BUILDING NATIONAL DECISION SUPPORT INFRASTRUCTURE FOR SUICIDE PREVENTION IN AUSTRALIA

Suicide remains one of the leading causes of death in young people and contributes significant social, economic and health system costs to Australia. Suicide prevention policies and programs over the last two decades have had limited impact on population-level suicide rates in Australia. This is despite substantial national and state government investment, resources contributed by business, community and philanthropic sources, senate committee inquiries, implementation frameworks, and efforts to improve coordination and alignment of programs and services.

The challenges of decision making for suicide prevention

Developing effective policies and programs for suicide prevention is challenged by:

(1) **The complexity of the problem**: there are a range of factors that contribute to suicide behaviour across the lifespan including mental health, social, cultural, economic and environmental factors. This provides many potential points of intervention;

(2) **Many options for intervening:** We have a broad range of options for intervening to reduce suicidal behaviour supported by evidence, but there is uncertainty about the likely effects of combining them (i.e. their combined effects are not necessarily additive) or applying them in specific contexts;

(3) **Geographical variation:** There are markedly different suicide rates across the country, with different communities having different needs. Therefore, a 'one-size-fits-all' approach is unlikely to be effective;

(4) **Changing needs over time:** major changes in socio-economic circumstances in communities can impact suicide risk, altering the program and service needs of an area;

(5) **Competing views and agendas**: There are locally contested views about the effectiveness of interventions, community advocacy for options not supported by the evidence, and competing interests vying for limited resources; all of which can prevent consensus on a course of action;

(6) **Inadequate data systems:** The quality and timeliness of data on suicidal behaviour are inadequate to support decision making and to measure impact of suicide prevention initiatives.

Challenging decision making environments such these often lead to the development of 'comprehensive' strategies to address the complex problem of suicide behaviour in the hope that if risk factors and interventions are more comprehensively included in the strategy, it is more likely to be effective. However, a comprehensive approach may just spread finite resources less intensively over a broader range of programs and services, diluting the potential impact of the investment.

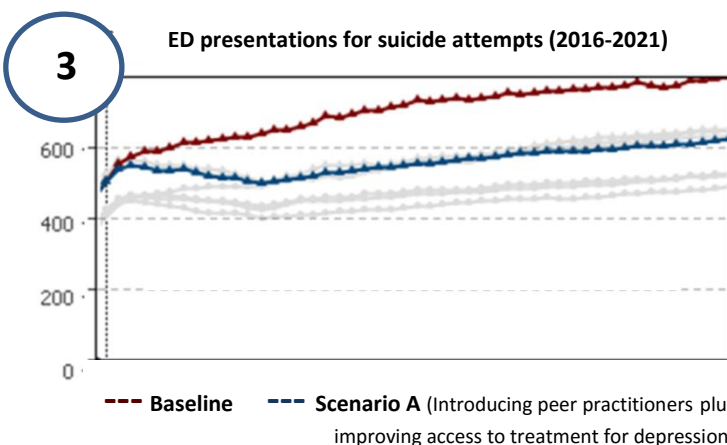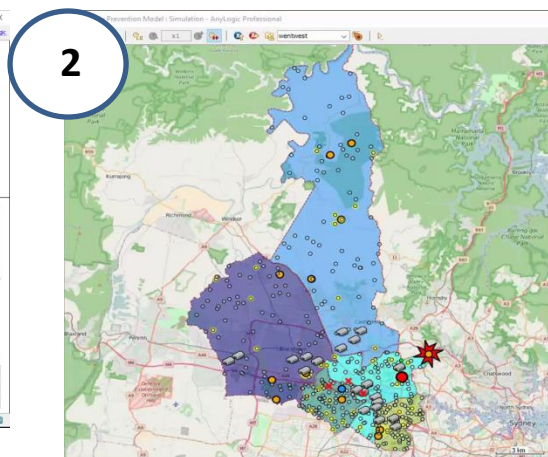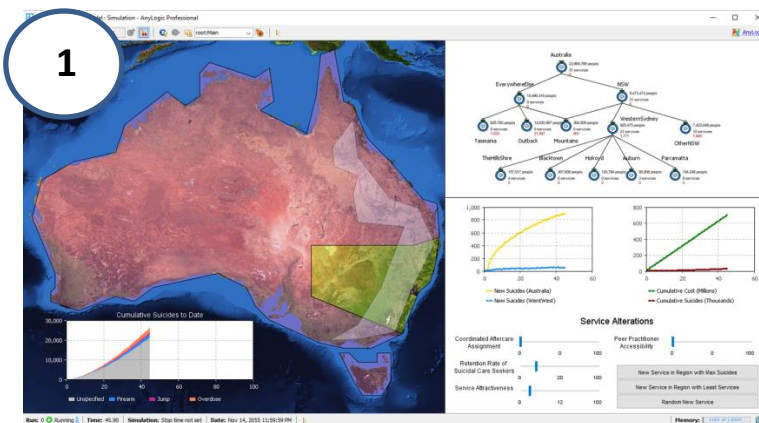## A new 'what-if' tool to guide investment in policies, programs and services for suicide prevention

Dynamic simulation models are computer models that are simplified representations of the real world. They have long been used in sectors such as engineering, defence, economics, ecology and business to simulate and help solve complex problems, optimise the use of limited resources, and to improve efficiency and public safety. More recently they are being applied to help solve complex problems in the health sector. Dynamic simulation modelling provides us with a tool that brings together a variety

of sources of evidence such as research, expert and local knowledge, practice experience, and data in order to map and quantify complex problems. The resulting dynamic model can then be used as a 'what-if' tool to test the likely impacts of different intervention combinations over the short and longer term, before they are implemented in the real world. This tool can help local and national decision makers determine where best to target investments for suicide prevention and with what intensity so that we can optimise the impact of limited resources and develop more effective, locally tailored strategies for reducing suicide behaviour.

> **"This is a decision support tool that will help us get the right services, to the right people, at the right time."**

The tool

The tool is a multi-level ('zoomable') dynamic simulation model for suicide prevention in Australia. It has a national focus but can be customised with input from local-level stakeholders and used to provide regional-level decision support capability, while retaining state and national level accounting. Different interventions can be incorporated at different levels and different points across the life-course, including interventions that range from early preventive interventions through to treatment services for mental illness and suicide behaviour, and postvention. These interventions can be turned on or off and scaled up or down in different combinations to explore what might provide the greatest impact to prevent suicide behaviour. For example, users can turn on interventions at a state or national level (such as an awareness campaign for suicide prevention) and explore the optimal intensity and frequency of the campaign to maximise its impact. In addition, decision makers in, for example, Western Sydney could explore the combinations of interventions implemented at a regional level that might work *synergistically* with the national campaign and other interventions that might also be implemented at state or national levels.

ED presentations for suicide attempts (2016-2021)

- - - **Baseline**   - - - **Scenario A** (Introducing peer practitioners plus improving access to treatment for depression)

1. An interface that allows users to navigate to specific geographical regions and experiment with turning on/off different combinations of interventions.
2. The effects of these interventions on behaviours of individuals over time (including treatment seeking and suicide behaviours) are modelled and compared against a baseline.
3. The impacts on mental health and suicide behaviour across a population are forecast and used to inform decision making.

The benefits of a participatory approach

Recent pioneering of this technology to support policy and program planning for complex health sector problems in Australia and elsewhere have highlighted the benefits of using a participatory approach. Engaging stakeholders in the development and use of these decision support tools can facilitate cross-disciplinary communication, advance contentious debates, improve transparency in decision making and build consensus for action. For suicide prevention, national and local stakeholders can be engaged in two ways:

1. Collaborative development and local customization of the decision support tool through a series of participatory workshops;
2. National policy dialogues or regional-level strategic planning with stakeholders, facilitated through interaction with the decision support tool. Model outputs are discussed among stakeholders, and trade-offs explored, with the aim of achieving improved agreement on the best course of action in order to facilitate wider buy-in and support for implementation.

Significance

As customised sub-models for each region are developed, they are added to the national model which essentially forms a national decision support infrastructure to guide effective, efficient, coordinated and regionally appropriate responses for suicide prevention and surveillance of suicidal behaviour. This infrastructure will bring together in one place, all the relevant data, research, expert and local knowledge in a way that makes it capable of supporting both short and longer term planning. Supported by improvements in regional data systems that collate real-time and routinely collected social and health service data (including socio-economic, social media, health and well-being data), this infrastructure becomes a powerful, flexible, long term asset that will help address the challenges that have prevented population level impact on suicidal behaviour in Australia over the past two decades.

Complex **problems** can't be **solved** by making random moves