



canary

Applying advanced machine learning to mental distress:  
finding and helping the teens most at risk

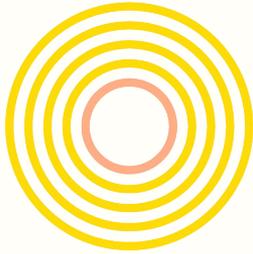
# THE PROBLEM

American teens are facing a mental health crisis.<sup>1</sup> With severe anxiety and depression now at critical levels for this age group, parents, caretakers, and communities are struggling to address the problem head on and keep the growing tide of consequences at bay.

We know the signs, and we know how to address them. But *we need a better way* to pinpoint them early on, and an easier path for families to follow—before mental illness reaches the point of no return.

# More teens are suffering from severe anxiety and depression than ever before.

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**1 out of 5** adolescents has a diagnosable mental health disorder.<sup>1</sup>



Only **20 percent** of these kids are ever diagnosed and treated for their illness.<sup>1</sup>



The number of children and adolescents seeking hospital treatment for thoughts of suicide or self-harm **more than doubled** during the last decade.<sup>2</sup>

## We all face the risks.

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Mental disorders like anxiety and depression put children and adolescents at much higher risk of:

- Academic failure
- Truancy
- Eating disorders
- Substance abuse
- Incarceration
- Criminal behavior
- Violence
- Suicide

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This all comes at a huge emotional and financial cost—to kids, their families, and our communities.<sup>3</sup>

# The financial costs can be devastating.

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It's not just the cost of treatment that takes an economic toll.

- Children who aren't treated for their depression grow up to be less educated, have lower incomes, and work fewer days each year. <sup>4</sup>
- 50-75% of the youth in juvenile detention facilities have diagnosable mental disorders, and the cost of incarcerating them is 3 times higher than that of those without mental illness. <sup>5,6</sup>
- Taxpayers are footing the bill—law enforcement, the juvenile justice system, and foster care/social services are all impacted by the teen mental health crisis.

Suicide is currently the SECOND leading cause of adolescent death.

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4,600

adolescents commit  
suicide every year<sup>3</sup>

157,000

more are hospitalized for  
self-injury<sup>3</sup>

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Every year, more teenagers and young adults die from suicide than from cancer, heart disease, AIDS, birth defects, stroke, pneumonia, influenza, and chronic lung disease—COMBINED.

# Since 2000, school violence has increased by 19%.

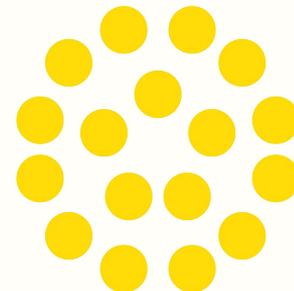
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**36%** of high school students have engaged in at least one physical fight in the past year <sup>7</sup>



**7%** of high school students reported bringing a weapon to school in the preceding month <sup>7</sup>



Only 12 weeks into 2018, the U.S. had already seen **17 school shootings** resulting in death or injury <sup>8</sup>

# Signs of Depression

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Increased isolation

Darker hues/tones

Sleep pattern changes

Smartphone addiction

Changes in energy levels

Avoiding/missing school

Changes in grades

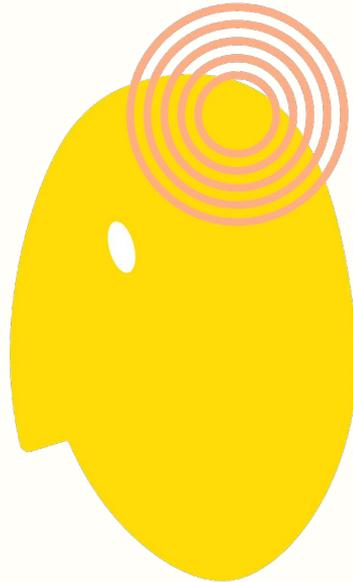
Reckless behavior

Different schedule

Difficulty concentrating

Unexplained pain and aches

Withdrawal from social settings



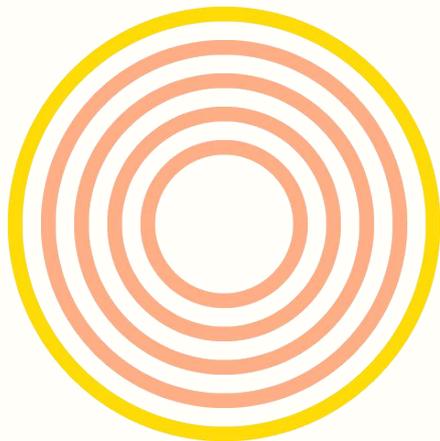
# Why aren't they getting help?

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- Many signs of anxiety and depression are easily written off as “typical teenager” behaviors.
- Teens sometimes use a different vocabulary to describe what they're feeling. Casual terms like “stressed out” and “bummed” can make mental illness harder to diagnose.
- The stigma of mental illness leads to a lack of awareness—if parents see it as something to be ashamed of, they're more likely to ignore or downplay the signs.
- There's no system in place to help parents or caregivers know what to look for—or understand what to do when they see that something's not right.

It doesn't have to be this way.

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4 out of 5 teens who attempt suicide have given clear warning signs.<sup>9</sup>

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The earlier a mental disorder is treated, the more effective it can be.

# THE SOLUTION

Teen mental illness can be treated. Catastrophic results can be avoided.

By using technology creatively, we can identify the early signs and help parents and caretakers respond appropriately.

*We can give them the tools they need, at their greatest time of impact.*

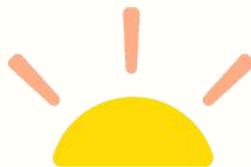
# Identify. Alert. Respond.

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## Identify

Recognize patterns from teens' regular life data inputs, to identify the symptoms of severe anxiety or depression.



## Alert

Act as a third party to alert the parent or caretaker of possible distress.



## Respond

Recommend options. Integrate API with Zocdoc. Provide auto emails to check therapist availability, along with next steps and guidance.

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Throughout this process, we'll provide comparative analyses to give parents and teens a big-picture perspective—and let them know they aren't alone.

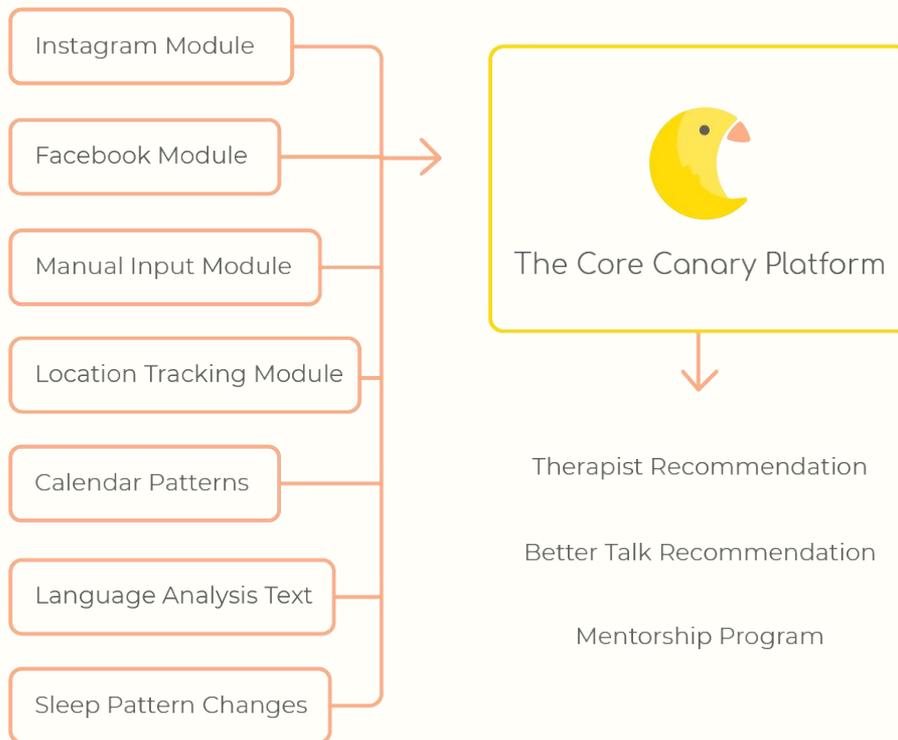
# Here's how we'll do it.

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The core of Canary.ai is a platform built on a corpus that can detect patterns of depression and symptoms of anxiety.

Multiple modules deliver specific data, from which the core platform identifies similar patterns that imply changes in behavior or mental health.

These channels are fully modular and can be scaled horizontally.



## Here's how we'll do it.

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### Manual Application

Parents use the platform to log habits, behaviors, and patterns. An alert system gives notifications, and allows specific data entry.



### Automated Digital Integration

Tracking on things like social media, wall postings, text messaging, Google calendar, and email detects patterns from digital sources.



### Automated Physical Integration

The platform integrates device features like the iPhone's detection of sleep/wake times and changes in schedule. It monitors activity for new hangout locations and signs of lower energy.

We're experienced professionals with machine learning muscle -  
and a drive to help.

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The professional team at Canary has a proven track record in using AI and machine learning to identify and address potential issues. That experience, coupled with a personal interest in reducing mental distress among our nation's most vulnerable demographic, leaves us uniquely qualified to make this technology work for millions of teens and their families.

## How you can help.

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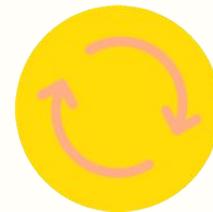
### Adopt

Sign on and share your ideas to help us develop the most powerful tool possible in the fight against teenage mental distress.



### Advocate

Share our story with other supporters and potential influencers so our work can continue to grow.



### Invest

Invest your money into our development. Help us stay aggressive, be creative, and push boundaries.



canary

Thank you / Contact info.

# Sources and supporting resources

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[The TODAY Show. Generation at risk: America's youngest facing mental health crisis](#)<sup>1</sup>

[AAP News. Children's hospitals admissions for suicidal thoughts, actions double during past decade](#)<sup>2</sup>

[Child Mind Institute. Children's Mental Health Report](#)<sup>3</sup>

[HuffPost. The Cost of Depression](#)<sup>4</sup>

[California Department of Corrections and Rehabilitation. Report: Cost of Incarcerating Youth With Mental Illness](#)<sup>5</sup>

[NAMI. Treatment, Not Jail: It's Time To Step Up](#)<sup>6</sup>

[Health Day. Depression and Violence in Teens](#)<sup>7</sup>

[CNN. 2018 School Shootings](#)<sup>8</sup>

[Jason Foundation. Youth Suicide Statistics](#)<sup>9</sup>

[New York Times. Why Are More American Teenagers Than Ever Suffering from Severe Anxiety?](#)

[VISTAS Online. School Shootings and Student Mental Health: Role of the School Counselor in Mitigating Violence](#)

[Deseret News. Why Pediatricians Are On the Front Line for Identifying Depression and Anxiety Among Teens](#)

[Steinberg Institute. Fact Sheet: The Cost Benefits of Early Intervention in Mental Illness](#)

[Shared Justice. The Mental Health Crisis in Our Juvenile Detention Centers](#)