Advances in AI to Identify Pediatric Psychiatric Severity in less than 1-minute.

Problem: There is a mental health crisis for Children and adolescents globally; this crisis has been exacerbated by COVID and the lack of trained mental health providers—the high rate of mental health issues for children and adolescents partly driven by undiagnosed and untreated trauma symptomology. Exposure to trauma has a pernicious impact on the development of children and adolescents, including signs of attention span dysregulation, distractibility, and disorganized attachment.

Solution: Addressing this crisis requires AI-enabled augmented clinical intelligence to support providers and patients. TQIntelligence is leveraging its patented voice biomarker technology for real-time decision support and triaging. The TQIntelligence solution enables care providers and caregivers to arrive at the severity of the psychiatric problem and a care plan quickly and effectively. Within minutes, TQIntelligence can assess the severity of the risk and route individuals to the right resources and care.

Innovation: Among the multitude of digital innovations to identify a biomarker for psychiatric diseases currently, as part of the macro-level digital health transformation, speech stands out as an attractive candidate with features such as affordability, non-invasive, and non-intrusive. TQI has developed a unique methodology, establishing a link between trauma, stress, and voice types partly related to the automatic nervous system changes, including disrupting speech-based characteristics. The patented voice biomarker algorithm is trained to understand behavioral and emotional tendencies and to anticipate future behaviors to determine if a child's vocal utterances deviate from age-appropriate linguistic and speech patterns.





Leadership Team Biography: Dr. Yared Alemu has over 20 years of experience as a psychologist, clinical supervisor, researcher, and administrator. He is an expert in digital mental healthcare, including precision and individualized approaches to mental health treatment. Dr. Hermon is a Psychiatrist in Ethiopia who is currently leading the algorithm's verification studies to evaluate the cross-cultural applicability of the Voice algorithm. Patrick is a Harvard and MIT-trained AI specialist leading ML/AI/Generative AI product development. TQI's digital mental health solutions address the global lack of skilled mental health providers. The organization and its leadership team have a strong track record of innovating and successfully implementing AI-based technologies, even in challenging and less-than-ideal clinical environments. Dr. Alemu and the TQIntelligence team have been the PI for an SBIR grant in Phase I and II, awarded by the National Science Foundation (NSF).

Recent Publications:

Alemu Y, Chen H, Duan C, Caulley D, Arriaga RI, Sezgin E Detecting Clinically Relevant Emotional Distress and Functional Impairment in Children and Adolescents: Protocol for an Automated Speech Analysis Algorithm Development Study JMIR Res Protoc 2023;12:e 46970

Caulley D, Alemu Y, Burson S, Cárdenas Bautista E, Abebe Tadesse G, Kottmyer C, Aeschbach L, Cheungvivatpant B, Sezgin E. Objectively Quantifying Pediatric Psychiatric Severity Using Artificial Intelligence, Voice Recognition Technology, and Universal Emotions: Pilot Study for Artificial Intelligence-Enabled Innovation to Address Youth Mental Health Crisis JMIR Res Protoc 2023;12:e51912
URL: https://www.researchprotocols.org/2023/1/e51912 DOI: 10.2196/51912

