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Study uses machine-learning approach to calculate risk for veteran homelessness
Self-reported depression, PTSD biggest factors

Bethesda, Md. – In the U.S. today, there are an estimated 1.4 million homeless veterans, which makes up about eight percent of the country's homeless population. Though it has been difficult to accurately predict homelessness before it occurs, a new collaborative study using a "personalized medicine" approach, led by the Uniformed Services University (USU), suggests self-reported lifetime depression and posttraumatic stress disorder were among the most important factors that put veterans at risk for becoming homeless.

The study, "Predicting Homelessness among U.S. Army Soldiers no longer on Active Duty," was published April 14 in *American Journal of Preventive Medicine.* It was part of the Army STARRS-LS, also known as the Study to Assess Risk and Resilience in Servicemembers-Longitudinal Study, led by researchers at USU's Center for the Study of Traumatic Stress (CSTS). The study was also a collaboration between multiple universities and agencies. The team of researchers used a machine-learning approach to identify soldiers at risk of becoming homeless, knowing that military veterans comprise such a large group of those at risk for homelessness and that they face unique challenges when it comes to finding safe and affordable housing.

The researchers used data from surveys completed by 16,589 soldiers between 2011-2014, as part of Army STARRS-LS. The soldiers were asked questions about whether they lived in stable housing that they own, rent, or stayed in as part of a household, and for how long. They were also asked about their personality characteristics, adverse childhood experiences, other lifetime traumatic events, chronic stressors, whether they had self-injurious thoughts/behaviors, physical health problems, and mental disorders. Then, using a machine-learning approach, their responses were coded and used to establish a prediction model to determine who might be most at risk for homelessness.

Ultimately, the researchers found that self-reported lifetime depression and posttraumatic stress disorder were the strongest predictors of homelessness in soldiers who have left service. Variables associated with higher risk of suicidality were also highly associated with an increased risk for homelessness.

"This study is one of several in which the STARRS team, now linked with investigators from the VA, have shown the value of machine learning to predict those at risk of a number of behavioral health outcomes including suicide and suicide attempt. The team was the first to use machine learning to predict suicide. In this study, homelessness is the outcome examined," said Dr. Robert Ursano, a co-author on the study and director of USU's Center for the Study of Traumatic Stress (CSTS). "Importantly, the study demonstrates the ability to predict this outcome which means we can consider targeting those people identified as at risk for specific interventions to mitigate their chances of becoming homeless. This

'personalized medicine' approach to care can substantially help in sustaining our soldiers and veterans' health."

The study was a collaboration between USU's CSTS, Massachusetts General Hospital, the Boston Health Care for the Homeless Program, the National Center on Homelessness among Veterans & Birmingham, the VA Health Services Research and Development Service, Harvard Medical School, the University of Washington, Fred Hutchinson Cancer Research Center, and the University of California San Diego. Funding for the study was provided by Department of the Army, DoD and the NIMH.

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About the Uniformed Services University of the Health Sciences: The Uniformed Services University of the Health Sciences, founded by an act of Congress in 1972, is the nation's federal health sciences university and the academic heart of the Military Health System. USU students are primarily active-duty uniformed officers in the Army, Navy, Air Force and Public Health Service who receive specialized education in tropical and infectious diseases, TBI and PTSD, disaster response and humanitarian assistance, global health, and acute trauma care. USU also has graduate programs in oral biology, biomedical sciences and public health committed to excellence in research. The University's research program covers a wide range of areas important to both the military and public health. For more information about USU and its programs, visit *www.usuhs.edu*.