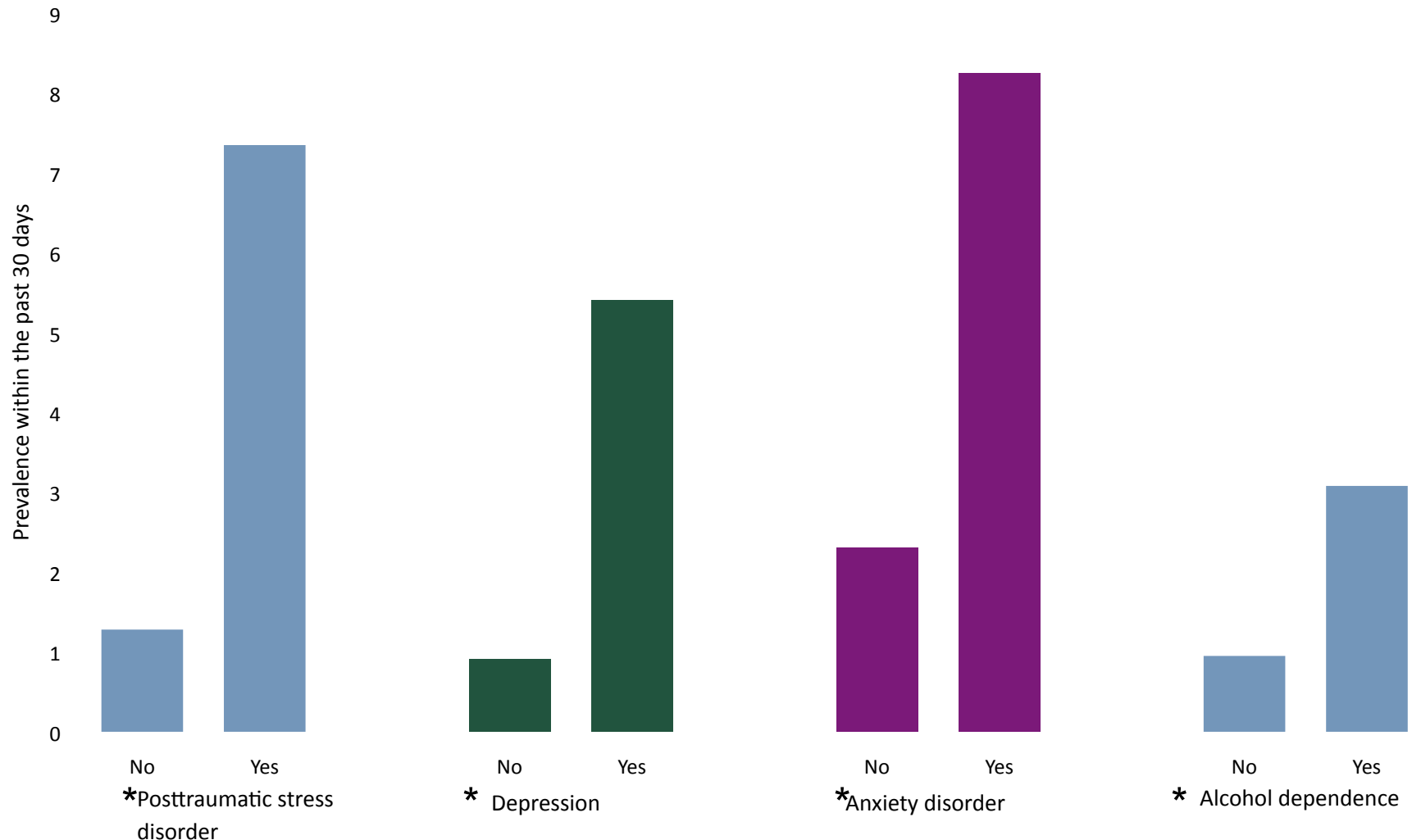
* p-value <0.05. From the Deployment Risk and Resilience Inventory. High levels created by median split. Calculated from baseline sample those who have been deployed (N=1607)

Stressors experienced over lifespan are associated with current suicidal ideation



*p-value <0.05. n = 2,508. Calculated with in baseline sample that answered all questions.

Among those never deployed (n = 907), current suicidal ideation was associated with a lifetime occurrence of mental health conditions



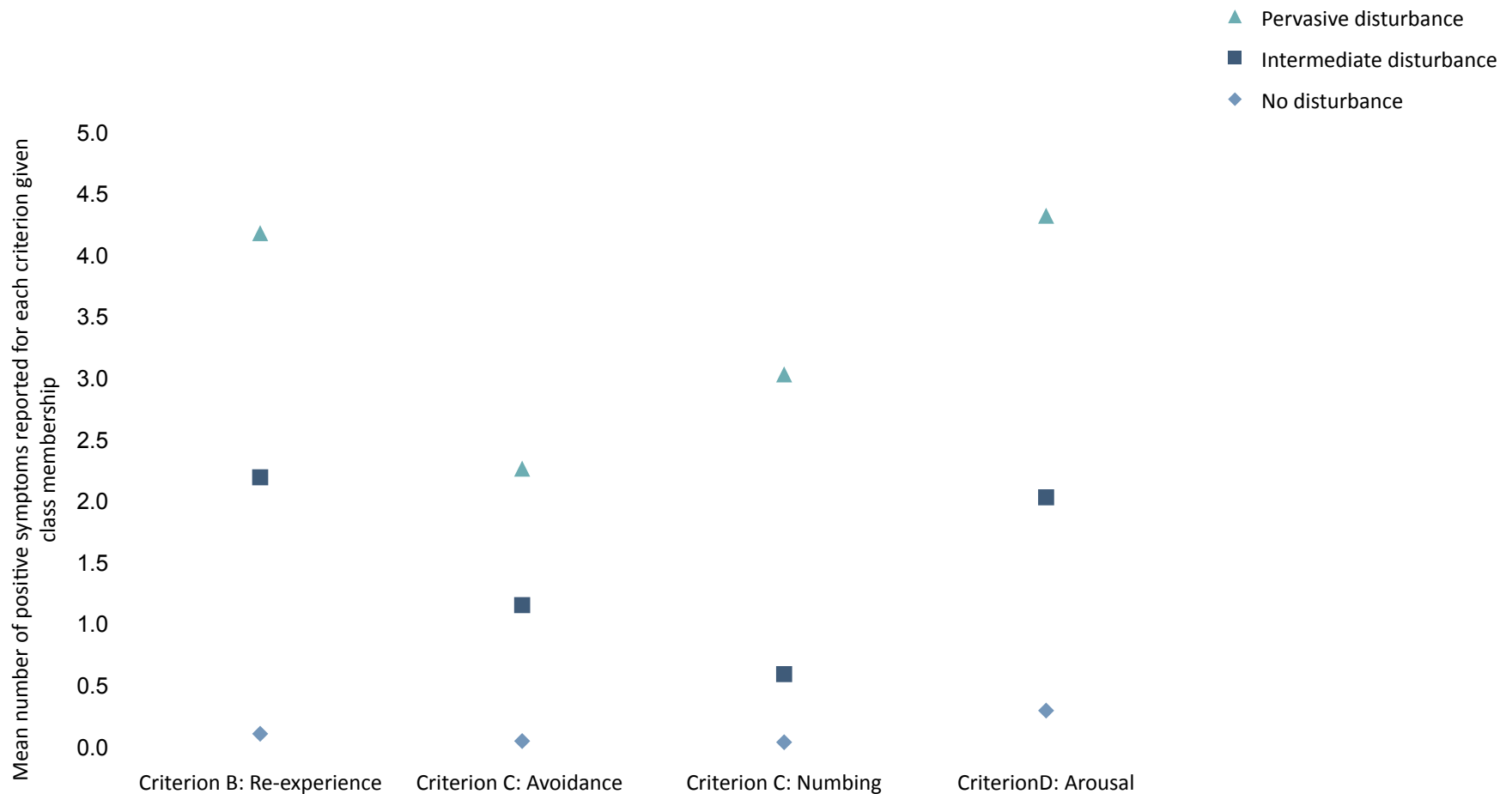
*p-value <0.05. Diagnoses by DSM-IV using: PTSD using the PTSD Checklist, Depression using the Patient Health Questionnaire, Anxiety Disorder using the Generalized Anxiety Disorder questionnaire and alcohol dependence using the MINI. For alcohol dependence the N=831 compared to N=907 for the other analyses.

**How does the context of the trauma matter
for PTSD symptoms: war-related compared to
non-war?**

Greater number of symptoms reported among those with non-war related trauma

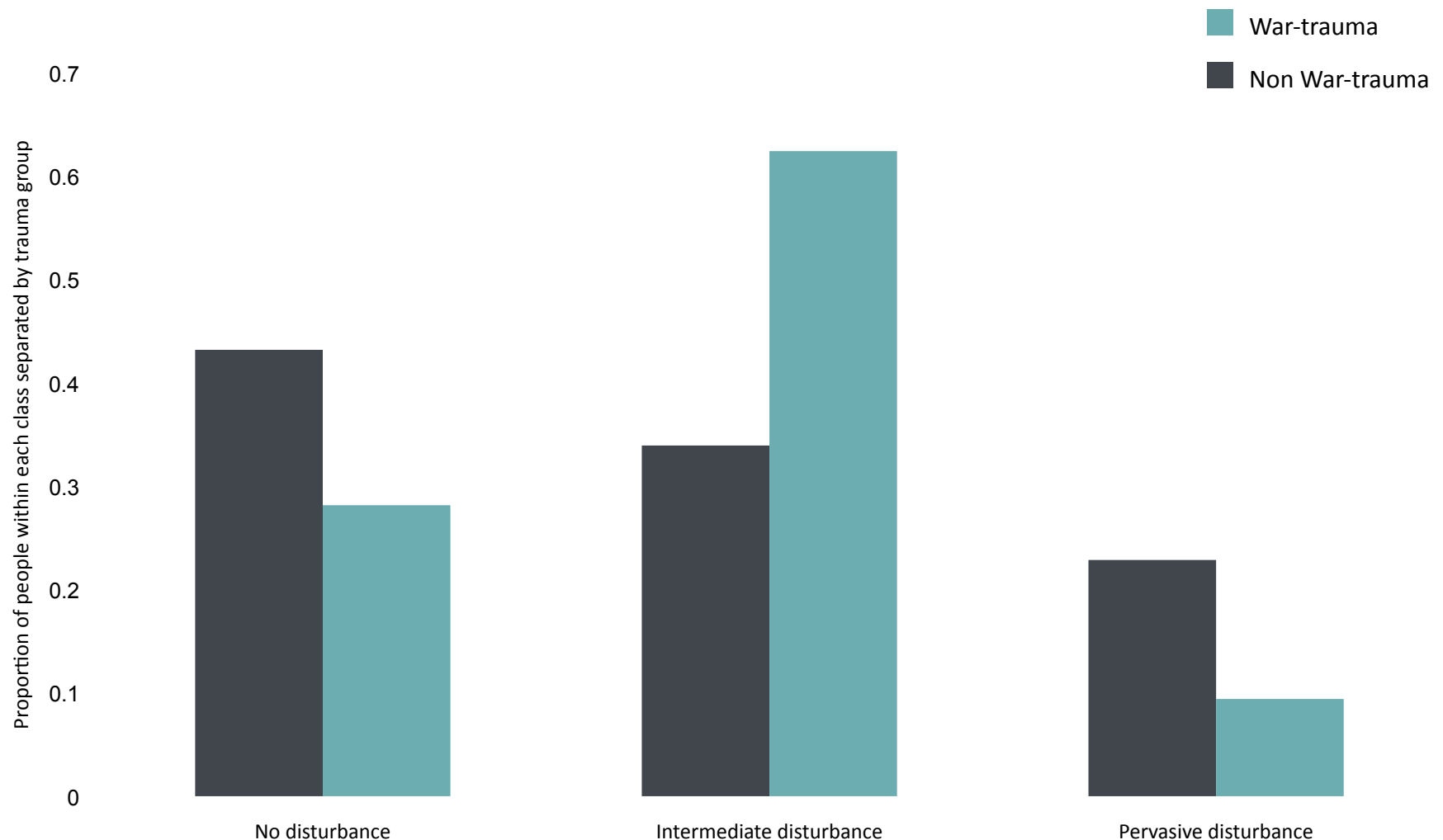
	PTSD symptoms on war-related trauma		PTSD symptoms on non war-related trauma		
	n	%	n	%	p-value
Criterion B symptoms					
Intrusive memories (B1)	123	32.9	76	54.7	<0.01
Nightmares (B2)	78	20.9	44	31.7	0.01
Flashbacks (B3)	66	17.6	36	25.9	0.04
Psychological reactivity (B4)	94	25.1	59	42.4	<0.01
Physiological reactivity (B5)	77	20.5	38	27.3	0.1
Criterion C symptoms					
Avoid thinking about event (C1)	100	26.8	68	48.9	<0.01
Avoid activities (C2)	67	17.9	58	41.7	<0.01
*Trouble remembering (C3)	39	10.4	33	23.7	<0.01
Diminished interest (C4)	55	14.7	27	19.4	0.19
Detached from people (C5)	63	16.8	45	32.4	<0.01
Feeling emotionally numb/restricted affect (C6)	55	14.7	37	26.6	<0.01
Foreshortened future (C7)	40	10.7	18	12.9	0.47
Criterion D symptoms					
Insomnia (D1)	94	25.1	40	28.8	0.39
Irritability (D2)	88	23.5	40	28.8	0.22
Concentration problems (D3)	74	19.8	40	28.8	0.03
Hyper-vigilance (D4)	139	37.1	71	51.4	<0.01
Exaggerated startle (D5)	104	27.7	44	31.7	0.38

Latent class analysis divides participants into 3 groups based on symptom presentation of PTSD after trauma: no disturbance, intermediate and pervasive disturbance class



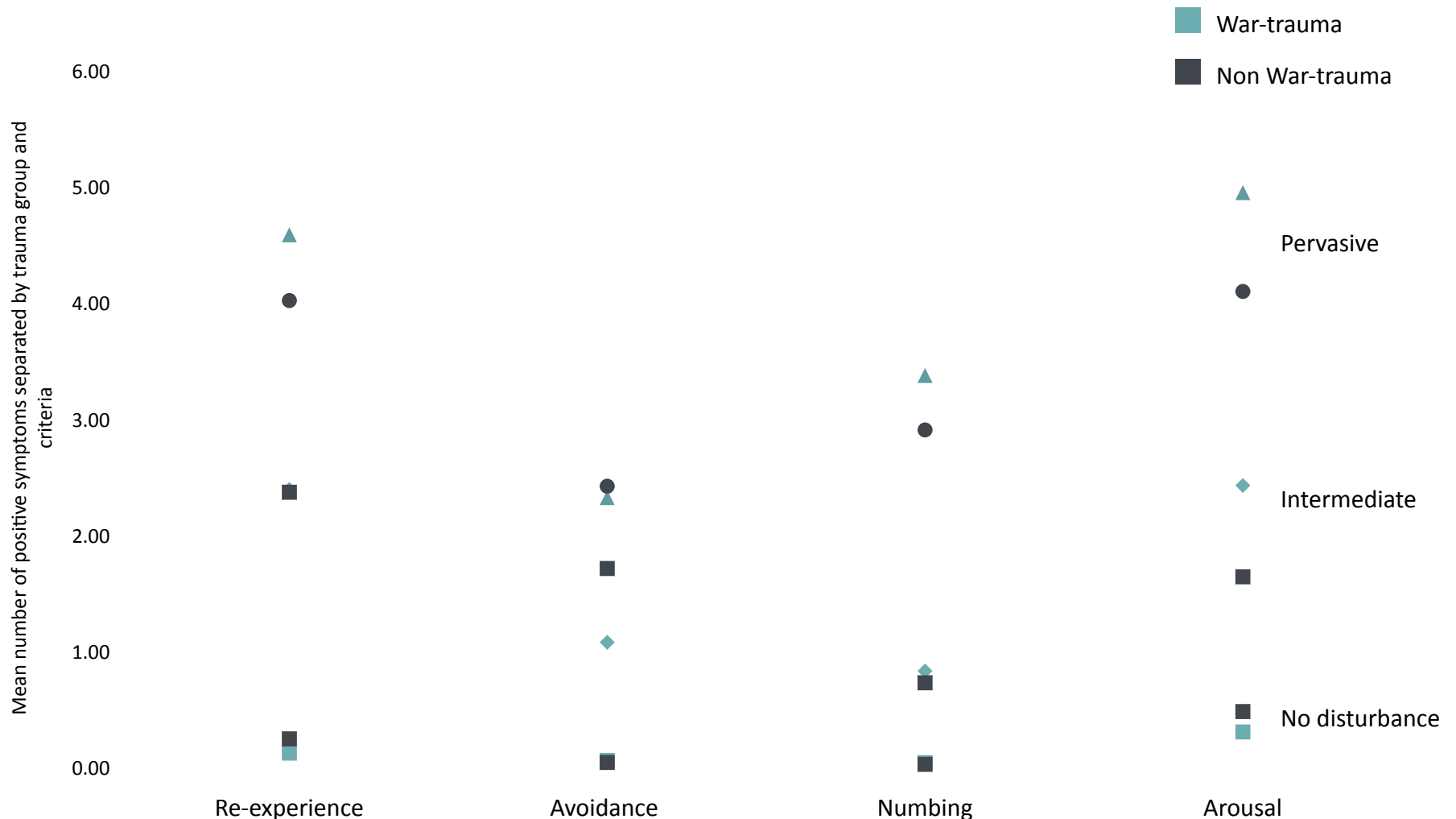
3 latent class model was tested against 2,4,5,6 class models and was selected for lowest BIC. Positive criteria were plotted by using the sum of 17 symptoms rho values separated into each criterion. Method based on Breslau, N., Reboussin, B., Anthony, J., Storr, C. (2005) The structure of posttraumatic stress disorder: latent class analysis in 2 community samples. Arch Gen Psychiatry; 62

Those with non war-related traumas were more likely to be in the pervasive disturbance group for PTSD symptoms



3 latent class model was tested against 2,4,5,6 class models and was selected for lowest BIC. Positive criteria were plotted by using the gamma values. Method based on Breslau, N., Reboussin, B., Anthony, J., Storr, C. (2005) The structure of posttraumatic stress disorder: latent class analysis in 2 community sampled. Arch Gen Psychiatry; 62

For both the intermediate and pervasive disturbance class, those with war-related traumas had more symptoms of arousal



3 latent class model was tested against 2,4,5,6 class models and was selected for lowest BIC. Positive criteria were plotted by using the sum of 17 symptoms rho values separated into each criterion. Method based on Breslau, N., Reboussin, B., Anthony, J., Storr, C. (2005) The structure of posttraumatic stress disorder: latent class analysis in 2 community sampled. Arch Gen Psychiatry; 62

Summary of findings

- Common mental illnesses in the general population are common mental illnesses in the military
- Life experiences both in and outside the military shape mental health in soldiers
- Pre-deployment traumas matter as do deployment traumas
- Guard soldiers are by and large resilient despite substantial traumatic event exposure
- We need to identify trajectories of psychopathology to improve our ability to intervene

Appendix C

Data analysis progress report submitted to the UHCMC Institutional Review Board on January 15, 2010 as part of the annual review application.

DATA DESCRIPTION

The Ohio National Guard sample of 2616 participants is comparable to the National profile of National Guard personnel. The majority of participants are male (85.2%) and white (87.7%) and the modal age is 17-24 (33.6%). The vast majority of participants (96.9%) are non-Hispanic. 86.2% of the sample are enlisted personnel, 64.1% have been deployed or mobilized in some capacity and 54.2% of the sample has been deployed overseas for their most recent deployment. Overall, nearly the entire sample has had at least one type of traumatic event in their lifetime (94.7%). Sixty nine percent have experienced an assaultive event (50.9% related to the most recent deployment and 54.3% occurred in civilian life), 75.0% have experienced a shocking event such as a transportation accident or serious injury, 72.3% have experienced trauma based on when they learned about events to others and 39% have experienced some form of combat.

Table 1. Kaptur Combat Mental Health Initiative study demographics

	CMHI Population (N=2616)		United States National Guard profile (2008)	
	N	%	N	%
Gender				
Male	2228	85.2	308,130	86.0
Female	388	14.8	50,257	14.0
Age				
17-24	878	33.6	125,556	35.0
25-34	848	32.4	114,557	32.0
35-44	634	24.2	77,275	21.6
45+	250	9.6	40,999	11.4
Race				
White	2295	87.7	287,713	80.3
Black	195	7.5	47,444	13.2
Other	123	4.7	23234	6.5

Among participants who had been deployed overseas, more than 60% report experiencing some form of combat with a unit receiving hostile fire being the most common and injured or wounded during combat being the least (see Figure below). Results from the mental health component of the survey suggest that 9.5% of participants met symptoms for posttraumatic stress disorder at some point in their lifetime compared with 5.2% within 30 days of the survey. Considering other mental health conditions, the results suggest that 21.4% of participants had depression at some point in their lifetime (6.4% within 30 days of the survey) and 12.4% have had generalized anxiety disorder in their lifetime (5.0% within 30 days of the survey.) The prevalence estimates highlight that while comparable to other studies on military populations, the Ohio National Guard appears to be a resilient group with a lower overall prevalence of mental health conditions than might be expected in a group with such marked traumatic event experiences.

Fig 1. Combat experiences related to most recent deployment among those deployed



FUTURE DIRECTIONS

The project is continuing data analysis for wave 1 and continuing data collection for wave 2. Given the longitudinal structure of the study and subsequent waves of the Kaptur Combat Mental Health Initiative we will examine the longitudinal course of psychopathologies and how these risk factors may influence mental health trajectories overtime. For wave 1, we will be examining the broad range of characteristics that are hypothesized to be associated with mental health conditions, as well as potential mediators of these associations. As analyses are completed, we will work on conference submissions and manuscripts to submit for publication. Listed below are preliminary analyses for the wave 1 data.

PRELIMINARY MULTIVARIABLE ANALYSES

Post traumatic stress disorder and associated factors

Research suggests that psychopathologies increase for military personnel after deployment and that National Guard personnel – who have a unique set of stressors, training and experiences – are at an even higher risk of developing mental health conditions. Therefore, for the baseline data for the Kaptur Mental Health Initiative we wanted to document the prevalence and correlates of certain psychopathologies within the Ohio National Guard including posttraumatic stress disorder, depression, and generalized anxiety disorder. To examine the factors associated with individual psychopathologies we first performed bivariable analyses and then multivariable logistic models to adjust for possible confounders. In bivariable analyses as well as multivariable analysis gender was the main predictor where women were more likely than men to have either posttraumatic stress disorder ($\beta=1.1$, $p<0.01$) or depression ($\beta=0.9$, $p<0.01$). Besides gender, the number of traumatic events experienced over the life course was the only other significant predictor ($p\text{-value}<0.01$) with more traumas increasing ones risk of posttraumatic stress disorder and depression. These results suggest that those who enter the military with previous traumatic event experiences may be at higher risk for having as well as developing mental health conditions while serving in the National Guard.

Mental health co-morbidities and associated factors

It is well documented that mental illness is frequently co-morbid and that focusing on one psychopathology may reduce the efficiency of intervention methods. The purpose of this analysis is to document the prevalence and correlates of co-morbidity among posttraumatic stress disorder, depression and generalized anxiety disorder in a sample of Ohio National Guard members. To examine correlates of co-morbidities we carried out both bivariable and multivariable multinomial logistic models. Overall, the results suggest that 71.7% of individuals have never had any of the three conditions in their lifetime, 17.0% have had at least one condition in their lifetime (12.7% in the past year) and 11.4% of participants have had at least two of the conditions in their lifetime (7.8% in the past year.) In multivariable multinomial analysis adjusting for demographics, women were more likely than men to have at least one disorder ($\beta=1.2$, $p<0.01$) or two disorders ($\beta=0.5$, $p<0.01$) compared to no disorders in their lifetime. Those who were married as compared to being divorced, separated or single were less likely to have at least one disorder ($\beta=-0.5$, $p<0.01$) or two disorders ($\beta=-0.5$, $p<0.01$) compared to no disorders over their lifetimes. The results also suggest that those with higher amount of lifetime traumatic events ($+12$) have a higher risk of at least one disorder ($\beta=2.0$, $p<0.01$) or two disorders ($\beta=1.2$, $p<0.01$) compared to having no disorder. These results

confirm that there are certain common factors that are not only associated with increased risk of psychopathology but that these factors also are associated with the co-morbid presence of posttraumatic stress disorder, depression and generalized anxiety disorder.

Conditional risk of posttraumatic stress disorder

Increasingly, studies have demonstrated that the type of trauma matters for the risk of developing posttraumatic stress disorder symptoms. Therefore, the purpose of this analysis was to examine if the type of traumatic event experienced may be associated with differential risks of developing posttraumatic stress disorder in a military sample with a diverse range of trauma experience. To examine this we calculated the conditional risk (probability of developing posttraumatic stress disorder given everyone has experienced a certain trauma) of various types of traumatic events within our sample. With respect to conditional risk, those who experienced assaultive traumas have the highest risk of developing posttraumatic stress disorder (11.4%) both if they were related to deployment (9.8%) and non-military related (13.7%). Those who experienced the sudden unexpected death of a loved one were had the second highest conditional risk of PTSD overall (8.9%.) Preliminary results also suggest that while the prevalence of posttraumatic stress disorder associated with certain traumas may differ, the risk factors associated with posttraumatic stress disorder remain constant regardless of the index trauma. Overall, these results suggest that within the Ohio National Guard the conditional risk of posttraumatic stress disorder does in fact depend on the type of traumatic event experienced and the context within which it occurs.

Social support and military preparedness as factors associated with deployment related posttraumatic stress disorder

Based on the possibility that the military environment may drive deployment related posttraumatic stress disorder, we examined whether support received during and after deployment influences psychological sequelae of deployment, specifically the risk of PTSD from a deployment-related traumatic event experience.

Of the 2616 individuals surveyed, 1677 (64.1%) had been deployed, the majority of whom had been deployment most recently overseas (84.6% overseas vs. 14.7% to U.S. locations). Deployment-related support included participants' perception of how prepared they had been for their most recent deployment (e.g. given training, information about the deployment, and necessary equipment), the relationships they had with other members of their unit, and how much support they received from others after their deployment. We found that all three deployment-related support factors were significantly associated with risk of PTSD. Of those who developed PTSD after deployment, significantly more participants reported low deployment preparedness (71.9% vs. high preparedness, 28.1%, $p < 0.01$), low unit support (67.8% vs. high unit support, 32.2%, $p < 0.01$), and low post-deployment support (81.8% vs. low post-deployment support, 18.2%, $p < 0.01$), demonstrating the protective influence of deployment support on the development of PTSD.

Suicidal behaviors

Research is inconclusive on how military experience affects the risk of suicidal outcomes including suicidal ideation. The purpose of this analysis to examine the factors associated with suicidal ideation in bivariable analysis. To examine this question we performed preliminary bivariable analysis. The results suggest that suicidal ideation, or thoughts they would be better off dead, or thoughts of killing themselves, for several days in a two week period in the 30 days prior to the interview was reported in 1.9% of participants and 10.1% of participants ever in their lifetime. Certain factors were associated with suicidal ideation in the 30 days before the interview including but not limited to being single ($p < 0.01$), low levels of social support ($p < 0.01$), parents with substance abuse problems ($p < 0.01$), being unemployed for 3 months or more ($p < 0.01$) and having serious financial issues ($p < 0.01$.) Having been deployed in the past was not associated with suicidal ideation in the 30 days before the interview ($p = 0.9$) or deployed within the past 3 years ($p = 0.9$.) While deployment as a whole was not associated with current suicidal ideation certain factors were predictive of suicidal ideation among those who have been deployed: feeling there was a lack of preparedness ($p\text{-value} < 0.01$), reporting low level of unit support ($p\text{-value} < 0.01$), feeling high amount of concern for family ($p\text{-value} < 0.01$), having low levels of post-deployment support ($p\text{-value} < 0.01$), and experience high levels of combat ($p\text{-value} < 0.01$). Among mental health conditions, those with a lifetime history of posttraumatic stress disorder ($p\text{-value} < 0.01$), generalized anxiety disorder ($p\text{-value} < 0.01$), and depression ($p\text{-value} < 0.01$) and alcohol dependence ($p\text{-value} < 0.01$) were more likely to have current suicidal ideation. These results suggest that deployment experience as a whole is not the driving force behind suicidal thoughts in the Ohio National Guard and certain subsets of vulnerable populations including those who experience lifetime stressful events and mental health conditions may benefit from focused suicidal prevention measures.

Appendix D

Reprints of submitted abstracts

Deployment characteristics, combat, and posttraumatic stress disorder among National Guard Members

Prescott, MR*, Tamburrino M, Liberzon I, Slembariski R, Calabrese J, Galea S
(University of Michigan, Ann Arbor, MI 48109)

The psychological consequences of combat may be modified by deployment characteristics such as proper training and unit support in reserve forces. We assessed the relation between combat, deployment characteristics, and posttraumatic stress disorder (PTSD) among Guard members. We interviewed a representative sample of Ohio National Guard members (N=821, 69% participation rate, 79% male, 32% between the ages of 24-32). Overall 45.5% of Guard members had an overseas deployment and 94.7% of Guard members reported at least one traumatic event. During their most recent deployment, 41.3% experienced high levels of combat, 52.1% felt well prepared, 47.6% felt high unit support, and 42.5% reported being concerned about their home life during deployment. Among those deployed overseas the prevalence of Diagnostic and Statistical Manual of Mental Disorders (IV)-consistent lifetime PTSD was 9.8%. In separate multivariate models, adjusting for demographics, overseas deployment and trauma exposure, high unit support (p-value=0.04) and being concerned about home life (p-value=0.03) both modified the effect of combat on developing PTSD. Specifically, persons experiencing higher unit support or fewer concerns regarding their home life, were less likely to develop PTSD than persons with lower support, or more home life concerns, given similar combat experiences. These data suggest that deployment characteristics of Guard members may jointly affect the psychological impact of deployment. Further work will evaluate the mechanisms, both behavioral and biologic, that may explain how we can modify the effect of combat by improving deployment conditions.

Context of military and civilian traumatic events and with the risk of posttraumatic stress disorder among National Guard soldiers

Prescott MR*, Tamburrino M, Liberzon I, Slembariski R, Goldmann E, Calabrese J, Galea S

While research has shown that the risk of posttraumatic stress disorder (PTSD) is not constant across traumatic event types, little work has examined if the context – military versus civilian – of the traumatic event has an effect on subsequent PTSD. To examine this relation we used the baseline sample of the Kaptur Combat Mental Health initiative, a ten-year longitudinal study of Ohio National Guard. The representative sample (N=2616) is majority male (85.2%) and has deployment experience (64.1%). Forty eight percent of participants have experienced a traumatic event during their most recent deployment and 91.0% have experienced a traumatic event outside of their most recent deployment. In bivariable associations and according to the Diagnostic and Statistical Manual of Mental Disorders version 4, assaultive traumas in the civilian context (13.3%) as compared to the military context (10.1%, p-value=0.15) had a higher prevalence of PTSD. In contrast, non-assaultive traumas in the civilian context (5.4%) compared to the military context (8.8%, p-value <0.01) had a lower prevalence of PTSD. In multivariable logistic models stratified by trauma type and context, those with low reported social support compared to high support consistently had higher odds of developing PTSD – assaultive military trauma (odds ratio (OR 3.5) 95% confidence interval (CI 1.6-7.8)) and assaultive civilian trauma (OR 5.1, 95% CI 2.2-11.7). These results suggest that while the context and type of the trauma may affect the development of PTSD, certain factors associated with the development of PTSD remained consistent and could be universal avenues for intervention.

Social and military characteristics associated with the co-occurrence of psychopathology among National Guard soldiers

Prescott MR*, Tamburrino M, Liberzon I, Slembariski R, Goldmann E, Calabrese J, Galea S
(University of Michigan, Ann Arbor, MI 48109)

Common factors associated with the individual prevalence and co-occurrence of posttraumatic stress disorder (PTSD), depression and generalized anxiety disorder (GAD) may highlight effective pathways to reduce the mental health consequences of war. To examine these relations within military personnel, we used the baseline cohort of the Kaptur Combat Mental Health Initiative – a ten-year longitudinal study of Ohio National Guard soldiers. Comparable to the Ohio National Guard in general, the baseline cohort was majority male (85.2%), white (87.7%), and have been deployed (64.1%.) According to Diagnostic Statistical Manual of Mental Disorders version 4, 79% of the sample has not had either PTSD, depression or GAD within the past within the past year. In the past year, the most common co-occurring conditions were depressive disorder and GAD (4%) while 2.1% of individuals had all three conditions. In multivariable, multinomial logistic models, women as compared to men were more likely to have at least two conditions (odds ratio, OR 2.0, 95% confidence interval CI 1.41-2.86) as compared to no psychopathologies within the past year. Additionally, low reported levels of social support (OR 6.5, 95% CI 4.2-10.1) and high levels of lifetime trauma (OR 7.7, 95% CI 4.5-13.3) were associated with the co-occurrence of at least two as compared to no mental health conditions. These findings suggest that while National Guard soldiers are resilient as a whole, there are common factors associated the co-occurrence of mental health conditions. It is possible that focusing on these factors may allow us to more efficiently intervene on multiple psychopathologies.

Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio National Guard soldiers

*Goldmann E, Tamburrino M, Liberzon I, Slembariski R, Prescott MR, Calabrese J, Galea S

(University of Michigan, Ann Arbor, MI, 48109)

Factors related to various stages of deployment – such as feeling prepared for deployment, unit support during deployment, and post-deployment support – may be associated with the risk of developing posttraumatic stress disorder (PTSD) from deployment-related traumatic events. We recruited a random sample of 2616 Ohio National Guard soldiers and conducted structured interviews to assess traumatic event exposure and PTSD related to the soldiers' most recent deployment, consistent with DSM-IV criteria. We assessed preparedness prior to deployment, unit support, and post-deployment support; all instruments showed good internal consistency ($\alpha=0.68, 0.84, 0.68$, respectively). Among the 1294 (49.5%) soldiers who had been deployed and experienced at least one traumatic event during their most recent deployment, the prevalence of deployment-related PTSD was 9.6% overall and 8.7% in the past year. In logistic models adjusted for demographic characteristics, paygrade, deployment location, number of deployments, and number of events experienced during the deployment, soldiers reporting higher levels of preparedness, unit support, and post-deployment support had significantly lower odds of past year PTSD than did those reporting lower levels (odds ratio(OR)=0.4, 95% confidence interval (CI):0.3-0.7, OR=0.4, CI:0.2-0.6, and OR=0.1, CI:0.1-0.2, respectively). Results show that factors throughout the lifecourse, including factors before, during, and after deployment may influence the risk of PTSD. This suggests that interventions aimed at mitigating the consequences of war need to consider soldiers' life experiences and specific aspects of deployment.

Symposium: Risk and Resilience in the National Guard

Army National Guard forces may have increased risk of psychopathologies after combat trauma as compared than their active duty counterparts due to differences in deployment experiences, training and ongoing civilian stressors. In this symposium we present findings from the baseline sample of the Kaptur Combat Mental Health Initiative cohort, a ten-year longitudinal study of Ohio Army Guard soldiers. For the baseline, we recruited 2616 randomly selected Ohio Army Guard soldiers who were given an hour-long structured telephone survey and a subset (N=500) were randomly selected to then participate in clinical appraisals. The standardized interviews assessed deployment and home-life characteristics as well as the presence of PTSD, depression, generalized anxiety disorder and substance use disorders. The focus of this symposium will be to highlight the underlying mechanisms and modifiable factors associated with psychopathology among Ohio Army Guard soldiers through four presentations:

1. The Kaptur Combat Mental Health Initiative: baseline collection of a ten-year longitudinal study sample
2. Determinants of co-occurring psychopathology among Ohio Army Guard soldiers
3. Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among Ohio Army Guard soldiers
4. Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among Ohio Army Guard soldiers

The Kaptur Combat Mental Health Initiative: baseline collection of a ten-year longitudinal study sample

The Kaptur Combat Mental Health Initiative is a ten-year longitudinal study of Ohio Army Guard soldiers created to examine the long-term impact of war on guard soldiers. Cohort members participated in baseline telephone interviews between November 2008 and December 2009. The baseline sample was comparable to the Ohio Army Guard overall where the majority were male (85.2%), white (87.7%) and an enlisted personnel or cadet (86.2%). Compared to the clinician administered PTSD scale, the telephone survey assessment for PTSD (PTSD checklist – civilian) was highly specific (range 91%(SE 0.02) to 97%(0.01) with moderate sensitivity (range 24%(0.09) to 63%(0.17)) depending on the type of diagnosis. The telephone survey assessment (Patient Health Questionnaire) of depression also was highly specific (97%(0.01)) and moderately sensitive (21%(0.04)) compared to the clinical appraisal using the SCID. Other psychopathologies assessed on the telephone included generalized anxiety disorder (sensitivity, se 36% (0.08) and specificity, sp 89%(0.01)) and alcohol dependence (se 78%(0.04) and sp 66%(0.02). The Kaptur Combat Mental Health Initiative will improve our understanding of the mechanisms by which war and stressful circumstances impact the mental health trajectories of soldiers.

Determinants of co-occurring psychopathology among National Guard soldiers

Understanding the modifiable factors associated with co-occurring posttraumatic stress disorder (PTSD), depression, and generalized anxiety disorder (GAD) may highlight effective pathways to mitigate the adverse mental health consequences of war. We used baseline data from the Kaptur Combat Mental Health Initiative cohort that was comparable to the Ohio Army Guard in general. Using Diagnostic Statistical Manual of Mental Disorders IV criteria, the prevalence of PTSD, depression and GAD within the past year was 7.2%, 14.0% and 9.3% respectively; 79% of the sample did not have any of the three conditions. In the past year, the most common co-occurring conditions were depressive disorder and GAD (4%). In multivariable, multinomial logistic models, women as compared to men (odds ratio, OR 2.0, 95% confidence interval CI 1.41-2.86) and those with low reported levels of social support (OR 6.5, 95% CI 4.2-10.1) and high levels of lifetime trauma (OR 7.7, 95% CI 4.5-13.3) were more likely to have at least two conditions as compared to no psychopathologies within the past year. These findings suggest that while National Guard soldiers are resilient as a whole, social support and prior trauma experiences are associated with the co-occurrence of mental health conditions. Focusing on these factors may point to avenues of intervention with this high-risk population.

Context of military and civilian traumatic events and the risk of posttraumatic stress disorder among National Guard soldiers

There is limited data on how comparable traumatic events, experienced in different contexts, may be associated with heterogeneity in risk of posttraumatic stress disorder (PTSD). We examined the differences in the risk of PTSD following traumatic events experienced in civilian vs. in military contexts. Within this representative sample (N=2616), 48% had experienced a trauma during their most recent deployment, 91.0% had trauma outside of their most recent deployment and 9.5% had had PTSD using the Diagnostic and Statistical Manual of Mental Disorders IV. Among those who had experienced a non-assaultive trauma, the prevalence of PTSD was higher among those who had experienced the trauma in the military as compared to the civilian context (8.8% vs. 5.4%, p-value <0.01). In multivariable logistic models stratified by context and limited to those who had experienced a non-assaultive trauma, women were more likely than men to have PTSD in a civilian context (odds ratio, OR 2.7, 95% confidence interval, CI 1.6-4.7) but not in the military context (OR 1.9, 95 CI 0.7-5.1). Similarly, prior traumatic event experiences were associated with greater risk of PTSD in the civilian context (OR 2.8, 95% CI 2.8-11.1) but not in the military context (OR 2.5, 95% CI 0.7-9.0). These results suggest that traumatic events experienced in different contexts may be associated with different risk of PTSD. Future work may fruitfully explore the underlying mechanisms for the role context plays in shaping risk of PTSD after specific traumatic events.

Pre-, peri-, and post-deployment characteristics and the risk of posttraumatic stress disorder among National Guard soldiers

Factors related to various stages of deployment – such as feeling prepared for deployment, unit support during deployment, and post-deployment support – may be associated with the risk of developing posttraumatic stress disorder (PTSD) from deployment-related traumatic events. To examine these factors we assessed preparedness prior to deployment, unit support, and post-deployment support; all instruments showed good internal consistency ($\alpha=0.68, 0.84, 0.68$, respectively). Among the 1294 (49.5%) soldiers who had been deployed and experienced at least one traumatic event during their most recent deployment, the prevalence of deployment-related PTSD was 9.6% overall and 8.7% in the past year. In logistic models adjusted for demographic characteristics, paygrade, deployment location, number of deployments, and number of events experienced during the deployment, soldiers reporting higher levels of preparedness, unit support, and post-deployment support had significantly lower odds of past year PTSD than did those reporting lower levels (odds ratio(OR)=0.4, 95% confidence interval (CI):0.3-0.7, OR=0.4, CI:0.2-0.6, and OR=0.1, CI:0.1-0.2, respectively). Results show that factors throughout the lifecourse, including factors before, during, and after deployment may influence the risk of PTSD due to traumatic events among soldiers. This suggests that interventions aimed at mitigating the consequences of war need to consider soldiers' life experiences together with specific aspects of deployment.