

**Diabetes in
New Zealand**
Models and Forecasts
1996–2011

Published in March 2002 by the Ministry of Health

ISBN 0-478-26284-1 (Booklet)
ISBN 0-478-26285-X (Internet)
HP 3493

This document is available on the
Ministry of Health's Web site:
<http://www.moh.govt.nz>



An epidemic of type 2 diabetes is occurring in New Zealand, as in other developed countries, driven mainly by demographic trends and the increasing prevalence of overweight and obesity. The epidemic most severely affects the Māori and Pacific ethnic groups.

The Ministry of Health has developed an epidemiological model of the diabetes epidemic with two underlying objectives:

- to provide estimates of the current burden of diabetes, consisting of internally consistent estimates of diabetes incidence, prevalence, duration and mortality
- to forecast future diabetes prevalence (and related variables) taking into account demographic changes, epidemiological risk factor exposures (especially obesity), and health service developments.

The model uses data on self-reported diabetes prevalence from the 1996/97 New Zealand Health Survey, obesity prevalence from the 1997 National Nutrition Survey and mortality data from the New Zealand Health Information Service. The main modelling method used is the multi-state life table. Conservative assumptions are used in the model, to reflect the limited data available. The model will be updated and extended as further data become available.

Key findings from the model are summarised here, but the full reports (see back page) should be consulted for more details and appropriate references.

Diagnosed or total diabetes?

Only *diagnosed* diabetes is modelled (since this is what we have data for). However, research indicates that for every person diagnosed with diabetes, there may be another whose diabetes has not yet been recognised.

Also, only diabetes in adults (age 25 and over) is modelled as a proxy for type 2 diabetes. The small (but increasing) proportion of type 2 diabetes with onset in childhood and adolescence is excluded from the model. On the other hand, the small proportion of type 1 diabetes with onset in adulthood is included.

The burden of diabetes in 1996

The model conservatively estimates that in 1996 almost 5000 adults were newly diagnosed with diabetes, approximately 81,000 were known to have diabetes, and almost 1500 deaths were attributable to diabetes.

Table 1: Modelled 1996 (diagnosed) diabetes counts

Number	Male			Female			Total
	Māori	Pacific	European	Māori	Pacific	European	
New diagnoses	585	165	1709	720	197	1366	4742
Existing diagnoses	7014	2003	31,790	9291	2686	28,707	81,491
Attributable deaths	238	56	498	274	61	367	1494

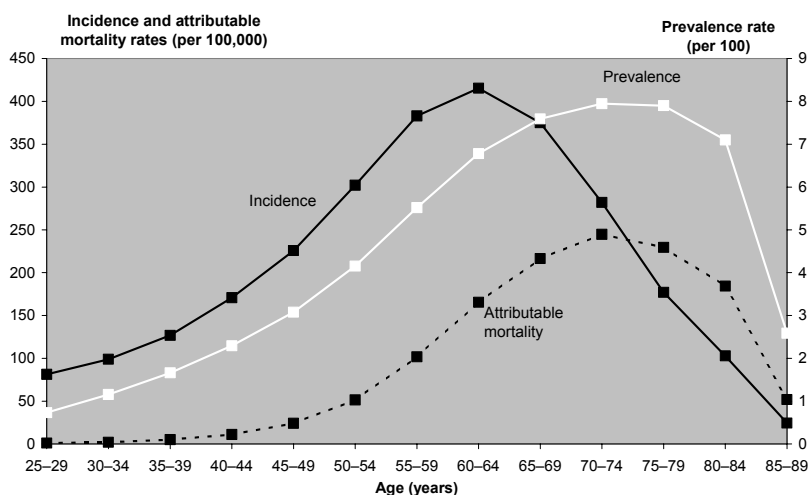
The incidence rates for Māori and Pacific peoples are more than three times higher than the European rates, and Māori and Pacific peoples are more than five times as likely to die from (diagnosed) diabetes.

Table 2: Modelled 1996 (diagnosed) diabetes rates

Rate	Male			Female		
	Māori	Pacific	European	Māori	Pacific	European
Incidence rate (per 100,000)	606	491	172	686	538	132
Prevalence rate (per 100)	8.0	6.8	3.1	9.8	8.2	2.5
Attributable mortality rate (per 100,000)	331	238	45	354	227	27

Note: all rates are age standardised to the WHO World population.

Figure 1: Modelled rates of (diagnosed) diabetes, by age, 1996



Note: genders and ethnic groups pooled.

For the population as a whole, diabetes incidence rates peak at ages 60–64 years. The prevalence and attributable mortality rates peak at ages 70–74 years, some 10 years later.

Table 3: Burden of (diagnosed) diabetes, 1996

	Male			Female		
	Māori	Pacific	European	Māori	Pacific	European
Lifetime risk of diabetes* (%)	26	23	10	32	27	8
Loss in life expectancy at birth of diabetics (years)	11.8	11.8	6.7	12.6	12.0	6.8
Years of life lost due to diabetes**	3551	841	5687	4328	940	4405

* Based on life table risk (i.e., takes into account mortality risk from all causes).

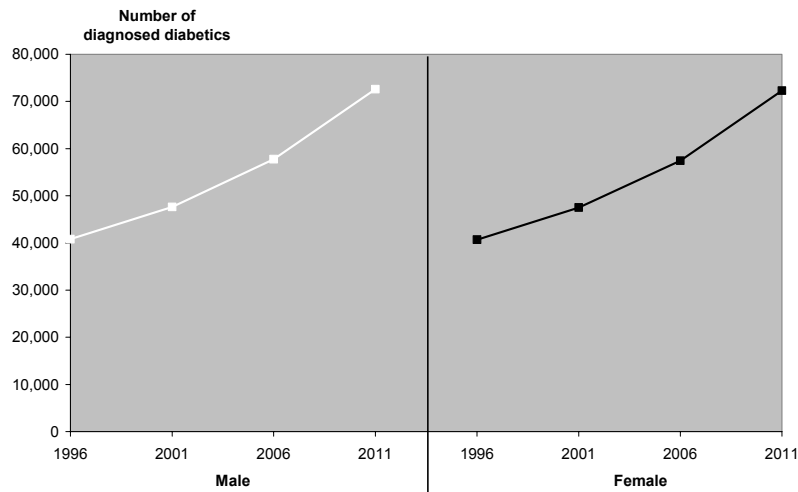
** Based on model life table West level 25 for males and 26 for females, discounted at 3% per year.

The lifetime risk of being diagnosed with diabetes is 25% or more for Māori and Pacific peoples, but less than 10% for Europeans. Pacific and Māori people living with diabetes lose on average about 12 years of life expectancy, and Europeans about seven years. In total, almost 20,000 years of life were lost to diabetes in 1996.

Forecasting the burden of diabetes to 2011

Based on the ‘most likely’ future scenario,¹ the diabetes epidemic is forecast to grow rapidly over the 15 years from 1996 to 2011.

Figure 2: Forecast increase in number of (diagnosed) diabetics, 1996 to 2011



¹ The ‘most likely’ scenario (1996 to 2011) assumes Statistics New Zealand series 4 population projection, increase in diabetes incidence rates by two-thirds (based on linear projection of obesity prevalence); and decrease in diabetes case fatality by one quarter (based on improvement in diabetes care) in all population subgroups. A number of other scenarios were also modelled in the report.

Table 4: Forecast 2011 counts

Number (forecast)	Male			Female			Total
	Māori	Pacific	European	Māori	Pacific	European	
New diagnoses	1532	469	3653	1934	575	2907	11,070
Existing diagnoses	16,202	4991	51,408	21,649	6558	44,105	144,913
Attributable deaths	403	103	618	454	105	421	2104

The number of new diagnoses of diabetes in 2011 is forecast to exceed 11,000, the number of people known to be living with diabetes may exceed 145,000, and the number of deaths attributable to diabetes may exceed 2100.

Table 5: Average annual compound rate of increase (%) from 1996 to 2011

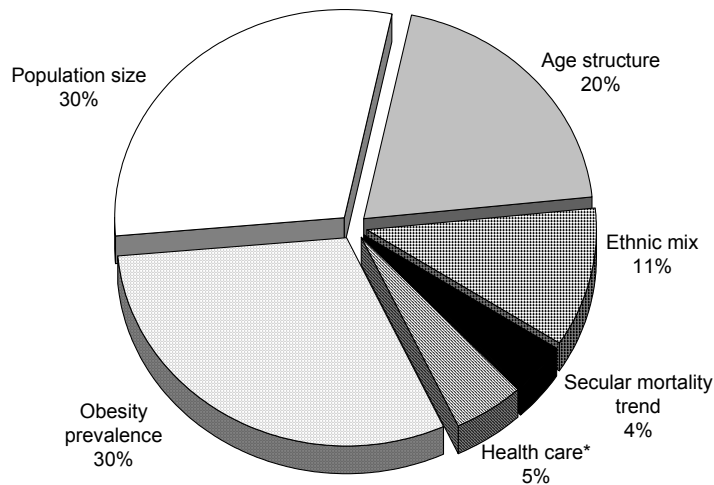
	Male			Female			Total
	Māori	Pacific	European	Māori	Pacific	European	
New diagnoses	6.6	7.2	5.2	6.8	7.4	5.2	5.8
Existing diagnoses	5.7	6.3	3.3	5.8	6.1	2.9	3.9
Attributable deaths	3.6	4.2	1.5	3.4	3.7	0.9	2.3

This amounts to a 1.8 fold increase in the number of existing diagnoses and more than doubling in the number of new diagnoses by 2011. The relative increase is forecast to be greater for Māori and Pacific peoples than for Europeans, further contributing to the health inequality between these ethnic groups.

What drives the growth in the diabetes epidemic?

Under the 'most likely' future scenario, the projected increase in the prevalence of obesity is a major driver, accounting for nearly a third of the overall increase in diabetes. Non-modifiable demographic factors account for the other two-thirds.

Figure 3: Relative contribution to forecast increase in number of (diagnosed) diabetics, 1996 to 2011



* 'Health care' refers to reduction in diabetes case fatality rate in excess of the secular mortality trend. Genders and ethnic groups pooled.

What is the potential scope for slowing the epidemic?

This will depend on our success in improving nutrition and raising physical activity levels among all population subgroups, so slowing the increase in obesity. Physical activity also decreases diabetes risk independently of obesity.

The model suggests that slowing the growth of the obesity epidemic to half its current rate—probably the best we could realistically achieve—would translate into 10% fewer people living with diabetes in 2011 than projected assuming the current trend in obesity continues unabated.

For more information

Full details of the modelling method, data sources, and results for different future scenarios are available in four occasional bulletins published by the Ministry of Health in 2002:

- *Modelling Diabetes: A summary*
- *Modelling Diabetes: 2011 forecast*
- *Modelling Diabetes: A multi-state life table model*
- *Modelling Diabetes: The mortality burden*

Limited copies of these reports are available from Wickliffe Ltd (tel 04 496 2277).

The reports are also published on the Ministry's web site: www.moh.govt.nz

Acknowledgements and disclaimer

The model was constructed and the reports written by Martin Tobias and Jit Cheung, Public Health Intelligence, Ministry of Health, and peer reviewed locally and internationally.

Opinions expressed are those of the authors and do not necessarily represent the view of the Ministry of Health. The Ministry of Health accepts no liability for decisions or actions based on the contents of these reports.