

Predicting US Army suicides after hospital discharge

November 12 2014

It has long been known that patients recently discharged from psychiatric hospitalizations have a significantly elevated suicide risk. However, the rarity of suicide even in this high-risk segment of the population makes it impractical to justify providing intensive post-hospital suicide prevention programs to all recently discharged patients. Targeted programs for patients at especially high suicide risk would be more feasible, but it is difficult for clinicians to predict with good accuracy which patients are at high risk for suicide.

A new report published online today in *JAMA Psychiatry* suggests that [big data](#) predictive analytic methods might help address the problem of determining which recently discharged patients are at highest risk for suicide. The report comes from the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS), a multicomponent epidemiological and neurobiological study of Army suicides and their correlates sponsored by the U.S. Army and funded under a cooperative agreement with the U.S. Department of Health and Human Services, the National Institutes of Health and the National Institute of Mental Health (NIH/NIMH).

The study looked at 53,769 regular Army soldiers during the 12-month period following their discharge from a psychiatric facility during 2004 to 2009. Hundreds of potential predictors of post-hospital suicide were abstracted from the extensive Army and Department of Defense administrative files that contain data on all soldiers. Big data machine-learning methods generated a prediction algorithm in which 5 percent of

hospitalized soldiers were classified as having the highest post-hospital [suicide risk](#). This 5 percent of those at highest risk accounted for 52.9 percent of all post-hospital suicides. Soldiers at highest risk also had significantly elevated risks of unintentional injury deaths, [suicide attempts](#) and rehospitalizations over the follow-up period. At least one of these adverse outcomes occurred in the year after discharge in 46.3 percent of the highest-risk hospitalizations.

"The high concentration of suicide risk in the 5 percent of highest-risk hospitalizations is striking," said lead author Ronald Kessler, McNeil Family Professor of Health Care Policy at Harvard Medical School.

"The fact that nearly half of all highest-risk hospitalizations were followed by at least one adverse outcome—either suicide, unintentional injury death, suicide attempt or rehospitalization—argues strongly for developing expanded post-hospital preventive intervention services for these highest-risk soldiers."

"The application of big data methods to target soldiers at high risk of rare but important outcomes like [suicide](#) is an exciting development because it gives us a way forward in focusing prevention efforts on an ongoing basis," said Robert Ursano, chairman of the Psychiatry Department at the Uniformed Services University of the Health Sciences and an Army STARRS Principal Investigator.

More information: Kessler RC, Warner CH, Ivany C, Petukhova MV, Rose S, Bromet EJ, Brown M, Cai T, Colpe LJ, Cox KL, Fullerton CS, Gilman SE, Gruber MJ, Heeringa SG, Lewandowski-Romps L, Li J, Millikan-Bell AM, Naifeh JA, Nock MK, Rosellini AJ, Sampson NA, Schoenbaum M, Stein MB, Wessly S, Zaslavsky AM, Ursano RJ. Predicting U.S. Army suicides after hospitalizations with psychiatric diagnoses in the Army Study to Assess Risk and Resilience in Servicemembers, *JAMA Psychiatry*, November 12, 2014. [DOI: 10.1001/jamapsychiatry.2014.1754](https://doi.org/10.1001/jamapsychiatry.2014.1754)

Provided by Harvard Medical School

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