Treatment Utilization Before Suicide

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| **Project Name:**  Treatment Utilization Before Suicide | |
| **Principal Investigator:**  Brian Ahmedani, PhD |  |
| **Principal Investigator** **Contact Information:**  [BAHMEDA1@HFHS.ORG](mailto:BAHMEDA1@HFHS.ORG) |  |
| **Principal Investigator institution:**  Henry Ford Health System Research Centers |  |
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| **Abstract:**  Adult suicide rates in the United States rose by almost 30 percent between 1999 and 2010. These rates have not markedly improved in decades. To date, previous suicide attempts and psychiatric diagnoses are largely the only known clinical risk factors for suicide death. Recent research shows that most individuals who die by suicide make a health care visit in the weeks and months prior to their death. Most of these visits occur in primary care or outpatient medical specialty settings. However, over half of these visits do not include a psychiatric diagnosis. Thus, there is limited evidence available from health care users in the US general population to inform targeted suicide screening and risk identification efforts in general medical settings. New research is needed to investigate the general medical clinical factors associated with suicide risk among individuals without a known risk factor. This research project uses data on more than 4000 individuals who died by suicide and made health care visits to one of eight health care systems across the United States in the year prior to their death. These health systems are members of the Mental Health Research Network and have affiliated health plans. They are able to capture nearly all health care for their patients via the Virtual Data Warehouse (VDW). The VDW consists of electronic medical record and insurance claims data organized using standardized data structures and definitions across sites. These data are matched with official regional mortality data. This project includes the following Specific Aims: 1) Identify the types and timing of clinical factors prior to suicide, 2a) Compare clinical factors before suicide to a matched sample of health care users, 2b) Detect associations between additional clinical factors and suicide, and 3) Develop a prediction model of clinical factors prior to suicide. We employ a case-control study approach to test specific hypotheses, while also using novel environment-wide association study methods and latent class analysis to detect new risk factors. We develop a prediction model of clinical factors and suicide. Clinical factors to be studied include medical diagnoses, medications, health care procedures, and types of health care visits. These results will inform decisions about how to focus suicide prevention in medical settings and provide information in response to the 2012 National Action Alliance for Suicide Prevention and US Surgeon General report. |  |
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| **Participating Sites:**  Henry Ford Health System  Harvard Pilgrim Healthcare HealthPartners Kaiser Permanente Hawaii Kaiser Permanente Northwest Kaiser Permanente Colorado Kaiser Permanente Georgia  Kaiser Permanente Washington |  |
| **Investigators:** Brian K. Ahmedani, PhD Gregory E. Simon, MD, MPH Rebecca Rossom, MD, MSCR Arne Beck, PhD Frances Lynch, PhD Beth Waitzfelder, PhD Christine Lu, PhD Ashli Owen-Smith, PhD Deepak Prabhakar, MD, MPH L. Keoki Williams, MD, MPH Edward Peterson, PhD |  |
| **Major Goals:** The main goal of this project is to investigate general medical and other healthcare factors and risk of suicide to develop a comprehensive healthcare algorithm to predict suicide, with particular focus on general medical settings. |  |
| **Description of study sample:** This large case-control study includes >3,000 individuals who died by suicide between 2000-2015 and >300,000 matched general population members of 8 large health systems across the United States. |  |
| **Current Status:**  March 27, 2018: Aims 1-2a have been completed.  The work in Aim 2b is currently underway, such that we will extract data on all clinical data elements for the sample using the environment-wide association study approach. |  |
| **Study Registration:**  N/A |  |
| **Publications:**  Ahmedani BK, Simon GE, Stewart C, Beck A, Waitzfelder BE, Rossom R, Lynch F, Owen-Smith A, Hunkeler EM, Whiteside U, Operskalski BH, Coffey MJ, Solberg LI. [Health care contacts in the year before suicide death.](https://www.ncbi.nlm.nih.gov/pubmed/24567199) J Gen Intern Med. 2014 Jun;29(6):870-7. doi: 10.1007/s11606-014-2767-3. PMID: 24567199  Ahmedani BK, Stewart C, Simon GE, Lynch F, Lu CY, Waitzfelder BE, Solberg LI, Owen-Smith AA, Beck A, Copeland LA, Hunkeler EM, Rossom RC, Williams K. [Racial/Ethnic differences in health care visits made before suicide attempt across the United States.](https://www.ncbi.nlm.nih.gov/pubmed/25872151) Med Care. 2015 May;53(5):430-5. doi: 10.1097/MLR.0000000000000335. PMID: 25872151.  Ahmedani BK, Peterson EL, Hu Y, Rossom RC, Lynch F, Lu CY, Waitzfelder BE, Owen-Smith AA, Hubley S, Prabhakar D, Williams LK, Zeld N, Mutter E, Beck A, Tolsma D, Simon GE. [Major Physical Health Conditions and Risk of Suicide](http://www.ajpmonline.org/article/S0749-3797(17)30222-2/fulltext). Am J Prev Med. 2017 Sep;53(3):308-315. doi: 10.1016/j.amepre.2017.04.001. PMID: 28619532.  Boggs JM, Simon GE, Ahmedani BK, Peterson E, Hubley S, Beck A. [The Association of Firearm Suicide With Mental Illness, Substance Use Conditions, and Previous Suicide Attempts](http://annals.org/aim/fullarticle/2636753/association-firearm-suicide-mental-illness-substance-use-conditions-previous-suicide). Ann Intern Med. 2017 Aug 15;167(4):287-288. doi: 10.7326/L17-0111. PMID: 28672343.  Prabhakar D, Peterson EL, Hu Y, Rossom RC, Lynch FL, Lu CY, Waitzfelder BE, Owen-Smith AA, Williams LK, Beck A, Simon GE, Ahmedani BK. [Dermatologic Conditions and Risk of Suicide: A Case-Control Study](http://www.psychosomaticsjournal.com/article/S0033-3182(17)30177-9/fulltext). Psychosomatics. 2018; 59(1): 58-61. doi: 10.1016/j.psym.2017.08.001. PMID: 28890116.  Boggs JM, Beck A, Hubley S, Peterson EL, Hu Y, Williams LK, Prabhakar D, Rossom RC, Lynch FL, Lu CY, Waitzfelder BE, Owen-Smith AA, Simon GE, Ahmedani BK.[General Medical, Mental Health, and Demographic Risk Factors Associated With Suicide by Firearm Compared With Other Means](https://ps.psychiatryonline.org/doi/abs/10.1176/appi.ps.201700237?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed). Psychiatric Services*.* 2018 Feb 15:appips201700237. doi: 10.1176/appi.ps.201700237. [Epub ahead of print]. PMID: 29446332. |  |
| **Resources:**  None |  |
| **Lessons Learned:**   * Most individuals make healthcare visits before suicide * Most visits occur in primary care or general medical specialty settings * Approximately half of individuals do not have a mental health condition diagnosed during their health care visits before suicide. * Among 19 physical health conditions under study, 17 were associated with increased risk for suicide after adjustment for age and sex, and 9 associations persisted after additional adjustment for mental health and substance use conditions. * Traumatic brain injury is associated with a >8-fold increase in suicide risk. |  |
| **What’s next?** Ongoing analyses are being conducted to evaluate other defined healthcare factors and risk of suicide, including lab test results, procedures, medications, and types of visits. New analyses will begin using environmental wide association study methods to identify new clinical risk factors for suicide. |  |