FACT SHEET

The Australian Prevention Partnership Centre
Systems and solutions for better health

Building a compelling case for prevention

A dynamic simulation model to demonstrate the value of reducing lifestyle-related chronic diseases

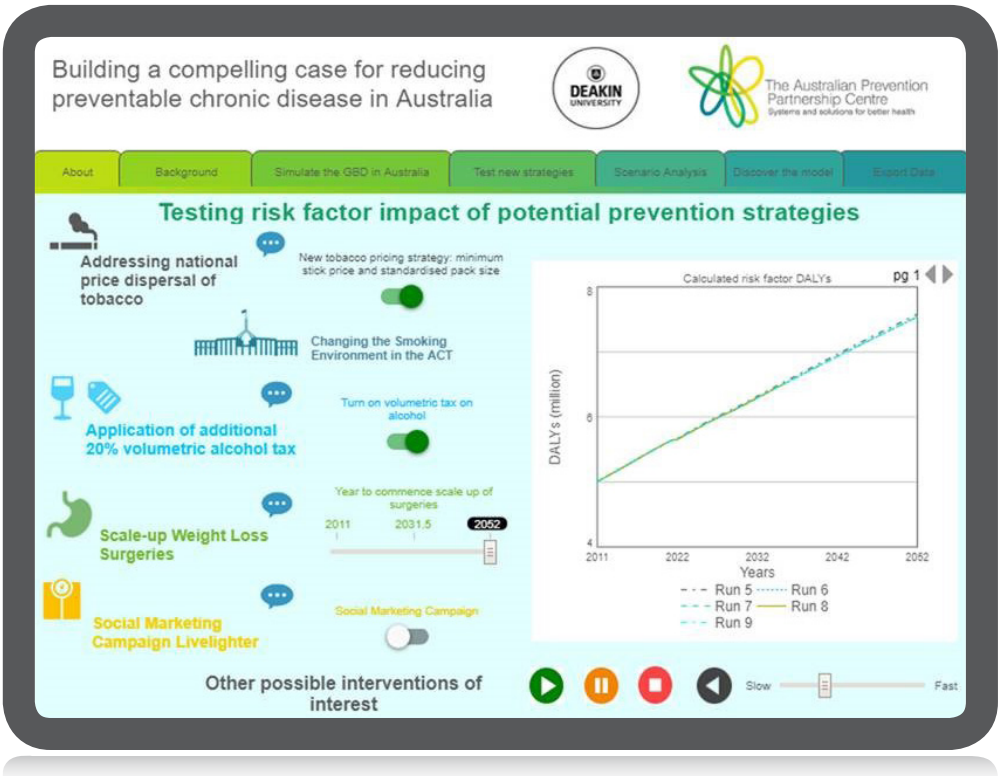
This national system dynamics model gives policy makers a tangible demonstration of the value of prevention and the associated impact on the costs of health service use and the change in health and wellbeing in Australia.

In a proof-of-concept demonstration of the potential of dynamic simulation methods to make a compelling case for investing in prevention of chronic disease, this engaging and useful tool can be used to illustrate the health benefits and economic value of prevention interventions to individuals, the health system and Australian productivity.

"Once completed, this model will show how interventions to address one risk factor will influence others. It will help us think more globally about different types of interventions, the type of intervention rather than the volume, and the sum benefit we might be able to gain with strategic investment in prevention."

– Professor Andrew Wilson, Director, Prevention Centre

This online simulation interface allows you to simulate hypothetical policy experiments using the limited interventions already included in the model structure. Using this proof-of-concept model, users can understand how the assumptions behind interventions may or may not influence their impact at a population level by adjusting them if required, and can explore the change over time in the costs and benefits of strategies over time and on a number of health or economic indicators.



About the model

We have produced a proof-of-concept national system dynamics model that computes Disability Adjusted Life Years (DALYs), healthcare costs and productivity costs by six key risk factors – tobacco, harmful alcohol consumption, physical inactivity, high BMI, overall dietary risk and high blood pressure. While methodological development is ongoing the proof of concept model demonstrates the complexity of pathways to chronic disease and accounts for the population dynamics, behavioural dynamics, service dynamics, the variation in the intervention impacts over time and the non-additive effects of combining interventions that challenge traditional decision analytic methods.

The model is being validated against the Global Burden of Disease Study 2016, using data extracted for 2016 and 2011, published in 2017 by The Lancet.[1]

One of the major technical innovations of this work is the integration of participatory conceptual mapping and computational modelling at the national and state levels. The model demonstrates how a number of modifiable (behavioural and metabolic) risk factors interact with a range of interventions and impacts on Australian health and economic burden measures, including risk factor prevalence, DALYs, productivity, and cost-effectiveness.

We have also shown the use of more textured agent-based models for specific risk factors in the ACT and how these can interact with the national model to track impacts on local and national performance.

The next phase of the project is to extend the scope of the model advance our understanding of the interaction of individual risk factors, integrate considerations of the inequalities of distribution of risk factor and chronic disease prevalence across the population and hence the differential effects of interventions. It will have wider and deeper participation across urban planning, transport, and education sectors. The ultimate aim is to provide a useful policy decision-support tool for policy makers in Australia.

The modelling team

We took a participatory approach to the development of models in this project. Input was provided by policy partners and advocacy agencies, including ACT Health, Cancer Council Victoria, the Obesity Coalition and the Australian Health Policy Coalition.

In facilitated workshops, we worked with our policy partners to firstly map the complex system that is preventable chronic disease burden in Australia. Partners then participated on model development and prioritisation of strategic interventions. The proof-of-concept model was built by an interdisciplinary research team from the Prevention Centre, and Deakin University.

Reference

1. Jackson H, Shiell A. Preventive health: How much does Australia spend and is it enough? 2017. Canberra: Foundation for Alcohol Research and Education.

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This factsheet was prepared by The Australian Prevention Partnership Centre

(02) 9188 9500 preventioncentre@saxinstitute.org.au preventioncentre.org.au @TAPPCentre

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