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MONTEREY, CALIFORNIA

ANALYSIS OF SUICIDE BEHAVIORS IN THE NAVY POPULATION

by

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Prepared for: N171 Navy Suicide Prevention Office

POC: Steve Holton

EXECUTIVE SUMMARY

Project Summary

Background

U.S. military suicides have increased significantly over the past decade and currently account for almost 20% of all military deaths. Effective suicide prevention efforts require better information to identify high-risk segments of the population. In this research project, we investigated the associations of suicides and suicide attempts among current and former service members with a comprehensive set of time-varying risk factors including: deployment, diagnoses of major mental disorders, history of unlawful activity, stressful life events, and other demographic and service factor. Importantly, we observe suicide death (although not suicide attempts) of veterans after separating from the military. We estimate all of our analyses for all-service population and Navy-only population.

Findings and Conclusions (to include Process)

Since last interim report, we have acquired additional data assets that allow us to have a more comprehensive model, including the Defense Casualty Analysis System (to capture oversea deaths), personnel separation file, and transaction file to capture initial service information. We decided to implement a survival analysis in order to capture the time varying effect of the risk factors, and moved to quarterly data analysis (as opposed to yearly observation). The project is very resource intensive due to the complexity of the data structure and estimation methods.

Our population is all U.S. military personnel who were on active duty between 2001-2011 (N=110,035,573 person-quarters for all-service analysis; N= 24,982,930 for Navy specific analysis). We implemented Cox proportional hazard models to examine associations of deployment, diagnoses of major mental disorders, history of unlawful

activity, stressful life events, and other demographic and service factors with suicide death.

We found that the strongest predictors of suicide deaths were current and past diagnoses of self-inflicted injuries, depression, and substance use disorder (comparing to those with no history of diagnoses, hazard ratio, HR, ranged from 1.47 to 13.75, all $p < 0.001$). Compared to those never deployed, hazards were lower among the currently-deployed (HR=0.47; CI,0.38-0.57) but significantly higher in the quarters following first deployment (HR=1.47; CI,1.13-1.90). Hazard of suicide was elevated within the first year of separation from the military (HR=2.73; CI,2.33-3.19), and remained high even for those who separated 6 or more years ago (HR=1.52; CI,1.36-1.70).

In the final phase of the FY16 project, we are now focusing on models for suicide attempts and replicating all models on the Navy specific population. Due to the sample size, some of the sub-sample analysis is only implemented in the all-service sample.

So far, we found consistent evidence that elevated hazard of suicide death varies by time-since-exposure to deployment, mental health diagnoses, and other stressful life events. To the extent that the elevated suicide hazards of the previously-deployed persist over time, the association between deployment history and suicide will increase in the current cohort due to the growing proportion of previously-deployed among those currently in the military. Continued monitoring is particularly needed for those with mental health history. Additional information should be gathered to address the persistent elevated risks of suicides among service members after separation.

Recommendations for Further Research

N/A as this is interim report.