

# HEALTH AND AGEING: Modelling multiple chronic diseases - Australia

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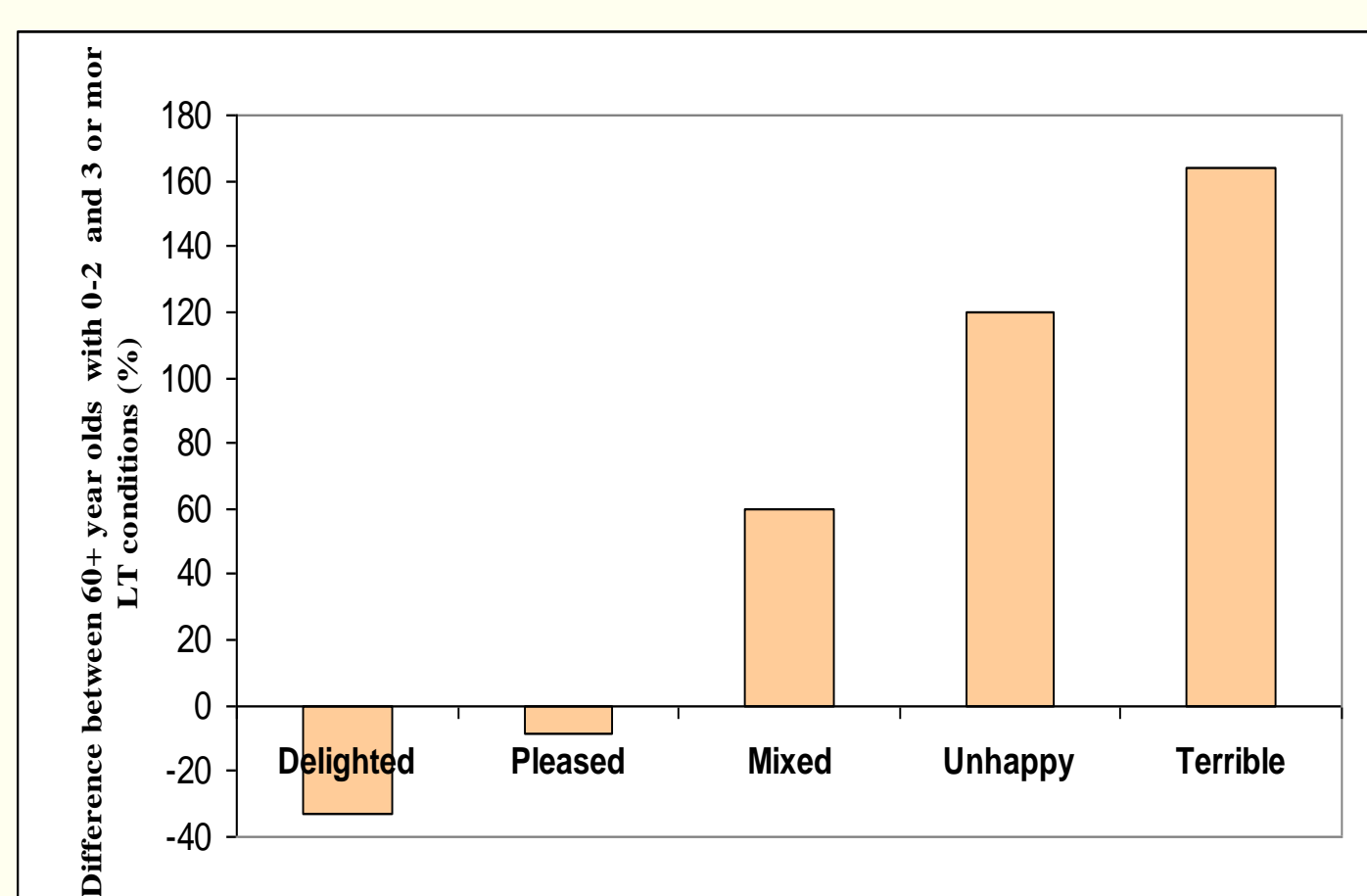


## INTRODUCTION

Chronic diseases - eg heart disease, cancer, diabetes - affect around 80% of older Australians, are the main causes of disability and premature death, and account for 70% of health expenditures. Australia's population is ageing, so future chronic disease prevalence and related treatment costs are predicted to increase considerably. The literature shows further worsening quality of life and more rapidly rising health costs as individuals acquire several chronic diseases as they age (chart/table below)

Poorer quality of life if 60+ year olds have 3 or more chronic illnesses

Higher per disease costs for those with multiple chronic diseases



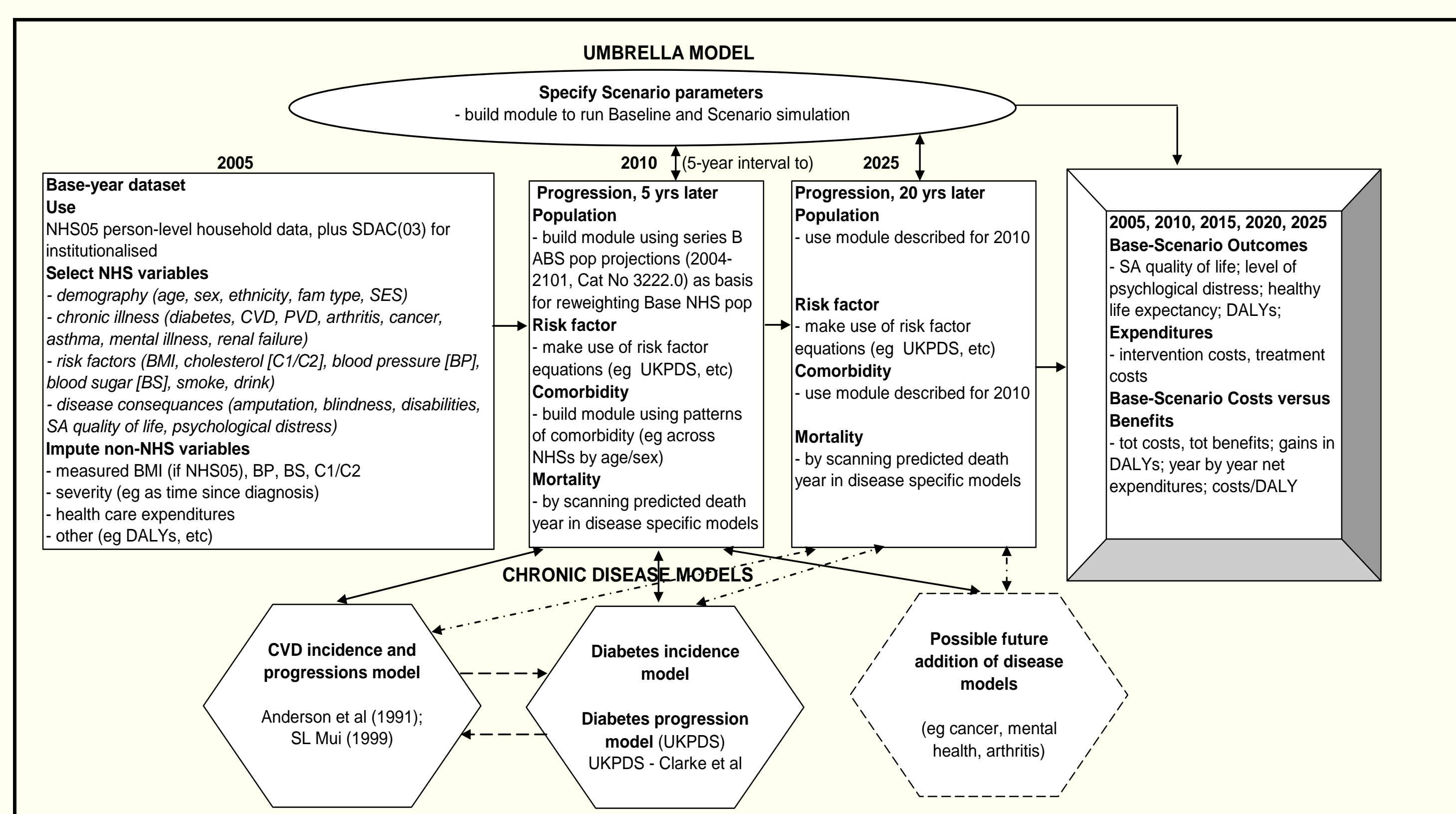
Description	Average cost per person per year (\$)
<b>Single chronic illness</b>	
Cardiovascular disease (CVD)	4006
Cancer	2,478
Diabetes	1,289
<b>Multiple chronic illnesses</b>	
Cancer and CVD	8526
Diabetes and mental illness	2738
Cancer, CVD and mental illness	10,090

## AIMS

- Report on the Prototype of *HealthAgeingMod*, a person-level cost-benefit model-system able to account for multiple chronic diseases that Australians may acquire as they age.
- Report on Illustrative Scenarios, using the Prototype.

## THE *HealthAgeingMod* PROTOTYPE

Disease-specific progression sub-models are linked to an 'Umbrella' microsimulation model representing the Australian population. Type 2 diabetes, cardiovascular disease (CVD), and CVD as a complication of diabetes are considered at this stage



The Prototype projects into the future and accounts for a nationally representative sample of individuals' demographic, socioeconomic, health and health-risk characteristics; the number of chronic diseases they accumulate; their quality of life; and the related health expenditures.

## REFERENCES

- Australian Bureau of Statistics (2005), *Population Projections*, No3222
- Australian Bureau of Statistics (2006), *National Health Survey 2004-05*
- Walker et al (2008) ACERH Research Report 3, [www.acerh.edu.au/publications/ACERH\\_RR3.pdf](http://www.acerh.edu.au/publications/ACERH_RR3.pdf)

## RESULTS - Illustrative Scenarios

### The Illustrative Scenario

- S1** projects, from 2005 to 2010, the number of Australians in 2010 with diabetes, with CVD hospital event(s), or with both. It also estimates the related health expenditures
- S2** is similar to S1, except that Australia's population structure is that projected for 2025. <sup>1</sup> This results in the proportion of 60+ year olds to rise from 17% in S1 to 26% in S2. This latter is similar Japan's proportion currently (close to 27%)
- S3** is similar to S1, except that each of Australia's 2.5 million obese adults has 10% lower weight (in kg)

### Results

#### Diabetes and non-fatal Cardiovascular hospital events, 2005-2010

	Scenario S1	Scenario S2	Scenario S3
	2010 population structure*	S1 with 2025 population structure*	S1 with 10% lower weight for obese** adults
<b>PERSONS IN 2010</b> (numbers)			
- Diabetes only	951,706	1,570,000	894,480
- Diabetes+CVD event	50,749	109,782	43,387
- CVD event only (non-fatal)	285,222	501,670	277,016
<b>All persons with diabetes and/or CVD event</b>	<b>1,287,677</b>	<b>2,181,452</b>	<b>1,214,883</b>
difference from S1		<b>+893,775</b>	<b>- 72,794</b>
<b>5-YEAR EXPENDITURES</b> (AU\$ million)			
- Diabetes only	4,816	8,166	4,629
- Diabetes+CVD event	1,128	2,425	981
- non-fatal CVD event only	5,767	10,111	5,594
- fatal CVD event only	1,317	3,385	1,317
<b>Total CVD plus diabetes treatment costs</b>	<b>13,028</b>	<b>24,087</b>	<b>12,521</b>
difference from S1		<b>+11,059</b>	<b>- 507</b>

\* Prototype estimates aligned to Australian Bureau of Statistics projections: a population of 20.2 million in 2010 and 24.7 million in 2025  
\*\* Body Mass Index of 30 or more  
Source: Survey-based<sup>2</sup> Prototype simulations

**S2** has a significantly older population, with 893,775 more Australians with diabetes and/or CVD and with 51% higher treatment cost per head of population than under S1. Under S3, with each obese Australian adult having lost 10% of their body weight, 72,974 less Australians have diabetes and/or CVD than under S1. This results in a 4% decline in treatment costs per head of population (a saving of AU\$507 million over 5 years).

## CONCLUSIONS

Accounting for multiple chronic diseases at the level of the individual allowed improved predictions of the chronic disease status and health cost implications of population ageing and of the costs and benefits of related policy interventions .