

System dynamics model as a national decision-support tool reduce the burden of cardiovascular disease

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ABSTRACT

Aims

To develop a system dynamics (SD) model that supports strategic planning to reduce the burden of cardiovascular disease (CVD) in Australia

Methods

A multi-disciplinary consortium of clinicians, researchers, consumer representatives, industry, and policy makers collaboratively mapped the relevant systems, defined policy options, and advised on interpretation of data and findings. The SD model was built based on the systems map and utilised data from cohort studies, clinical trials, and administrative databases. It captured population dynamics, disease progression of first and recurrent acute and chronic CVD, and incorporated economic analysis. Modelled scenarios included a range of strategies that targeted primary prevention, pre-hospital care, and medication and treatment.

Results

Findings showed that the number of Australians hospitalised for, dying from, and living with CVD is likely to almost double over the next 20 years due to changes in population structure, and highlighted the importance in prevention of primary CVD in curbing the growth of burden. Reducing CVD deaths from acute events without addressing underlying risks, on the other hand, results in a subsequent increase in hospitalisations from recurrent CVD. It also showed that the economic benefits of improved health outcomes may lie outside of the sector that invests in public health strategies, and demonstrated importance in a multi-stakeholder, pan-Governmental approach to planning of public health initiatives.

Conclusion

The SD model provides a tool for policy makers to understand behaviours of the systems and the need for broadening of mental models and awareness of dynamics over time in strategic decision-making.