9. Enhanced Services (Scenario 2)

The enhanced services scenario assumes an increase in targeted service provision above current levels, as well as increased research, monitoring and other public health services. It is based on international research findings and assumptions, which suggest a combination of services to assist with better targeting and to delay or reduce severe complications such as heart attack, stroke, kidney failure or limb amputation.

The additional services and treatments include minor increases in publicly provided personal health services, more screening of high-risk groups, additional public health services designed based on research.

This scenario also assumes greater service effectiveness because of improved access to services, particularly GP and specialist services, when a patient is first diagnosed with diabetes. Under this scenario, it is expected that the outcomes for more of those with diabetes will be improved and severe complications will be delayed. The rationale behind this scenario is that by increasing the level of education, those with undiagnosed diabetes are likely to get early treatment and avoid some severe complications. Further, greater access to effective services by those with diagnosed diabetes will also have the effect of delaying complications.

The outcome sought under this scenario is an increase in complications-free diabetes years and reduced severe complications. This will increase quality of life for the individual and increase life expectancy. It will also save costs over the next twenty years because of reductions in severe complications.

It should be noted that primary and public health preventive strategies for Type 2 diabetes may also be useful in the prevention of other non-communicable diseases, such as heart disease and high blood pressure, especially if linked to community based awareness programmes and screening. This scenario does not attempt to estimate the cost savings due to reduction in numbers of these other disorders which would follow.

Table 32: Enhanced Services (Scenario 2)

The increase in the level of services required (in addition to that already supplied) should be as follows:

- specific targeting and screening for undiagnosed diabetes which would benefit from early intervention. Education focused on at risk communities (low socio-economic ethnic groups, people with family history of diabetes, people who are obese etc)
- four free hours per year per person with diagnosed diabetes of nutrition and health education services, to be delivered by specially trained educators and dietitian
- four free GP visits per year for people with diagnosed diabetes
- increased free eye screening
- one free podiatrist visit per year
- initiation and development of a co-ordinated diabetes register and monitoring system
- increase in research to find more effective ways to prevent complications for people with Type 2 diabetes

The above services are likely to generate the following outcomes:

1. New diagnoses of Type 2 diabetes: 5% in year 5, 10% in year 10, 15% in year 15, and 20% in year 20
2. New diagnoses of IGT at the same rate
3. A slowing of the increase of diagnosed people suffering from complications

In countries with well-organised diabetes health care, such as Scandinavian countries, Australia or Canada, services are provided to ensure access. Coverage in New Zealand is more limited and remains still limited under Scenario 2 with some further targeting to provide more effective services.

These specific diabetes services would need to be delivered through the relevant health and non-health organisation of a collaborative basis with ongoing obesity and dietary education throughout schools and the population. There is a significant body of research that shows the biggest risk factor for diabetes is obesity.

Table 33: Summary of literature that supports proactive services for people with diabetes

UK Prospective Diabetes Study: Services which enable intensive control of blood glucose reduces the risk of diabetes-related complications *Eastman and Kean:* Found people with diagnosed diabetes live longer with less cardiovascular disease if they receive more aggressive treatment *Diabetic Retinopathy:* Blindness can be prevented *Footcare:* Education reduces lower extremity abnormalities.

The main studies are discussed briefly below.

The UK Prospective Diabetes Study is one of the biggest international evidence based research project. Among the UKPDS findings is that intensive control of blood glucose concentrations in patients with Type 2 diabetes significantly reduces the risk of diabetes-related complications[102]. In particular, the UKPDS study has shown that:

- Better blood glucose control reduces the risk of:
  - major diabetic eye disease by a quarter
  - early kidney damage by a third
- Better blood pressure control, in the many patients who have high blood pressure, reduces the risk of:
  - death from long-term complications of diabetes by a third
  - strokes by more than a third
  - serious deterioration of vision by more than a third

The additional costs of intensive glucose control are largely offset by significant reductions in the costs of treating complications of diabetes. The intensive management of patients with Type 2 diabetes is a feasible and supportable option[103].

The importance of early diagnosis is addressed. UKPDS has shown that, by the time diabetes is diagnosed, approximately half of the people with Type 2 diabetes already have some evidence of diabetic tissue damage. The results of UKPDS suggest that a formal screening programme should be established in high risk to identify diabetes before symptoms occur[104]. This would allow early therapy and greater chance of results, as the sooner

[102] UK Prospective Diabetes Study (UKPDS 33).
[103] A Gray, M Raikou, A McGuire, P.Fenn, R Stevens, C. Cull, I. Stratton, A. Alder, R. Holman and R. Turner, on behalf of the UKPDS, 2000.
[104] UK Prospective Diabetes Study , Turner R, Holman R, Fox C, Wright D, Hadden, D.

diabetes is diagnosed, the greater chance of treating merely a micro-chemical disorder i.e. raised blood sugar rather than waiting until the high sugar overflowing into tissue eventually alter the tissue and thus the function of the organs such as eyes, kidneys or blood vessels[105]. Under the microscope, no changes can be seen in eyes or kidneys for those with IGT, but when there is 20 years of raised blood sugar, such tissue damage can always be seen[106].

(a) Cardiovascular Disease

Eastman and Kean[107] reviewed work on the causal relationship between diabetes and cardiovascular disease and concluded that people with diabetes will live longer if they receive more aggressive correction of smoking, dyslipidaemia and high arterial pressure, combined with intensive glycaemic control[108]. In practice, this suggests an emphasis in the GP's check lists and education to ensure that people with diabetes are receiving the support they need.

(b) Diabetic Retinopathy

Prevention strategies involving the early detection of retinopathy have been shown to be effective in preventing blindness. The cost effectiveness of screening for retinopathy has been well-established[109]. The HFA accepts that regular screening and appropriate treatment has proven to be both effective and cost effective[110].

(c) Footcare

In a randomised controlled study, aimed at showing how education reduces lower extremity abnormalities, results showed that primary care physicians in the intervention group conducted more examinations of lower extremities, identified those at risk for amputation and referred more patients for podiatric care. Patients in the intervention groups received ore patient education, made more changes in appropriate self-care behaviours, and had fewer short-term foot problems than patients in the control unexamined group[111].

The key elements of preventive care include: annual examination of the feet including the nerves by health care providers to determine risk factors for ulceration; subsequent exams of high risk feet at each patient visit[112]; patient education about daily self-care of the feet and careful glucose management[113].

[105] Scherbaum WA, 2000.
[106] Niccolucci A et alia, 1996.
[107] Eastman RC, Keen H, 1997.
[108] Giu K, Cowie CC, Harris MI, 1998; Scott RS, 1991; Schaaf D, Scragg R, Metcalf P, 2000; Stern M 1996, Shaw JE, Hodge AM, de Courtan M et alia, 1999.
[109] Javitt JC, Aeillo LP, 1996.
[110] Diabetes 2000 Report. HFA 2000.
[111] Barth R, Campbell LV, Allen S, Jupp JJ, Chisholm DJ, 1991.
[112] Saydah S, Eberhardt MS, Loria CM, Brancati FL, 1999; Simmons D, Kenealey T, Beaven D, 1999; Simmons D, Thomson , Scott D, 1994.
[113] National Institute of Health, NIDDK3 .

9.1 Diabetes Cost to Vote Health Projections: Scenario 2

Under the enhanced services scenario, the total direct medical cost of services for those with Type 2 diabetes will be lower than the current service scenario by year 20. In year 20 the total cost of Type 2 diabetes to Vote Health will be $1,003 million (in today's dollars). This is a cost saving from the current scenario of around $63 million.

This saving arises because the increased services for people with Type 2 diabetes, targeting, screening for at risk communities and expenditure on public health has decreased the number of people with severe complications from diabetes during the 20 year time horizon[114]. An increased spending on research has enabled more cost effective ways of reducing or delaying diabetes complications to be identified. In Scenario 2, more undiagnosed people are becoming diagnosed through targeted screening. Because a person with diabetes is likely to delay developing severe complications once they are diagnosed and are educated and supported to control their blood sugar levels, the cost of treating that person will fall, bringing the total health cost down.

The table below shows the number of patients for the Enhanced Services Scenario. With the enhanced services, there will still be more than 5 times as many people with severe complication in 20 year times than there are today. However, there will be nearly 5,700 less people with severe complications in 20 years time in Scenario 2 compared to the current service Scenario 1. This corresponds to a saving on spending for severe complications of $114 million dollars.

Table 34: Number of patients with severe complications in scenario 2

Enhanced Services – Scenario 2 Number of patients with severe complications	**Year 1** ***2001/02***	**Year 5** ***2006/07***	**Year 10** ***2011/12***	**Year 15** ***2016/17***	**Year 20** ***2021/22***
Diagnosed	3,135	5,818	9,256	13,552	18,857
Undiagnosed	1,568	3,002	4,549	6,165	7,837
Total	4,703	8,820	13,806	19,718	26,694

Source: PricewaterhouseCoopers estimate based on Diabetes 2000 projection of number of those diagnosed with diabetes.

The total cost of hospital inpatient treatment will still escalate over the next 20 years because only a percentage of people with Type 2 diabetes is reached and treated effectively. Again, the cost for severe complications such as heart attack, stroke, kidney failure or limb amputation is the main cost driver for the model.

The total cost of services under the Enhanced Services Scenario for those with Type 2 diabetes are shown in Table 34. The expenditure on prevention and targeting strategies will of course be more than in the current scenario and is shown in Table 35. The main cost driver for the expenditure is the treatment for people with diagnosed Type 2 diabetes to

[114] American Diabetes Association, 2000; Engelan M et alia, 1998.

control their blood sugar levels. The expenditure on prevention and targeting strategies is an increasing percentage of the total spending of Vote health for people with Type 2 diabetes. This leads to people with diabetes having less severe complications which will benefit all people with diabetes and their families as well as the government as less people will become unable to work due to severe complications as heart disease, stroke, kidney failure or limp amputation.

Table 35: Total Cost of Type 2 diabetes to Vote Health in Scenario 2

Total Cost of Type 2 diabetes to Vote health	**Year 1 ($m)**	**Year 5 ($m)**	**Year 10 ($m)**	**Year 15 ($m)**	**Year 20 ($m)**
Enhanced Services – Scenario 2	257	405	582	778	1,003

Table 36: Spending on Prevention and Targeting Strategies in Scenario 2

Spending on Prevention and Targeting strategies	**Year 1 ($m)**	**Year 5 ($m)**	**Year 10 ($m)**	**Year 15 ($m)**	**Year 20 ($m)**
Enhanced Services – Scenario 2	20	50	86	119	153

9.2 Conclusion

The enhanced service delivery scenario shows that by reducing the number of people who have severe complications such as heart disease, stroke, kidney failure or limb amputation by less than 20% in 20 years time, a saving of $66 million can be made. Enhanced services not only provide a better chance of delay the complications of diabetes, but also improve the quality of life for a greater number of people.