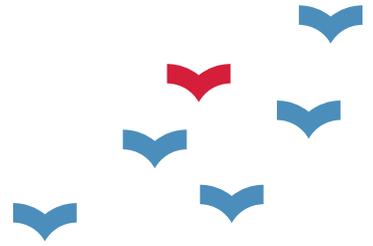


Building Ohio's Road Map to Mental Wellness, Resilience and Prevention



Ohio's \$20 million foundational investment in the State of Ohio Adversity and Resilience (SOAR) initiative has created one of the most forward-thinking mental health research programs in the nation – one designed not only to explain why Ohioans struggle, but also to identify **what works in developing resilient citizens, what can change** to improve mental health and well-being, and where **policy and community action** can make the greatest impact. It is the beginning of developing a road map for prevention: These findings cannot be produced by Medicaid claims, workforce data or national surveys. We need to dig deeper to understand and report the lived experiences of Ohio families across generations.

In its first years, SOAR has built a research infrastructure unlike any other in the U.S.:

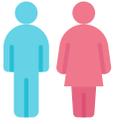
- A 15,000+ person statewide **Wellness Discovery Survey** captured biological, psychological, social, and environmental drivers of risk and resilience.
- A distributed, multisite, multigenerational **Brain Health Study** of more than 2,400 Ohioans brought advanced neuroscience tools directly to urban, rural and Appalachian communities.

Together, these studies reveal clear, changeable, and early warning signs for distress and suicide risk, addiction and overdose – and equally clear pathways that help individuals and families recover, adapt and live meaningful lives, with resilience, connection and purpose.



Which Ohioans are Involved in SOAR

SEX



RACE



MARITAL STATUS



HOUSEHOLD INCOME



WELLNESS DISCOVERY SURVEY (Survey Sample = 15,312)

Male: 49%
Female: 51%

White/Caucasian: 82%
Black: 9.8%
Multiple: 4.7%
Asian: 1.6%
Hispanic: 3.7%

Married: 56.9%
Single/Never Married: 28%
Divorced/Separated: 10%
Widowed: 5.1%

Under \$18K: 14.9%
\$18K to 36,999: 15.1%
\$37K to 59,999: 18%
\$60K to 74,999: 10%
\$75K to 149,999: 28%
\$150K or greater: 14%

BRAIN HEALTH STUDY (Survey Sample = 2,452 consented from over 1,600 families)

Male: 34%
Female: 65.8%

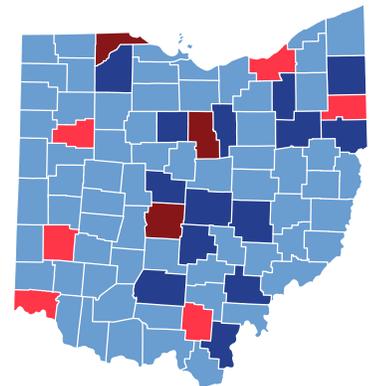
White/Caucasian: 82.2%
Black: 8.5%
Multiple: 4.5%
Asian: 2.0%
Hispanic: 3.9%
Other: 1.5%

Married: 47.2%
Single/Never Married: 35.6%
Divorced/Separated: 13.4%
Widowed: 2.6%

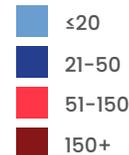
Under \$18K: 16.2%
\$18K to 36,999: 14.4%
\$37K to 59,999: 17.4%
\$60K to 74,999: 9.6%
\$75K to 149,999: 25.8%
\$150K or greater: 13.4%

Why It Matters for Ohio

- **It modernizes how we understand suicide, addiction and distress:** Instead of static labels like “high risk,” SOAR shows how risk fluctuates, how to intervene at the right moment, and how early prevention and current systems are already making a big difference.
- **This research is already saving lives:** More than 60 Ohioans were referred for further care after brain irregularities were detected in the study.
- **It gives policymakers early, actionable levers of change, not abstract data:** Factors such as sleep, loneliness, community economic opportunity, family stability, sense of purpose and coping skills emerge as high-impact, modifiable targets.
- **It sets the stage for SOAR 2.0:** As the next wave of follow-up data collection begins with these families and communities, Ohio could build the nation’s most advanced, longitudinal partnership of citizens and scientists to fuel our understanding of how resilience grows and how challenges can be prevented or overcome.



Enrollments by County



Key Findings — Suicide, Substance Use, Distress, Resilience

The following pages are snapshots of each of the major research findings to date and their potential impact on Ohioans.

REACHING ALL OHIOANS

SOAR's mobile and community-based approach successfully brought brain health research to nine unique Ohio regions, making it easier for families to participate who are often left out. It built trust and began the process to include participants as long-term partners in the study.

What We're Learning

- **More rural voices are included than ever before.**

Our mobile MRI moved between sites in Ontario, Jackson, Boardman and Lima to bring mental health access within reach for families across the state.

- **Participation rises when barriers fall.**

Local hospital partnerships, shorter travel distances, and community-embedded outreach and engagement dramatically increased rural involvement.

- **SOAR treats rural residents as partners, not participants.**

Community events and community conversations foster trust and ensure what we learn from research reflects and impacts rural priorities.

- **This creates one of the most representative datasets in the country.**

Experiences, strengths, and challenges of urban, suburban and rural families are reflected in brain and mental health data.

Academic partners include:

1. Bowling Green University
2. Central State University
3. Kent State University
4. Youngstown State University
5. Nationwide Children's Hospital
6. Northeast Ohio Medical University
7. Ohio University
8. University of Cincinnati/Cincinnati Children's Hospital
9. University Hospitals/Case Western Reserve University
10. University of Toledo
11. Wright State University

Partners also include behavioral health providers and community hospitals across Ohio:

12. Avita Health Systems in Ontario
13. Holzer Health in Jackson
14. Bon Secours Mercy Health in Boardman and Lima



Why It Matters

- **Better data leads to better local AND statewide solutions.**

Rural and Appalachian regions face high overdose and suicide rates; their inclusion enables us to understand unique and specific patterns of risk and pathways for prevention strategies.

- **Supports all Ohioans.**

Policies built on SOAR's data will serve urban, rural and Appalachian communities more effectively.

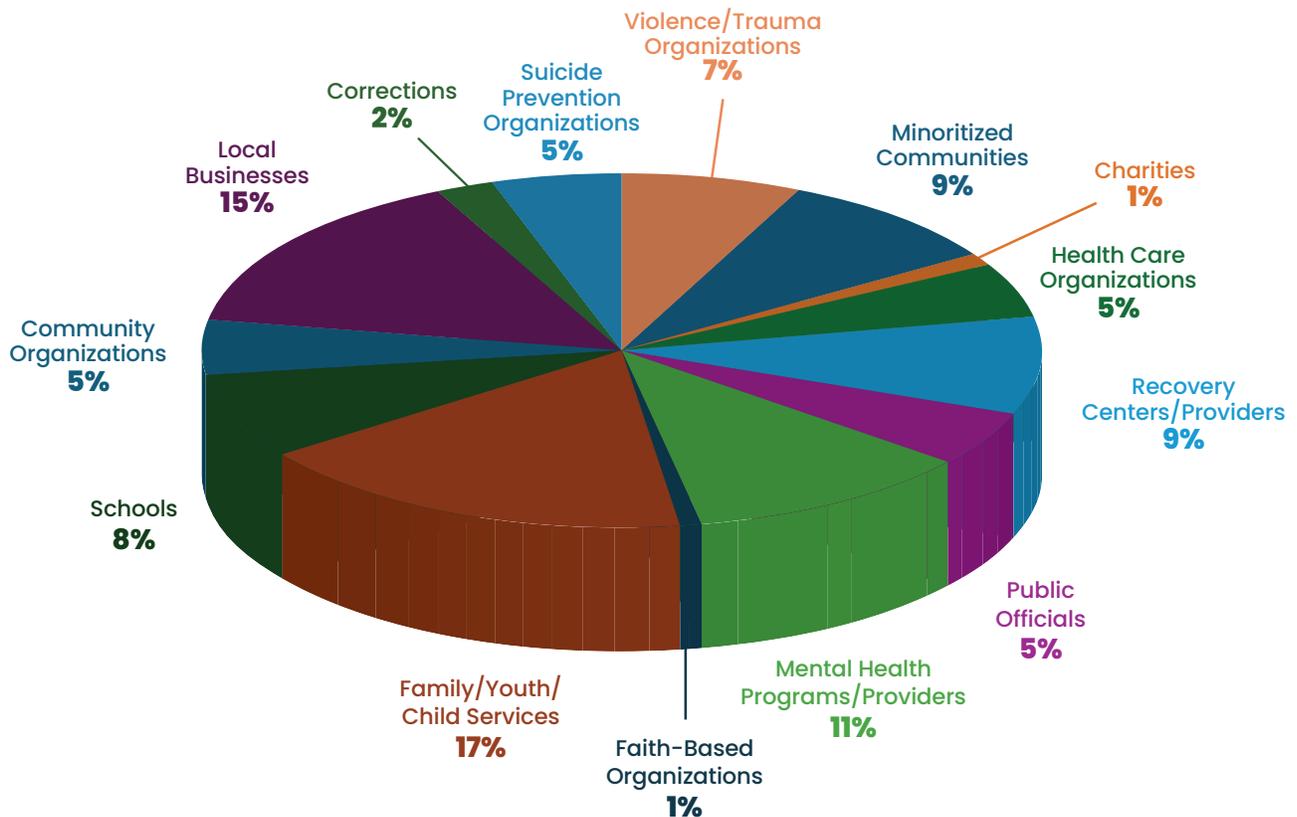
Community Engagement

Between May 2024 and October 2025, the SOAR team held individual meetings with approximately 200 community stakeholders; we participated in 154 tabling events, 14 conferences and three ribbon-cutting ceremonies to launch SOAR testing sites in rural communities.

We hosted four regional SOAR summits and provided updates on the SOAR studies to community stakeholders. Panel discussions revealed challenges and solutions related to supporting mental health and substance use treatment and prevention in their communities.

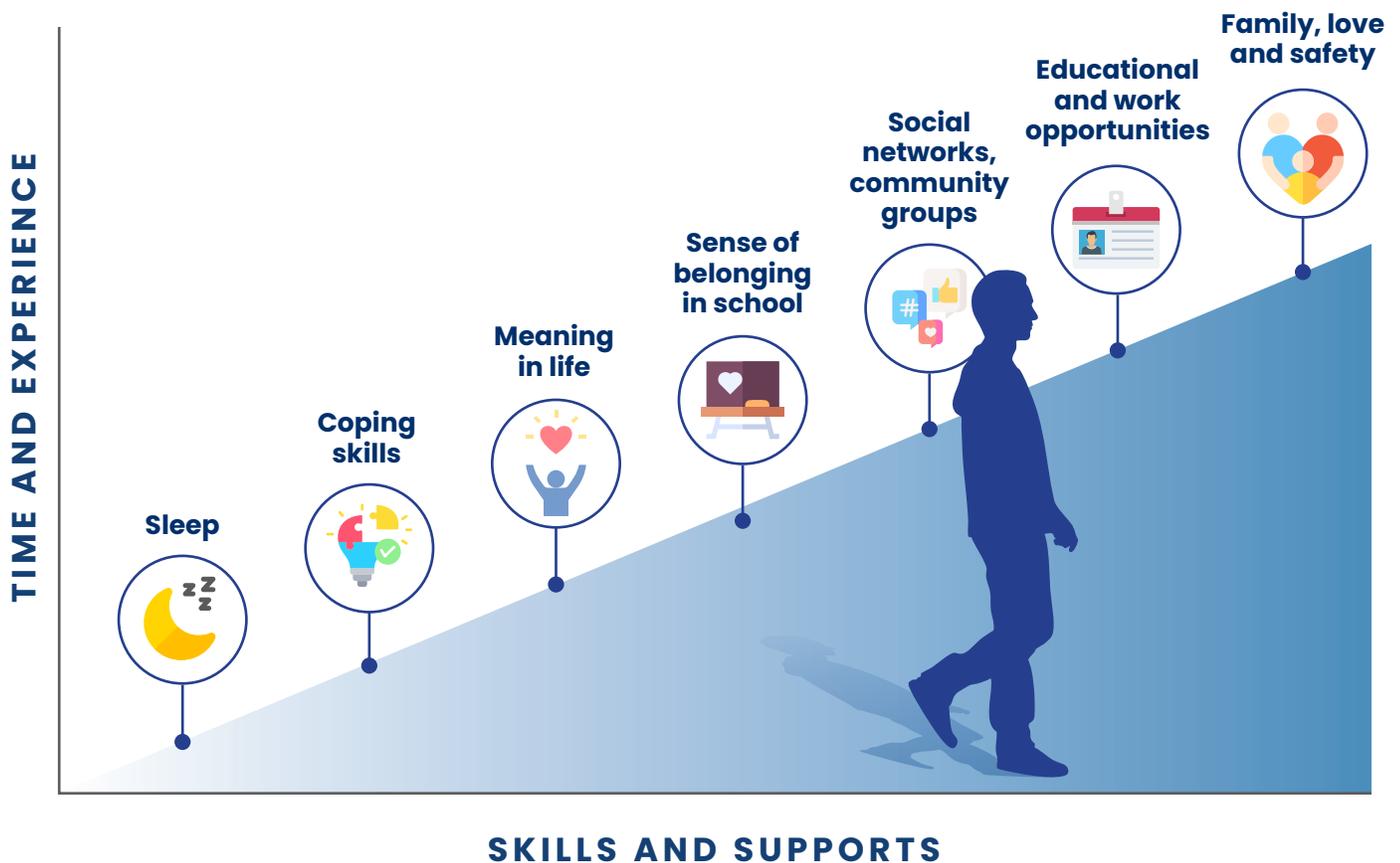
The team is working closely with an Engagement Community Advisory Council (ECAC) to ensure findings are shared in a way that is useful, respectful and impactful. The goal is for the ECAC to contribute and advise on interpretations, feedback and next steps. Community conversations are planned for the next phase of SOAR - we will continue to meet, share discuss and learn with community partners, interested SOAR participants, and other stakeholders.

A breakdown of our partnership network:



Why It Matters

- Resilience and well-being efforts begin with children and youth.
- Brain markers help identify risk **earlier** and **more accurately**.
- Early findings highlight how life experiences and family history shape mental health and how community resources – school, faith communities, sports, and recreation can fill in gaps for positive skill development and connection.
- They also point to new opportunities for **prevention, skill-building** and **family-focused support** long before a crisis emerges.



UNDERSTANDING PSYCHOLOGICAL RESILIENCE

Resilience is not something people either have or don't have — it is shaped by life experiences and can be strengthened over time.

What We're Learning

- **Resilience is influenced by many parts of a person's life.**

Biological factors, emotional skills, social support, and community conditions all contribute to how well someone bounces back from stress or psychological trauma. No single factor determines resilience.

- **Lower resilience is strongly linked to active mental health challenges.**

Individuals with lower resilience are four times more likely to be dealing with depression, anxiety, substance use or other mental health concerns. Those with high resilience are only half as likely.

- **Certain life experiences weaken resilience.**

Distress, loneliness, lack of hope or meaning, discrimination, chronic pain, and trauma are among the strongest contributors to low resilience and higher symptom severity.

- **Resilience looks similar across rural, suburban and urban areas.**

Geography does not determine resilience — conditions and supports do.

- **Trauma affects both resilience and the brain.**

People with lifetime trauma show reduced cortical thickness in brain regions tied to emotional control and decision-making, providing biological evidence that life experiences physically shape the brain.



Why It Matters

- **There is hope. Resilience can be learned.**

Because so many contributors to resilience are changeable — skills, hope, meaning, connection — Ohio can invest in interventions that strengthen resilience across the lifespan.

- **Early support reduces risk in youth.**

If distress, loneliness, and lack of meaning are key drivers of low resilience and mental health and substance use problems, these become priority areas for prevention and early intervention for kids.

- **Families and communities play a major role.**

Social support, stable environments and healthy coping skills help people recover after difficult experiences — no one needs to build resilience alone.

- **Environmental supports and opportunities also matter.**

A lack of access to health care and community support, as well as economic barriers, can blunt the development of resilience.

- **This informs SOAR 2.0 and could inform statewide and local policy.**

Tracking resilience over time (where, HOW and for whom it improves) will help Ohio understand what truly helps people adapt and remain well, and which interventions create the greatest impact at scale.



UNDERSTANDING SUICIDE RISK IN OLDER ADULTS

Feelings of numbness or lack of joy, loneliness and a loss of meaning in life appear to combine in ways that raise suicide risk for older adults. Because patterns in older adults are not the same as younger adults, SOAR provides an opportunity to identify unique patterns of suicide and resources that are available.

What We're Learning

- **Loss of pleasure is a powerful warning sign.**
Many older adults experiencing suicide risk report anhedonia, which means difficulty feeling joy or interest in activities they once enjoyed.
- **Loneliness amplifies emotional pain.**
Feeling isolated or disconnected from others plays a major role in elevating suicide risk among aging adults.
- **Feeling “no longer needed” erodes meaning.**
When older adults believe they're a burden or feel life has lost purpose, these beliefs predict suicidal thinking.
- **Risk can appear even without major depression.**
Many older adults at risk do not meet criteria for severe psychiatric disorders but still show the same dangerous symptom patterns.



Why It Matters

- **Opens new doors for prevention.**
Interventions that increase social connection, rebuild purpose, or restore daily enjoyment or support pathways to these needs may be especially effective for older Ohioans.
- **Helps providers catch risk earlier.**
Screening for loneliness, loss of joy and sense of purpose may be more sensitive than traditional depression measures for this age group.
- **Guides statewide aging-focused strategies.**
These insights support targeted outreach through aging networks, faith communities, senior centers and caregivers — places and people where older adults already seek support.
- **Supports family and caregiver education.**
Loved ones can be taught to recognize subtle (silent) early signs long before a crisis emerges.

MOMENTARY SHIFTS IN SUICIDE RISK DETECTED IN REAL TIME

What We're Learning

- **Suicide risk fluctuates much faster than clinicians can traditionally monitor.**

Emerging research — and SOAR's own data — shows that suicide risk can rise sharply over minutes or hours, not weeks or months.

- **Stressful daily events matter.**

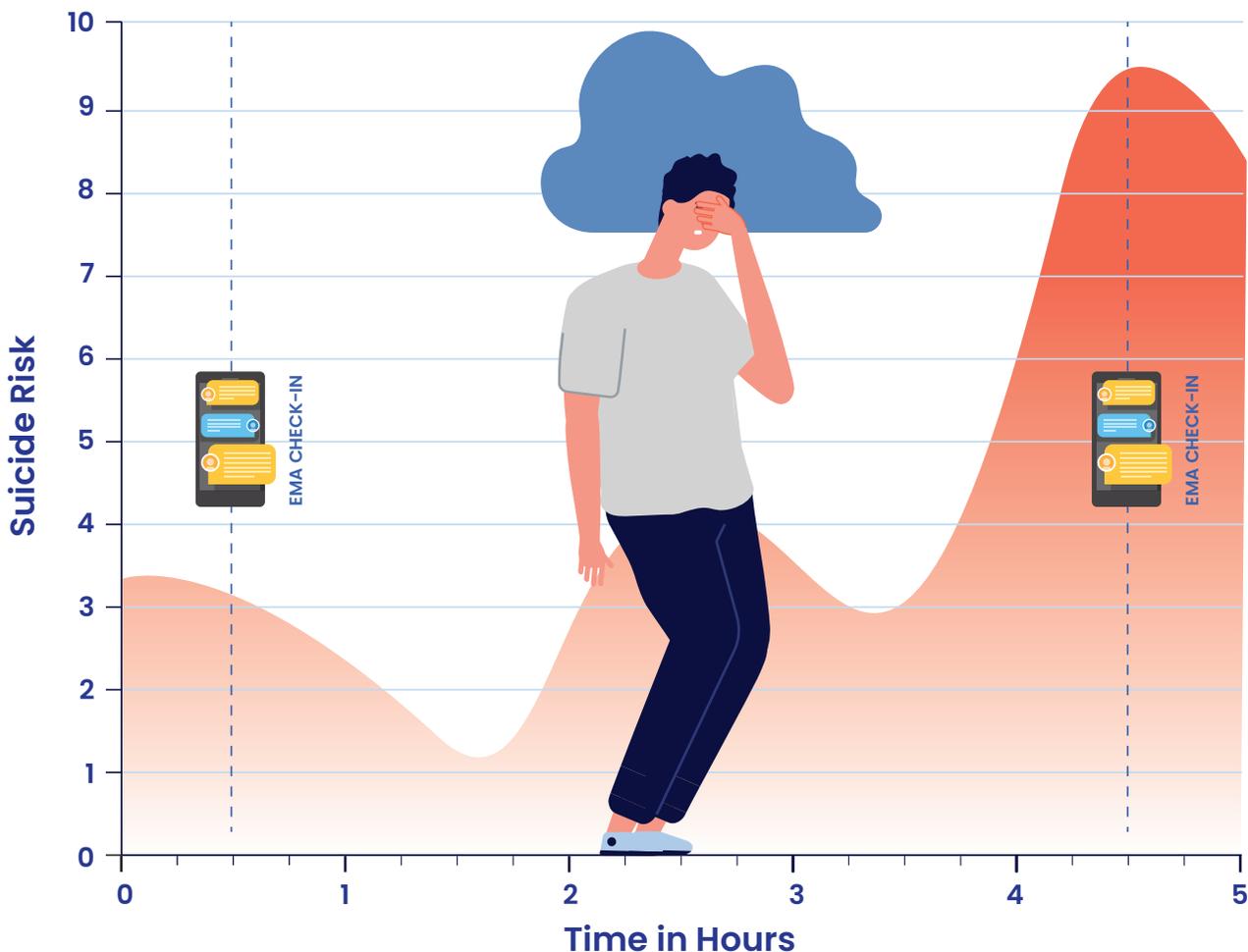
Relationship conflict, financial strain, health frustration or sudden negative events can quickly escalate suicidal thinking.

- **Real-time smartphone check-ins capture risk as it unfolds.**

Ecological Momentary Assessment (EMA) sends short surveys to participants' phones multiple times a day, tracking thoughts and stressors as they happen. This produces far more accurate and immediate information than traditional questionnaires that ask people to recall the "past two weeks."

- **Warning signs can now be tested scientifically.**

SOAR's EMA work examines whether known suicide warning signs — such as social withdrawal, interpersonal stressors or increased agitation — predict short-term increases in suicidal thoughts.



Why It Matters

- **Better timing to saves lives.**

If our tools and supports can detect rising risk within minutes and hours, not weeks, trained personnel can intervene before a crisis becomes life-threatening.

- **Helps personalize care.**

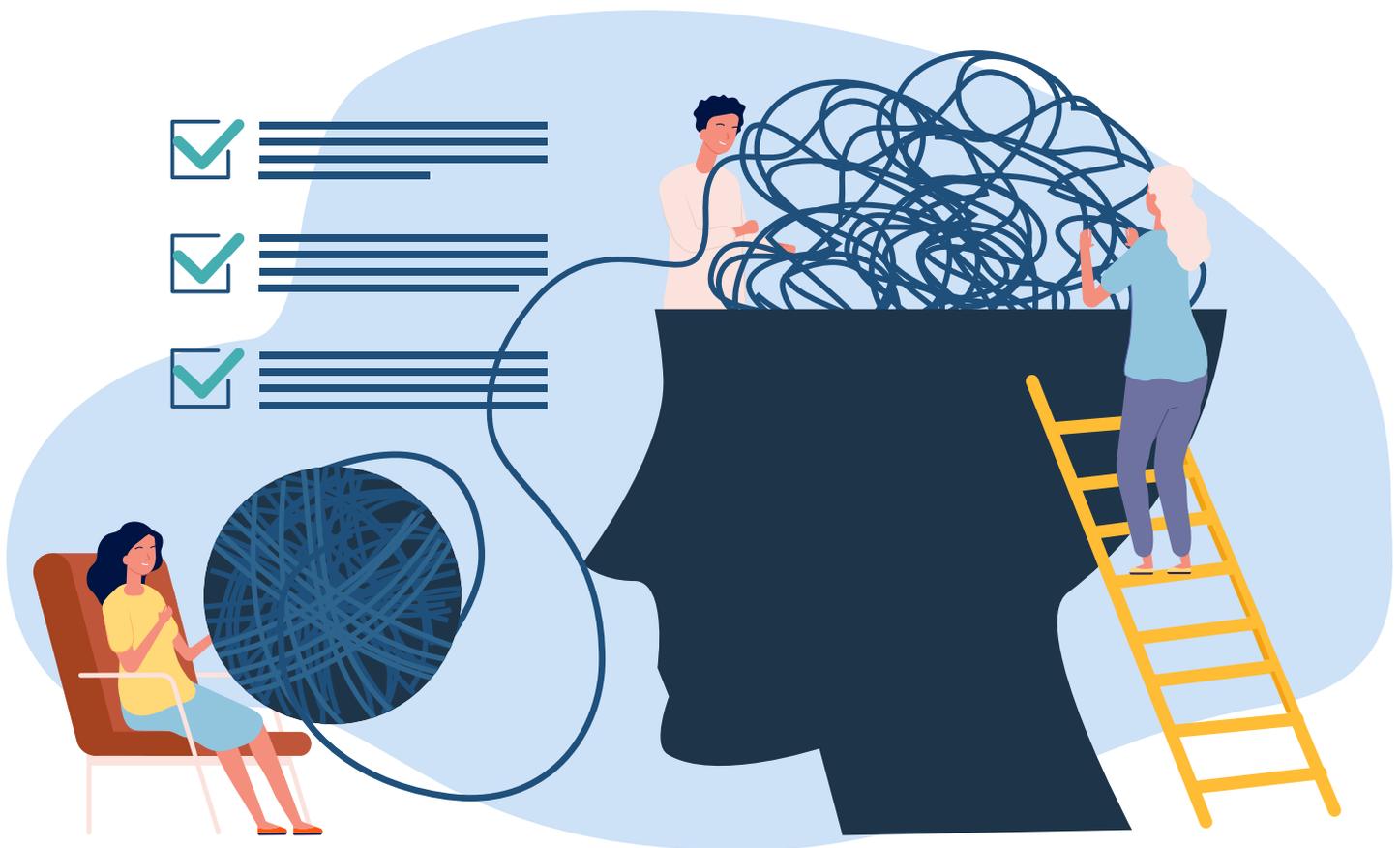
Real-time data shows how an individual's specific triggers or stressors impact their suicide risk, allowing more tailored support.

- **Reduces reliance on memory.**

Participants do not need to recall the past month accurately – EMA captures feelings and stress in the moment.

- **Opens the door to next-generation tools when people need it.**

This work sets the stage for future just-in-time interventions: supportive messages, crisis plan prompts or care team alerts delivered exactly when risk spikes.



UNDERSTANDING HOW IMPULSE CONTROL AND FLEXIBILITY SHAPES SUICIDE RISK, GAMBLING, DRINKING AND SUBSTANCE USE

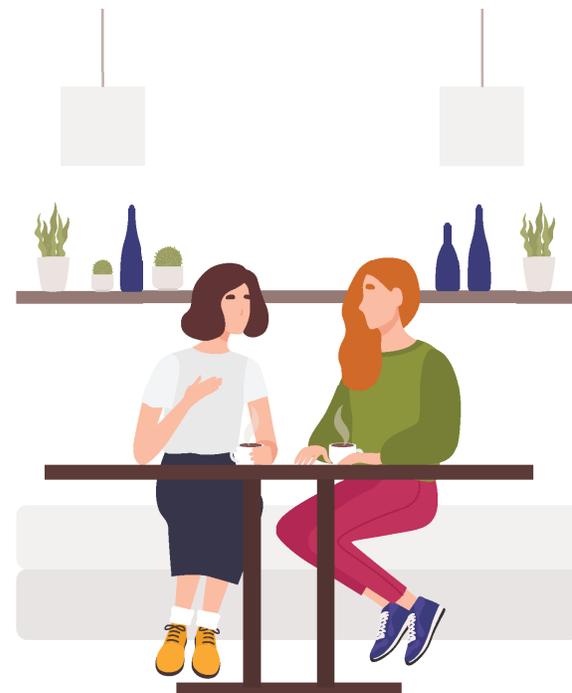
We used tests of cognitive performance, or “thinking skills” to help us understand how problem-solving, attention, flexibility, memory and impulsivity (self control) skills relate to risky behaviors across Ohioans.

What We’re Learning

- **Suicide risk is strongly tied to impulse-control problems.**
People with a history of suicide attempts have more difficulty stopping or shifting actions during fast decision-making tasks.
- **Gambling problems are linked to attention and flexibility.**
Individuals with gambling issues show challenges with staying focused and switching tasks – not simply impulsivity.
- **Heavy drinking and opiate use reflect different brain patterns.**
These groups are often more cautious on risk-taking tasks and may use substances to cope with uncertainty, stress, pain, loneliness or other experiences linked to strong emotions – this is different than the stereotype of thrill-seeking that might drive alcohol and substance use.
- **Different risky behaviors exhibit different cognitive signatures.**
Suicide, depression, substance use and gambling are not driven by the same underlying thinking patterns.

Why It Matters

- **We can target prevention more precisely.**
Suicide-related interventions can focus on impulse control, while addiction or gambling efforts can focus on coping, attention and emotional skills.
- **Treatments don’t need to be one-size-fits-all.**
Each behavior requires a different approach, supported by this objective data. Individual differences in profiles can match the needs of the youth, family and situation.
- **Earlier identification becomes possible.**
Cognitive patterns offer clues that risk patterns may be present before behaviors fully develop. That means we can avoid effect changes early to avoid negative outcomes and break generational patterns of despair and challenges.



BRAIN SIGNALS THAT HELP IDENTIFY MENTAL HEALTH RISK

SOAR participants go through a set of health and psychological assessments, along with brain scans (MRI and EEG) to study brain structure and function. The EEG test measures two key brain responses that occur in less than a second.

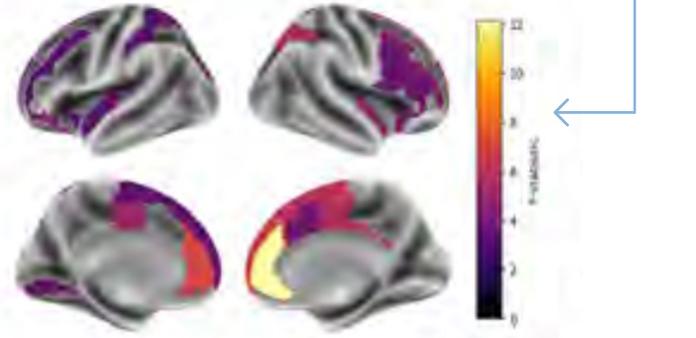
- **Error Response (ERN):** How strongly the brain reacts when we make a mistake.
- **Reward Response (RewP):** How strongly the brain reacts to positive feedback.

These signals help reveal early risk, resilience and intergenerational family patterns that traditional assessments often miss.

There are many unanswered questions from the brain health study. Biomarker, brain MRI, EEG, cognitive testing, diagnostic interviews and longitudinal change – the puzzle remains to be solved.

How MRI Works

- 1.** People lie comfortably in the MRI scanner.
- 2.** They are asked, “Think about the saddest memory for your family. How does that make you feel?”
- 3.** We combine those brain responses with additional similar types of mental losses, rejections, hurt, etc.
- 4.** Cortical thickness in key brain networks is reduced in people who have experienced trauma.



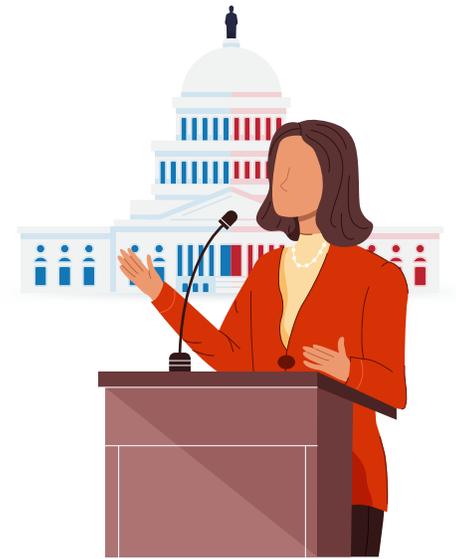
What We're Learning

- **Trauma leaves a measurable brain footprint.**
People with a more diminished ERN (error responses) tend to report more childhood trauma, more substance misuse, poorer physical functioning and lower motivation.
- **Resilience and trauma are linked to cortical thickness in key brain regions.**
Adults with close relatives affected by substance use disorders show weaker error responses and stronger reward responses.
- **Risk can appear before symptoms do.**
Teens with a family history of mental illness show reduced reward sensitivity even when they have no diagnosis.
- **Family history of addiction has a distinct brain signature.**
Adults with close relatives affected by substance use disorders show weaker error responses and stronger reward responses.

IMPLICATIONS AND OPPORTUNITIES FOR OHIO

Ohio has already demonstrated national leadership in addressing substance use and mental health support through innovative approaches, and this research reinforces the value of continuing those efforts. SOAR 1.0 data is just starting to build the framework for understanding these complex human experiences and risks. What we are learning validates the work and policies that are currently underway in the state of Ohio. What we learn can also guide smarter investments; from efficient and targeted prevention to strategically building stronger communities across the state.

SOAR's integrated data and innovative design, from EEG markers to rural engagement to real-time suicide-risk monitoring, point to a set of modifiable factors that influence mental health outcomes and can save lives across Ohio right now. These factors extend across personal skills, social supports, community conditions and access to care. We can learn so much more as we go.



1. Strengthen Upstream, Skills-Based Prevention

SOAR shows that resilience can be built through skills such as emotional regulation, sleep health, coping, hope-building and social connection. We can start prevention early in kids and teens, evaluate community connections and support employer-based mental wellness programs, especially in high-stress areas and sectors.



2. Expand Access to Mental Health Resources in Rural Ohio

SOAR's mobile MRI successful recruitment and outreach strategy demonstrates that access, not willingness, is the barrier to accessing mental health support. Continuing to strengthen partnerships with local hospitals, faith organizations and community hubs, and expanding mobile mental health and diagnostic services could have far-reaching implications. Ohio's has initiatives and incentives for behavioral health workforce development, placement and retention in rural and Appalachian counties and more can be done to improve access for all.



3. Invest in Early Identification and Real-Time Risk Detection

SOAR's daily phone/EMA analyses show that suicide risk can change in minutes to hours. Static, sporadic screenings miss these shifts and may miss important contextual features of risk, such as location, events, stressors and access to lethal means. Modernizing emergency medical team and clinician guidance to recognize rapid fluctuations in suicide risk and piloting EMA-based monitoring tools for high-risk individuals are two opportunities to reduce Ohio's suicide rate. Planned work for SOAR 2.0 will include crossover to measuring quickly shifting risks in substance use, alcohol and overdose prevention.



4. Support Family and Community-Focused Prevention

SOAR shows that brain markers — and risk — often run in families, where biology, stress responses and resilience skills can span generations. These insights point to the value of continuing Ohio’s progress in approaches that strengthen families as a whole — from early education for caregivers to supports that help youth navigate the added challenges that come with a family history of mental health or substance and alcohol use concerns.



5. Address Loneliness and Connection Challenges for Older Adults

Loneliness and loss of interest, pleasure or purpose are strong, interconnected predictors of suicide risk in older adults. Expanding programs with elder specific content through intergenerational programming or statewide “meaning and belonging” initiatives could provide the connection and purpose older adults are seeking.



6. Drive Community-Level Change Through Economic Opportunity

Strengthening the economic and social foundations of communities remains one of Ohio’s most promising avenues for improving mental wellness and reducing substance use risk. The SOAR findings show that neighborhood stability, economic optimism and access to opportunity act as powerful protective factors for families. Ohio has already demonstrated national leadership in addressing substance use and suicide prevention through innovative approaches, and this research reinforces the value of continuing those efforts.

Opportunities ahead may include deeper collaboration between behavioral health, housing and economic-development partners; support for local revitalization efforts that also embed mental health resources; and investments in community and leaders who help build connection and stability at the neighborhood level. Addressing these issues could align with what Ohioans are telling us — that strong communities create the conditions for resilience.

The Big Takeaway

SOAR 1.0 demonstrates that Ohioans care deeply about strengthening resilience in themselves, their families and their communities — and that **resilience is not fixed. It can be built, measured and improved over time.** The results so far show that circumstances do not determine a person’s future; with the right assistance, lives and **trajectories can change for people, and no one must do that alone.** Most importantly, SOAR’s longitudinal approach proves that understanding how people grow and adapt over time is essential. Results from SOAR 1.0 lay the foundation for a healthier, more resilient Ohio — one where **prevention is possible, recovery is supported and every family has a path forward.**



We welcome the opportunity to partner or hear any feedback or ideas on how best to make the most of this important research.

Contact us by email at SOARStudies@osumc.edu or at 614-388-8223. | soarstudies.org

Thank you to the state of Ohio's initial \$20 million investment and continued commitment to launch the landmark SOAR Study, taking a transformational step toward rewriting the future of mental health care. This study is also not possible without all our partners.

