Links:

Summary:

Whether it's veterans, civilian patients with medical records, or your run-of-the-mill social media user, there have been efforts to use algorithms to identify the risk of suicide in all of these populations. Historically, suicide-prevention services have only been provided to those who have actively reached out for help or have been admitted to the hospital for either self-harm or for a suicide attempt. That means there is a significant portion of those who commit suicide that never receive preventative services. Algorithms that can identify factors that normal human observation might not intuitively see might help with this problem (it's like Minority Report lite but for suicide—for now).

Not being able to identify potential suicide risk is especially problematic in the VA system. In the general population, suicide rates have climbed by 30% nationally since 2000, and the rates in the VA system, unsurprisingly, are even higher than the general population (NY Times article). The VA model uses their database of thousands of veterans who committed suicide and takes in 61 factors (e.g. age, marital status, diagnoses, prescriptions), and likely does some linear regression analysis to generate a composite score for suicide risk. Early trials have shown that there are those who doctors have not identified that have been identified using this algorithm. Services will then be suggested to those flagged by the algorithm. Since the study is ongoing, there is not yet any data on whether this successfully lowers the suicide rate among veterans.

Similarly, data scientists at Vanderbilt University have created a machine-learning algorithm that uses hospital-admission data such as age, gender, zip code, medication, and diagnostic history, to predict suicide likelihood (Quartz article). In their trials, the researchers claim 84% accuracy at predicting a suicide attempt in the next week and 80%

accuracy at prediction suicide within 2 years (there was a pay wall to get to their research paper, but I would hope their methodology was retrospective and that they didn't let people kill themselves to get their accuracy statistics).

Facebook has also made some similar efforts, especially with the problem of those who livestream their suicide, in identifying those at risk of suicide from users' posts and the responses to those posts. Those flagged might eventually get a visit from the police if Facebook staffers notify the local 911 operator.

Nonetheless, the reality remains that the ability for AI and ML to efficiently, effectively and ethically identify suicidal humans is really in its nascent state. The vast majority of efforts and studies to make technology useful in this area is a little over two decades old—with the most significant advances taking place within the last five years. However, there is a silver lining in this fact: the growth capacity is gargantuan in this field.

What our study of this topic has revealed is more nebulous than what we would have liked. It is not currently a given that advanced artificial intelligence technologies are the balm that we all need to significantly address this issue. What is apparent is that it is more likely that even with significant advances in these technologies, what will most significantly improve suicide prevention is an amalgam of approaches. As we outlined in our presentation, AI and ML can help us study big data and identify insights that will in turn support the development of other technologies, policies and approaches that will result in efficacious results. Specifically, a combination of wearable tech, NLP surveilling social media and other internet-based applications, professional techniques, and advanced policies and procedures for dealing with suffering individuals will result in improved outcomes.

It is our contention that AI and ML have a positive role to play in suicide prevention and detection. However, whatever the final iteration of the approach will be, the ethical issues may never be completely resolved. The significant issues around privacy, use, security, and stigmatization are ones that have potentially severe implications for healthy functioning and thriving in our society. It will be up to us and future generations to work through these issues—and we will be well advised to address these issues continuously as we progress towards a better state of affairs.

For:
- Humans, even trained professionals, have not had much success in identifying those at risk of suicide (https://www.scientificamerican.com/article/suicide-risk-assessment-doesnt-work/).
- Can help increase awareness of mental health issues even for individuals that might not be aware of their own risk factors
- Algorithms might be able to look past the "brave face act" of those who might need help
- Those identified can receive services and potentially be saved


Against:
- Potentially ethical issues with machines "learning" at the expense of people actually killing themselves to collect efficacy data
- Violation of HIPPA?
- These algorithms flag a person as at high risk of suicide, without providing any rationale.
- False positives marks a lot of people at high risk who are not
- The analysis did not detect a difference in suicides, at least up to that stage.
- The decision to keep a person under forced health care, for their own protection but potentially against their will, is extremely ethically sensitive, removing personal autonomy.
- Moral hazard of becoming over-reliant on algorithms
- Who has access to the data? The stigma associated with that could be harmful downstream.
- How well-protected is the data? What could potentially happen if the data falls into the wrong hands?
- Those who are considering suicide might start policing their own speech more carefully to overcome algorithms


**Likely Path**


- Employ AI & ML to mine big data to reveal insights that will aid in prevention & detection—while reducing false-positives & stigmatization. Impact areas:
  - Human Training
  - Influence institutional policies
  - Software development & enhancement
  - Refinement of AI & ML algorithms (i.e. NLP, search, analysis, etc.)

- Develop technology inside of common physical devices to supplement the work of AI & ML applications.
- Facial recognition to catalog and analyze micro-expressions in specific (including non-crisis) contexts.
- Virtual reality coupled with brain scanning technology to improve diagnosis and prevention (specifically identifying ideation/subtle indicators).
- Wearable tech to identify subtle changes in biometrics

**Ethical Concerns**

- Massive data collection with necessary intrusion

- Managing access & privacy

- Facility of stigmatization

- Over reliance on hybrid approach (skewing towards machine prowess)

- Implication for societal roles (i.e. work, school, family, etc.)