



# Cohort profile: the Ohio Army National Guard Mental Health Initiative (OHARNG-MHI)

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## Abstract

**Purpose** Rates of mental disorders in the United States military have increased in recent years. National Guard members may be particularly at risk for mental disorders, given their dual role as citizen-soldiers and their increased involvement in combat deployments during recent conflicts. The Ohio Army National Guard Mental Health Initiative (OHARNG-MHI) was launched to assess the prevalence, incidence, and potential causes and consequences of mental disorders in this unique population.

**Methods** OHARNG-MHI is a decade-long dynamic cohort study that followed over 3,000 National Guard members yearly through structured telephone interviews.

**Results** Findings thus far have applied a pre-, peri-, post-deployment framework, identifying factors throughout the life course associated with mental disorders, including childhood events and more recent events, both during and outside of deployment. An estimated 61% of participants had at least one mental disorder in their lifetime, the majority of which initiated prior to military service. Psychiatric comorbidity was common, as were alcohol use and stressful events. Latent class growth analyses revealed four distinct trajectory paths of both posttraumatic stress and depression symptoms across four years. Only 37% of soldiers with probable past-year mental disorders accessed mental health services in the subsequent year, with substance use disorders least likely to be treated.

**Conclusion** Strengths of this study include a large number of follow-up interviews, detailed data on both military and non-military experiences, and a clinical assessment subsample that assessed the validity of the telephone screening instruments. Findings, methods, and procedures of the study are discussed, and collaborations are welcome.

**Keywords** Military health · Cohort study · PTSD · Depression · Alcohol use disorders

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## Introduction

Mental disorders represent a substantial burden on the overall health and functioning of the United States (U.S.) military. About one in four U.S. service members meet criteria for a past-month mental disorder, and mental disorders now rank second only to injuries as reasons for health care visits and days out of duty for military personnel [1].

The Global War on Terror, an international military campaign launched by the U.S. following the September 11th attacks, includes Operation Enduring Freedom (OEF; 2001–2014), Operation Iraqi Freedom (OIF; 2003–2011), and Operation New Dawn (OND; 2010–2011) in Afghanistan and Iraq. There has been much scientific interest in understanding the psychological sequelae of OEF/OIF/OND combat deployments. This focus on the effects of military-related trauma, rather than the range of deleterious experiences across the life course, has led to a public conversation around “military mental health”, suggesting that the military is the cause of poor mental health. However, many of the studies in this area have neglected pre-military experiences and how they might shape “military mental health”. The importance of pre-military and non-military stress or traumatic exposures on mental health among personnel may be particularly salient among the Reserve and National Guard, a unique population of part-time military personnel who have both civilian and military duties, and whose risk for mental disorders remains less clear [2]. Accordingly, a longitudinal cohort study was needed to evaluate the burden and needs within this population.

The Army National Guard is part of the Reserve Component (RC) of the U.S. military force, under dual control of the state and federal government, and can be mobilized upon declaration of a state or national emergency or during times of war to supplement the Active Component (AC). Army National Guard members receive training for their wartime duties similar to those of their AC counterparts. However, Guard members must balance their civilian occupations with military training duties, typically one weekend per month and 15 days annually. Although Gulf War I marked the beginning of the Army Reserve’s increased role in war time operations, the role of citizen-soldier was never fully realized until OEF, OIF, and OND. During these conflicts, the National Guard was deployed at unprecedented rates; at least 15% of the total number of deployed U.S. military personnel were National Guard members [2, 3].

In addition to the record deployment of Reservists to conflict areas, the Army National Guard is also mobilized for humanitarian relief after or during natural disasters [4], which have also been occurring more frequently over time

[5], as well as to unrest such as protests and riots. Further, Guard members may undergo unpredictable deployment schedules and have time-limited military health insurance following deployment. Together, these factors may constitute a potentially greater mental health burden among Army National Guard soldiers compared to AC soldiers [4, 6, 7]. Yet, there have been far fewer studies of mental health among the RC compared to the AC [4, 8, 9]. The Ohio Army National Guard Mental Health Initiative (OHARNG-MHI) was launched in part to fill this gap.

## Methods

OHARNG-MHI is a longitudinal study that aims to evaluate the relationships between risk and resilience factors for mental disorders in a National Guard population. The primary study was carried out with computer-assisted telephone interview (CATI) surveys of respondents, aged 18 years or older, randomly selected from the roster of all current OHARNG service members active in 2008 [10].

With the help of the Ohio National Guard leadership, an alert letter about the study was mailed to all 12,225 serving National Guard members in the state of Ohio at that time who had current addresses listed with the Guard [10]. About 8% of these soldiers ( $n = 1013$ ) opted out of the study by sending back an opt-out card that was included in the initial mailing. After allowing time for opt-out responses and removing duplicate entries and soldiers with no working telephone number listed with the Guard ( $n = 4698$ ), a sample of 3980 individuals were telephoned by trained lay interviewers, before the close of the baseline recruitment year. One-hundred and eighty-seven of these contacted individuals consented to the interview but were then deemed ineligible for the study (e.g., because they were under age 18 or had left the Guard); 31 individuals were disqualified because they did not speak English or had hearing problems; and 1364 declined participation when called. The baseline interview closed at 2616 completed interviews, with an overall response rate of 43% (taking into account all potentially eligible soldiers with working phone numbers) and cooperation rate of 68% (taking into account only those who were successfully contacted before the baseline study’s close). This baseline sample, and the Ohio Army National Guard in general, is representative of the U.S. Army National Guard population as a whole in terms of demographic and social factors such as military rank, gender, and age [10, 11].

The first and primary cohort of the study ( $n = 2616$  participants at baseline as described above) was subsequently followed via telephone interviews approximately once per year for a decade. The baseline telephone interview assessed demographic information, mental disorders, life events, and military experiences that occurred throughout the life

course, mostly without reference to specific timing, to keep the first interview relatively short. The follow-up surveys primarily assessed past-year disorders, events, and military experiences that occurred since the last interview, to avoid repetition.

Some of the assessments within the surveys included portions of the Deployment Risk and Resilience Inventory (DRRI) to assess deployment-related events and characteristics including unit support [12]; traumatic events from the Life Events Checklist-Civilian Version [13], the Detroit Area Survey of Trauma [14], and the Adverse Childhood Experiences (ACE) study [15]; the Mini-International Neuropsychiatric Interview to assess alcohol misuse [16]; the nine-item Patient Health Questionnaire (PHQ-9) to assess depression [17]; the Posttraumatic Stress Disorder (PTSD) Check List-Civilian Version [18]; the Generalized Anxiety Disorder-7 scale [19]; and the 3-item National Opinion Research Center Diagnostic Screen—Loss of Control, Lying, and Preoccupation Screen to assess problematic gambling [20], among other scales.

Participants gave verbal, informed consent, were compensated for all interviews they completed (\$35 each), and were assured that their responses would be confidential, de-identified, and have no bearing on the status of their employment with the Guard. Telephone interviews were employed as the primary mode of data collection for this study due to the cost-effectiveness, feasibility, and relative ease of contacting Guard members via telephone compared to other methods, particularly in 2008 at the start of the study.

A random sample of 500 OHARNG-MHI respondents from the cohort's baseline interview were additionally enrolled into an in-person clinical assessment interview to validate the mental health screeners used in the telephone survey. This subsample completed in-depth interviews conducted by clinicians, using the gold standard Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (SCID) [21] and the Clinician-Administered PTSD Scale (CAPS) [22]. Within this group, diagnoses from the in-person interview were compared with diagnoses from the telephone survey instruments. The telephone survey measures (used for the full cohort) were generally found to have good to excellent specificity and moderate sensitivity [23, 24]. The clinical assessment cohort members were first interviewed between 2008 and 2009 and were followed up annually through 2012. In addition, 105 newly enlisted

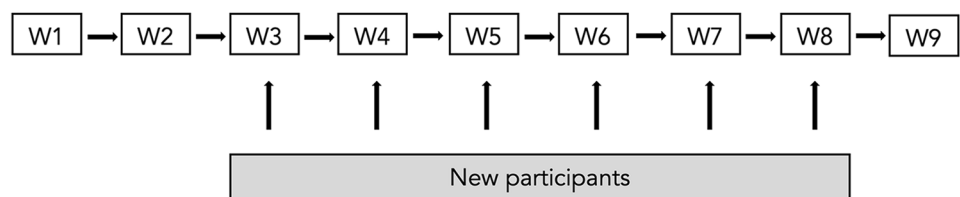
OHARNG members were enrolled into the clinical assessment subsample in 2011 (year 3) to increase the analytical power and provide data on the most recent cohort of enlisted soldiers. Details describing the clinical assessment sub-study design have been previously published [23–25].

In the primary cohort, to counteract loss of sample size due to attrition (loss to follow-up) and changes in demographic make-up over time due to both attrition and time-varying factors such as retirement from the Guard (those who retired or left the Guard were able to remain in the study), smaller random samples from newer recruits to the Guard replenished the original group of respondents each year beginning in the third year of the study, creating a dynamic cohort study design (Fig. 1). The second group of participants (following the original cohort) consisted of 578 new respondents whose baseline interviews were conducted during the original group's third year of the study; the third group of participants included 263 additional respondents whose baseline interviews were carried out during the original group's fourth year of the study; the fourth group of participants included 121 respondents whose baseline interviews were conducted during the original group's fifth year of the study; the fifth group of participants included 73 respondents whose baseline interviews were conducted during the original group's sixth year of the study; the sixth group of participants included 156 respondents whose baseline interviews were conducted during the original group's seventh year of the study; and the final group of participants included 34 respondents whose baseline interviews were conducted during the original group's eighth year of the study. These participants were enrolled using the same procedures described above, with the exception of the fifth group ( $n = 73$ ), which was enrolled through an opt-in rather than opt-out process, due to a temporary change in Guard policy.

After the year of their initial baseline interviews, these additional groups' follow-up interviews were conducted at the same time as and using the same follow-up survey as the other study members from previous groups. The last year of the study, the ninth year, had no new baseline cohort, and consisted only of follow-up questions. The total number of individuals interviewed at least once across all cohorts was 3841.

The Ohio National Guard and the institutional review boards of University Hospitals Cleveland Medical Center,

**Fig. 1** Study participation diagram showing dynamic cohort design for the Ohio Army National Guard Mental Health Initiative. *W* wave/interview year



University of Toledo, University of Michigan, Ann Arbor Veterans Administration Medical Center, Columbia University, Boston University, and the Office of Human Research Protections of the U.S. Army Medical Research and Materiel Command approved the study protocol.

While the participants aged out of the younger age groups over time as expected, demographics otherwise remained relatively stable across the length of the study due to the dynamic cohort design, with new individuals replenishing those lost to follow-up over time.

## Results

### Sample characteristics

The cohort had the following characteristics at baseline: 85% male; 34% between the ages of 17 and 24; 32% between the ages of 25 and 34; and the remaining third older than age 35. The majority (88%) of the cohort was White; 7% were Black; and 5% reported “other” race or were of Hispanic ethnicity. Over half (59%) of the soldiers reported an income of less than or equal to \$60,000, and 72% had greater than a high school education. About half (47%) were married and 87% were Enlisted soldiers (i.e., not Officers or Warrant Officers).

Figure 2 shows the distribution of gender, race, and age group by each year or “wave” of the study through year 8.

### Prevalence, incidence, and correlates of common mental disorders

The rate of any incident mental disorder as measured in the in-person subsample cohort was approximately 10 per 100 soldiers per year between 2008 and 2012, with alcohol use disorder (AUD) and major depressive disorder (MDD) having the highest individual disorder rates (5.0 and 4.2 per 100 person-years, respectively) [25]. Soldiers with a deployment in the past year had a 29% greater risk of onset of anxiety disorder (i.e., panic disorder, agoraphobia, specific or social phobia, obsessive compulsive disorder), PTSD, or mood disorder (i.e., MDD, bipolar I/II, other mood disorders). Those who experienced a potentially traumatic event outside of deployment (e.g., unexpected death of a loved one) had a 32% greater risk of anxiety or mood disorder onset [25]. Having been deployed multiple times was associated with

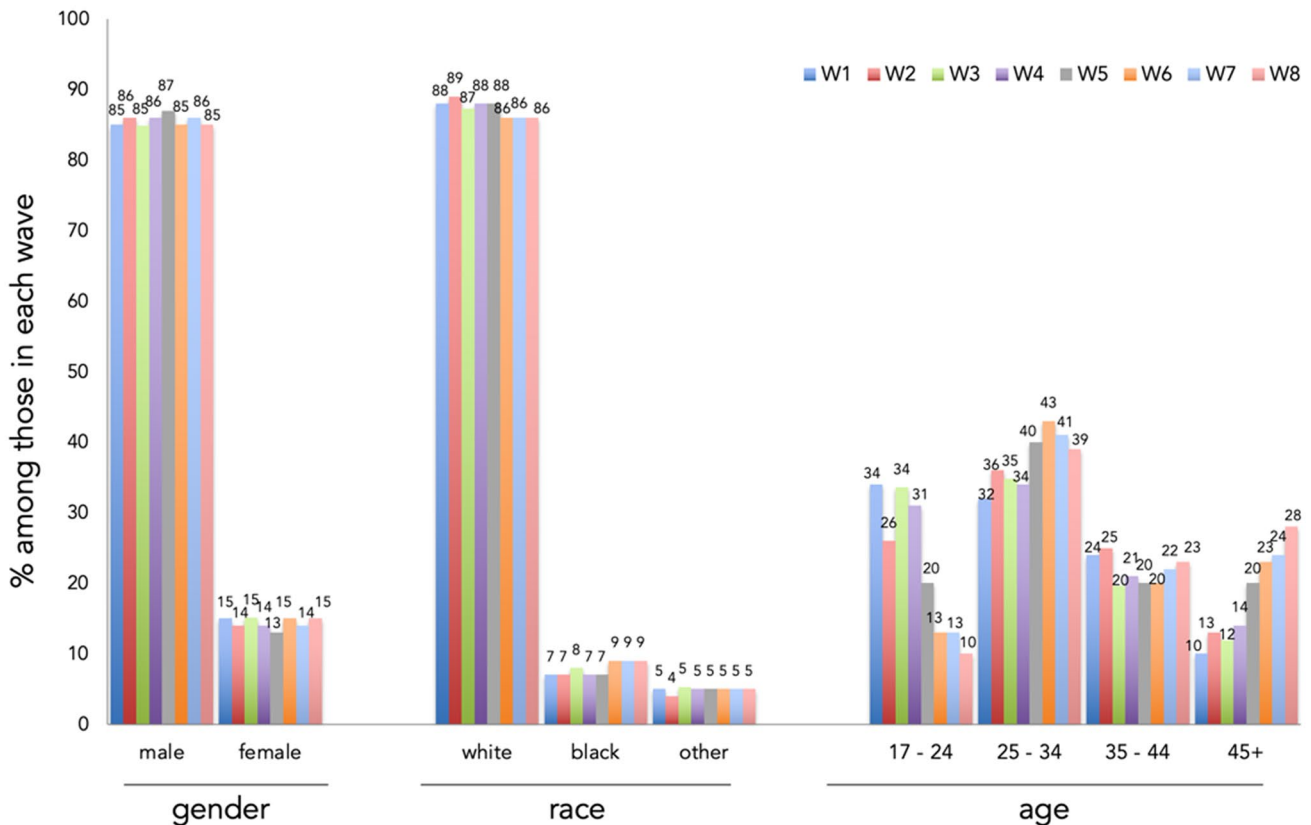


Fig. 2 Prevalence of gender, race, and age group across eight study years in the Ohio Army National Guard Mental Health Initiative. W wave/ interview year

higher odds of PTSD, AUD, and substance use disorder [26]. At any point in their lifetime, 61% of the in-person sample met criteria for at least one mental disorder, the majority of which started before enlistment in the military (64%). Alcohol abuse or dependence (based on the Diagnostic and Statistical Manual of Mental Disorders Version IV (DSM-IV; 44%) and MDD (23%) were the most common disorders. Anxiety disorders had the earliest age-of-onset of any disorder assessed, with a median age of onset of 15 years of age [27].

In the primary (telephone survey) cohort, incidence of probable depression (either MDD or depression not otherwise specified, as assessed with the PHQ-9) was 15% among men and 25% among women across five years of follow-up [28]. We used cross-validated random forests—a type of machine learning classifier—to identify the optimal combination of predictors of depression out of 85 candidate predictors from the baseline interviews. Using variable importance metrics, we found that stressful and traumatic events (e.g., emotional mistreatment, adverse childhood experiences), demographics (e.g., being a parent or student), and military characteristics (e.g., paygrade, deployment location) were most predictive of incident depression [28].

Subthreshold PTSD affected almost 12% of the telephone survey cohort members each year [29]. Subthreshold symptoms, which do not meet full PTSD diagnostic criteria, are nonetheless important to detect, as such persons may go on to develop threshold PTSD. Indeed, this subthreshold group was more likely than those without subthreshold PTSD to develop full (threshold) PTSD at a later wave, and they accounted for a substantial proportion of the overall burden of PTSD cases measured at a later wave, suggesting that early intervention after trauma may be key.

In addition to measuring prevalence and incidence, other OHARNG-MHI studies have analyzed the symptom structure of depression [30], PTSD [31], the two disorders together [32–35], and generalized anxiety disorder [36]. These studies found support for different factor models and symptom overlap, furthering our understanding of the underlying symptom components of these disorders and their comorbid presentation.

## Comorbidity

There are high levels of psychiatric comorbidity in this cohort. At baseline, among those with past-year PTSD, 62% had at least one other psychopathology and 20% had at least two other co-occurring conditions; depression was the most common co-occurring condition. Respondents with PTSD were 5.4 times more likely to report suicidal ideation than those without PTSD, and those with at least two additional conditions along with PTSD were 7.5 times more likely to

report suicidal ideation at some point in their lifetime than those with PTSD alone [10].

Although alcohol use is known to be prevalent among military personnel [37], data examining the relationship between psychiatric conditions and alcohol misuse occurring during or after deployment were limited prior to OHARNG-MHI. We found that soldiers with coincident depression and PTSD were significantly more likely to screen positive for peri- or post- deployment DSM-IV alcohol abuse; in contrast, soldiers reporting pre-deployment depression or PTSD were at no greater risk for this outcome. The risk of peri- or post-deployment alcohol abuse was 7%, 17%, 23%, and 44% among those with no peri- or post-deployment depression or PTSD, PTSD only, depression only, and both PTSD and depression, respectively [38].

Depression and alcohol dependence were found to be associated with suicidal ideation with the same magnitude of risk, 6% each, compared to 2% among those with neither condition [39]. Together, depression and alcohol dependence interacted to confer a 17% risk, or 5% greater than that conferred by adding the risks of each condition alone, suggesting that depression and alcohol dependence may work synergistically to produce suicidal ideation [39].

AUD co-occurs with both mood and anxiety disorders, but the sequencing of initial and co-occurring disorders has been unclear. In our study, among those with a history of co-occurring anxiety disorders, an approximately equal proportion of individuals had anxiety disorders onset first as had AUD onset first [40]. The same was true for co-occurring mood disorders. Regardless of onset timing, the majority of AUD cases initiated between the ages of 16 and 23, which may serve as a crucial window for prevention [40].

Another OHARNG-MHI study assessed the number and pattern of depression and PTSD symptoms across four years and found that soldiers clustered into four distinct groups, or trajectories, over time for each disorder (e.g., increasing symptoms over time, decreasing symptoms over time, chronically high symptoms, etc.). However, regardless of trajectory group, the average number of symptoms at each time point was significantly higher among those with co-occurring AUD, suggesting that AUD may make symptoms of depression and PTSD worse, or that there is a feedback loop between these different disorders [41].

## Pre-, peri-, post-deployment or life course framework

Many analyses that have emerged from this study have employed the pre-, peri-, and post-deployment paradigm, in contrast to the sole focus on deployment in many previous military studies. Traumatic and stressful events that occur during (or “peri-”) deployment, such as combat, can be predictive of mental disorders such as depression and

PTSD. However, it may be equally important to consider experiences that occur outside of deployment, such as social support from family and friends at home or financial problems [6]. These experiences that generally occur in civilian life may be particularly salient for National Guard service members, who often hold civilian jobs in addition to their positions in the Guard, and frequently transition between civilian life and military service.

One OHARNG-MHI study that applied this pre-, peri-, post-deployment framework measured soldiers' pre-deployment preparedness (e.g., being accurately informed of what daily life would be like during deployment), peri-deployment unit support (e.g., feeling comfortable going to other soldiers in unit with personal problems), and post-deployment support (e.g., feeling appreciated and proud once returning home, based on reception from others) using questions from the DRRI. Responses that resulted in higher levels of each of these three characteristics were independently associated with lower adjusted odds of post-deployment PTSD [42]. Specifically, respondents who scored above the median score on pre-deployment preparedness had 40% lower odds of PTSD; respondents who were above the median score on unit support had 50% lower odds of PTSD; and respondents who were above the median score on post-deployment support had 70% lower odds of PTSD.

These pre-, peri-, and post-deployment measures were also associated with other health and behavioral outcomes: peri-deployment unit support was associated with lower odds of experiencing sexual assault and harassment [43] and pre-deployment preparedness was protective against incident alcohol abuse and dependence [44]. Pre-deployment characteristics and experiences can also include temporal periods much earlier in the life course; one study found that respondents who endorsed ACEs (e.g., sexual, physical, or emotional abuse by a caregiver) had a 90% greater risk of incident depression during or after deployment compared to those with no such events [45]. Similarly, the previously mentioned machine learning study found that ACEs were predictive of new-onset depression during follow-up for both men and women [28].

### Treatment and service use

An estimated 16% of OHARNG soldiers accessed mental health services during a one-year period [46]. Among those with probable mental disorders, 37% reported using services in the subsequent year. Female gender, non-white race, having health insurance, and comorbid general medical and mental health conditions were each associated with higher use of services.

Another study examined diagnostic predictors of mental health service use, to identify clinical targets for increasing treatment access [47]. Soldiers with substance use disorders

had the lowest rates of service use; these disorders were the only ones not predictive of accessing services. Current mood disorder, current anxiety disorder, and lifetime history of service use were the strongest predictors of recent service use. Overall, about half of soldiers who could benefit from mental health services used these services [47].

### Substance use and risky behavior

Previous studies have shown that combat-area deployment is associated with increases in alcohol use. However, studying the influence of deployment on alcohol use is typically confounded by factors that predict being deployed, such as general mental health and fitness, which are also associated with alcohol use (i.e., the healthy warrior effect) [48]. To address this challenge, one study used propensity score matching to balance baseline covariates for the two comparison groups and control for probability of being deployed. When applying this method, a non-significant increase was observed in estimated monthly drinks in the first year after deployment, which returned to pre-deployment drinking levels two years after deployment. This study also found substantial heterogeneity among soldiers in terms of their post-deployment alcohol use behaviors [49].

Another OHARNG-MHI study on alcohol use found that when considering measures of both civilian stressors and deployment-related traumatic events, only civilian stressors were associated with subsequent AUD, among those with no prior history of AUD [50].

Another study investigated problematic gambling and its association with demographics and behavioral characteristics. Past-year frequent gambling (at least once per week) and lifetime potential problematic gambling were reported by 13% and 8% of respondents, respectively [51]. Past-year gambling frequency and problem gambling were associated in a dose–response relationship. Other correlates of problematic gambling included being male, being currently unmarried, having left the Guard or retired, minor depression, alcohol dependence, legal problems, and pain.

As assessment of risky driving and its demographic, mental health, and deployment-related correlates in this cohort found that the prevalence of risky driving was higher in soldiers with a history of mental disorders, deployment to a conflict area, deployment-related traumatic events, and post-combat or combat-related stressors. In contrast, the prevalence of risky driving was lower for soldiers who reported high levels of psychosocial support [52].

One OHARNG-MHI study found that HIV risk behavior (including use of intravenous drugs, receipt of treatment for a sexually transmitted or venereal disease, giving or receiving money or drugs in exchange for sex, or anal sex without a condom) in the past year was associated with MDD and comorbid depression and PTSD, but not PTSD alone [53].

## Findings in the context of the broader literature

The results from OHARNG-MHI studies have built on and expanded the existing literature on mental health among U.S. military personnel and veterans, including studies of past conflicts, such as the National Vietnam Veterans Readjustment Study [54] as well as other, more recent studies of cohorts deployed to OIF and OEF. One such project is the Millennium Cohort Study, which began in 2001 and has continued follow-up across these conflicts, enrolling new samples over time in a design similar to OHARNG-MHI, but on a larger scale. The Millennium Cohort Study includes Reservists, allowing for comparisons between AC and RC members [55]. Similar to our cohort, the Millennium Cohort Study documented high levels of comorbidity, including between PTSD and alcohol misuse [56]. They also observed four distinct classes of trajectories of both PTSD and depression over time, similar to our trajectory findings [41], both among a subsample of participants who screened positive for both disorders at baseline [57], and among a larger cohort of deployers [58]. As in our study, membership in a higher-symptom trajectory group was associated with combat deployments.

Another large, ongoing cohort study of military personnel is the Study to Assess Risk and Resilience in Servicemembers—Longitudinal Study (STARRS-LS), an extension of the original STARRS study which was launched in 2009 to better understand risk factors for suicide among soldiers. Although the study is primarily focused on suicide as an outcome, other mental health outcomes have also been assessed, and findings similar to ours have included the importance of unit cohesion for buffering against post-deployment PTSD [59, 60] and the link between ACEs and later mental health problems [61]. Similar to the Millennium Cohort Study, there have also been STARRS papers focused on the RC [62] and comparing the RC with the AC [63]. Unlike OHARNG-MHI, Army STARRS has a considerably larger sample size and access to administrative data from the Army and Department of Defense, allowing for outcomes such as attempted and completed suicide to be studied, unlike our study, which is only able to assess suicidal ideation.

Two other studies specifically following Reserve and National Guard members from other U.S. states included the Readiness and Resilience in National Guard Soldiers Project and the U.S. Reserve and National Guard Study. These cohorts also produced consistent findings to OHARNG-MHI, including the prevalence of comorbid conditions [64], the importance of civilian trauma [65], and the relationship between deployment and PTSD [66].

## Study strengths and limitations

A central strength of this study is the large number of repeat follow-ups, including serial measurements of an array of psychological conditions. OHARNG-MHI is one of the few prospective military studies to examine long-term risk and resilience in relation to subsequent psychopathology in U.S. service members. Availability of detailed data on both military and non-military experiences, including a range of potentially confounding factors such as civilian occupation and experiences, are additional strengths. Further, a clinical subsample specifically assessed the validity of the screening instruments.

The main limitations of the study include a relatively geographically specific sample of National Guard members, which may reduce the generalizability of findings to other National Guard populations. In particular, the racially homogenous sample does not necessarily reflect the larger U.S. National Guard. Further, although the distribution of male to female participants does more accurately reflect the larger target population [10, 11], the small absolute number of women in our study makes it difficult to examine potential differences by gender among our findings, or to report on health issues specific to women, as larger cohorts of military personnel are able to do [67], despite similarly small proportions. Second, history of lifetime mental disorder was assessed at baseline in our study and may fall victim to recall bias. Other measures (e.g., trauma history), may also be affected by misclassification, given the use of telephone interviews as the primary data collection method. Analytic methods such as quantitative bias analysis could be applied in future studies to estimate the potential effects of any resulting biases [68], and where possible, other sources of data might supplement the telephone interviews. Finally, given the long follow-up period, there was substantial attrition; fewer than half of the initial baseline respondents were included in the final wave of data collection over ten years later. However, our use of a dynamic cohort design to recruit new Guard members over time, in addition to statistical weighting of participants, are able to offset this issue.

## Conclusions and future directions

OHARNG-MHI has followed a unique cohort for over a decade, collecting epidemiologic data on a range of characteristics and events. In addition to the primary telephone and in-person interviews that produced the publications described in this manuscript, many OHARNG-MHI participants have been recruited into related studies including a randomized control trial for alcohol misuse prevention, a brain imaging sub-study, and a genetic sub-study that collected oral fluid [69]. Lessons learned from this study include the importance of close collaboration with the National Guard leadership,

whose support is crucial in a long-term cohort study of this population.

Analyses of these data are ongoing, and there are several potential future avenues of research that can emerge from this cohort. Future pursuits might include tracking implementation of Guard policies and interventions in order to examine effects of such changes on mental health over time; examining longer-term trajectories of PTSD, depression, and alcohol use across all nine waves of follow-up, beyond those already published; assessing how genetic factors may be associated with such trajectories; estimating the prevalence and correlates of head injury during deployment; understanding how psychopathology may relate to sleep problems in this population; determining how reports of sexual assault and harassment may have changed over the past decade; and potential linkage to other data sources including administrative military data, which may allow prediction of suicide or other outcomes we are unable to capture in the survey data.

Data and collaboration requests can be submitted at <https://www.militarybehavioralhealth.org/contact>. More information and other analytic results can be found on the study website (<https://www.militarybehavioralhealth.org>).

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**Data availability** Not applicable.

**Code availability** Not applicable.

## Declarations

**Conflict of interest** No authors have any conflict of interest to disclose.

**Ethical approval** The Ohio National Guard and the institutional review boards of University Hospitals Cleveland Medical Center, University of Toledo, University of Michigan, Ann Arbor Veterans Administration Medical Center, Columbia University, Boston University, and the Office of Human Research Protections of the U.S. Army Medical Research and Materiel Command approved the study protocol.

**Consent to participate** Verbal, informed consent was obtained from all individuals.

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