THE UNIVERSITY OF WESTERN AUSTRALIA

Sometime today one Western Australian will die by suicide. Another died yesterday and one will die tomorrow. The situation throughout Australia is progressing backwards.

Until we do something different, this trend will continue.

We aim to achieve something that has never been done. Something that many have said is impossible.

Suicide represents a devastating loss of human potential. It is a loss felt by our entire community and is accompanied by unspeakable grief for friends and loved ones left behind. Despite significant investment into mental health and suicide prevention research, little progress has been made towards accurate predictions for suicidal behaviour. Tragically, the suicide rate in Australia continues to rise.

In 2017 3,128 Australians took their lives (a 9.1% increase from 2016) and Western Australia recorded its highest suicide rate in more than 20 years.

A major challenge has been early identification of people at high risk to focus prevention efforts. While a number of risk factors are known, including mental illness and exposure to major life stress events, their usefulness for targeting prevention efforts is limited. In particular, the number of people presenting with serious mental illness and suicidal ideation is large compared with available resources in a health system that is already under considerable stress.

"We have preventative efforts and there are lots of community groups, lots of government resources that are trying to prevent suicide and that's good — but the main challenge is we don't have enough resources to allocate them to the right people at the right time."

Professor Andrew Page

The answer is enticingly simple, yet intractably difficult

The answer is enticingly simple because we already have long lists of known risk factors. We know many resilience factors and have insight into a number of programs that work. However, the problem is intractably difficult because we do not know which intervention is needed for whom on a given day, and how to rapidly mobilise the necessary services.

Suicidal intent fluctuates but current predictors are static

This problem has proved insoluble for many reasons. One contributing factor has been the failure to take the dynamic nature of suicidal vulnerability into account. Recent advances in analytics and machine learning, now allow us to model a vast and complex collection of biological, genetic, psychological, psychosocial and environmental markers that are typically associated with suicidal behaviour in real-time.

The Young Lives Matter Foundation aims to save lives by creating the world's first Developmental Vulnerability Index (DVI). This index will assess, predict, and communicate the risk of suicidal behaviour. Unlike measures to-date, it will be dynamic in nature to reflect how risk/resilience fluctuates in the short-term.

> "Youth suicide is an increasingly complex issue and there are huge benefits to undertaking this project now, given advances in modelling and analytics, as well as mental health research."
>
> Professor Dawn Freshwater
> Vice-Chancellor, UWA

When research disciplines collide, unexpected discoveries occur.

This ambitious interdisciplinary research initiative has drawn together leading experts in Medicine, Psychology, Social Sciences, Education, Mathematics and Indigenous Studies. This world-class team is transcending traditional discipline boundaries in their unique approach to this complex issue.

Early pilot results are promising. A proof of concept, using state of the art machine learning, has

> We aim to develop a model of prediction that will facilitate early intervention, treatment and recovery, by making the best use of public healthcare funding for the benefit of all Australians.

enabled the team to move from developing the first DVI, to translation, where at-risk patients are identified in real-time using this novel approach. This tool is currently being utilised at Perth Clinic, a long-term collaborator on the project, to accurately predict short term risk of self-harm for inpatients.

The successful creation of a DVI will improve health outcomes for the Australian community by facilitating early intervention, personalised treatment, and recovery, for those most at risk of suicide and self-harm behaviours.

What is needed to create a Developmental Vulnerability Index?

A team, a vision, and a means to understand the dynamic interplay of risk and resilience factors is required. We are uniquely placed to implement this project with a cross-disciplinary and multi-organisational team of world-leading researchers in the required disciplines, including Psychology, Psychiatry, Mathematics, Big Data, Epidemiology, and experimental and regenerative neurosciences.

Whilst Perth is one of the most isolated capital cities in the world, our remoteness and the State's small but stable population, make Western Australia the ideal location to develop and implement the world's first DVI. The stable population base will allow us to leverage existing expertise in developmental research such as Young Minds Matter (the largest Australian Child and Adolescent Survey of Mental Health) and internationally recognised longitudinal studies, such as the Raine and Busselton Health Studies.

Western Australia's isolation and our experience with data linkage will enable us to monitor what happens to the broad population exposed to these interventions and track hospital presentations and suicide register endpoints, more easily than in the eastern states, where geographic mobility is greater.

The Young Lives Matter Foundation

The University of Western Australia made a bold commitment to suicide prevention through the launch of the Young Lives Matter Foundation in 2018. The Foundation capitalises on UWA's unique position as one of the Nation's leading research institutions. Backed by a select team of academic experts and collaborating organisations and governed by a Board of Directors with over 25 years' experience in suicide prevention, the Young Lives Matter Foundation is pursuing an innovative approach to this complex problem.

We have undertaken an unprecedented, translational, large-scale research program to develop a tool that can be replicated and/or adapted globally to reduce suicide rates. This includes the provision for specific models to address traditionally high-risk cohorts (Aboriginal and Torres Strait Islander, youth, rural/remote communities, first-responders, and FIFO workers).

A project of this nature has never been undertaken before, anywhere in the world. The successful creation of a DVI will have a major impact on suicidal mental health outcomes. We hope you will join us on this ground-breaking and important journey.

"The Board initially bought into the grand vision of the DVI when it still seemed like "science fiction", but now that we are beginning to see the concrete evidence of the idea and its translation into practice, we are even more committed to the belief that a DVI has the power to save lives and move the needle on this serious public health problem."

Mr Ronald W. Woss AM
Young Lives Matter Foundation Chairman