Dynamic simulation modelling

Supporting decisions to reduce alcohol-related harms in NSW

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On behalf of Alcohol Modelling Consortium and
The Australian Prevention Partnership Centre

Complex aetiology of drinking behaviour
Many intervention options

**Supply reduction**
- Increasing taxes
- Restricting hours of sale
- Lockouts
- Licencing controls
- Raising minimum legal age
- RSA enforcement
- Secondary supply laws

**Demand reduction**
- Screening and brief intervention in primary health setting
- Treatment services for alcohol dependence
- Education and social marketing
- Workplace interventions
- Alcohol free events
- Advertising bans

**Harm reduction**
- Altering the drinking environment
- Drink driving countermeasures
- Sobering up centres

**Other important considerations:**
- Contested views about the likely effectiveness of intervention combinations;
- Community advocacy for options not supported by evidence;
- Challenges inherent in introducing interventions that impose on business and industry practices.
Challenging policy environments: comprehensive approach vs. systems approach:

<table>
<thead>
<tr>
<th>Comprehensive approach</th>
<th>Systems approach</th>
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<tbody>
<tr>
<td>■ Aims to inclusively address identified modifiable risk factors (individual, social, environmental, health service influences).</td>
<td>■ Encompasses holistic, cross-sectoral thinking.</td>
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<td>■ Cross-sectoral considerations.</td>
<td>■ Seeks to identify where best to focus action and with what intensity.</td>
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<td>■ Often invest in a broad range of available responses.</td>
<td>■ Tools to analyze which responses are likely to have the greatest impact.</td>
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<td>■ Can help determine what can be reasonably be left out of strategies.</td>
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What is dynamic simulation modelling?
Alcohol modelling multi-disciplinary expert group

- Academic alcohol experts
- Clinical experts
- Policy and program experts
  - NSW Ministry of Health
  - NSW Treasury
Rules govern the behaviour of individuals

Capacity
- Does an individual have time to plan and execute?
  - TimeCapacity
  - GoOut
  - GoHome

- Can individual drink more alcohol given their current context?
  - Yes
  - No

Motivators
- What motivates an individual to take more alcohol than they have intended?
  - Preferences
  - socialMotivation
  - Environment

Opportunity
- What does an individual have to drink to be in their current context?
  - Alcohol
  - Water
  - Non-alcoholic

Environmental factors
- Weather
- Temperature
- Time
- Daytime
- Occasion
- Social interaction
- Emotional state

Structural factors
- Age
- Gender
- Health
- Mental health
- Environment

Interpersonal factors
- Family
- Friends
- Colleagues
- Social activities

Health factors
- Physical health
- Mental health
- Sensory perceptions
- Emotional state

Technical factors
- Smartphone
- Computer
- Kitchen
- Bar

Social factors
- Peers
- Colleagues
- Family
- Friends
- Social activities

Emotional factors
- Happiness
- Stress
- Anxiety
- Depression

Cultural factors
- Alcohol culture
- Food culture
- Drink culture

Environmental factors
- Weather
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- Food culture
- Drink culture
Drinking episodes

The model keeps track of each individuals' blood alcohol concentration

Chronic harms simulated:
- Lip, oral and pharyngeal cancer
- Oesophageal cancer
- Liver cancer
- Breast cancer (female)
- Colorectal cancer
- Hypertensive diseases
- Ischaemic heart disease
- Haemorrhagic stroke
- Cirrhosis of liver

Acute harms simulated:
- Violence
- Road traffic accidents
- Alcohol poisoning
- Accidental injuries (e.g. falls, fire, drowning)
- Acute presentations resulting from chronic alcohol use disorder
Model interventions:

- Brief interventions (delivered by health professionals)
- Improved access to alcohol treatment services
- Restriction of hours of sale of alcohol
- ‘Lock outs’
- Limiting the density of licensed venues
- Advertising bans
- Minimum pricing
- Enhanced enforcement of RSA
Flexible intervention interface

The effects of multiple interventions are not necessarily additive
Some interventions can have unintended consequences.

The effect of interventions can grow stronger over time with impacts not seen within a policy cycle.

- Baseline
- Enhanced BI & treatment services
# The Alcohol Modelling Consortium

<table>
<thead>
<tr>
<th>Name:</th>
<th>Position:</th>
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<tbody>
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<td><strong>Philip Coates</strong></td>
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<td>Acting CEO, ACON</td>
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| Professor Andrew Wilson                   | Director, The Australian Prevention Partnership Centre; Director, Menzies Centre for Health Policy, University of Sydney |
In summary, dynamic simulation modelling is:

- A method for combining diverse evidence sources into a ‘what if’ tool to test a range of policy and program options;

- A platform for engaging multi-disciplinary stakeholders and building consensus around policy and program options;

- Adds strength to business cases for investment.

Thank you

For more information contact:
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