

Researchers develop new models for predicting suicide risk

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Combining data from electronic health records with results from standardized depression questionnaires better predicts suicide risk in the 90 days following either mental health specialty or primary care outpatient visits, reports a team from the Mental Health Research Network, led by Kaiser Permanente research scientists.

The study, "Predicting Suicide Attempts and Suicide Death Following Outpatient Visits Using Electronic Health Records," conducted in five Kaiser Permanente regions (Colorado, Hawaii, Oregon, California and Washington), the Henry Ford Health System in Detroit, and the HealthPartners Institute in Minneapolis, was published today in the *American Journal of Psychiatry*.

Combining a variety of information from the past five years of people's [electronic health records](#) and answers to questionnaires, the new models predicted [suicide risk](#) more accurately than before, according to the authors. The strongest predictors include prior suicide attempts, [mental health](#) and substance use diagnoses, medical diagnoses, psychiatric medications dispensed, inpatient or

emergency room care, and scores on a standardized depression questionnaire.

"We demonstrated that we can use electronic health record data in combination with other tools to accurately identify people at high risk for suicide attempt or suicide death," said first author Gregory E. Simon, MD, MPH, a Kaiser Permanente psychiatrist in Washington and a senior investigator at Kaiser Permanente Washington Health Research Institute.

In the 90 days following an office visit:

- Suicide attempts and deaths among patients whose visits were in the highest 1 percent of predicted risk were 200 times more common than among those in the bottom half of predicted risk.
- Patients with mental health specialty visits who had risk scores in the top 5 percent accounted for 43 percent of suicide attempts and 48 percent of suicide deaths.
- Patients with primary care visits who had scores in the top 5 percent accounted for 48 percent of suicide attempts and 43 percent of suicide deaths.

This study builds on previous models in other [health systems](#) that used fewer potential predictors from patients' records. Using those models, people in the top 5 percent of risk accounted for only a quarter to a third of subsequent [suicide attempts](#) and deaths. More traditional suicide risk assessment, which relies on questionnaires or clinical interviews only, is even less accurate.

The new study involved seven large health systems serving a combined population of 8 million people in nine states. The research team examined almost 20 million visits by nearly 3 million people age 13 or older, including about 10.3 million mental health specialty visits and about 9.7 million primary care visits with mental health diagnoses. The

researchers deleted information that could help identify individuals.

"It would be fair to say that the health systems in the Mental Health Research Network, which integrate care and coverage, are the best in the country for implementing suicide prevention programs," Dr. Simon said. "But we know we could do better. So several of our health systems, including Kaiser Permanente, are working to integrate prediction models into our existing processes for identifying and addressing suicide risk."

Suicide rates are increasing, with suicide accounting for nearly 45,000 deaths in the United States in 2016; 25 percent more than in 2000, according to the National Center for Health Statistics.

Other health systems can replicate this approach to risk stratification, according to Dr. Simon. Better prediction of [suicide](#) risk can inform decisions by health care providers and [health](#) systems. Such decisions include how often to follow up with patients, refer them for intensive treatment, reach out to them after missed or canceled appointments—and whether to help them create a personal safety plan and counsel them about reducing access to means of self-harm.

Provided by Kaiser Permanente

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