

Appendix B – Financial Model

Results

Costs of Type 2 Diabetes to Vote Health						
		Start Year	Year 5	Year 10	Year 15	Year 20
<i>Year Beginning</i>		<i>Jun-01</i>	<i>Jun-06</i>	<i>Jun-11</i>	<i>Jun-16</i>	<i>Jun-21</i>
Current Services - Scenario 1	\$m	247	398	588	809	1,066
Enhanced Services - Scenario 2	\$m	257	405	582	778	1,003
Optimal Services - Scenario 3	\$m	287	414	540	657	746

Prevention and Targeting strategies.						
		Year 1	Year 5	Year 10	Year 15	Year 20
		<i>Jun-01</i>	<i>Jun-06</i>	<i>Jun-11</i>	<i>Jun-16</i>	<i>Jun-21</i>
Current Services - Scenario 1		10	26	51	77	102
Enhanced Services - Scenario 2		20	50	86	119	153
Optimal Services - Scenario 3		50	110	181	265	339

Numbers suffering from severe complications						
		Year 1	Year 5	Year 10	Year 15	Year 20
		<i>Jun-01</i>	<i>Jun-06</i>	<i>Jun-11</i>	<i>Jun-16</i>	<i>Jun-21</i>
Current Services - Scenario 1						
Diagnosed		3,135	6,585	10,891	16,155	22,531
Undiagnosed		1,568	3,164	5,068	7,283	9,851
Total		4,703	9,749	15,960	23,438	32,382
Enhanced Services - Scenario 2						
Diagnosed		3,135	6,128	9,974	14,792	20,753
Undiagnosed		1,568	3,002	4,549	6,165	7,837
Total		4,703	9,130	14,524	20,958	28,590
Optimal Services - Scenario 3						
Diagnosed		3,292	5,472	7,539	9,702	11,377
Undiagnosed		1,411	2,198	2,485	2,084	1,349
Total		4,703	7,670	10,025	11,786	12,726

Cost Savings from Current Approach						
		Year 1	Year 5	Year 10	Year 15	Year 20
		<i>Jun-01</i>	<i>Jun-06</i>	<i>Jun-11</i>	<i>Jun-16</i>	<i>Jun-21</i>
Enhanced Services - Scenario 2	\$m -	10 -	7	6	31	63
Optimal Services - Scenario 3	\$m -	40 -	16	48	152	321

Assumptions

KEY	
Input Data - MOH	
Calculated Data From Calculation Sheet	
PWC Assumptions	

GENERAL ASSUMPTIONS							
Model Year	Base	Start Year	Year 5	Year 10	Year 15	Year 20	
MOH Financial Year (1)	2000/01	2001/02	2006/07	2011/12	2016/17	2021/22	
Diabetes Prevalence							
MOH Forecast - Diagnosed (Type 2) Diabetes (2)	103,858	106,404	119,338	133,895	149,576	166,749	
Type 2 as a % of Total Diabetes (3)	85%						
Undiagnosed Diabetes as a proportion of Diagnosed Diabetes (4):	50%	50%	50%	50%	50%	50%	
Hospital Care Costs Per Person							
Inpatient Treatment for Severe Complications (5)	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	
Inpatient Treatment for Minor Complications (6)	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	
Diabetes Specialist Services (7)	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	
Inpatient Treatment for Medium Complications due to undiagnosed diabetes (8)	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	
HFA Costs							
	Diabetes Total	Type 2					
Primary Care (9)	\$ 72,400,000	\$ 61,540,000					
Total Hospital costs for diagnosed diabetes (10):	\$ 90,000,000	\$ 76,500,000					
Inpatient	\$ 80,000,000	\$ 68,000,000					
Severe (90% of inpatient services) (11)	\$ 72,000,000	\$ 61,200,000					
Minor (10% of inpatient services) (11)	\$ 8,000,000	\$ 6,800,000					
Outpatient	\$ 10,000,000	\$ 8,500,000					
Estimated total Hospital costs for diagnosed and undiagnosed diabetes (12)	\$ 200,000,000	\$ 170,000,000					
Estimated total Hospital costs for undiagnosed diabetes	\$ 110,000,000	\$ 93,500,000					
% of Estimated Hospital Costs on Severe Complications (11)		90%					
% of Estimated Hospital Costs on Minor Complications(11)		10%					

Assumptions

- (1) The model takes the present financial year as base for spending for diagnosed diabetes. The scenarios start in the next financial year.
- (2) The prevalence figures of people with diagnosed Type 2 diabetes are taken from the model in the Diabetes 2000 report and are given in the table below, nominated into ethnicity groups.

	Base	Start Year	Year 5	Year 10	Year 15	Year 20
Other	71,487	72,825	79,328	86,349	93,670	101,417
Maori	23,952	24,824	29,398	34,715	40,565	47,073
Pacific Island	8,420	8,755	10,612	12,831	15,341	18,259
TOTAL	103,858	106,404	119,338	133,895	149,576	166,749

- (3) Of all people with diabetes, 85% are assumed to have Type 2 diabetes and therefore 85% of HFA estimated spending for diabetes is allocated to Type 2 diabetes on the model.
- (4) The Fletcher Workforce study (ref 52, p.15) found that about 2/3 of the people with Type 2 diabetes had not been diagnosed before. Therefore the model assumes that another 50% of the people with diagnosed Type 2 diabetes have Type 2 diabetes but are not diagnosed.
- (5) The average cost of severe complications is based on the following figures:

Average cost of Stroke	\$17,857 ^(a)
Average cost of Dialysis – first year	\$37,000 ^(b)
Average cost of Dialysis – subsequent years	\$25,044 ^(b)
Average cost of Home Dialysis	\$24,567 ^(b)
Average cost of Coronary Bypass	\$17,870 ^(b)
Average cost of Foot Amputation with rehabilitation	\$17,150 ^(b)
Estimated Cost per Severe Complication	\$20,000^(c)

(a) calculated from a total cost of \$125 million estimated to be spent annually on an average of 7000 patients. The cost includes rehabilitation.

(b) Cost provided by Christchurch Hospital

(c) Rounded estimate average cost for severe complications

- (6) The average cost of inpatient treatment for minor complications was arbitrarily estimated to be \$1000.
- (7) The cost of for diabetes specialist services was estimated to be \$1000. This includes intensive blood glucose control according to the UK Prospective Diabetes Study Group, eye-screening, dietitian services etc.
- (8) People with undiagnosed diabetes might be hospitalised due to a condition that was caused by their diabetes, eg pneumonia. An average cost of \$10,000 for hospital treatment was estimated.
- (9) The HFA estimates the spending on primary care for diabetes to be \$70 million in 1999/2000. This amount was increased in the model under the assumption that \$5 million extra funding annually that is proposed in the *Diabetes 2000* report is split \$2.4 million into primary care, \$0.2 million into Public Health and \$2.4 million for diabetes specialist services.
- (10) The HFA estimates the spending on hospital care for diabetes to be \$90 million of which \$80 million is spent on inpatient services and \$10 million on outpatient services.
- (11) Of the spending on inpatient hospital care 90% is assumed to be spent on severe complication and 10% on minor complications.
- (12) Simmons (ref 33, p7) estimated the true spending on hospital care for people with diabetes to be \$200 million. Here we assume that the difference to the HFA estimate of \$110 million is spent on people with previously undiagnosed diabetes.

Assumptions

CURRENT SERVICES - SCENARIO 1	Base	Start Year	Year 5	Year 10	Year 15	Year 20
	2000/01	2001/02	2006/07	2011/12	2016/17	2021/22
% of new diagnoses due to screening etc (13)		0%	0%	0%	0%	0%
Diagnosed Diabetes						
Increase in the percentage of people diagnosed with severe complications (14)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people diagnosed with severe complications (15)	2.95%	2.95%	5.45%	7.95%	10.45%	12.95%
Increase in the percentage of people diagnosed with minor complications (16)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of diagnosed people with minor complications (17)	6.55%	6.55%	9.05%	11.55%	14.05%	16.55%
Percentage of diagnosed people who get specialist diabetes services (18)		4.51%	10.06%	17.92%	24.07%	28.79%
Undiagnosed Diabetes						
Increase in the percentage of people undiagnosed with severe complications (19)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with severe complications (20)	2.95%	2.95%	5.45%	7.95%	10.45%	12.95%
Increase in the percentage of people undiagnosed with minor complications (21)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with minor complications (22)	6.55%	6.55%	9.05%	11.55%	14.05%	16.55%
Increase in the percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (23)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (24)	11.46%	11.46%	13.96%	16.46%	18.96%	21.46%
Primary Care						
Primary care per person with type 2 diabetes (25)	\$ 593	593	593	593	593	593
Targeted Primary Care for all diagnosed person with type 2 diabetes (26)	\$ 2,400,000	4,800,000	12,000,000	24,000,000	36,000,000	48,000,000
Fixed Costs						
Outpatient Costs (27)	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
Public Health (28)	\$ 400,000	600,000	1,400,000	2,400,000	3,400,000	4,400,000
Monitoring Tools (29)	0	0	0	0	0	0
Research (30)	0	0	0	0	0	0
Register and Local Teams (31)	0	0	0	0	0	0

- (13) The percentage of people with undiagnosed Type 2 diabetes that are diagnosed due to screening and targeting.

Scenario	Start Year	Year 5	Year 10	Year 15	Year 20
Current Services	0.0%	0.0%	0.0%	0.0%	0.0%
Enhanced Services	0.0%	5.0%	10.0%	15.0%	20.0%
Optimal Service	10.0%	30.0%	50.0%	70.0%	85.0%

- (14) The percentage increase of people with diagnosed Type 2 diabetes who develop severe complications. Due to an ageing population and an predicted increase in obesity, the percentage is estimated to increase by 0.5% of the total population each year in the current scenario (making 2.5% increase over 5 years). The same increase is expected for minor complications (16) and for minor, medium and severe complications in people with undiagnosed diabetes (19,21,23). In the enhanced scenario the increase in complications for people with diagnosed diabetes is expected to slow down to 0.4% annually as preventive measures take their effect (2% increase over 5 years). In the optimal service scenario the increase in complications slows with time and comes to a halt after 20 years. In both the enhanced and the optimal service scenarios, the percentage of people with undiagnosed Type 2 diabetes developing complications is the same as in the current scenario because none of the extra spending has reached them or otherwise they would have become diagnosed.

- (15) The 2.95% of people with diagnosed diabetes developing severe complications is calculated from the estimated spending on severe complications (40) and is the base to estimate the future prevalence of severe complications by adding the percentage estimated in (14). The table below compares the prevalence of severe complications in people with diagnosed Type 2 diabetes under the different scenarios.

Scenario	Start Year	Year 5	Year 10	Year 15	Year 20
Current Services	2.95%	5.45%	7.95%	10.45%	12.95%
Enhanced Services	2.95%	4.95%	6.95%	8.95%	10.95%
Optimal Service	2.95%	3.95%	4.45%	4.75%	4.75%

- (16) The percentage increase of minor complications in people with diagnosed Type 2 diabetes is assumed to be the same as argued under (14) for severe complications.

- (17) Equally to (15), the 6.55% of people with diagnosed diabetes developing minor complications is calculated from the estimated spending on minor complications (40) and is the base to estimate the future prevalence of minor complications by adding the percentage estimated in (14). The table below compares the prevalence of minor complication in people with diagnosed Type 2 diabetes under the different scenarios.

Scenario	Start Year	Year 5	Year 10	Year 15	Year 20
Current Services	6.55%	9.05%	11.55%	14.05%	16.55%
Enhanced Services	6.55%	8.55%	10.55%	12.55%	14.55%
Optimal Service	6.55%	7.55%	8.05%	8.35%	8.35%

- (18) It was estimated that of \$5 million additional annual spending for diabetes proposed in the *Diabetes 2000* report, \$2.4 million would be spent on diabetes specialist services such as blood glucose control, dietitians, eye screening, podiatry etc with a cost of \$1000 per patient (7). This allows us to calculate the percentage of people with diagnosed diabetes receiving diabetes specialist services (43). In the enhanced service scenario, the spending, and thus the percentage of people receiving services was doubled in the first year, and increased by 10% of the total population compared to the current scenario for following years.

ENHANCED SERVICES - SCENARIO 2	Base	Start Year	Year 5	Year 10	Year 15	Year 20
	2000/01	2001/02	2006/07	2011/12	2016/17	2021/22
% of new diagnoses due to screening etc (13)		0%	5%	10%	15%	20%
Diagnosed Diabetes						
Increase in the percentage of people diagnosed with severe complications (14)		0.00%	2.00%	2.00%	2.00%	2.00%
Percentage of people diagnosed with severe complications (15)	2.95%	2.95%	4.95%	6.95%	8.95%	10.95%
Increase in the percentage of people diagnosed with minor complications (16)		0.00%	2.00%	2.00%	2.00%	2.00%
Percentage of diagnosed people with minor complications (17)	6.55%	6.55%	8.55%	10.55%	12.55%	14.55%
Increase in the percentage of diagnosed people who get specialist diabetes services (18)		200.00%	10.00%	10.00%	10.00%	10.00%
Percentage of diagnosed people who get specialist diabetes services (18)		9.02%	20.06%	27.92%	34.07%	38.79%
Undiagnosed Diabetes						
Increase in the percentage of people undiagnosed with severe complications (19)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with severe complications (20)	2.95%	2.95%	5.45%	7.95%	10.45%	12.95%
Increase in the percentage of people undiagnosed with minor complications (21)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with minor complications (22)	6.55%	6.55%	9.05%	11.55%	14.05%	16.55%
Increase in the percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (23)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (24)	11.46%	11.46%	13.96%	16.46%	18.96%	21.46%
Primary Care						
Primary care per person with type 2 diabetes (25)	\$ 593	593	593	593	593	593
Targeted Primary Care for all diagnosed person with type 2 diabetes (26)	\$ 2,400,000	4,800,000	12,000,000	24,000,000	36,000,000	48,000,000
Targeted Primary Care per newly diagnosed person with type 2 diabetes		1000	1000	1000	1000	1000
Fixed Costs						
Outpatient Costs (27)	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
Public Health (28)	\$ 400,000	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000
Monitoring Tools (29)	\$ -	500,000	1,000,000	1,000,000	1,000,000	1,000,000
Research (30)	\$ -	1,000,000	5,000,000	10,000,000	10,000,000	10,000,000
Register and Local Teams (31)	\$ -	500,000	500,000	500,000	500,000	500,000

- (18 ctd) In the optimal service scenario, the initial spending was tripled, and then increased to reach further 30% of people with undiagnosed Type 2 diabetes after 5 years, another 25% after 10 years, 20% after 15 years and 10% after 20 years so that at the end of the 20 year period nearly all people with diagnosed Type 2 diabetes receive diabetes specialist services.
- (19) The percentage increase of people with undiagnosed Type 2 diabetes is assumed to be the same as for people with diagnosed Type 2 diabetes in the current services (14).
- (20) The percentage of people with undiagnosed Type 2 diabetes is calculated as in (15).
- (21) Assumed to be the same as (14) and (16)
- (22) Follows to be the same as (17) current scenario for all scenarios.
- (23) Assumed to be the same as (14) and (16)
- (24) The initial percentage of people with undiagnosed Type 2 diabetes developing medium complications is calculated from the estimated spending for this (37). The percentage remains the same for all scenarios but as the number of undiagnosed people decreases through targeting and screening, the actual spending decreases for the enhanced and even more so for the optimal services scenario.
- (25) This is the average spending on primary care for people with diagnosed Type 2 diabetes (42). In the current services all people with diagnosed Type 2 diabetes are assumed to receive primary care treatment of this cost. In the enhanced and optimal service scenarios all people that were previously diagnosed receive primary care for the amount, while people that were newly diagnosed in that year receive a higher amount (26).
- (26) It was estimated that of \$5 million additional annual spending for diabetes proposed in the *Diabetes 2000* report, \$2.4 million would be spent on primary care. This spending is categorised as 'Targeted Primary Care' and added as a fixed spending (not linked to the number of patients treated) in the current scenario. In the enhanced services scenario in addition to this spending, \$1000 is spend on each newly diagnosed person. In the optimal service scenario the spending on targeted primary care is only linked to the people that are newly diagnosed with Type 2 diabetes.
- (27) The current estimated spending for outpatient services is \$8.5 million. This is assumed to remain the same fixed cost in each scenario. An increase of outpatient services is covered by the diabetes specialist services which vary between the different scenarios (18).
- (28) It was estimated that of \$5 million additional annual spending for diabetes proposed in the *Diabetes 2000* report, \$0.2 million would be spent on public health. The spending of public health is raised from \$0.4 million by \$0.2 million annually in the current services scenario. In the enhanced service scenario the spending remains static at \$3.5 million annually, and in the optima service scenario the spending is \$19 million in the first year and \$20 million annually in the following years.
- (29) In contrast to the current services scenario, the enhanced and optimal services scenarios introduce funding of \$0.5 million in the first year and \$1 million thereafter for monitoring tools.
- (30) In the enhanced scenario, the spending on research is raised from \$1 million annually in the first year to \$5 million annually after five years to \$10 million annually after 10 years. In the optimal service scenario, \$10 million are spent on research annually from year 1.
- (31) The enhanced and optimal services provide \$0.5 million annually for Register and Local Teams.

OPTIMAL SERVICES - SCENARIO 3	Base	Start Year	Year 5	Year 10	Year 15	Year 20
	2000/01	2001/02	2006/07	2011/12	2016/17	2021/22
% of new diagnoses due to screening etc (13)		10%	30%	50%	70%	85%
Diagnosed Diabetes						
Increase in the percentage of people diagnosed with severe complications (14)		0.00%	1.00%	0.50%	0.30%	0.00%
Percentage of people diagnosed with severe complications (15)	2.95%	2.95%	3.95%	4.45%	4.75%	4.75%
Increase in the percentage of people diagnosed with minor complications (16)		0.00%	1.00%	0.50%	0.30%	0.00%
Percentage of diagnosed people with minor complications (17)	6.55%	6.55%	7.55%	8.05%	8.35%	8.35%
Increase in the percentage of diagnosed people who get specialist diabetes services (18)		300.00%	30.00%	25.00%	20.00%	10.00%
Percentage of diagnosed people who get specialist diabetes services (18)		13.53%	43.53%	68.53%	88.53%	98.53%
Undiagnosed Diabetes						
Increase in the percentage of people undiagnosed with severe complications (19)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with severe complications (20)	2.95%	2.95%	5.45%	7.95%	10.45%	12.95%
Increase in the percentage of people undiagnosed with minor complications (21)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with minor complications (22)	6.55%	6.55%	9.05%	11.55%	14.05%	16.55%
Increase in the percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (23)		0.00%	2.50%	2.50%	2.50%	2.50%
Percentage of people undiagnosed with Medium Complications due to undiagnosed diabetes (24)	11.46%	11.46%	13.96%	16.46%	18.96%	21.46%
Primary Care						
Primary care per person with type 2 diabetes (25)	\$ 593	593	593	593	593	593
Targeted Primary Care per newly diagnosed person with type 2 diabetes (26)		1000	1000	1000	1000	1000
Fixed Costs						
Outpatient Costs (27)	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
Public Health (28)	\$ 400,000	19,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Monitoring Tools (29)	\$ -	500,000	1,000,000	1,000,000	1,000,000	1,000,000
Research (30)	\$ -	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Register and Local Teams (31)	\$ -	500,000	500,000	500,000	500,000	500,000

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Base Calculation and Prevalence Data

Prevalence (32)

Base Diabetes Prevalence - MOH Forecasts	Base	Start Year	Year 5	Year 10	Year 15	Year 20
Diagnosed Diabetes	103,858	106,404	119,338	133,895	149,576	166,749
Undiagnosed Diabetes	51,929	53,202	59,669	66,947	74,788	83,375

Calculation of Base Assumptions

Current Funding Costs - Diabetes 2000	Base Year Type 2
Hospital Care	
Actual \$ Spent on Hospital Care on Diagnosed Type 2 diabetes (33)	\$ 76,500,000
Estimated \$ for Undiagnosed Spent on Hospital Care (34)	\$ 93,500,000

Complication Breakdown		
Diagnosed Diabetes		
% of Estimated Hospital Costs on Severe Complications (35)		90%
% of Estimated Hospital Costs on Minor Complications (35)		10%
Diagnosed Diabetes Inpatient Care		
		Type 2
Inpatient care - \$ spent on severe complications (36)	\$	61,200,000
Inpatient care - \$ spent on minor complications (36)	\$	6,800,000
TOTAL	\$	68,000,000
Undiagnosed Diabetes (37)		
Hospital care - \$ spent on severe complications	\$	30,600,000
Hospital care - \$ spent on minor complications	\$	3,400,000
Hospital care - \$ spent on medium complications	\$	59,500,000
TOTAL	\$	93,500,000
Diagnosed Diabetes		
		BASE
Number of diagnosed with severe complications (38)	No of People	3,060
Number of diagnosed with minor complications (38)	No of People	6,800
Undiagnosed Diabetes		
		BASE
Number of undiagnosed with severe complications (39)	No of People	1,530
Number of undiagnosed with minor complications (39)	No of People	3,400
Number of undiagnosed with medium complications (39)	No of People	5,950

To Be Used As Base Assumptions:		
% of Diagnosed with (40)		
Severe Complications	%	2.95%
Minor Complications	%	6.55%
% of Undiagnosed with (41)		
Severe Complications	%	2.95%
Minor Complications	%	6.55%
Medium Complications	%	11.46%
Primary Care Cost Per Person (42)	\$	593

Specialist Diabetes Services Calculations (43)	Base	Start Year	Year 5	Year 10	Year 15	Year 20
	2000/01	2001/02	2006/07	2011/12	2016/17	2021/22
<i>Used as starter assumptions</i>						
Current Additional Spending on Specialist Diabetes Services	2,400,000	4,800,000	12,000,000	24,000,000	36,000,000	48,000,000
Patients treated	2400	4800	12000	24000	36000	48000
% of diagnosed diabetes who are treated	2.31%	4.51%	10.06%	17.92%	24.07%	28.79%

- (32) The prevalence data from the *Diabetes 2000* report use the assumption (4) for people with undiagnosed Type 2 diabetes.
- (33) Total spending on hospital cost for people with diagnosed Type 2 diabetes. Please refer to (10).
- (34) Total spending on hospital cost for people with undiagnosed Type 2 diabetes. Please refer to (12).
- (35) The cost between severe and minor complications are assumed to be split 90%:10%. Please refer to (11).
- (36) This is the amount spent on minor and severe complications with the above assumption.
- (37) This is the split in spending for severe, minor and medium complications assuming severe and minor complication incur at the same percentage with people with undiagnosed diabetes than for people with diagnosed diabetes (20) and (22).
- (38) This is the number of people that are treated with severe and minor complications under the assumption of total spending (36) and average cost per treatment (5) and (6).
- (39) This is the number of people with severe, minor, and medium complications under the assumption of total spending (37) and average cost per treatment (5), (6) and (8).
- (40) The percentage of people with diagnosed Type 2 diabetes developing severe and minor complications is calculated from the number of patients receiving treatment (38) and the prevalence data (32). This feeds into (15) and (17).
- (41) The percentage of people with undiagnosed Type 2 diabetes developing severe and minor complications assumed to be the same as for people with diagnosed Type 2 diabetes. The percentage of people with undiagnosed Type 2 diabetes developing medium complications is calculated from the number of patients with medium complications (39) and the prevalence data (32).
- (42) The average cost of primary care is calculated from the estimated spending on primary care for people with diagnosed Type 2 diabetes (9) and the prevalence data (32) and feeds into (25).
- (43) This is the calculation which is explained under (18). The percentage of people that receive diabetes specialist services is used as a base in the current and enhanced services scenarios while in the optimal service scenario, treatment is given to more people at the beginning.

Current Services – Scenario 1

Prevalence		Start Year	Year 5	Year 10	Year 15	Year 20
	Units	2001/02	2006/07	2011/12	2016/17	2021/22
Base (44)						
Diagnosed Diabetes	No.	106,404	119,338	133,895	149,576	166,749
Undiagnosed Diabetes	No.	53,202	59,669	66,947	74,788	83,375
Undiagnosed - now Diagnosed due to screening etc (45)	No.	0	0	0	0	0
Undiagnosed - now Diagnosed due to complications (46)	No.	0	1,568	3,164	5,068	7,283
New total Diagnosed Diabetes (47)	No.	106,404	120,905	137,059	154,644	174,032
New Total Undiagnosed (48)	No.	53,202	58,101	63,783	69,719	76,091

Calculations:		Start Year	Year 5	Year 10	Year 15	Year 20
		2001/02	2006/07	2011/12	2016/17	2021/22
DIAGNOSED DIABETES						
Cost of Severe Complications (49)	\$	62,700,135	131,697,704	217,822,677	323,092,358	450,615,253
Cost of Minor Complications (50)	\$	6,966,682	10,938,750	15,826,699	21,723,437	28,797,757
Cost of Diabetes Specialist Services (51)	\$	4,800,000	12,157,620	24,567,202	37,219,863	50,096,501
Cost of Primary Care (52)	\$	63,048,469	71,640,866	81,212,474	91,632,392	103,120,542
Cost of Primary Care -targeted (53)	\$	4,800,000	12,000,000	24,000,000	36,000,000	48,000,000
TOTAL \$		142,315,286	238,434,940	363,429,053	509,668,051	680,630,054
UNDIAGNOSED DIABETES						
Cost of Severe Complications (54)	\$	31,350,067	63,287,716	101,367,775	145,662,381	197,020,756
Cost of Minor Complications (55)	\$	3,483,341	5,256,648	7,365,244	9,793,756	12,591,131
Cost of Medium Complications (56)	\$	60,958,465	81,097,334	104,973,199	132,173,509	163,276,226
TOTAL \$		95,791,873	149,641,698	213,706,219	287,629,645	372,888,114
FIXED COSTS						
Public Health (28)	\$	600,000	1,400,000	2,400,000	3,400,000	4,400,000
Monitoring Tools (29)	\$	0	0	0	0	0
Research (30)	\$	0	0	0	0	0
Register and Local Teams (31)	\$	0	0	0	0	0
Outpatient Services (27)	\$	8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
TOTAL \$		9,100,000	9,900,000	10,900,000	11,900,000	12,900,000
TOTAL COSTS (57)		247,207,158	397,976,638	588,035,271	809,197,696	1,066,418,168

- (44) This are the base prevalence data from (32).
- (45) This is the number of people that become diagnosed through screening and targeting which is calculated by multiplying the percentage of people that become diagnosed (13) with the number of people with undiagnosed diabetes (44).
- (46) This is the number of people that had became diagnosed in the previous time interval because they had severe complications. The model assumes that people with undiagnosed diabetes who had minor or medium complications were not diagnosed at that time.
- (47) This is new number of people with diagnosed diabetes which is calculated by adding the number of new diagnosed to the previously diagnosed.
- (48) This is the new number of people with undiagnosed Type 2 diabetes which is calculated by subtracting the number of newly diagnosed people from the number of people that were undiagnosed.
- (49) The cost for severe complications is calculated by multiplying the percentage of people that develop severe complications (15) with the total number of people with diagnosed Type 2 diabetes (47) and the cost for severe complications (5).
- (50) The cost for minor complications is calculated by multiplying the percentage of people that have minor complications (17) with the total number of people with diagnosed Type 2 diabetes (47) and the cost for minor complications (6).
- (51) The cost of diabetes specialist services is calculated from the percentage of people that receive this service (18), the cost for the service (7) and the total number of people with diagnosed diabetes (47).
- (52) The cost of primary care is calculated from the total number of people with diagnosed Type 2 diabetes (47) and the average cost per patient for primary care (25).
- (53) The cost of targeted primary care varies between scenarios as explained under (26).
- (54) The cost of severe complications is calculated by multiplying the percentage of people that develop severe complications (20) with the total number of people with undiagnosed diabetes (48) and the cost of severe complications (5). In the optimal scenario the same prevalence data was used as in the other scenarios in the start year because even though people were diagnosed, there was no time for treatment to prevent complications. The same applies for minor and medium complications.
- (55) The cost of minor complications are calculated following the same principle as (54), using (22), (48) and (6).
- (56) The cost of minor complications are calculated following the same principle as (54), using (24), (48) and (8).
- (57) This is the total costs for Type 2 diabetes to Vote Health, calculated by adding the total cost for people with diagnosed Type 2 diabetes, the total cost for people with undiagnosed Type 2 diabetes and the total fixed costs.

Enhanced Services – Scenario 2

Prevalence		Start Year	Year 5	Year 10	Year 15	Year 20
	Units	2001/02	2006/07	2011/12	2016/17	2021/22
Base (44)						
Diagnosed Diabetes	No.	106,404	119,338	133,895	149,576	166,749
Undiagnosed Diabetes	No.	53,202	59,669	66,947	74,788	83,375
Undiagnosed - now Diagnosed due to screening etc (45)	No.	0	2,983	6,695	11,218	16,675
Undiagnosed - now Diagnosed due to complications (46)	No.	0	1,568	3,002	4,549	6,165
New total Diagnosed Diabetes (47)	No.	106,404	123,889	143,591	165,343	189,589
New Total Undiagnosed (48)	No.	53,202	55,118	57,251	59,020	60,534

Calculations:		Start Year	Year 5	Year 10	Year 15	Year 20
		2001/02	2006/07	2011/12	2016/17	2021/22
DIAGNOSED DIABETES						
Cost of Severe Complications (49)	\$	62,700,135	122,558,588	199,485,898	295,842,639	415,061,277
Cost of Minor Complications (50)	\$	6,966,682	10,589,230	15,145,089	20,746,232	27,580,283
Cost of Diabetes Specialist Services (51)	\$	9,600,000	24,846,493	40,097,190	56,329,259	73,533,720
Cost of Primary Care (52)	\$	63,048,469	71,640,866	81,116,194	91,324,822	102,458,285
Cost of Primary Care -targeted (53)	\$	4,800,000	14,983,445	30,694,725	47,218,182	64,674,910
TOTAL \$		147,115,286	244,618,622	366,539,096	511,461,134	683,308,476
UNDIAGNOSED DIABETES						
Cost of Severe Complications (54)	\$	31,350,067	60,037,959	90,986,329	123,309,122	156,738,946
Cost of Minor Complications (55)	\$	3,483,341	4,986,725	6,610,943	8,290,812	10,016,816
Cost of Medium Complications (56)	\$	60,958,465	76,933,072	94,222,509	111,890,245	129,893,642
TOTAL \$		95,791,873	141,957,756	191,819,781	243,490,179	296,649,404
FIXED COSTS						
Public Health (28)	\$	3,500,000	3,500,000	3,500,000	3,500,000	3,500,000
Monitoring Tools (29)	\$	500,000	1,000,000	1,000,000	1,000,000	1,000,000
Research (30)	\$	1,000,000	5,000,000	10,000,000	10,000,000	10,000,000
Register and Local Teams (31)	\$	500,000	500,000	500,000	500,000	500,000
Outpatient Services (27)		8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
TOTAL \$		14,000,000	18,500,000	23,500,000	23,500,000	23,500,000
TOTAL COSTS (57)		256,907,158	405,076,377	581,858,876	778,451,313	1,003,457,880

Optimal Services – Scenario 3

Prevalence		Start Year	Year 5	Year 10	Year 15	Year 20
	Units	2001/02	2006/07	2011/12	2016/17	2021/22
Base (44)						
Diagnosed Diabetes	No.	106,404	119,338	133,895	149,576	166,749
Undiagnosed Diabetes	No.	53,202	59,669	66,947	74,788	83,375
Undiagnosed - now Diagnosed due to screening etc (45)	No.	5,320	17,901	33,474	52,352	70,868
Undiagnosed - now Diagnosed due to complications (46)	No.	0	1,411	2,198	2,485	2,084
New total Diagnosed Diabetes (47)	No.	111,724	138,649	169,566	204,413	239,702
New Total Undiagnosed (48)	No.	47,882	40,357	31,276	19,951	10,422

Calculations:		Start Year	Year 5	Year 10	Year 15	Year 20
		2001/02	2006/07	2011/12	2016/17	2021/22
DIAGNOSED DIABETES						
Cost of Severe Complications (49)	\$	62,700,135	109,430,742	150,788,949	194,041,338	227,539,975
Cost of Minor Complications (50)	\$	6,966,682	10,464,370	13,645,615	17,063,073	20,008,784
Cost of Diabetes Specialist Services (51)	\$	15,120,000	60,358,565	116,209,250	180,973,150	236,185,902
Cost of Primary Care (52)	\$	63,048,469	71,547,986	80,639,852	90,101,793	100,039,963
Cost of Primary Care -targeted (53)	\$	5,320,213	17,900,668	33,473,626	52,351,516	70,868,368
TOTAL \$		153,155,499	269,702,330	394,757,293	534,530,868	654,642,992
UNDIAGNOSED DIABETES						
Cost of Severe Complications (54)	\$	31,350,067	43,959,916	49,705,214	41,683,110	26,985,373
Cost of Minor Complications (55)	\$	3,483,341	3,651,290	3,611,513	2,802,605	1,724,571
Cost of Medium Complications (56)	\$	60,958,465	56,330,552	51,473,117	37,823,101	22,363,481
TOTAL \$		95,791,873	103,941,759	104,789,845	82,308,816	51,073,425
FIXED COSTS						
Public Health (28)	\$	19,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Monitoring Tools (29)	\$	500,000	1,000,000	1,000,000	1,000,000	1,000,000
Research (30)	\$	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Register and Local Teams (31)	\$	500,000	500,000	500,000	500,000	500,000
Outpatient Services (27)		8,500,000	8,500,000	8,500,000	8,500,000	8,500,000
TOTAL \$		38,500,000	40,000,000	40,000,000	40,000,000	40,000,000
TOTAL COSTS (57)		287,447,371	413,644,089	539,547,138	656,839,684	745,716,417

