



Diabetes Review

2003-2007

Prepared by

**Planning and Funding Directorate
Capital and Coast District Health Board**

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Executive summary

- **Priority:** Reducing the incidence and impact of diabetes has been a priority in C&CDHB since 2003/04 and remains a key focus in 2007/08 as part of the DHB's two key objectives: to reduce the incidence and impact of chronic conditions and to reduce disparities. There was significant additional investment in diabetes detection and treatment over the period 2003-2006. Because of different methodologies in 'counting' hospital service funding, it is difficult to quantify exactly but there has been significant investment over the last three years with an **estimated additional \$790,000 in community-based services** for diabetes and about **\$1.9 M additional expenditure in the hospital**.
- **Number of people with diabetes:** In 2002/3, the estimated prevalence of people diagnosed with diabetes in the C&CDHB district, based on the Ministry of Health modelling was 6262 people and forecast to increase to 7721. Using Get Checked data and hospital admission, almost 8000 people have been diagnosed with diabetes in C&CDHB. C&CDHB is working with the Ministry of Health as the 'model' is updated.¹
- From 2003 to 2006, **diabetes cases** reported in the **Diabetes "Get Checked"** programme in C&CDHB **increased from 3792 to 5,262**. **Maori case detection** remains at **39%** of the expected number and there has been little progress over the past three years. Pacific case detection has increased markedly (82% of the predicted detection levels), higher than that for "Other" ethnicity.
- **Estimated laboratory expenditure** on diabetes related tests and volumes have **decreased** from levels in 2003. **Pharmaceutical expenditure** has shown a steady increase from just over \$2M per year to \$2.5M per year.
- There have been **slight gains in percentage with good glucose control** over the past three years, despite increases in newly diagnosed diabetics but ethnic disparities remain. **Despite an increasing number of diagnosed diabetics, hospitalisation rates for any condition related to diabetes have remained steady, with there is a decrease in the age-adjusted rate of diabetes-related admissions for Maori.** There is a suggestion of reduction in amputations but different data sources and definitions make analysis difficult.
- **Retinal screening:** although absolute **volumes screened have increased** year by year, the percentage **coverage has dropped** from 91% to 77% and ethnic **disparities remain** with Pacific people with diabetes having the lowest coverage.
- Despite an increasing number of people identified with diabetes, **hospital First Specialist Assessment and outpatient followup volumes are stable** for C&CDHB adult residents. Possible data quality issues make interpretation cautious. However, from the apparent trends and feedback from hospital clinicians, while the volume in outpatients is steady, those seen have **complex problems**, requiring intensive and specialised support and advice. More of the straightforward patients are being managed at primary care level and there is growth in the volumes (based on 0708) being seen by specialist diabetes educators. This is a positive trend.
- For children and young people, Diabetes Nurse Educator consultations have decreased and outpatient consultation volumes remain steady.

¹ Report updated Mar 2008 before circulation – new total estimated prevalence of diabetes in C&CDHB is 12,294. More information available through Local Diabetes Team Annual Report for 2007 –available on www.ccdhb.org.nz under Chronic Care Management (or long term conditions) link.

- Up to date mortality data is not available but to 2003, the rate remains steady. There are significant differences in premature mortality related to diabetes with the peak for Maori and Pacific ten years younger than for Other ethnicity.

Recommended future approach

A Chronic Care Management Framework and Action Plan (or “Long Term Conditions Management Framework and Action Plan”) is being developed and will be finalised in 2008.

Diabetes is a key focus for this framework and an action plan for diabetes, building on the information from this review, input from key stakeholders including the Local Diabetes Team, the hospital team, PHOs, GPs, primary care and allied health providers and consumer groups. However there are some areas already highlighted including:

- Continued focus on primary and secondary **prevention**: We have an action plan for Healthy Eating, Healthy Action which contributes significantly to the prevention of diabetes and to better outcomes for those living with diabetes.
- A **different funding model for HHS** services is under discussion to ensure funding is not limited to traditional outpatient face-to-face contact, to recognise complexity and intensity of specialist support for some people with diabetes and the value of indirect support offered to primary care through clinical review during outreach sessions in primary care, telephone consultations etc.
- A priority is improving the detection and access to services for Maori, a population currently under served in C&CDHB as evident from this report. Targeted **additional investment** is required to improve **Maori case detection** and support gains being made in glucose control and reducing hospitalisation rates.
- Pacific diabetes case detection and service development requires sustained support.
- Maintain and **build on primary care services** and community-based prevention and early detection of diabetes. Development of the **multidisciplinary team**, primary/secondary/allied health linkages and more support to optimise **self/whanau management** is required. A range of resources and supports are needed to suit different age groups and different populations.
- Service developments will include **better linkages with psychological/community support** and better management of diabetes with related **co-morbidity** across the community/primary/secondary interfaces. Strategies to support coherent District-wide systems and service development for quality and improved “patient journey” between and within services will be developed using primary/secondary clinical governance and Local Diabetes Team for advice.
- Workforce development in this critical area will remain a priority.
- **Improved monitoring**, including ability to **review clinical quality** is anticipated with the new database and provider/PHO and DHB levels of data access.

Introduction

1.1 Background

Diabetes is a complex chronic disease associated with higher than normal blood glucose levels and can lead to a range of serious complications which include cardiovascular disease (heart attack and stroke), eye disease (retinopathy, blindness, and cataract), foot disease (chronic ulceration, infection, amputation, and neuropathy), renal disease (kidney failure) and premature death (UKPDS, 1998, HFA, 2000). Reducing the incidence and impact of diabetes is a priority in the New Zealand Health Strategy and was identified as a key priority for C&CDHB in the Health Needs Analysis and District Strategic and Annual Plans of 2002/03. It remains a priority in 2007 as part of the emphasis on reducing the incidence and impact of chronic disease and reducing disparities.

The incidence of diabetes is increasing dramatically at a time when many chronic diseases are showing a slowing of growth. The prevalence of diagnosed type 2 diabetes in New Zealand (NZ) is projected to increase by approximately 45% over the decade from 2001 to 2011. A recent Ministry of Health (Tobias, Yeh et al. 2007) study identifies the increasing and ageing population together with the obesity epidemic as the key drivers (98% contribution) for increasing Type 2 diabetes prevalence.

The patterns and trends of diabetes epidemiology in New Zealand underline the higher risk of diabetes and its complications, especially end-stage renal failure, among Maori and Pacific people. (Moore and Lunt 2000). The evidence in this District supports the expected rapid growth in the number of people with diabetes particularly in Maori and Pacific populations and poorer outcomes in these populations.

Over the last decade, the Ministry of Health (MOH) has responded to the growing diabetes epidemic with a Diabetes Strategic Plan (Ministry of Health 1997) in 1997, a Diabetes Implementation Plan (Ministry of Health 2000) followed by a Diabetes Toolkit for district health boards (DHB) in 2001. The free annual "Get Checked" programme for diabetes patients was initiated and Local Diabetes Teams (LDT) established at DHB level. A set of guidelines for the management of Type 2 diabetes were released in 2003 (New Zealand Guidelines Group 2003). There have been several other strategic documents and research from Ministry of Health, Diabetes New Zealand, universities and District Health Boards over this time and all have influenced C&CDHB prioritisation and implementation.

Diabetes services aim to enable people with diabetes to achieve a quality of life and life expectancy similar to the general population by reducing the complications of diabetes. Improving nutrition and promoting physical activity, addressing food security and environmental factors are strategies to reduce the incidence of diabetes, as in the Healthy Eating, Healthy Action Framework published by the Ministry of Health (MOH) in 2003.

The rapid increase in the numbers of people living with diabetes necessitates re-thinking the use of health workforce and optimising the use of the whole health professional team to provide services and work effectively with families, people with diabetes consumer groups and community support services. All stakeholders must work together to ensure diabetes services are people centred, efficient, equitable and accessible, promoting a consistent quality of service, consistent expertise of practitioners, district-wide diabetes policies, evidenced based practice, "Local" Guideline implementation, to remove barriers to care, and support the prevention of diabetes in vulnerable populations (NZGG, 2003).

1.2 Diabetes “Get Checked”

The “Get Checked” diabetes annual review programme has been operating since 2000. The overall system is outlined in the Ministry of Health Diabetes toolkit. (MOH, 2003). In C&CDHB, Annual Checks over the period of 2003-06, have been provided by general practice/primary health care services, funded by the DHB with administration of the programme and data capture contracted to the Wellington Region Diabetes Trust (WRDT).

Aggregate data is forwarded to the Local Diabetes Team (LDT), DHB and MOH. The DHB and LDT consider the data with other information and come up with pragmatic recommendations for improving performance against targets for detection and diabetes management.

The MOH has contracted the development of a new national database application, the Diabetes Get Checked / Cardiovascular (CVD) Information Technology (IT) Upgrade named “CANARY” Canary Data Solutions (CDS). The Canary database is very comprehensive and has the ability to be quite flexible giving providers the ability to gain access to the data by password and to monitor and manage the data at a PHO level.

1.3 Diabetes in C&CDHB

C&CDHB health needs assessment in 2002 ranked diabetes as one of the highest priority areas for attention and diabetes remains a key focus within the priority of reducing the incidence and impact of chronic disease in 2007-10.^{2,3}

This report reviews the impact of investment in diabetes detection and treatment by C&CDHB between years 2003 – 2006, using trend analysis in routinely collected data and information contributed through the Local Diabetes Team, provider reports and input from consumer groups. Most relevant prevention activity involving the DHB has been summarized in the Stocktake of Healthy Eating, Healthy Action⁴ and evaluation of the impact of this and national social marketing, social policy and diabetes-specific initiatives is more appropriately analysed over a longer time period and through robust national health and nutrition surveys and trends.

Since 2003/04, service development for diabetes has been guided by a three year operational plan generated out of strategic planning through the Board and sector consultation in 2003, with additional investments each year guided by hospital, community provider and Local Diabetes Team input.

The three main themes in the operational plan for this period were:

1. Prevention of diabetes. This links with the investment in nutrition and physical activity promotion (including Healthy Eating, Healthy Action initiatives) and prevention of obesity.
2. Services to improve detection and optimal treatment of diabetes –including uptake and effectiveness of ‘Get Checked Aotearoa’ free annual checks, retinal screening and associated services such as podiatry, nurse educator services. Primary health care and specialist hospital services, allied health services for people with diabetes, plus related

² C&CDHB Health Needs Assessment. 2002 www.ccdhb.org.nz

³ C&CDHB District Strategic Plan 2006-12. www.ccdhb.org.nz

⁴ C&CDHB Stocktake of Healthy Eating – Healthy Action (HEHA) activities in Capital & Coast District Health Board (unpublished) 2006 – www.ccdhb.org.nz

pharmaceutical and laboratory expenditure.

3. Improved support for self management/whanau management of diabetes.

Across all three areas, relevant workforce development and a consistent focus on reducing inequalities was supported.

WHERE WE WERE AT IN 2003

The scope of the problem for diabetes in C&CDHB was outlined in 2002 and a strategy for diabetes for the DHB was approved including development of services, a workforce plan and described indicators for measuring health outcomes (CAPHAC, 2003).

An integration of national strategies was suggested including:

- NZ Health Strategy
- Primary Health Care Strategy
- He Korowai Oranga
- Pacific Health Action Plan
- Diabetes 2000

A number of key initiatives arising out of these strategies were identified to facilitate and create a vehicle for the delivery of these including:

- Continuing development of Primary Health Organisations (PHOs)
- A focus on integrated care initiatives within the DHB
- Recognition of the need for innovation in the way services are provided if the goal of reducing disparities in health status is to be realised.
- Local implementation of He Korowai Oranga especially whanau ora approach and intersectoral action.
- Development of a Pacific models

Priority populations were identified for particular focus: Maori, Pacific and socioeconomically deprived populations. The incidence of diabetes in Maori and Pacific populations is about 2-3 times that of the European population. The disease occurs at earlier ages in these populations and is associated with a higher rate of mortality. Research shows a definite link between service shortfalls and poor health statistics for Maori, not only among low-income Maori but for Maori in all socio-economic groups.

To address Maori health, the intention was to build capacity of Maori providers, work to improve mainstream provider responsiveness to Maori and to support the implementation of comprehensive strategies as in He Korowai Oranga.

Te Plan and District Annual Plans combined with public health services, PHOs, hospital-based and community-based services have all been part of the District's efforts to reduce the incidence and impact of diabetes.

In addressing Pacific health, the stated intention was to:

- Improve the health status of Pacific people within communities to become healthier by building and strengthening community action.
- Work closely and in partnership with Pacific Health Services

Socioeconomically Deprived Populations

Approximately 10,000 people in Wellington live in areas of high deprivation. It has been demonstrated that, allowing for age and gender, the people in these areas have some of the highest health needs. Particular emphasis on access to services for low income populations and efforts to remove cost and other barriers to achieving good outcomes for those with diabetes was supported.

Prevalence and detection of diabetes in C&CDHB population

In 2002/3, the estimated prevalence of people diagnosed with diabetes in the C&CDHB district, based on the Ministry of Health modelling was 6262 people. By 2006, this estimate has increased to 7721.⁵

Accurate (actual) diabetes prevalence data is not available at a District level. The population of people with diabetes includes those not yet diagnosed, those identified at primary care level or in in-patient settings and a sub-set of these people access and complete free "Annual Checks". These are counted in our analysis as diabetes 'cases' or 'detection'. The Ministry of Health has recently worked with the DHB to identify the number of people with diabetes identified in either the Annual Check data or hospital data and this, along with intended work with primary care practices will allow the DHB to have a more accurate idea of actual detection over the next few months.

The following table identifies those people (known to have diabetes) compared to the estimates in the Ministry of Health model (MOH, 2002a), updated to December 2006. The numbers in Table 1 are derived from the central database maintained for annual reviews and the hospital patient management system. It should be noted that the actual number of people with diagnosed diabetes has exceeded the MoH forecast by 2006 for all ethnic groups except Maori.

Table 1 - People known to have diabetes in C&CDHB

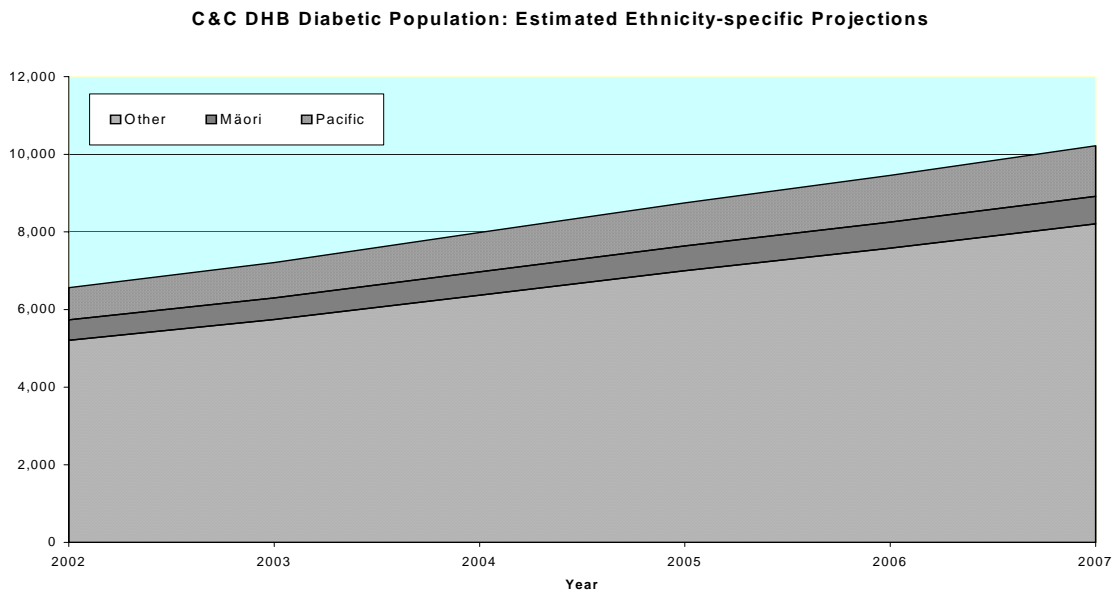
	Maori		Pacific		Other		Total C&CDHB	
	2003	2006	2003	2006	2003	2006	2003	2006
TLA								
Kapiti	45	103	9	25	1016	1418	1070	1546
Porirua	220	371	413	738	721	751	1354	1860
Wellington	203	346	308	515	2916	3701	3427	4562
TOTAL	468	820	730	1278	4653	5870	5851	7968
MOH Model forecast	829	1226	641	947	4793	5548	6262	7721

The data demonstrates the estimated prevalence of diabetes and the number of people diagnosed with diabetes is 7,968 to the estimated projection. As in 2002/3, the number of Maori diagnosed in 2006 is substantially below the estimate.

⁵ Recent (reviewed) prevalence model from Ministry of Health estimates 12,294 people with diabetes in C&CDHB in 2007.

Figure 1 illustrates the projected increase in the number of people with diabetes for the period of the 'Current Diabetes Strategy 2003 -2007'.

Figure 1 - Projected diabetes population in C&CDHB



It should be noted that:

- It is a sector-wide problem where the only major statistical modelling of the diabetes epidemic in NZ (Ministry of Health 2002) was based on 1996/1997 New Zealand Health Survey (NZHS) with limited diabetes-specific data and inadequate estimates for small areas (such as DHB or territorial authority levels). This model is currently being updated with the 2002/2003 NZHS data which is already five years out of date.
- There is an assumption that only half of people with diabetes will have been diagnosed and hence we could expect there are an additional 6000 people in our district still to be identified.

Robust ethnic-specific national data is needed as a baseline against which the impact of both current initiatives, like the free annual 'Get Checked' programme, and future DHB/ PHO initiatives and intervention can be assessed. The reviews of NZ regional diabetes studies and surveys (Joshy and Simmons 2006) have highlighted the rather patchy data collections in NZ. Data collections from the 'Get Checked' programme are considered as potential for a comprehensive surveillance of diabetes and for monitoring national programmes and local initiatives in future. (Tobias, Yeh et al. 2007), Joshy (Joshy and Simmons 2006) and Robinson (Robinson, Simmons et al. 2006)

Expenditure - Personal health services - 2003/04 and 2005/06

The following information is taken from the CAPHAC (2003) decision making paper which included a summary of the estimated expenditure for diabetes within the District at that time.

Primary care has received significant funding increases through the generic primary health care strategy investments. The annual capitation funding (from 1 January - 31 December 2006) for people with diabetes who have enrolled with a PHO is demonstrated in the table below, along with other services funded and provided at a PHO, general practice or community level. This excludes CarePlus funding and general medication management funding at PHO level.

4.1 Primary Care

The figures in the table below are an approximation only. Comprehensive data was not readily available and different methodologies were used. It does not include expenditure in contracts providing a range of services that are relevant but not diabetes-specific.

A summary of estimated investment in diabetes over the period 2003-06 is outlined in this section. A more detailed summary is provided in Appendix 1.

Table 2 - Estimated Community Services Expenditure

Community Services	Estimated Expenditure 2003/ 04 \$	Estimated Expenditure 2005/ 06 \$
Primary care – diabetes education and management	578,220.58	593,890.66
Annual reviews	265,115.96	339,931.13
Diabetes pharmaceuticals	2,123,362	2,552,805
Laboratory tests	650,117	515,215
Retinal screening	277,368.96	356,571.42
Podiatry	192,137.49	211,391.18
General practice visits – proportion of GMS*	613,188	911,764
TOTAL	4,699,509.80	5,481,568.20

* See Appendix 1 for more details

4.2 Specialist secondary and tertiary services

As above, the following table (Table 3) demonstrates estimated hospital expenditure for 2003/04 and 2005/06 on diabetes.

Table 3 - Estimated hospital expenditure

Secondary Services	Estimated expenditure 2003/ 04 \$	Estimated expenditure 2005/06 \$
Diabetes clinic attendances	307,780.44	259,517.53
Diabetes education and management	162,819.76	147,285.14
Podiatry	6,178.70	10,776.03
Insulin Pumps	12,475.64	6,563.12
Counselling	-	10,330.00
Coordinator	-	30,000
Case weighted hospital admissions*	8,333,250	10,260,916
TOTAL	8,822,504.50	10,725,387

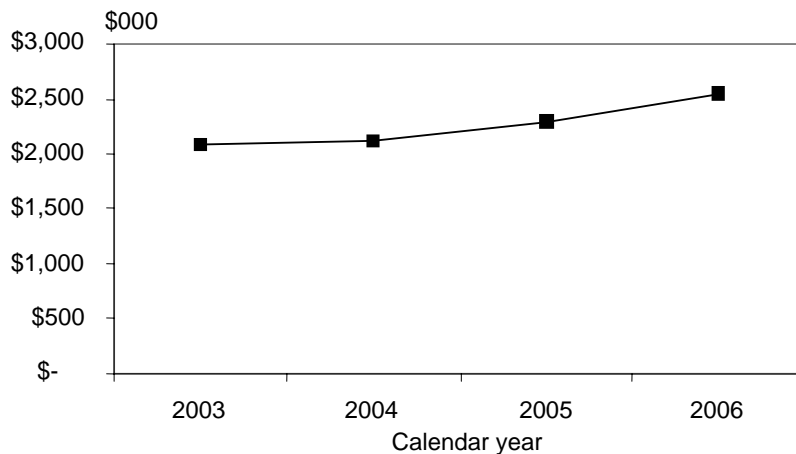
* This figure is thought to include all admissions not just where diabetes is the primary diagnosis.

4.3 Diabetes Pharmaceuticals/Laboratory

Diabetes Pharmaceuticals

The following graph demonstrates Pharmaceutical expenditure over 2003-2006

Figure 2 - Pharmaceutical Expenditure by year.



Laboratory

Extraction of the tests identified whereby C&CDHB as the funder. The figures are only an estimate of expenditure due to a number of caveats:

There is no reliable method to differentiate the people tested with and those without diabetes.

Contracting for lab services has been different over the years for example, the contract for Southern Community Labs in Waikanae was not always held by C&CDHB therefore testing before devolution will not be included in the figures.

As of Nov 2006 Hutt Valley DHB holds the contract for lab services in both DHBs, therefore two months of 2006 are not included in the figures.

The lab spend in 2001/02 may not be accurate due to the inability to identify their source.

Table 4 - Sum number of diabetes related tests calendar year visited

Test code	Test description	Number of tests		
		2004	2005	2006*
BG2	Glycosylated haemoglobin	20,257	19,304	20,341
BG3	Glucose Tolerance Test standard	2,288	1,919	1,976
BG4	Glucose Tolerance Test post-polydose	3,297	2,839	2,938
BG5	Serum glucose	81,250	72,447	72,275
BP8	Microalbumin, early morning urine	8,693	8,336	8,995
Total		115,785	104,845	106,525

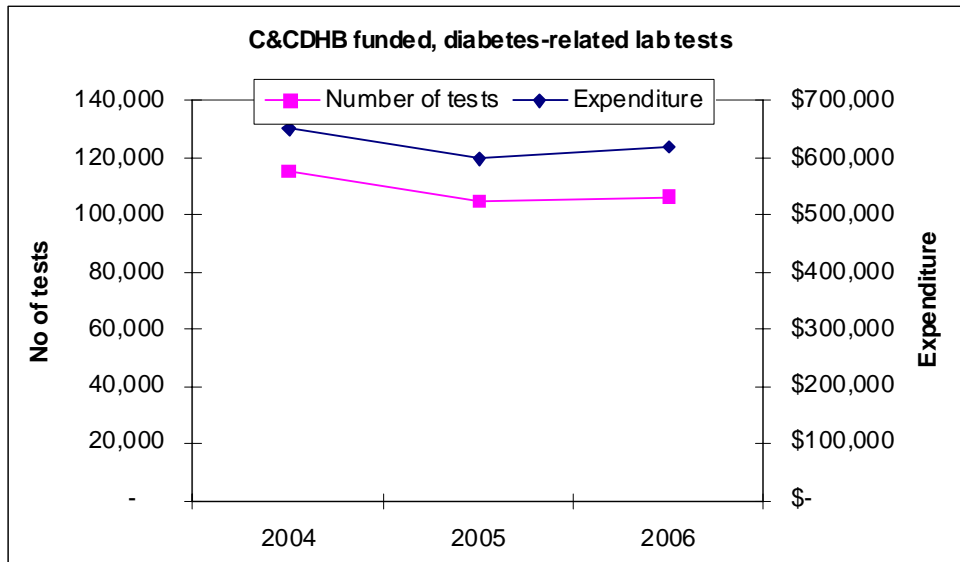
* 2006 is an annualized figure based on 10 months of data (Nov/Dec not available due to change in contract)

Table 5 - Sum number of diabetes related claims calendar year visited

Test code	Test description	Expenditure		
		2004	2005	2006
BG2	Glycosylated haemoglobin	\$213,391	\$203,339	\$214,271
BG3	Glucose Tolerance Test standard	\$40,360	\$33,855	\$34,876
BG4	Glucose Tolerance Test post-polydose	\$18,166	\$15,643	\$16,188
BG5	Serum glucose	\$250,065	\$222,859	\$222,127
BP8	Microalbumin, early morning urine	\$128,135	\$122,322	\$130,798
Total		\$650,117	\$598,017	\$618,259

* 2006 is an annualized figure based on 10 months of data (Nov/Dec not available due to change in contract)

Figure 3 - Laboratory diabetes related tests by year



Investments and Developments

In 2003-4, the development of Primary Health Organisations and other contextual changes lead to more of a local District focus, increasing capacity across all of the primary care sector and from strategy discussion to a more action-oriented, investment phase.

The achievement of good outcomes for people with diabetes is dependent on the provision of accessible, well organised and integrated care. This requires a multi-disciplinary approach working in partnership with people with diabetes and their families and in a way that meets the needs of people from different cultural and social backgrounds and different age groups.

Recent developments built on established hospital-based and general practice/primary health care and community-based services, consumer support and public health services. Regional Public Health, Local Government, Iwi, PHO's, hospital specialist staff, general practice, primary care services, midwives, pharmacists, dietitians, podiatrists and other allied health professionals, consumer groups, field workers, youth support workers and community health workers have all contributed to the outcomes described in this document.

Over 2003-06, key initiatives influencing diabetes outcomes include:

- 1) Expanded clinical capacity across the District. Ensuring each PHO has dedicated diabetes nurse educator resource and general practice capability in diabetes management;
- 2) Increased access to primary care: community-based specialist outreach clinics, nurse-led clinics, Care Plus, support for pharmacists and medication management, assistance to access medication.
- 3) Expanded investment and clinical capacity in the hospital: Within the hospital: Diabetes Nurse Clinician (inpatients), additional child/youth diabetes nurse specialist capacity, increased insulin pumps, hospital-specific workforce development funded
- 4) Improving the interface between the hospital and primary care sector: Diabetes Nurse Practitioner Candidate position; specialist outreach clinics.
- 5) Initiatives to reduce disparities in access to primary care and diabetes services, including Maori-specific and Pacific specific initiatives: Maori provider-led services, Maori peer support group; Pacific diabetes service
- 6) Additional support for children with diabetes and their families; improvements in hospital admission process for diabetic children; outpatient follow-up and outreach services in youth-friendly settings; psychological support services for young people, diabetes camps.
- 7) Expanding community-based retinal screening including outreach clinics, continuation and strengthening of Regional Retinal Screening Service utilizing optometrists and with hospital specialist support
- 8) Expanded free, community-based podiatry services for people with diabetes.
- 9) Community-based dietitian(s) and dietetic services. Links with nutrition and physical activity programmes have been promoted, obesity prevention and treatment both in public and personal health.
- 10) Intersectoral initiatives that impact on environmental factors such as income and

employment for people with diabetes

- 11) A directory of diabetes services was produced and updated and a free personal-held record developed.
- 12) . Improving ability to monitor progress using annual 'Get Checked' and 'Retinal Screening' data through contractual changes with WRDT, relationship between WRDT and LDT and DHB analysis capacity.
- 13) Diabetes Wellington, Diabetes Youth Wellington, Porirua's Health Cluster, Diabetes Kapiti Coast have been active participants in advising and supporting the DHB in efforts to improve diabetes recognition, care and outcomes and, in turn have received funding support for their participation and activity.
- 14) Workforce development programme in primary and community sector: Wellington Regional Diabetes Trust (WRDT) contracted to provide workforce development for primary care. A workforce programme was developed each year based on discussions with a number of stakeholders, diabetes hui outcomes and previous course evaluations from participants.

Since 2006, the workforce development programme has been provided through WRDT, in collaboration with Whitireia Polytech and WIPA.

The secondary care diabetes services are responsible for their own in-house training. On going education includes updates of current trends in diabetes management; facilitating Secondary Care Diabetes Link Nurse Programme; ensuring standardisation and consistency of care by all ward staff and assisting in developing protocols on diabetes management.

5.1 Maori-specific investment and development

Investment includes the development of 'whanau models of care', innovation in crossing the boundaries between a 'disease management' approach and a whanau centred, strength based approach, self-management and education, targeting whanau. Some of these are listed below:

- Kaupapa Maori Diabetes Education and Management services in both Wellington (Te Ngawari Hauora) and in Kapiti (Hora Te Pai).
- A mobile disease state management nurse in Porirua at Ora Toa, with a focus on diabetes.
- Maori peer support group (NUHS)

The above services work with whanau and clinical staff to improve the management of Type 2 Diabetes). Key components of these services are:

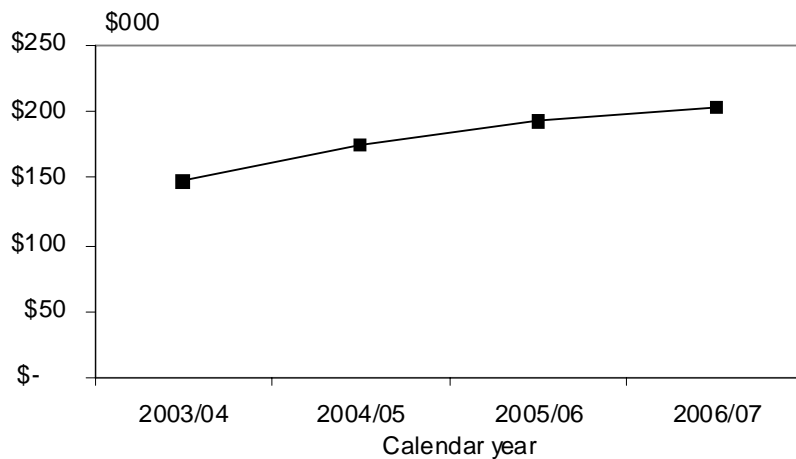
- education and information sharing with whanau
- acknowledging whakapapa links
- pro-active self-management
- healthy lifestyle options congruent with Maori values and lifestyle

The aim of the above programmes was to improve self and whanau management of diabetes, to increase the attendance at annual checks and include whanau in understanding preventative strategies.

Investment into by 'Maori for Maori' Services are steadily increasing, demonstrated in the graph

below in Figure 4.

Figure 4 – Funding: By Maori for Maori Services 2003-2007



5.2 Pacific-specific investment and development

- Investment to support innovative family models of care including family ownership with support and family wrap-a-round programs.
- Diabetes Nurse Educator position

Capital and Coast District Health Board submitted a successful joint proposal between Elective Services, Medical Services and Pacific Planning & Funding for a Ministry of Health Elective Services Innovation Fund (ESIF). The pilot had a focus on an integrated approach to Diabetes Case Management.

Diabetes can have devastating effects for individuals and families. The effect of poorly controlled diabetes impacts on hospitals through potentially avoidable acute admissions and non attendance for outpatient appointments delays treatment. For those patient's with elevated glycosylated haemoglobin (HbA1c) and existence of co-morbidities failure to attend appointments can lead to a significant increase of acute admission and non reversible health changes. This can lead to increased costs for hospital services, patient and families.

DNA by patients increase the wait for outpatient appointments for all patients both first appointments (FSA) and Follow ups. Avoidable hospital admissions can put pressure on beds and has a flow on effect to Elective surgery which may lead to cancellations of surgery.

The innovation comprised of two steps that included:

- 1 A joint initiative with the C&C DHB Diabetes Department, Endocrinology, Pacific Health Service Porirua, Pacific Health Service Wellington (both NGOs) and Pacific Support Service within the HHS, to establish a 1FTE position focused on dedicated diabetes case management and action based research.
- 2 Increase the ability of C&C DHB Information Technology (IT) department to electronically track these patients in order to capture cost of Length of Stay (LOS) and do not attends (DNA) to enable assessment of the cost and number of admissions/appointments.

The position of nurse /case manager was established as 1 FTE based at the two Pacific Health centres with responsibility for case managing the patients. This included: coordination of

appointments, arranging transport as required and cancelling or rescheduling if patient was an in-patient. Also in conjunction with C&C DHB diabetic department began to identify the target of 50 Pacific patients who fitted the following criteria:

High Risk Patient Group

- 1 HbA_{1c} > 7 with micro or macrovascular complications
- 2 5 year cardiovascular risk assessment of >15% for non-fatal or fatal cardiovascular event Using MOH and NZ Guideline Group guidelines as published in MIMS New Ethicals)
- 3 Body Mass Index > 30kg/m² (World Health organization criteria for obesity)

“Hard to Reach” Patient Group

- 1 HbA_{1c} > 8.5% and
- 2 Missed > 2 follow up appointments in the previous year
- 3 Recurrent hospital admissions for diabetes (>2)

Criteria for ‘Admission’ and ‘Discharge Criteria’ to the nurse caseload were established and agreed by C&C DHB Endocrinology Department and the two Pacific Health networks.

The focus of the integrated approach was to enhance clinician education, develop an achievable management plan, ensure GP follow-up, link with Diabetes Nurse Specialists who worked with RN, Practice Nurses, Primary Care RNs and support Community Health Workers through educational up-skilling.

The initial funding from the Ministry was \$59,062.50 to December 2005. In January this was topped up by C&CDHB by \$30,000 until June 2006 and then \$95,000 from 2006/07 which has become sustainable and is part of the baseline funding for the HHS.

WHAT IMPACT HAS THE INVESTMENT HAD?

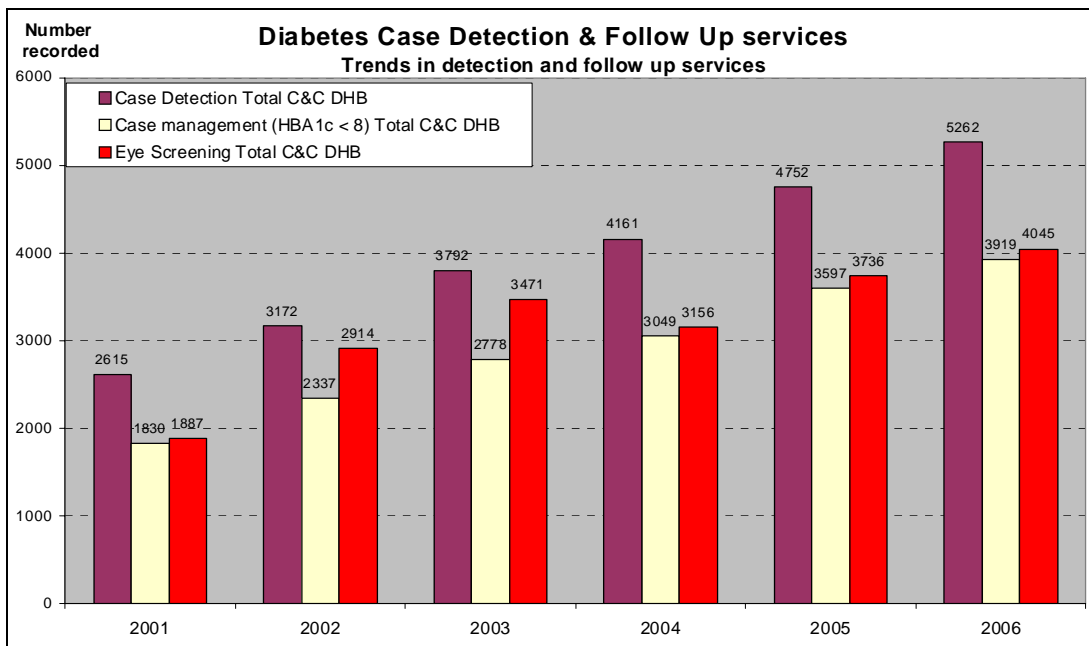
There is no single measure or set of measures to simply assess the impact of recent investment on diabetes detection, access to treatment, outcomes and inequalities but the following set of indicators together give an impression of progress and areas requiring more focus or more effective intervention. There may be data quality issues. Particularly with hospital activity data and where this is known, there are caveats. Otherwise, it is assumed to be accurate.

Diabetes Annual Checks and retinal screening data

Figure 5 summarises numbers and trends for total population for case detection, case management (control) and retinal screening.

Each of these areas is examined in more detail in the following tables and graphs.

Figure 5 - Diabetes Case Detection & Follow up Services 2001 – 2006

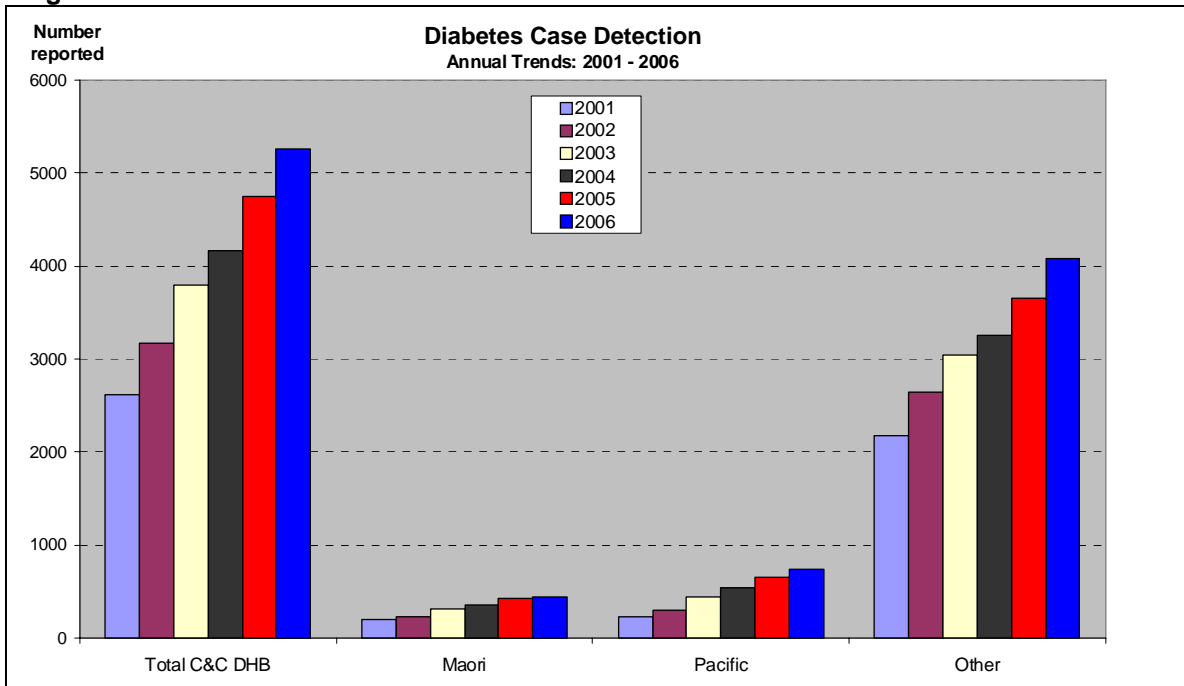


6.1 Diabetes Case Detection

Case detection is an indicator that attempts to track how many of the expected number of people with diabetes, have had their diabetes identified and have received an annual check. The predicted number for the District or for a PHO is based on a model that utilizes national disease prevalence data, developed by the Ministry of Health.

Figure 6 and the associated table show that, from 2001 to 2006, diabetes cases reported in the Diabetes "Get Checked" programme in C&CDHB have increased by 100% to a total of 5,262 cases. Maori and Pacific people showed higher increases in case detection at 122% and 217% respectively. This is based on claim data following Annual Checks.

Figure 6 - Diabetes Case Detection – Annual Trend 2001 - 2006



	2001	2002	2003	2004	2005	2006
Maori	201	228	312	358	433	447
Pacific	233	296	437	539	660	738
Other	2,181	2,648	3,043	3,264	3,659	4,077
All	2,615	3,172	3,792	4,161	4,752	5,262

Figure 7 - % of predicted population with diabetes (MOH Model) 2006

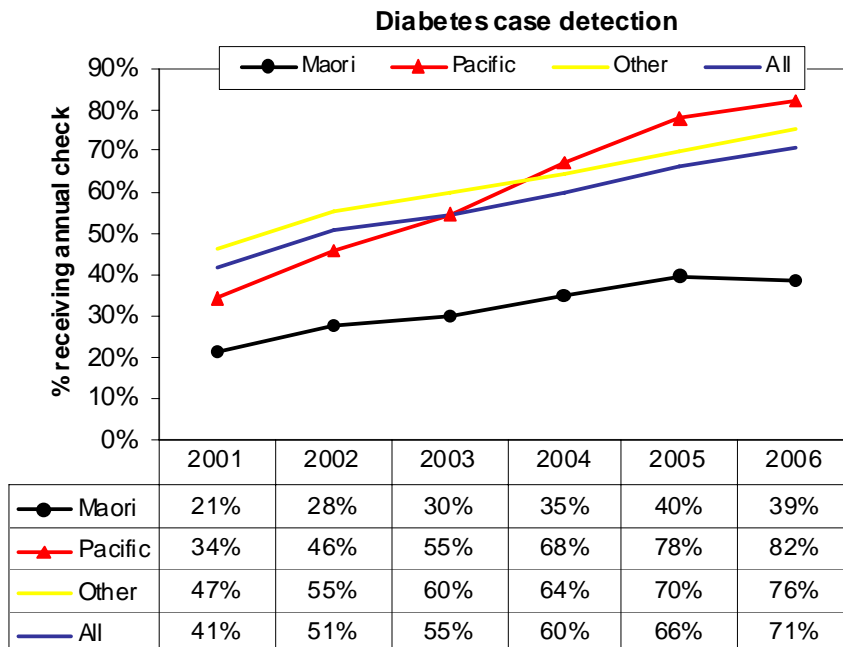


Figure 7 illustrates the percentage of predicted people with diabetes who have completed annual checks, by ethnicity. There has been impressive progress in the Pacific population and, despite the increased numbers in the preceding graph, there remains a significant disparity against expected 'detection' for Maori.

6.2 Indicators of Diabetes Management

The percentages of 'case management' are calculated using the total number of annual reviews as the denominator and registered people that have had an HbA1c \leq 8% as the numerator.

This analysis focuses on Type 2 Diabetes since these are mainly monitored and managed at primary care level.

6.21 Case Management

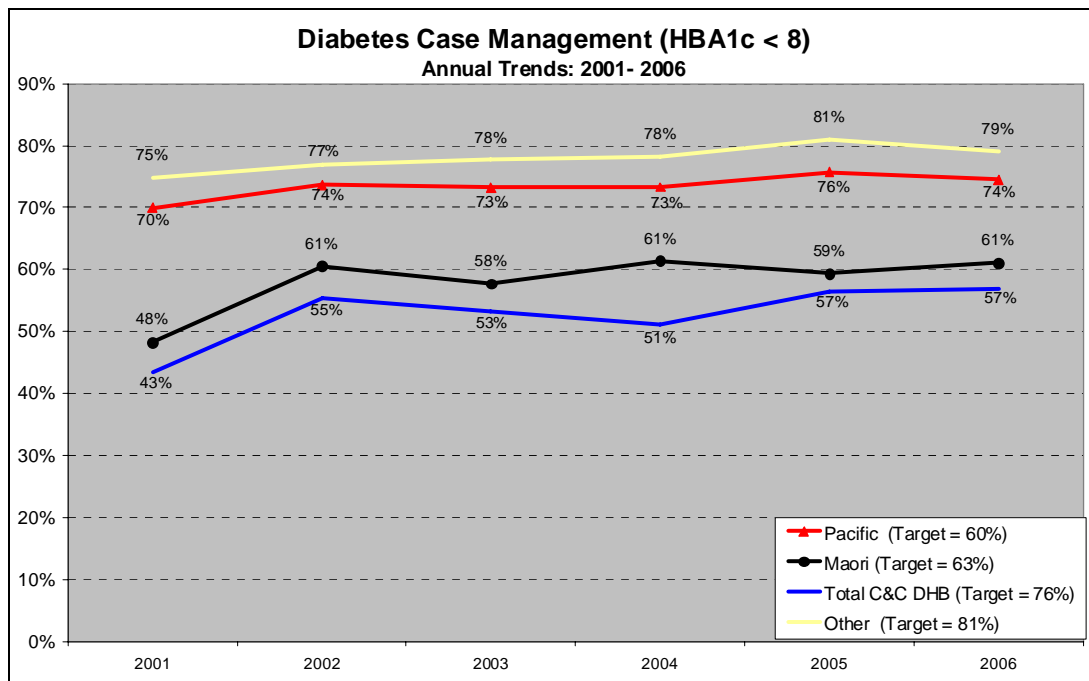
There are several caveats and limitations that are applicable to the analysis:

- 3 A very small proportion may have had more than one annual review within 12 months. This only occurs when people have a review within one month of when the annual review is due but may result in slight over counting of annual reviews.
- 4 Case management trends need to be interpreted over a period of time as the figures are obviously influenced by newly diagnosed people with diabetes initially presenting with a raised HbA1c.
- 5 This predicted model may have captured prevalence rates that are very different from the actual diagnosed diabetes in each PHO. However, the MOH model of diabetes prevalence is essential for deriving a common and appropriate denominator across the 6 PHOs.

Historically Case management measures the number of people with poorly controlled diabetes so that the lower the number, the closer to target. However from 2006 this has changed to measuring those with better diabetes control. To ensure understanding in relation to trends, the figures have all been changed to reflect those with better control demonstrated in the graph below in **Figure 8**.

The case management graph below demonstrates an increasing trend in all population groups, indicating good blood glucose control to those engaged with health services.

Figure 8 - Diabetes Case Management 2001 – 2006



In terms of reducing inequalities, C&C DHB is making progress, but focus needs to continue. The 'gap' between Maori, Pacific and other ethnicities remains. Despite the gains, in actual numbers Maori are still under-represented in Annual Reviews and other services.

While the overall gains are encouraging and reflect efforts across primary care, secondary care, allied health and through consumer groups and families in C&CDHB, efforts to reduce inequalities need more effective focus.

There are variations in the Type 2 Diabetes case detection rates across the 6 PHOs. Possible explanations include:

- 1 The MOH model is based on 'normal' population distribution whereas 'access' practices and PHOs within C&CDHB have clusters of high needs people. The high need populations enrolled with Access PHOs tends to have higher number of diagnosed diabetes. The actual number of diagnosed diabetes is much higher than the MOH model prediction based on the national average.
- 2 Access PHOs have used different models of care, utilising outreach nurses and community health workers to achieve wider reach to the people at risk. As all PHOs expand these types of service delivery, the positive effect may be observed more broadly across all PHOs.

Maori and Pacific percentages of case detection continue to be lower compared with all other ethnicities in each PHO. The Access PHOs appear to have increased their annual reviews for all ethnic groups. On the other hand, any significant increases in the enrolment of the PHO population would also reduce the case detection percentages.

Maori case detection is still relatively low compared with the total case detection rate for this DHB and while they stay the same and other ethnicities progress increases inequality.

It should be noted that people who identify with both the Maori and Pacific ethnic groups have been included in the population projections (denominator) as just the Maori ethnic group. This

approach of prioritising ethnicity means that more Maori but fewer Pacific are counted in the denominator. The same approach may not been used at the practice level, where people with Maori ancestry may not have identified themselves as Maori. The net effect would be an under-estimation of Maori case detection rate but over-estimation of Pacific case detection rate.

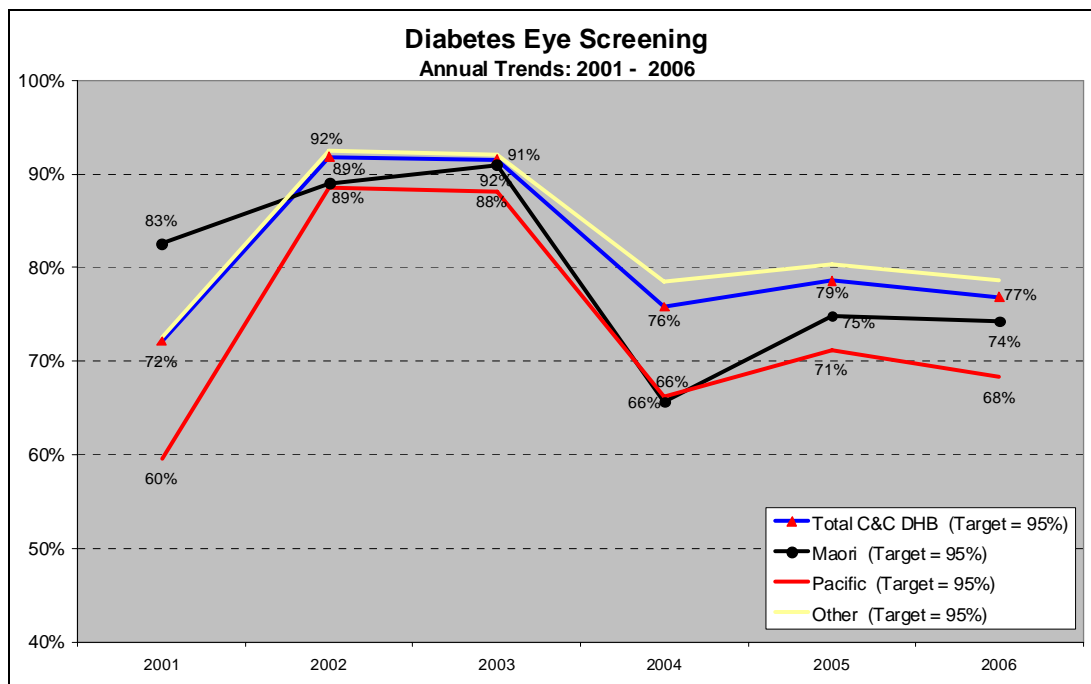
6.22 Retinal Screening

As in case management, the retinal screening percentages are calculated using the number of annual reviews as the denominator measuring the people registered and have had retinal screening in the last two years.

Under contract with the C&CDHB, Wellington Independent Practice Association (WIPA) manage the regional, community-based retinal screening programme.

The total number of people screened is usually upward. The data is reported from the Retinal Screening database and is independent of the number of people with diabetes who received a free annual review. (See **Figure 9** below).

Figure 9 - Trends in Retinal Screening in C&CDHB, 2001-2006 by Ethnicity



A conscious effort has been made to increase the uptake of retinal screening across all ethnicities and to identify the ethnicity of 'Other and Unknown'.

6.3 Review of Maori-specific investment

In 2006 C&C DHB undertook a review of the Diabetes Education & Management services in Wellington (Te Ngawari Hauora) and Kapiti (Hora te Pai) to elicit how the service/delivery has impacted on:

- individuals/ whanau
 - health outcomes
 - level of understanding preventative strategies
- and what in the model(s) is working well/not working well

A draft report of the review has been received and initial findings note:

- 1 Providers and clients identified the challenge that exists for clients to maintain lifestyle changes long term
- 2 Providers highlighted the need for an experienced nutrition and exercise person – a motivator for clients to focus on their weight loss through nutrition and exercise.
- 3 Annual checks/reviews – are time consuming taking up to 6 months to complete all aspects.
- 4 Many of the resources available to the services have had to be adapted to provide for cultural appropriateness.

Recent diabetes annual check figures support an increase in connection with Maori for annual checks but are still significantly below expectations. Local data also indicates that the percentage of Maori with HBAc1 greater than 8% (poor control) has reduced. (See Table 6, page 18)

6.4 Review of Pacific-specific service

As part of the Pacific diabetes service, an 'action research' component supervised under a study protocol by the Capital & Coast Health Endocrinology and Diabetes consultants was established. This included: a clinical audit of patient outcome (measured by glycaemic control and avoidance of diabetic complications), assessment of patient satisfaction and compliance with treatment, and assessment of the net benefits to the health care organisations involved.

Outcome indicators:

- Measurable impact on Elective Services Performance Indicators (ESPI) and elective service improvement activities in general.
- Increase in FSA
- Waiting time for FSA reduced
- Decreased acute admissions reducing pressure on beds for elective admissions.

Outcomes:

- An extra out reach clinic was started at Pacific Health in Strathmore.
- Attendance at outreach clinics was 97% at Strathmore and 91.4% in Porirua, which is a significant decrease in DNA rate.
- Better networks were formed into the community.
- Boost in staff morale, consultant and nursing.
- Consensus of the requirement of a 1FTE based in both Wellington and Porirua.
- Contract of the 1FTE nurse has been extended beyond the finishing time of 18/1/06 to support the business case for a permanent position.

6.5 Hospital Services

Secondary care provide services for patients with type 1 diabetes, complex type 2 diabetes, gestational diabetes, paediatric and adolescent services, insulin pump therapy and outreach clinics in lower socio-economic regions where transport to hospital services is difficult.

Major complications of diabetes are managed largely through specialist care in hospital and other settings. These include the treatment of renal failure and renal dialysis, vascular complications, retinopathy and managing acute ischaemic heart disease and acute metabolic crises.

Type 1 diabetes patients (mainly European) are mainly seen in secondary care clinics, frequency of attendance depending on how their diabetes is controlled. This ranges from once a year for those with adequate control to every three months for those that are poorly controlled.

The majority of patients seen in diabetes clinics are those with type 2 diabetes who have multiple co-morbidities or have particularly complex disease and/or social circumstances requiring more intensive support and advice.

Diabetes Nurse Educator hours have increased from 4.7 (FTE) to 6.7 (FTE). This does not include diabetes research nurses. Nurse led clinics are being increased in addition to outreach clinics attended by diabetes physicians.

6.51 Adult Outpatient/Volume

The 2003 data may be incomplete due to unclear definitions at that time.

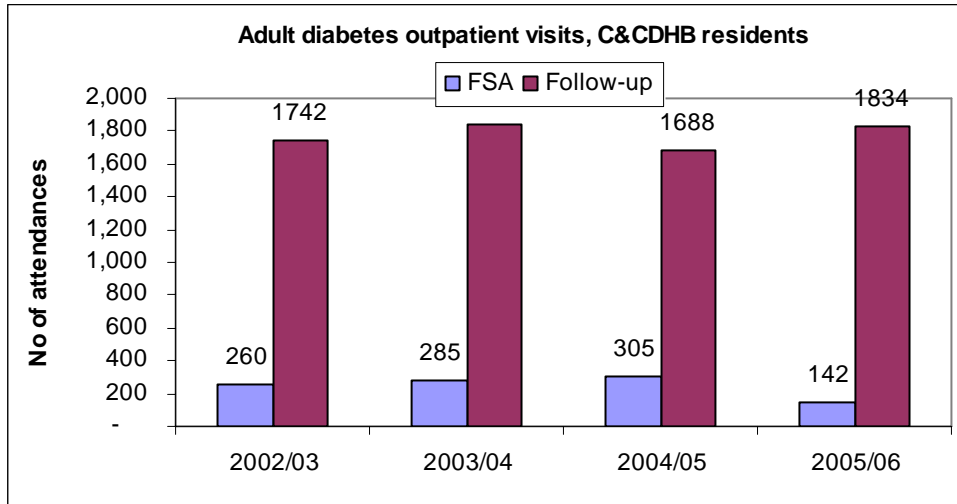
Figure 10 illustrates adult diabetes contacts through first specialist assessment (Diabetes specialist outpatient consultation) and follow-up. Some consultations are in community settings through outreach clinics, based in Porirua and Wellington South.

The observed stabilisation of total First Specialist Assessment and outpatient followup numbers may in part reflect data issues but there also a shift to more primary care focused care with specialist clinics being utilised for advice and follow-up of people with more complex diabetes and co-morbidity.

Actual volumes for the first half of 2007/08 suggest a sustained decrease in FSAs (112 FSAs for six months giving and projected full year volume of approximately 224). There were 630 follow-ups in the first half of 2007/08 giving a projected full year volume of 1260.

What is not illustrated in the numbers is the increase in case discussion and advice at primary care level, associated with the outreach specialist clinics.

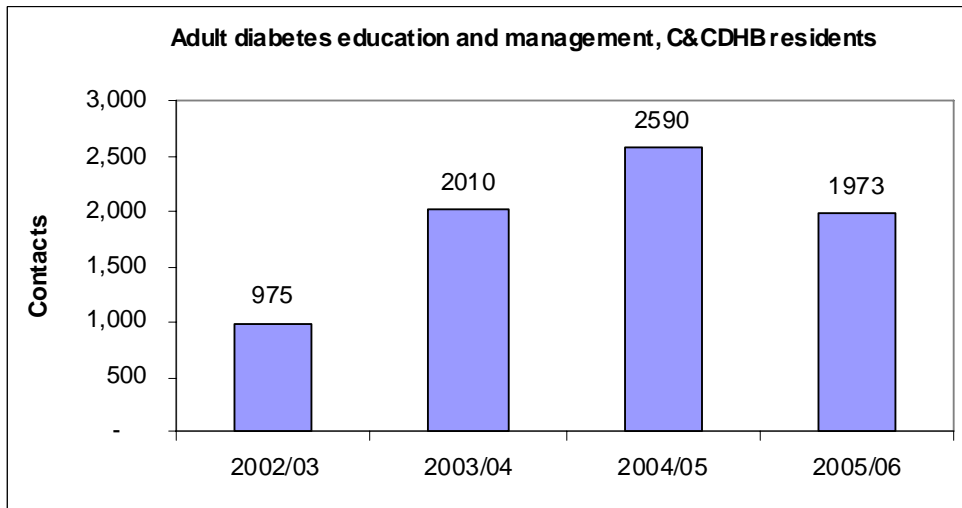
Figure 10 - Adult Diabetes Outpatient Attendances (Diabetes Consultants) - C&CDHB residents



Adult - Diabetes Education & Management (Diabetes Nurse Educators –Hospital Based)

Again, the workload for diabetes nurse educators has shifted to lower volumes but more complex case management. This is an anticipated outcome of the service developments that C&CDHB has funded. Specialist Diabetes Nurse Educators (DNEs) also provide advice and support to GPs, Diabetes Nurse Educators in PHOs and other primary care nurses, supporting them to manage more people at primary care level.

Figure 11 - Adult Diabetes Education & Management

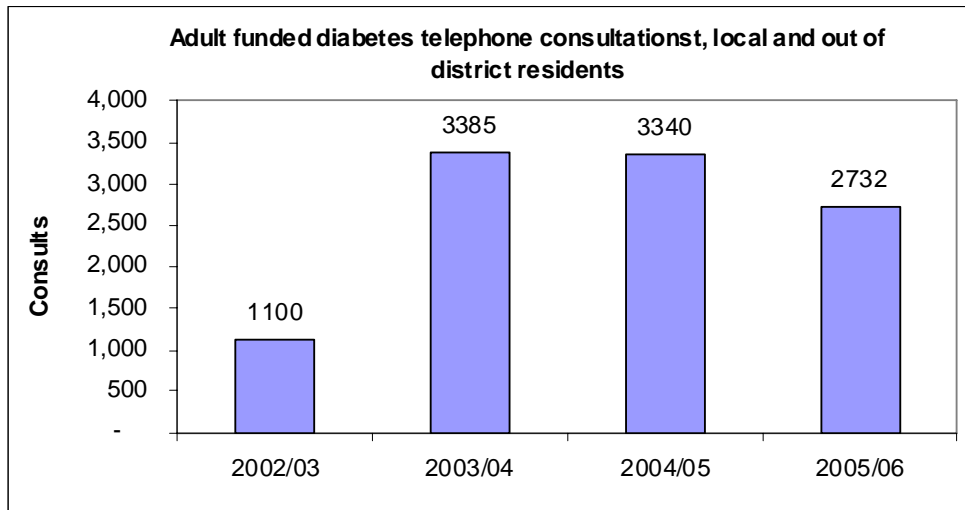


Note: Caution should be taken when interpreting data as system change and counting methodology between years affects data quality and comparability. For the first six months of 2007/08 the volume currently recorded is 2445. This suggests an overall trend of growth in contacts with 2005/06 year more likely to be low due to incomplete data or other system issues.

Adult - Diabetes Education & Management - Telephone Consultations

Telephone consults are a useful, time saving method of follow up.

Figure 12 - Telephone Consultations demonstrated by graph



Gestational Follow Up

Diabetes associated with pregnancy (gestational diabetes) is managed in joint arrangements between the obstetric specialist services, Lead Maternity Carers and diabetes specialist services.

Figure 13 – Gestational follow ups



Adult - Insulin Pumps Issued

When Ministry of Health funding started for insulin pumps in 2002/3, two adults were placed on pumps. At that time it was agreed to supply these people both consumables (with a cost approximately \$3,000 per year per patient). Since future allocations of \$12,000 per annum had to cover five DHBs. In 2004 two adults were commenced on pumps and in 2005 there were four more. The usage of 'Insulin Pumps' (in adults) has increased from two (in 2003) to seventeen (2006).

6.52 Admissions

There is evidence a diagnosis of diabetes increases the number of admissions, length of hospital stay and complexity of treatment in nearly all diagnostic categories. It was anticipated that better access to primary health care, appropriate and timely support and information to support self/whanau management would reduce hospitalisations for people with diabetes.

The trend analysis below demonstrates that, despite increased recognition of diabetes in the population, admission caseweights related to diabetes are stable or decreasing.

Figure 14 - Hospitalisations with diabetes as any diagnosis, C&CDHB.

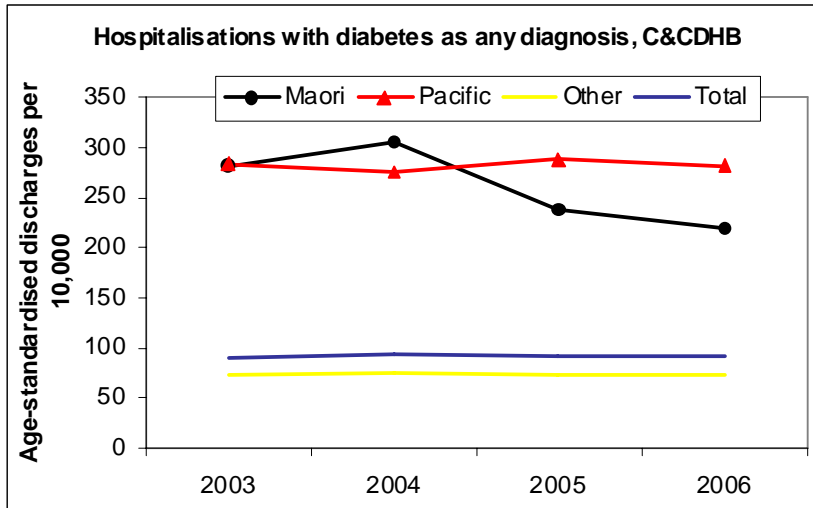


Figure 15 - Hospitalisations with diabetes as any diagnosis, Maori.

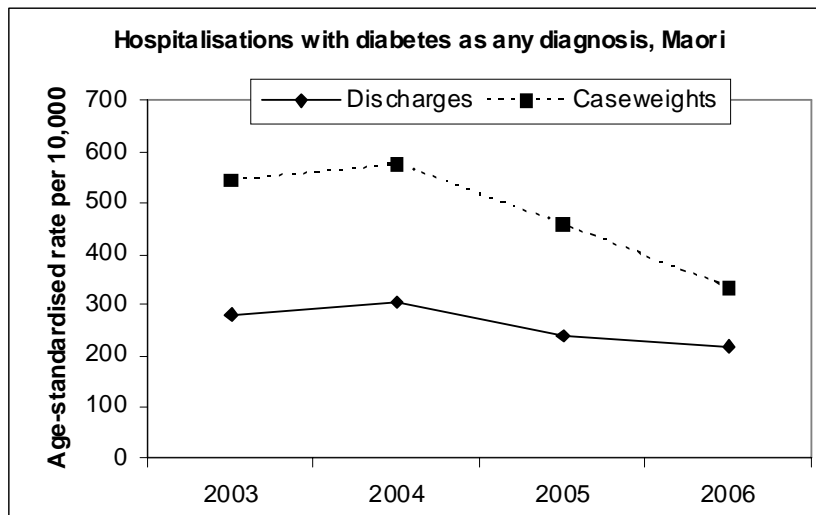


Figure 16 - Hospitalisations with diabetes as any diagnosis, Pacific.

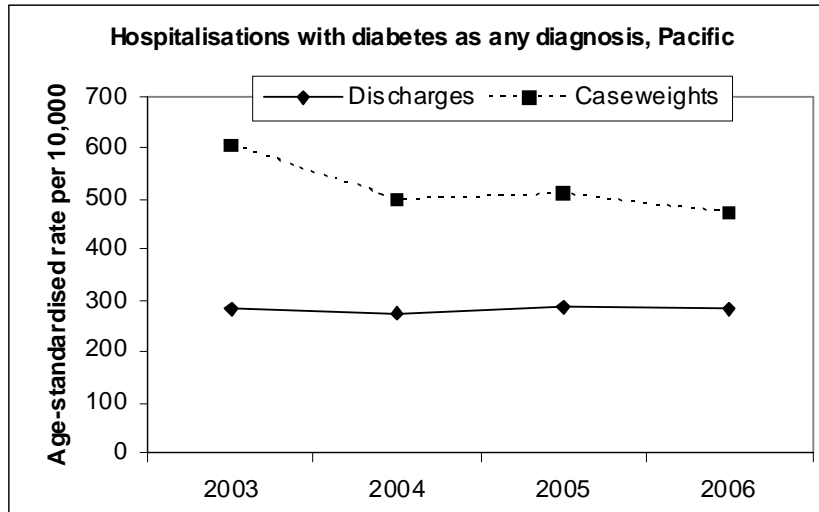


Figure 17 - Hospitalisations with diabetes as any diagnosis, Other.

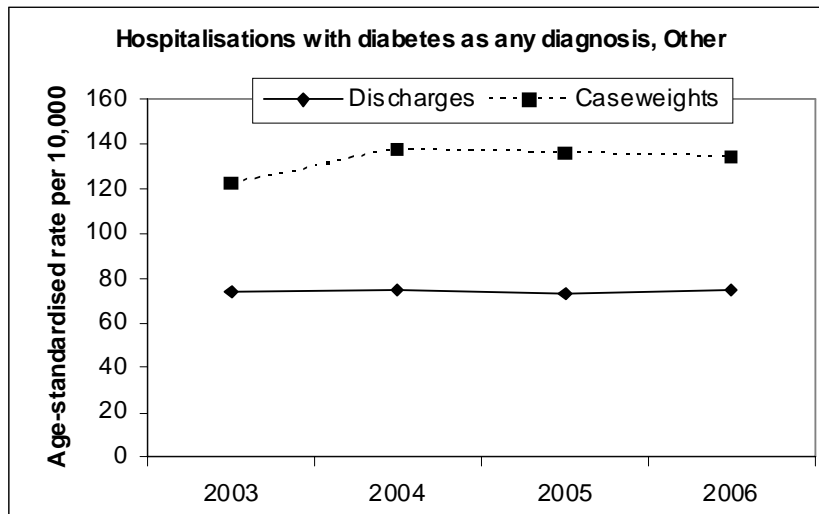
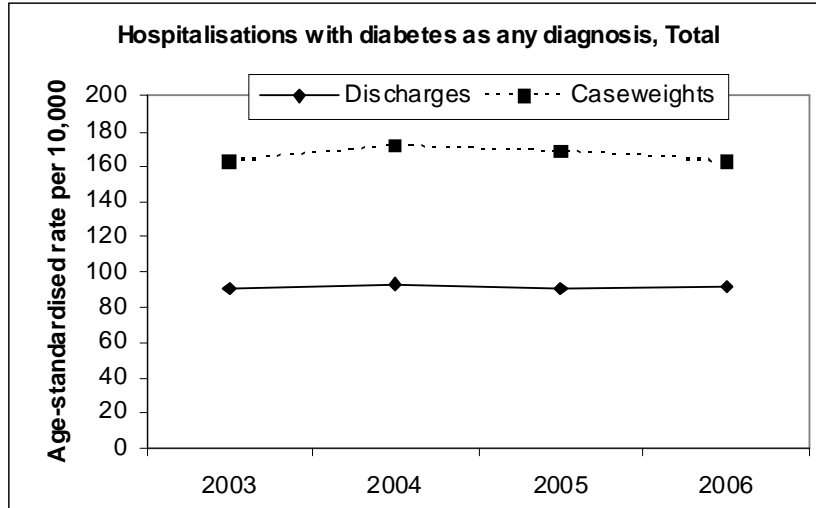


Figure 18 - Hospitalisations with diabetes as any diagnosis, Total

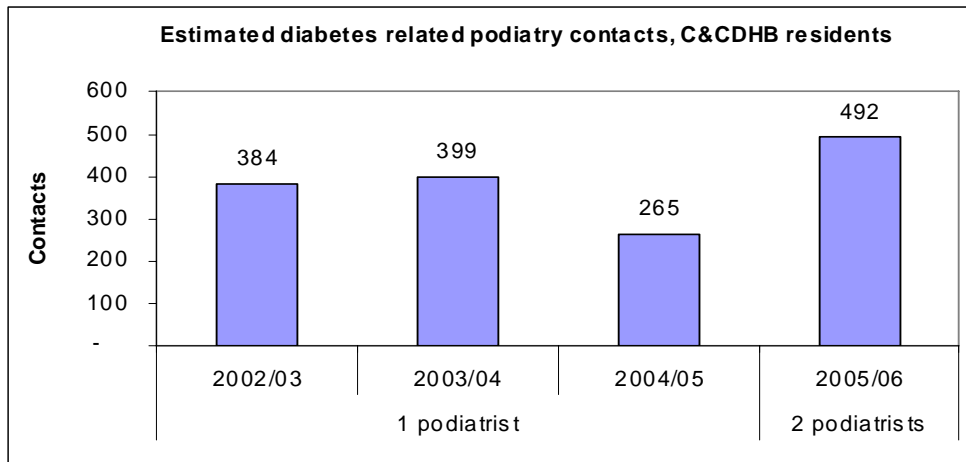


6.53 Podiatry

Non- Medical Adult Podiatry Clinics

Diabetes Podiatry in the HHS cannot be clearly defined as there is no 'Diabetes Specific' service code under this purchase unit. The following graph demonstrates all non-medical clinics.

Figure 19 - Estimated diabetes specific podiatry contacts



Amputations

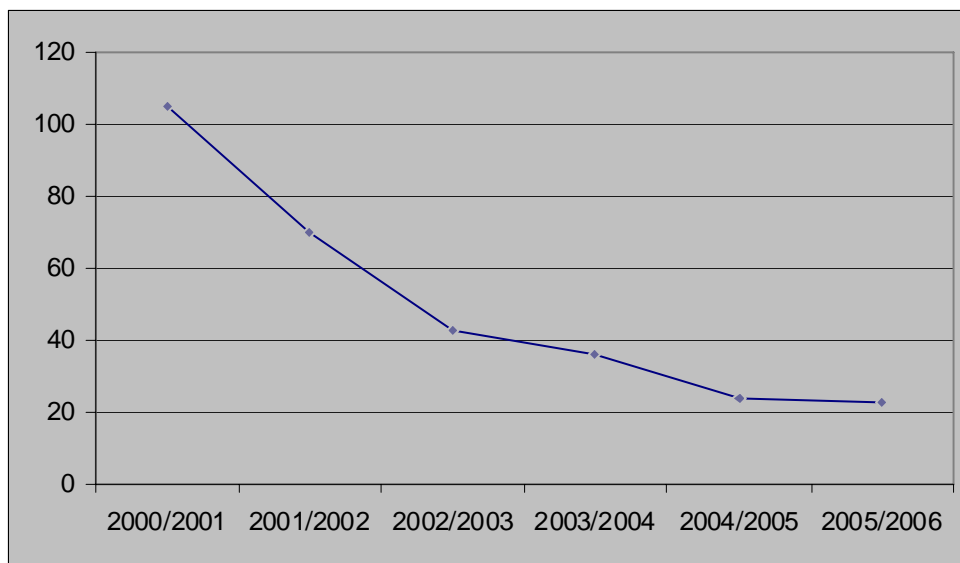
C&CDHB performs amputations for patients across the whole of the Wairarapa, Hutt and Greater Wellington Regions. There has been a general decline in the rate of amputations since heralding of the district wide podiatry service as shown in the following tables:

Table 6 - Total amputations since commencement of the district wide 'Podiatry Service' C&CDHB residents NMDS Data. (Source MOH)

Financial Year	Amputations
2003/04	23
2004/05	20
2005/06	24

Wellington Independent Practice Association (WIPA), one of the contract holders for podiatry services, reports a general decline in the rate of amputations over the past 5 years (LDT Annual Report, 2006). This is demonstrated in **Figure 20**.

Figure 20 - General decline in the rate of amputations over the past 5 years (Source: WIPA analysis)



Please Note: The term amputation (in Figure 20 above) is variable for example in 2006 data, 23 amputations does not necessarily mean 23 people as they count each amputation as one. It appears that the majority of amputations were toes. There were three cases of leg amputations (above knee). There are two main categories 1) Amputation of toes. 2) Above knee amputations.

6.54 Vitrectomy

Good primary care and retinal screening should minimise the need for 'Vitrectomy' which is a salvage operation.

Table 7 - Vitrectomy- actual numbers - Source: Ministry of Health (NMDS)

Financial Year	Vitrectomy
2003/04	15
2004/05	22
2005/06	23

6.55 Renal morbidity

In Australia and New Zealand, all patients who reach ESKD and receive RRT, dialysis or kidney transplant, are registered with the Australia and New Zealand Dialysis and Transplant Registry (ANZDATA). The Registry is funded by the Australia and New Zealand governments and Kidney Health Australia. Data is collected from renal units and nephrologists on a regular basis, and includes all people receiving chronic renal replacement therapy in Australia and NZ. Diabetes is found to be a major contributing factor for dialysis treatment.

Further details about collection methodology are available from the Registry (www.anzdata.org.au).

There is currently no means of tracking ESKD patients who do not receive any form of treatment.

The ANZDATA registry collects patient demographic information and statistical information regarding incidence, prevalence, modality utilization,

The impact of diabetes has been demonstrated by (ANZDATA) that nearly half of people who commence dialysis treatment have diabetes.

There is presently no reliable method of demonstrating investment into diabetes specific renal services. The total \$ investment in 2005/06 for renal services as a whole (including IDF) was \$5,666,485.

6.6 Diabetes Related Mortality

A key aim of service improvements is to reduce diabetes related mortality. Mortality data is not available for the 2004-07 period but the following rates provide a baseline for future trend analysis.

The following graph (Figure 21) demonstrates the most recent data available (2001 -2003).

Figure 21 - Diabetes mortality rate

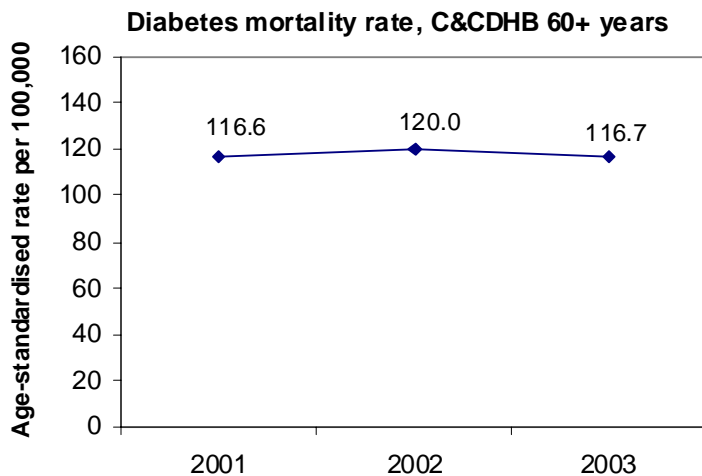
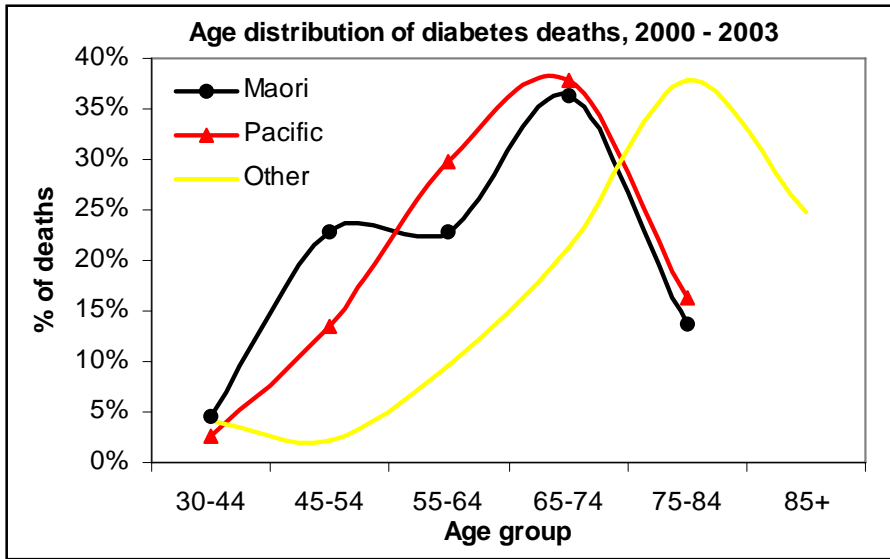


Figure 22 - Diabetes mortality by ethnicity



The graph above shows that Maori and Pacific peoples die at younger ages than 'Other' Maori and Pacific peoples have a higher proportion of diabetes deaths occurring in the younger age groups.

6.7 Child and Youth

C&CDHB's aim is to provide effective diabetes support for children and youth with diabetes and their families. Additional diabetes nurse educator hours have been funded and clinical services (outpatients and follow-ups) are being provided in youth-friendly settings such as the Wellington Youth Health Service (Evolve), at school, home etc.

Figure 23 - Paediatric outpatient attendances, C&CDHB residents

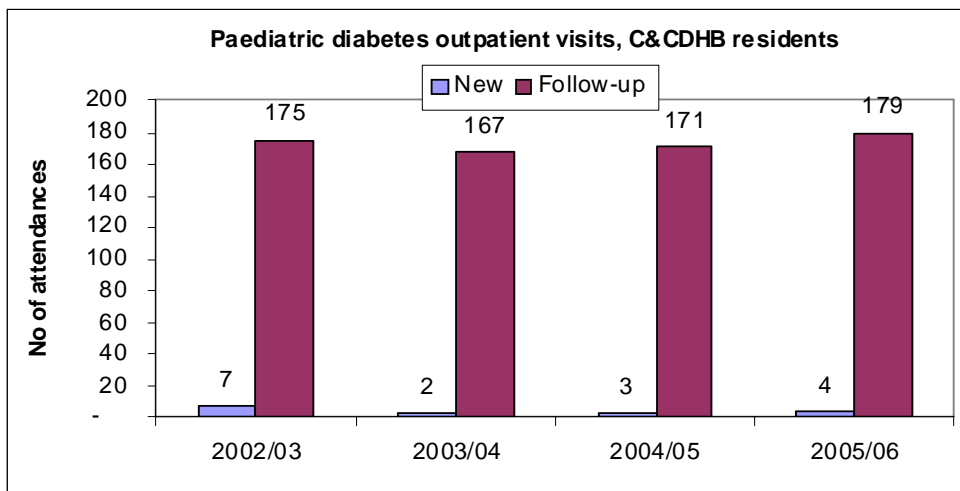
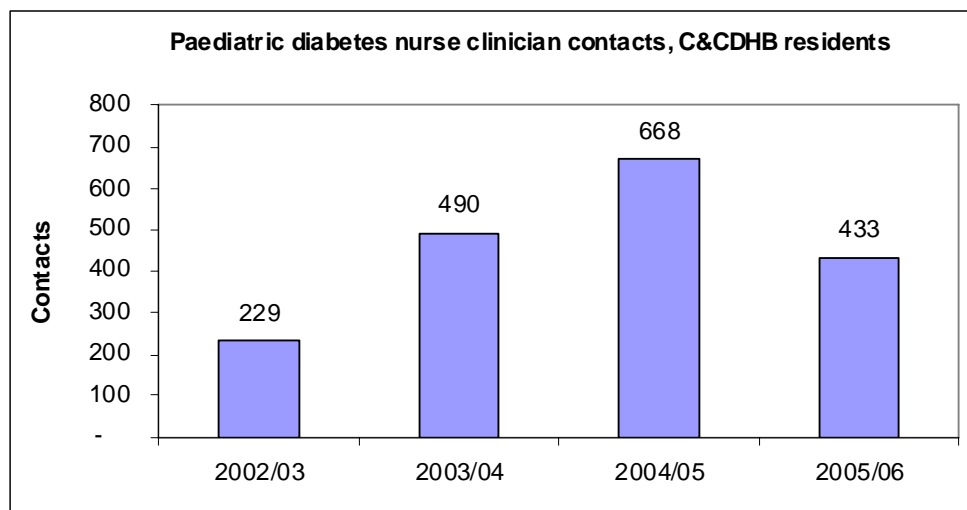


Figure 24 - Paediatric Diabetes Nurse Clinician Contacts (HHS) – C&CDHB



Paediatric – Continuous Supply of Insulin Infusion (Insulin Pumps)

There are significant benefits from using Continuous Supply of Insulin Infusion (CSII) therapy in children and young adults, improving HbA1c levels and reducing hypoglycaemic events. CSII therapy delivers precise doses of normal fast-acting insulin, mimicking normal insulin secretion from the pancreas.

MOH funding for insulin pump dates back to 2004. Funding allocation (like for adults) was \$12,000, ring fenced for children under 18 years. Parents pay for consumables. Of this \$12,000, \$6000 was for C&CDHB and \$6000 for IDF. In 2005 a second pump was purchased. In financial year 2005/6 all dollars were allocated to C&CDHB where two children/youths were put onto Ministry of Health funded pumps. A further two bought their own. In 2006/7 financial year another two children/youth were funded. There is currently a waiting list for pumps.

Whilst costs related to pump therapy are high, this is off set by significant improvement in glycaemic control, potentially resulting in less admissions in the short term and complications in the long term.

Service Planning and Review

C&CDHB is part of a Regional Paediatric Diabetes Service Committee which meets at Hutt valley and C&CDHB alternate meetings.

Diabetes Youth Wellington is an active group that contributes to activities such as the camp described above and provides links and advocacy for young people with diabetes. Advocacy from this group has supported the development of alternative outpatient and DNE education and followup in schools and youth friendly settings such as Evolve (Wellington Youth Health service).

Camps

C&CDHB both fund and support child and youth camps. The camps are an important and useful way of enabling children and young people with diabetes to learn about their diabetes and a great source of peer support aiding self management.

Children's camp

Annual camps for children with diabetes are supported through Diabetes Youth Wellington, hospital service support and volunteers.

Youth Camp

The most recent Adolescent Camp was held in Otaki, housed at Riverslea Lodge and, organized with 'Captive' a company licensed to run outdoor adventure activities. Diabetes Youth Wellington (DYW) and staff at the diabetes centre at Capital & Coast hosted and supported the camp.

The programme included initial ice breaker activities and an orientation course, rafting, abseiling and high ropes. There was a talent quest, a quiz night and education sessions. Staff observed increased confidence, information sharing and more independence.

An excerpt (below) from a report on the youth camp captures some of the gains as well as they enjoyment of this model of supporting self management.

"Funding from the DHBs makes education a required part of the camp and it is a good opportunity to find out what adolescents don't know.

The first session was on food. The food pyramid was discussed, numbers of serves from each group per day, portion sizes, label reading for fat, sugar and fibre and the other names used for these categories. In groups they worked out the nutritional evidence of 4 items on the menu at camp – cereal, bread, muesli bars and milo – and discovered that the cereal and muesli bars definitely did not fit the criteria for healthy eating! The cereal was removed from the menu and muesli bars only used for hypo recovery.

In their groups they then planned a menu for the meals they were given (lunch and dinner each day for 3 days, and one group to do morning and afternoon teas and suppers). They had to run it past the cooks and shoppers who negotiated with them the final form of the menu. They then designed a poster for display and prizes were given for the best poster.

The second education session on Thursday was done in groups. Each group was given a diabetes scenario – hypo management, sick day management, night out with alcohol and mates, exercise extreme – and asked to come up with a way of presenting this to the whole group. They were able to use any props (a few were supplied), skit, poster, and pamphlets and so on. They were given reading material to help them get started.

They had the afternoon to prepare it and then in the evening had to present it to the whole group. Prizes were awarded based on factual accuracy, humour, use of props, multiple presentation techniques. The alcohol group won the prize for best presentation."

WHAT ARE WE AIMING FOR?

7.1 Annual Review Targets

The table below **Table 8** demonstrates C&CDHB Annual Review Targets to 2009 -10 targets. We will be especially targeting disparities in access to Annual Reviews.

Table 8 – Annual Review Targets for years 2004-2010

Capital & Coast DHB – Diabetes Mellitus							
Forecast	Service Performance	Actual	Actual	Actual	Target	Target	Target
Statement of Intent 2006/09		2004	2005	2006	2007	2008	2009
Diabetes Mellitus Management – registered diabetes patients showing good control							
	Maori	61%	59%	61%	62%	64%	66%
	Pacific	51%	57%	57%	60%	62%	64%
	Other	78%	815	79%	80%	82%	83%
	Control	<u>73%</u>	<u>76%</u>	<u>74%</u>	<u>79%</u>	<u>80%</u>	<u>81%</u>
Diabetes Mellitus management – annual check for registered patients							
	Maori	35%	40%	39%	42%	45%	47%
	Pacific	68%	78%	82%	85%	87%	88%
	Other	64%	70%	76%	80%	82%	83%
	Annual Check	<u>60%</u>	<u>66%</u>	<u>71%</u>	<u>75%</u>	<u>77%</u>	<u>80%</u>
Diabetes Mellitus – retinopathy screening rate							
	Maori	66%	75%	74%	75%	77%	79%
	Pacific	66%	71%	68%	70%	72%	74%
	Other	79%	80%	79%	80%	82%	83%
	Retinopathy	76%	79%	77%	79%	80%	82%

7.2 Future Investments and Service Development

Future investment to reduce the incidence and impact of diabetes will continue to focus on the prevention of diabetes, improving uptake and effectiveness of 'Diabetes Get Checked Aotearoa' free annual checks, retinal screening and associated services such as podiatry and nurse educator services and improved support for self management /whanau management of diabetes.

7.21 Get Checked Issues and Improvements

There are some issues that need to be addressed for the services to operate more effectively. These include the need to:

- 1 Identify the population eligible to participate in the programme (that is, those people diagnosed with diabetes) so that the programme's coverage can be accurately assessed and progress towards targets can be measured with certainty. While a sector-wide solution is still being developed by MoH, a district-level estimate for diagnosed diabetes is possible only through record linkages between primary care, specialist diabetes services and hospital discharges.
- 2 Carry out audits to ensure that general practices are preparing good quality treatment plans, in line with the relevant guidelines, and are giving the necessary support to patients so they can implement the plans.
- 3 Monitor the completeness of clinical process for essential clinical checks and prescription of appropriate treatment for diabetes as the measure of quality of care in the primary care setting.
- 4 carry out more cohort studies, using repeated measurement of people who have participated in the programme over several years, to identify how effective the programme is and how best to improve diabetes management.

Adequate monitoring of clinical quality of care is only possible for C&CDHB with sufficient access to more complete data from the 'Get Checked' programme.

7.3 Reporting Framework

This monitoring framework is based on evidence from overseas and New Zealand studies as well as keeping the key measures used by the Ministry of Health (Ministry of Health 2003). Research in the UK [(New, Hollis et al. 2000) and (Edwards, Burns et al. 2003)] uses a set of measurable processes such as completing the essential clinical checks and prescription of appropriate treatment for diabetes as the measure of quality of care. These indicators are key factors that are under the control of the clinicians in delivering diabetic care in the primary care settings. New Zealand studies [(Tomlin, Dovey et al. 2007), (Coppell, Anderson et al. 2006) and (Robinson, Simmons et al. 2006)] also proceed along similar framework. These studies suggest generally positive findings of improvements in the clinical process and outcomes of diabetic care, affirming strong relationship between process and intermediate outcomes, making these indicators useful for ongoing monitoring of diabetes care.

Monitoring effort since the start of 'Get Checked' programme has focused on annual check uptake, glycaemic control and the proportion of patients achieving targets set in the guidelines. However, most research evidence points out that overall improvement in glycaemic control for diabetes patients participating in annual general practice checks is difficult to achieve. Other health gains measured by intermediate outcomes have a much stronger positive relationship to process indicators in measuring quality of care. Therefore, C&CDHB is proposing expanding the MoH indicators to include several measures of clinical process and intermediate outcomes in order to highlight any significant changes in the quality of care and health gains of diabetes patients.

7.31 Routine Reporting

It is anticipated that routine reports will include progress summary by PHO generated by the PHO-managed Canary Diabetes Solution based on the practice data submitted. Standard indicators will include:

Patient's demographics and risk factors:

Percentages by gender, ethnicity, deprivation, smoking history/ status
Mean age of onset and duration of diabetes

Process measures: Case detection percentage, percentage dropping off 'Get Checked', percentage completed recommended clinical measures such as:

<u>Metabolic/ glycaemic Control:</u>	HbA1C (%)
<u>Lipids:</u>	Cholesterol, HDL, Triglycerides (mmol/L)
<u>Blood Pressure:</u>	Systolic, Diastolic (mmHg)
<u>Renal characteristics:</u>	Albumin creatinine ratio (mg/day)
<u>Physical characteristics:</u>	BMI, Waist circumference
<u>Screening:</u>	2-yearly retinal screening, foot checks

Percentage receiving treatments such as:

Anti-platelet (Aspirin/ Clopidogrel)
Anti-hypertensive (ACE inhibitors/ blockers etc)
Lipid-lowering (Statin/ Fibrate)
Oral hypoglycaemics, insulin, green prescription or combinations.

Intermediate Outcomes:

Mean BMI, HbA1c, BP, lipid/ cholesterol;
Percentage good case management (HbA1c < = 8)

Health Outcomes/ Complications:

Microvascular: renal complications, eye complications, neuropathy
Macrovascular: stroke, CVD, CHD, foot complications (foot ulcer, lower limbs amputations)

This framework also recognises those factors outside of the control of the primary care intervention such as characteristics of the practice population, particularly in relation to ethnicity and deprivation. It is well known that ethnicity and deprivation influence health outcomes (Joshy and Simmons 2006) and while primary health care actively addresses the influences of these factors, the influence on outcomes is usually the result of a broader set of factors.

7.32 Service Audit

It is also essential to carry out audits to ensure that GPs, nurses are preparing good quality treatment plans, in line with the relevant guidelines, and are giving the necessary support to patients so they can implement the plans.

Examples where treatment plans were being monitored as part of a wider quality improvement process is implemented by Counties Manukau and Waitemata DHBs (Controller and Auditor-General 2007), which was funding the Diabetes Care Support Service (DCSS) Audit in South and West Auckland. The audit service was provided free to GPs.

Figure 25 – Service Audit Outline

The Diabetes Care Support Audit in South and West Auckland

The Diabetes Care Support Audit is run and managed by the Diabetes Project Trust, and 156 GPs participate in the programme, with over 10,000 records viewed in 2006.

The voluntary audit is free to practices, and involves trained nurses identifying all patients with diabetes, reviewing patient records, and filling out an audit tool. The audited practice receives:

- a patient register listing all patients with diabetes, pre-diabetes, or gestational diabetes;
- summary information about patients with diabetes in the practice;
- an individual report for each patient, with up-to-date “prompts”;
- personal feedback from the audit nurse (in some circumstances);
- special interest confidential reports; and
- Maintenance of Professional Standard credits for participating GPs.

The audit is designed as a quality improvement process. Its primary purpose is to help GPs to identify improvement opportunities in their practice, encourage GP behaviour change, and promote contemporary research-based practice, through feedback and clinical support from a specialised executive committee. It also gathers non-identifiable patient information for research and service development.

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Appendix 1

INVESTMENTS INTO DIABETES OVER 2003 - 2006						
CATEGORY		2003 \$	2004 \$	2005 \$	2006 \$	Total \$ Given 03-06
HHS	Diabetes Education and Management - Adult		162,820*	256,290*	147,285.00	566,395
PRIMARY CARE	Diabetes Education and Management	442,176	578,220.58	588,952.02	593,890.66	1,609,348.50
PRIMARY CARE	Local Diabetes Team Coordination, Admin Support Services		45,000.00	15,833.33	10,000.00	70,833.33
	Management Services Diabetes - Youth/Consumer	9,000.00	18,000.00	26,916.68	22,833.37	76,750.05
	Podiatry	115,541.66	192,137.49	204,850.00	211,391.18	723,920.33
	Diabetes Fundus Screening	210,627.54	277,368.96	371,514.35	356,571.42	1,216,082.20
	Free Annual Review	308,240	265,115.96	265,115.96	339,931.13	1,178,403
	Training & Workforce Development		42,583.00	42,583.00	102,327.07	187,493.07
	Resource Development Project (Directory)		10,000.00	10,000.00	833.33	20,833.33
	Research & Development		73,000.00			73,000.00
	TOTALS	\$1,085,585.20	\$1,664,245.90	\$1,782,785.20	\$1,785,063	
GRAND TOTAL						\$6,317,679.30
* - Includes IDF, whereas 2006 only 'Local'						

