

Machine learning approach predicts suicide risk

Suicide attempt rates are highest in adolescents, and suicide is the second leading cause of death in this population. Suicide prevention is currently hindered by suboptimal methods to determine those at risk. Now, a study has evaluated the performance of machine learning on routinely collected electronic health records, as a possible approach to accurately screen and detect adolescents at risk of making suicide attempts. The researchers used a dataset from 1998-2015 including patients <18 years with self-injury medical claims. Self-injury incidents were interrogated by suicide experts and classed as either “other self injury” (OSI; n=476) meaning evidence of harm without suicide intent, or as a “nonfatal suicide attempt” (n=974) and analyzed together with a general hospital control group (n>32,000). The machine learning approach could accurately predict risk of suicide attempt (Area Under the Curve = 0.8-0.9), especially when comparing affected patients to general hospital controls. This predictive approach required no additional clinical assessment, to achieve good performance, as far as 2 years in advance of nonfatal suicide attempts. The researchers note that much work now remains to externally validate the approach and develop clinical support tools. However, machine learning may become a broad, scalable screening method to identify adolescents at risk of nonfatal suicide attempts where a common data source, such as an electronic health record, is available.

Walsh, C.G., Ribeiro, J.D. & Franklin, J.C. (2018), Predicting suicide attempts in adolescents with longitudinal clinical data and machine learning. *J Child Psychol Psychiatr.* doi:10.1111/jcpp.12916

Glossary:

Machine learning: a computer-based method in which statistical techniques permit computers to progressively improve performance (learn) on a given task without being explicitly programmed

Area Under the Curve (AUC): A measure as to which model most accurately predicts an outcome; an AUC of 1 means that the prediction model is perfect whereas an AUC of 0.5 means that the prediction model is worthless