We read with much interest the paper by Larson et al. (1), and we appreciate the challenges in conducting analyses of military health. We think that several clarifications should be made regarding comparison to results published from the Millennium Cohort Study.

The Millennium Cohort Study was designed in the late 1990s in response to US Department of Defense, congressional, and Institute of Medicine recommendations for coordinated epidemiologic research to determine how military occupational exposures, including deployment-related exposures, affect long-term health (2–4). In collaboration with all military service branches and the Department of Veterans Affairs, the Millennium Cohort Study was launched in July 2001 (2, 3).

The Millennium Cohort (currently, n > 150,000) includes both deployed and nondeployed service members for comparison (3, 5–7). Enrollment began prior to September 11, 2001, and the start of the wars in Afghanistan and Iraq. Therefore, the cohort provides significant abilities to 1) evaluate longitudinal health by using consistent metrics that compare pre- and postdeployment health status among deployers and the same health metrics among the nondeployed; 2) evaluate exposures with consistent metrics, including combat stressors among deployers, because all deployments are not comparable; 3) evaluate self-reported outcomes, symptoms, and functional status, as well as linked hospitalization and outpatient health-encounter data; 4) make inferences to the US military as a whole since this large, population-based study includes active-duty, Reserve, and National Guard members and all service branches; 5) evaluate health after members retire or separate from military service; and 6) investigate long-term health measures while accounting for baseline confounders, such as smoking and alcohol consumption.

Regarding differences between our reports (5, 7) and that of Larson et al. (1), we offer possible explanations. First, the stigma often attached to certain diagnoses such as posttraumatic stress disorder (PTSD) may result in underreporting of these conditions in administrative data (8, 9). Although aggregated diagnoses of any mental disorder in hospitalization data may be a crude estimate of the burden of disease, the sensitivity and specificity of such a measure for a disorder such as PTSD is questionable. For these reasons, numbers based on military hospitalization records alone most likely underestimate the true burden of these conditions. Focusing on only Navy and Marine Corps data could also underestimate this burden because ascertainment of shipboard health-care data may be incomplete (10). Limiting the study to active-duty members excludes important contributions of Reserve and National Guard members.

Additionally, multiple confounding variables were not addressed in the paper by Larson et al. (1) Occupational, environmental, demographic, and behavioral factors, as well as baseline health prior to deployment, should be considered...
by using a multivariable analytic approach. Finally, the authors failed to adequately address combat exposures. Recent work indicates significant differences in mental health outcomes among those deployed and having combat exposures compared with those deployed and not having combat exposures (nearly 50% of deployers do not report combat exposures) (5, 8, 9). Combat exposures cannot be adequately assessed by using administrative (pay) data; self-reported metrics must be included. Our research has demonstrated that, while combat-exposed deployers are at increased risk, deployers without combat exposures are actually at reduced risk of new-onset mental health morbidity relative to nondeployers. Combining combat-exposed with non-combat-exposed deployers dilutes the true effect of combat exposures on these important outcomes.

The Millennium Cohort Study was developed in response to the limitations of prior study designs attempting to assess important health outcomes related to military deployments. Only population-based, longitudinal efforts, using comprehensive measures of exposures, confounders, and outcomes over time, can assess the true burden of mental health morbidity that may be attributable to military service in order to help mitigate future challenges.

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