ARMY STARRS

Army Study to Assess Risk and Resilience in Servicemembers

Patterns and predictors of suicides in the U.S. Army: An introduction to the Army Study to Assess Risk and Resilience in Servicemembers (Army STARRS)

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Disclosures

Dr. Kessler has been a consultant for AstraZeneca, Analysis Group, Bristol-Myers Squibb, Cerner-Galt Associates, Eli Lilly & Company, GlaxoSmithKline Inc., HealthCore Inc., Health Dialog, Hoffman-LaRoche, Inc., Integrated Benefits Institute, J & J Wellness & Prevention, Inc., John Snow Inc., Kaiser Permanente, Lake Nona Institute, Matria Inc., Mensante, Merck & Co, Inc., Ortho-McNeil Janssen Scientific Affairs, Pfizer Inc., Primary Care Network, Research Triangle Institute, Sanofi-Aventis Groupe, Shire US Inc., SRA International, Inc., Takeda Global Research & Development, Transcept Pharmaceuticals Inc., and Wyeth-Ayerst; has served on advisory boards for Appliance Computing II, Eli Lilly & Company, Mindsite, Ortho-McNeil Janssen Scientific Affairs, Johnson & Johnson, Plus One Health Management and Wyeth-Ayerst; has had research support for his epidemiological studies from Analysis Group Inc., Bristol-Myers Squibb, Eli Lilly & Company, EPI-Q, GlaxoSmithKline, Johnson & Johnson Pharmaceuticals, Ortho-McNeil Janssen Scientific Affairs., Pfizer Inc., Sanofi-Aventis Groupe, Shire US, Inc., and Walgreens Co.; and owns 25% share in DataStat, Inc.

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Administration & Funding

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- Army STARRS is being conducted by a consortium of investigators — from the Uniformed Services University of the Health Sciences (USUHS), the University of California-San Diego (UCSD), Harvard Medical School (HMS), & the University of Michigan (UM) — in collaboration with the NIMH.
  - Co-PIs: R. Ursano (USUHS) & M. Stein (UCSD)
  - Site-PIs: R. Kessler (HMS) & S. Heeringa (UM)
  - Collaborating NIMH Scientists: L. Colpe & M. Schoenbaum
  - Consulting Army Scientists: K. Cox & S. Cersovsky

- Army STARRS in-theater research was conducted under a protocol reviewed and approved by the U.S. Army Medical Research and Materiel Command (MRMC) Institutional Review Board, and in accordance with the approved protocol.

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Distribution of suicide by rank and time in service, all Regular Army Soldiers 2004-2009

	Never deployed	Currently deployed	Previously deployed
I. Suicides/100,000 person-years			
A. Enlisted			
0-4 years of service	18.4	31.3	29.4
5+ years of service	12.1	13.1	20.8
B. Officers			
0-4 years of service	5.8	0.0	11.6
5+ years of service	14.3	11.5	9.0
II. Percent of all Regular Army Soldiers/suicides			
A. Enlisted			
0-4 years of service	22.6/22.5	9.3/15.8	8.2/13.0
5+ years of service	11.2/7.4	10.2/7.2	22.2/25.0
B. Officers			
0-4 years of service	1.7/0.5	0.6/0.0	0.6/0.4
5+ years of service	4.5/3.5	2.5/1.6	6.5/3.2

Gilman et al. in press *Psychological Medicine.*

NIMH UC San Diego School of Medicine

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Basic descriptive correlates of suicide among enlisted Regular Army Soldiers 2004-2009

	Population attributable risk
Never married among currently deployed	32.4%
Lower-than-expected junior enlisted rank	
– Never deployed (0-4 years of service)	20.3%
– Currently deployed (0-4 years of service)	14.9%
– Previously deployed (0-4 years of service)	13.6%

Gilman et al. in press *Psychological Medicine.*

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Using administrative data to predict post-hospital suicides among Regular Army Soldiers 2004-2009: Basic distribution of annual inpatient and outpatient contacts for ICD-9 mental or substance disorders and suicide rates

	Percent of all soldiers	Percent of all suicides	Suicides/ 100,000 person-years
Inpatient	1.2	14.1	208.8
Outpatient	28.3	43.6	28.4
All others	70.4	42.4	11.1

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Using administrative data to predict post-hospital suicides among Regular Army Soldiers 2004-2009: Procedures

- Army/DoD administrative data available at time of hospitalization used to predict
  - Demographic, administrative, medical, criminal justice
  - Intake diagnosis and information on suicidality as a reason for admission
- Suicides predicted in 12 months after hospital discharge.
- Machine learning methods used to predict
  - Random forests
  - Penalized regression (ridge, lasso, elastic net)
  - Super learner

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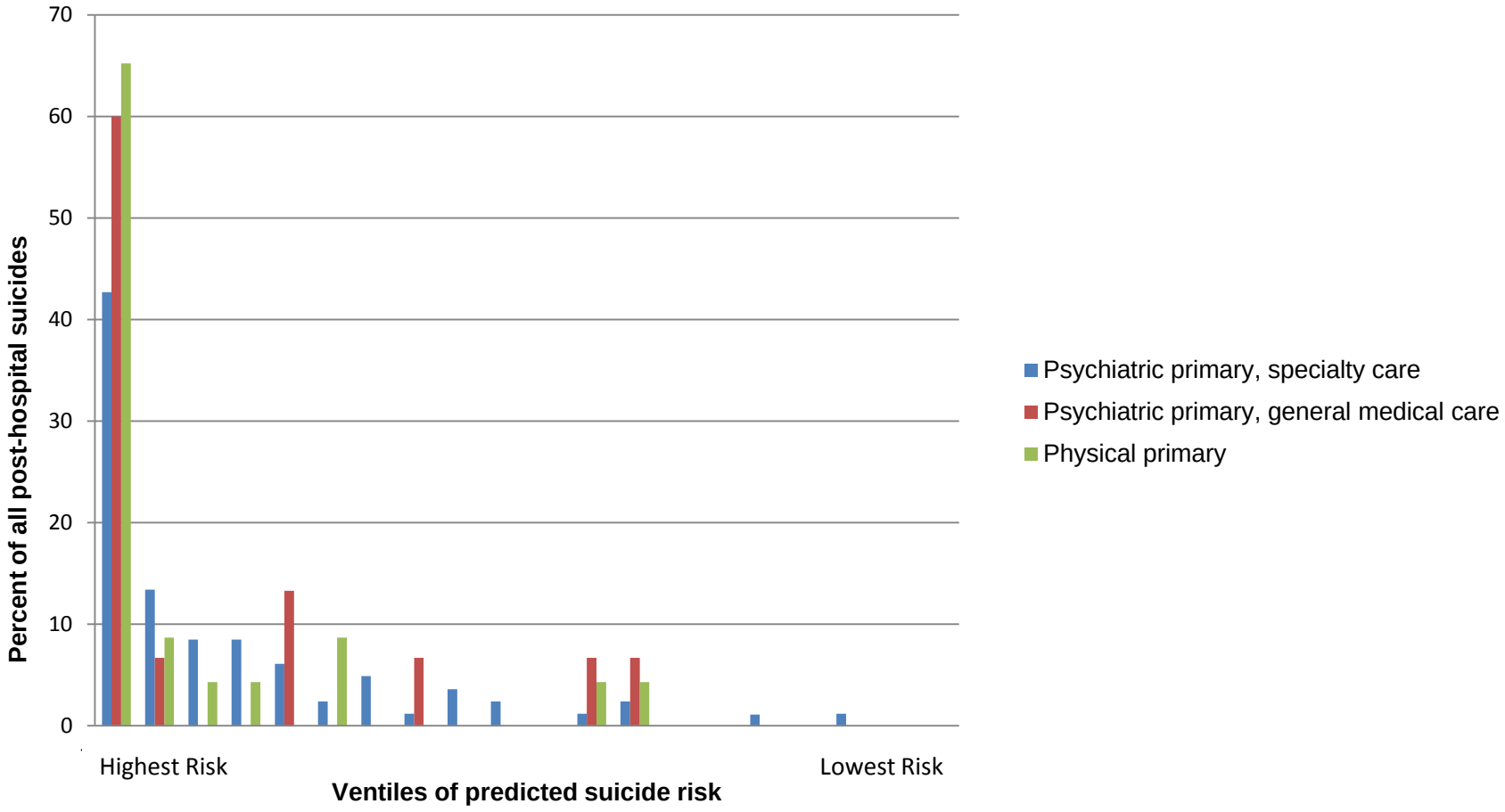
Using administrative data to predict post-hospital suicides among Regular Army Soldiers 2004-2009: Concentration of observed risk across ventiles of predicted risk



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Using administrative data to predict post-hospital suicides among Regular Army Soldiers 2004-2009: Interpretation

- 63% of all post-hospital suicides occurred among the 10% of patients with highest predicted risk.
- High-risk patients also had elevated risks of “accidental” deaths, suicide attempts, and a number of other adverse outcomes in the year after hospital discharge.
- The numbers are small enough, and the risks high enough to warrant targeting an enhanced post-discharge preventive intervention program if results hold up in replication in more recent years.
- That analysis of validation is currently underway.

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Predicting Army suicides: Where do we go from here?

- Developing risk algorithms for other high-risk sub-populations (e.g., outpatients, soon-to-deploy, etc.).
- The two tasks of prediction
  - CQI related to the first task
  - Quasi-experimental policy simulation related to the second task
- Evaluation of interventions