

et al., 2007; Pelletier, 2001). Meta evaluations have been undertaken by Chapman (2003, 2005) and Pelletier (2001) on the effectiveness of such programmes. In spite of methodological differences between evaluation studies, meta-analysis has shown a high degree of “congruence” with worksite-based programmes showing “average reductions in sick leave, health plan costs, and workers’ compensation and disability costs of slightly more than 25%” (Chapman, 2005). Chapman (2005) also found that more recent intervention studies have shown cost/benefit ratio returns of 1:6.3. Pelletier (2001:115) has concluded that:

“the most salient issue for insurers and corporations to address is not whether worksite health promotion and disease management programmes should be implemented...to reduce risks..., but rather how such programmes should be designed, implemented and evaluated in order to achieve optimal clinical effectiveness and cost-effectiveness.”

Studies since, have reported that the most effective interventions both clinically and cost wise:

- are typically targeted to high risk populations (those with a wide range of health co-morbidities or risky lifestyles, income and education) and multifaceted (Mills, Kessler, Cooper *et al.*, 2007);
- use methods such as:
 - mandatory annual health risk appraisal;
 - a Transtheoretical model of change and self-directed change;
 - telephone support to particularly high risk participants;
 - internet based health information delivery;
 - tailored health information to the circumstances of the participant;
 - financial incentives linked to benefits of participating in the programme (Chapman, 2005).

Section 3: Results of a study using GP practice data examining the effects of co-morbidities upon GP and ACC consultation rates respectively

Key findings – Primary Care Service Utilisation and Cost Impacts to ACC (CBG Health Research Ltd, 2009)

ACC

In the 12 month period April 2008 to March 2009, a study by CBG using New Zealand HealthStat data collected from GP Practices has clearly shown that:

- approximately 32% of the GP patient population has at least one health co-morbidity (Asthma, COPD, IHD, Hypertension, HF, Diabetes, Mental Health, Cancer) recorded on their patient file;
- irrespective of age, sex, and ethnicity ACC patients who have a recorded chronic disease have approximately twice as many ACC consultations for injury treatment than ACC patients who don't have a chronic condition. The same rate of extra service utilisation was found in GP clients with a health co-morbidity but who weren't ACC clients;
- ACC Consultations represented 8.1% of all GP consultations.

The extra burden to ACC of consultations for patients with a recorded health co-morbidity is estimated to be 340,000 consultations nationally, which at an average cost of \$37.12 per consultation for the period, equates to a cost of \$12,620,800 (excl GST) in the 12 month period.

Introduction and Methods

In the previous section a descriptive summary of the literature on the effects of health co-morbidities upon health treatment utilisation and workers' compensation costs was presented. In this section, research findings specific to ACC Consultation rates in General Practice settings is reported.

ACC Research commissioned CBG Health Research to examine the relationship between health co-morbidity and injury treatment utilisation at the primary care level in New Zealand using HealthStat data (CBG Health Research Ltd, 2009). The following is a summary of the full report. The report is available from ACC Research or ACC Library services.

A random sample of HealthStat data of 94 General Practices and 453,113 patients was drawn for the 12 month period April 2008 to March 2009. Read codes and prescribing patterns were statistically analysed to examine the relationship between patients treated for an injury resulting in an ACC Claim, and the existence of a health co-morbidity. Injury treatment was defined as an ACC invoiced service. ACC consultation rates for patients with an identifiable co-morbidity were compared to the consultation rates of those without a co-morbidity. Co-morbidity was defined as having one or more of the following coded flags:

1. Asthma – diagnosis or related prescription
2. Coronary obstructive pulmonary diseases (COPD)

3. Ischaemic heart disease diagnosis or related prescription
4. Hypertension – as measured through Blood Pressure
5. Heart Failure
6. Diabetes diagnosis or related prescription
7. Mental health diagnosis or related prescription
8. Any other Chronic disease or cancer diagnosis.

Findings

Examination of the HealthStat data set drawn showed that the observed pattern of health co-morbidity by age, sex and ethnicity in the sample was as expected when compared to national prevalence estimates reported by the MOH.

Effect of Health Co-morbidity on ACC Consultation Rates and All Consultations Respectively

Overall, there were 1,826,188 GP consultations (“visits” or “encounters”) made by the 453,113 patients in the sample. Of these 148,974 (8.1%) were identified as ACC consultations involving an invoice to ACC for payment.

The following table shows the mean number of ACC consultations compared to All GP Consultations by demographic group, existence of a health co-morbidity, and the ratio of consultations between those with and without a co-morbidity respectively.

ACC consultations increase with age, and men have more consultations than women, which would be expected from a range of injury risk profiles. In contrast, for all GP Consultations, there is a clear increase in consultation rate with older age groups. Those aged 65+ have the highest rates. Females have higher overall rates compared to men, and people of “Other” ethnicity have more consultations than Māori and Pacific ethnicities.

In the table, the ratio of consultations of those with a co-morbidity compared to those without provides a measure of the extra service utilisation associated with the existence of a health co-morbidity in the sample population.

The ratios indicate that for ACC consultation rates, overall (total sample population) there is an extra 88% primary care treatment service utilisation associated with those who have a health co-morbidity. The extra utilisation varies by demographic group, ranging from a low 43% for Pacific Peoples, to a high of 235% for females. Higher rates of service utilisation are seen in the “All Consultations” column.

Table 4: Mean Number Consultation Rates by Demographic Group and Existence of Co-morbidity

Patient Group	ACC Consults			All GP Consults		
Age group	No Chronic Condition	Chronic Condition	Ratio Chronic / No Chronic	No Chronic Condition	Chronic Condition	Ratio Chronic / No Chronic
0-5	0.15	0.23	1.53	5.12	7.49	1.46
6-17	0.21	0.31	1.48	1.95	4.19	2.15
18-24	0.25	0.36	1.44	2.53	5.60	2.21
25-44	0.27	0.44	1.63	2.82	6.93	2.46
45-64	0.36	0.56	1.56	3.73	9.55	2.56
65+	0.37	0.65	1.76	5.92	13.71	2.32
Sex						
Female	0.20	0.47	2.35	3.67	9.65	2.63
Male	0.32	0.53	1.66	2.71	7.96	2.94
Ethnicity						
Māori	0.25	0.41	1.64	2.90	8.06	2.78
Other	0.27	0.54	2.00	3.35	9.18	2.74
Pacific	0.21	0.30	1.43	2.84	8.30	2.92
Total	0.26	0.49	1.88	3.19	8.88	2.78

Source: Adapted from CBG Health Research Ltd (2009), Table 3, page 13

Table 5 (next page) focuses upon ACC Consultations, and compares the mean number of consultations between those with and those without the presence of a health co-morbidity. 95% confidence levels are presented, to show the statistically significant differences between the two groups. Multivariate analysis showed that the observed differences persist after controlling for age, sex and ethnicity (CBG Health Research Ltd, 2009).

For the study sample, the additional rate of service utilisation associated with co-morbidity equals an additional 34,000 injury treatment consultations. Extrapolating this result to the whole population, these findings suggest that the rate of additional injury treatment utilisation to ACC is in the order of 340,000 consultations per annum at an additional cost of approximately of \$12,620,800 (excl GST), assuming an average cost per consultation of \$37.12¹ for the time period.

Discussion

The findings in the CBG report are consistent with the published literature reviewed earlier. Patients with a health co-morbidity have nearly twice as many ACC visits than patients who do not have a co-morbidity. The higher number of ACC visits is consistent with the medical

¹ Average cost provided by Jenny Mason, Senior Analyst, ACC Business Intelligence Injury Prevention, 14/7/10.

treatment complications arising from health co-morbidities. For example, patients with diabetes can suffer from neuropathies that reduce heat and pain sensation so burn injuries are more likely. In addition, treatment for such injuries is prolonged because poor tissue perfusion associated with diabetes results in a delay in wound healing. The same situation applies to those with circulatory disease problems. Obese patients will have reduced opportunities for physical activity-based rehabilitation. Age, sex and ethnicity are all complicating factors.

Another factor to consider is the nature of health service delivery in New Zealand and the existence of ACC, which may result in more claims in New Zealand compared to overseas. For example, patients with a chronic condition who visit their GP, provides opportunities for extra treatments to be provided for relatively minor injuries, the costs for which are passed onto ACC. The ability to make such an ACC claim, may consequently be acting as means to reduce what otherwise could be a cost barrier for patients with chronic co-morbidities in seeking treatment. While this is arguably important for improving the health of the population, arguably it should not be at the cost to the ACC levy payer.

Table 5: Mean Number (and 95% Confidence Intervals) of GP ACC Consultations by Patients With No Co-Morbidity Compared to Patients With Co-morbidity,

Patient	No Health Co-morbidity		With Health Co-morbidity	
	Mean Consults	95% Confidence Interval	Mean consults	95% Confidence Interval
Age group				
0-5	0.15	0.14 – 0.15	0.23	0.21 – 0.25
6-17	0.21	0.20 – 0.21	0.31	0.29 – 0.32
18-24	0.25	0.24 – 0.26	0.36	0.34 – 0.38
25-44	0.27	0.27 – 0.28	0.44	0.42 – 0.45
45-64	0.36	0.35 – 0.37	0.56	0.54 – 0.57
65+	0.37	0.34 – 0.39	0.65	0.63 – 0.67
Sex				
Female	0.20	0.19 – 0.20	0.47	0.46 – 0.48
Male	0.32	0.32 – 0.33	0.53	0.51 – 0.54
Ethnicity				
Māori	0.25	0.25 – 0.26	0.41	0.40 – 0.43
Other	0.27	0.27 – 0.27	0.54	0.53 – 0.55
Pacific	0.21	0.20 – 0.21	0.30	0.27 – 0.32
Total	0.26	0.26 – 0.26	0.49	0.49 – 0.50

Source: Adapted from CBG Health Research Ltd (2009), Table 4, page 14

Section 4: Selected Health Co-morbidities and ACC Injury Treatment Utilisation and Compensation Costs: Results of a trial of linked ACC-MOH Data

Key findings –Injury Treatment Utilisation and Cost Impacts to ACC for Selected Co-morbidities

- The prevalence of diabetes and coronary heart disease in the ACC population is similar to that reported in national estimates for all age groups up to 80 years of age.
- Clear evidence that the selected co-morbidities (diabetes and coronary heart disease) increases the risk of making an ACC claim (claim utilisation), increases the mean cost of All Claims² and Entitlement claims respectively, and results in increased duration of some claims. The effects are statistically significant for Entitlement Claims.
- Irrespective of statistical significance, small levels of increased costs associated with the co-morbidity adds up to significant costs to the Scheme.
- Extra All Claims costs of at least \$60 million for the 2008/09 financial year have been attributed to the presence of coronary heart disease at the 6 month time point following a claim.
- Extra All Claims costs of at least \$36 million for the 2008/09 year have been attributed to the presence of diabetes at the 6 month time point following a claim.
- Costs, for both co-morbidities continue to increase to the 12 month time point for All Claims and Entitlement Claims respectively, but not significantly.
- Increased costs of All Claims are likely to be related to increased complexity of treating claims due to the presence of the co-morbidity.
- Increased cost of Entitlement claims is likely to be associated with increased rehabilitation required due to the presence of the co-morbidity.
- The effects of the selected co-morbidities are significantly related to older population age-groups. This has implications for increased Scheme liability, particularly in the Non-Earners' Account and to some degree the Work and Earners' Accounts as the population gets older.
- Linked ACC and MOH data was used to examine the effects of diabetes and coronary heart disease on ACC claim rates and costs. The findings reported are the first to quantify ACC related co-morbidity size effects using linked data.
- Linked MOH and ACC data is required to quantify co-morbidity effects on ACC injury treatment utilisation and costs. Using the approach by Sarfati (2010), a more disaggregated analysis could be undertaken in a future study using more detailed data from MOH data on the health treatment history of ACC clients. Such a request though may raise significant ethical and confidentiality issues.

² All Claims includes Med Fees only claims, Weekly Compensation claims and Other Entitlement claims.

Introduction

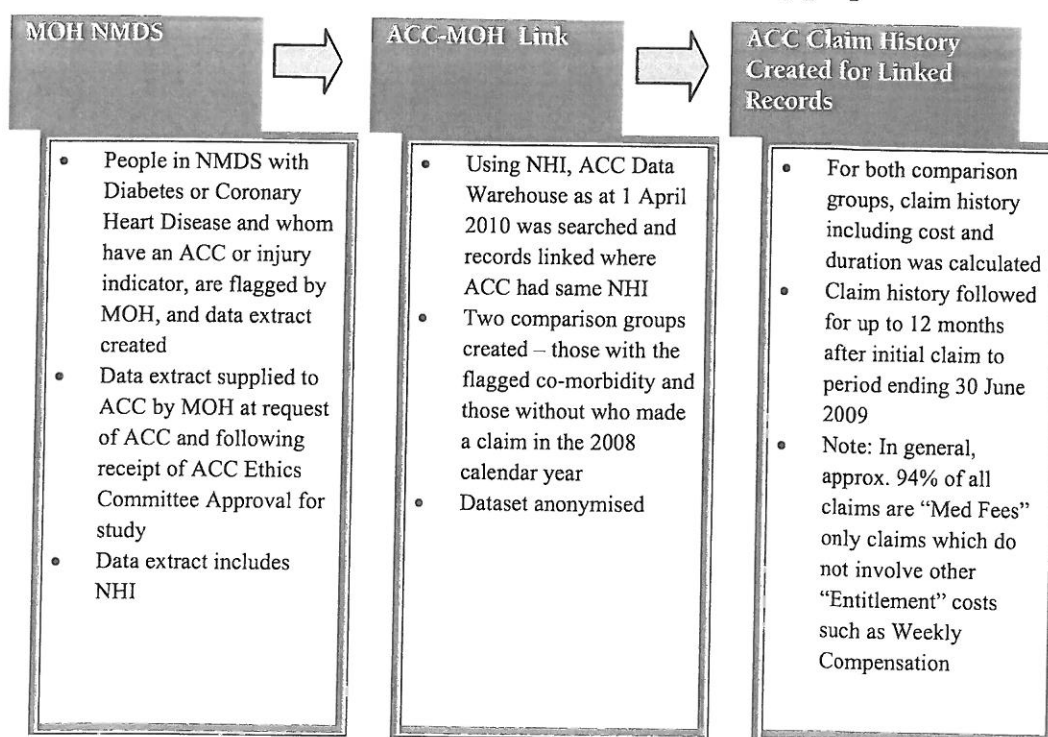
In the previous section, research findings that explored the effects of a wide range of existing health co-morbidities upon ACC Consultation rates in General Practice settings was presented (CBG Health Research Ltd). The research clearly showed that having a health co-morbidity was significantly associated with increased primary care injury treatment utilisation and associated costs to ACC compared to those with no record of a pre-existing health co-morbidity.

In this section the results of an ACC research project, in collaboration with ACC Business Intelligence (Injury Prevention), using linked ACC and MOH data is presented.

Methods

ACC Business Intelligence (Injury Prevention) using National Health Index (NHI) numbers linked Ministry of Health (MOH) National Minimum Data Set (NMDS) data to ACC data to identify all people flagged by MOH as having diabetes and coronary heart disease and an ACC injury claim. By linking the data, the claim histories, including cost and duration, of people with and without these conditions were able to be followed and compared for up to a 12 month period ending 30 June 2009 (Mason, 2010). The process of linkage and claim history preparation is outlined in the following diagram.

Figure 1: MOH - ACC data linkage process and claim history preparation



The data linkage process involved identifying all ACC clients born before 1 July 2008 and for whom ACC held a NHI number that could be linked to the MOH data. This amounted to just over 3,037,435 million people out of 7 million records (or 44% of records) in the ACC Data Warehouse in April 2010. The details of all claims made by these people in the year from 1 January 2008 to 31 December 2008 were then extracted along with all information about the treatment and entitlements received in the first year of these claims through to 30 June 2009.

Although less than half the personal records contain an NHI number, there have been recent attempts to improve the proportion of claims on which the NHI number is provided and currently it is known for about 80% of new claims. The NHI number is provided by the initial treatment provider when a new claim is lodged and some treatment providers are able to provide this and others are not. Some primary care treatment providers are not able to provide an NHI because of the nature of the electronic claims filing system. Once an NHI has been provided on one claim, it can be attached to all subsequent claims for that person. Therefore it is likely to be held for most people who have made a claim at any time in recent years and there is no reason for any bias to result from including only these people in this analysis. However to check for population level biases, the prevalence of Diabetes (irrespective of type) and CHD in the ACC data set has been compared to those reported by the MOH for the general population by sex and life cycle age group. The comparisons are presented in Tables Table 6 and Table 7 on the following pages.

The results indicate that the prevalence of Diabetes and CHD in the ACC dataset is close to the national prevalence estimates reported by the MOH – except for females aged over 80 years.

Other points to note: The ACC Data Warehouse includes a record for every person who has ever made a claim to ACC, so:

- it will include people who have since died – ACC is usually only informed of a client's death if that person is currently receiving some sort of payment from ACC (at the time of death). All records where the person is known to have died have been omitted;
- it will include people currently living overseas and visitors who made a claim while they were in New Zealand, for whom co-morbidity information does not exist. It is not known how many these may be, however the number is likely to be very small;
- it will include duplicate records for some people. Typically these occur when a claim was lodged with differences in the personal details such as change of name or address and a new record was created instead of the person being recognised as an updated form of the original record. However, any new claims for this person within approximately the last two years will be assigned to only one of these records. This issue applies to both the comparison groups.³

In all these cases, the personal record will have had no new claims related to it but it does not mean that that person was alive and well and living in New Zealand and made no claims. This will be a problem if there are a large number of these records of this type in either group as it will reduce the incidence claim rate for that group.

Why Diabetes and CHD?

Diabetes and CHD were selected for analysis because of their relevance to injury treatment and rehabilitation, and specific validated flags were available from the Ministry of Health for this study (*Craig Wright, Health and Disability Intelligence*).

³ ACC Business Intelligence – Data Integrity have commenced a project to improve the integrity of ACC data, including the reconciliation of duplicates records.

Injury patients with diabetes can suffer from neuropathies that reduce heat and pain sensation so burn injuries are more likely. Furthermore, treatment for such injuries is prolonged because poor tissue perfusion associated with diabetes results in a delay in wound healing. The same situation as diabetes applies to those with circulatory disease problems. Obese patients will have reduced opportunities for physical activity-based rehabilitation. Age, sex and ethnicity are all complicating factors. The presence of both diseases complicates primary treatment.

Since this project was commenced, Sarfati et al (2010) have examined the quality of routinely collected MOH data to provide co-morbidity data using the standard MOH National Minimum Data Set (NMDS) coding frames. The researchers concluded that routine MOH administrative data “provides a reasonably useful source of accessible information on co-morbidity for risk adjustment particularly in multivariable models” (Sarfati, Hill, Purdie et al., 2010).

Recommendation:

Future co-morbidities studies using linked ACC-MOH data should follow the methods published by Sarfati et al (2010). Such an approach would have the advantage of allowing for the effects of a much larger range of health co-morbidities to be quantified, than those reported below. However, such a project may have to address privacy and confidentiality issues as it would require linking data concerning other health issues.

Findings

Introduction

In the analysis presented in the following two parts, the key findings for diabetes and CHD are presented separately. The findings presented focus upon quantifying and comparing differences in:

- extra claims utilisation for “All Claims” and “Entitlement Claims” respectively
- extra costs in terms of “All Claims” and “Entitlement Claims” respectively at 6 and 12 months for each type of claim
- claims duration as measured by number of payments made over time

The findings are briefly discussed in the context of additional analyses that have been undertaken, but which are not reported in detail in this paper. The additional analysis looked at injury situations where the selected co-morbidity could be expected to result in a differential pattern given the medical condition should an effect be true. For example, for diabetes and CHD due to the medical nature of the two conditions it could be expected to find increased service utilisation and costs are associated with:

- older age groups
- specific injury types such as falls, burns and extremities and amputation, fractures soft-tissue damage.

Prevalence of Diabetes and CHD in the ACC Population Compared to National Estimates

Diabetes

Of the 3,037,435 people in the ACC claims dataset with an NHI number 140,117 people (4.6%) were identified as having diabetes.

The population distribution of ACC clients with diabetes is very similar to the national estimates from the MOH, apart from those aged over 80 years. In this age group the ACC proportion is 4% lower than would be expected from MOH population data.

Analysis of the ACC data by age group, ethnicity and social deprivation⁴ also shows that the:

- greatest number of ACC clients with diabetes are those aged 45 – 64 years;
- rate among Pacific Peoples is slightly higher than for other ethnic groups despite the fact that this group tends to have a younger average age than other groups;
- rate of diabetes rises steadily from 3.6% for ACC clients living in the least deprived (or decile 1) areas, to 5.7% for clients living in the most deprived or decile 10 areas.

Table 6: Percentage of the population with diabetes, comparison of MOH estimates with ACC data set

Age group / Sex	MOH national figures			ACC clients in study		
	Female	Male	Total	Female	Male	Total
Aged under 15	0.3	0.3	0.3	0.4	0.4	0.4
Aged 15 -24	0.9	0.5	0.7	1.1	0.6	0.8
Aged 25 - 44	2.5	1.8	2.1	3.0	1.8	2.3
Aged 45 - 64	6.1	7.6	6.8	7.0	7.9	7.4
Aged 65 - 79	14.0	17.1	15.5	14.3	16.9	15.6
Aged 80 and over	15.0	17.7	16.0	11.5	13.6	12.3
Total	4.3	4.6	4.4	4.9	4.3	4.6

Coronary Heart Disease

Of the 3,037,435 people in the ACC claims dataset with an NHI 127,000 (4.1%) were identified with having CHD in the dataset.

The population distribution of CHD among ACC claimants is very similar to the national totals for all ages except those aged over 80 years, which is the situation similar to that for diabetes. The largest numbers of ACC clients with this condition are males aged 65 - 79 years (38,000) followed by females aged 65 -79 years (29,000) and men aged 45-64 (27,000).

When examined by ethnicity, Māori, Pacific Peoples and Asians, ACC clients have observed rates of CHD at approximately half of that compared to Other / European, 2% compared to

⁴ Details are available on request from ACC Research.

5%. This is likely to reflect the different demographic profile of the groups, with Māori and Pacific Peoples having a much higher proportion of young people than the Other/European. However, other ACC research (*Kake et al, 2010*) indicates that this may also represent some under-claiming by these groups.

In terms of socio-economic status (as measured by deprivation), the distribution of CHD is not as clear as that for diabetes. The lowest rate at 3.5% is in the least deprived group (i.e. Decile 1). The highest rates of close to 4.5% are found in each of the deciles 5-9, however the most deprived group (i.e. decile 10) have a lower rate at less than 4%. No statistical tests of significance were done on these analyses.

Table 7: Percentage of population with CHD, Comparison of National Estimates with ACC Data set

Age group / Sex	MOH national figures			ACC clients in study		
	Female	Male	Total	Female	Male	Total
Aged under 15	0.1	0.1	0.1	0.2	0.2	0.2
Aged 15 -24	0.1	0.1	0.1	0.2	0.2	0.2
Aged 25 - 44	0.4	0.6	0.5	0.5	0.6	0.6
Aged 45 - 64	2.9	5.3	4.1	3.6	5.8	4.7
Aged 65 - 79	14.1	20.3	17.1	15.7	21.1	18.3
Aged 80 and over	27.2	31.6	28.8	22.1	24.8	23.0
Total	3.4	4.3	3.8	4.2	4.2	4.2

Does the presence of Diabetes or CHD result in Extra Claims Utilisation?

All Claims

Diabetes

In the July / June 2008/09 financial year, there were in total 1,416,349 claims invoiced to ACC in the dataset. Of these, 71,857 (1.97%) were from people who had diabetes.

Looking at Table 8 and Figure 2 a higher rate of claiming can be observed for those with diabetes, particularly for those over 80 years of age. Statistically, the All Claims differences were not significant at the 95% confidence level; however this changes when examining Entitlement Claims.

Coronary Heart Disease

In the period under analysis there were 127,000 (4.1%) ACC clients with CHD in the data set.

The ratios in

Table 9 show the levels of extra claiming associated with clients having CHD. There is a marked age gradient, with the risk of extra claiming significantly increasing with age. In contrast, only males with CHD over 65 years have an All Claims rate higher than their counterparts without CHD. Overall, when looking at the ratio of claims between the two groups the only age group that is substantially higher is the over 80 age group, where the rate of claiming is 79% and 206% higher for females and males respectively. For all age-groups, the ratios are small, and the differences are not statistically significant. This changes when looking at Entitlement Claims.

Table 8: Claims Rate – All Claims ‘Has Diabetes’ Compared to ‘No Diabetes’ July / June 2008-09 Financial Year

Diabetes: <u>All Claims</u>		No. of Claims With Diabetes	Claim Rate: Number of claims per 1000 people, in July / June 2008/09 Year & for whom ACC has an NHI number			Claim Rate Ratio Diabetes / No Diabetes
Sex	Age Group		Has diabetes	Does not have diabetes	Total	
Female	Aged under 15	520	451	432	432	1.05
	Aged 15 -24	1,118	514	444	445	1.16
	Aged 25 - 44	5,140	463	425	426	1.09
	Aged 45 - 64	11,786	489	461	463	1.06
	Aged 65 - 79	10,933	518	470	476	1.10
	Aged 80 and over	7,814	673	436	463	1.54
	Sub-Total Number of Claims	37,313	611,280			
Male	Aged under 15	677	499	500	500	1.00
	Aged 15 -24	1,013	688	636	637	1.08
	Aged 25 - 44	3,740	503	520	519	0.97
	Aged 45 - 64	13,410	476	479	478	0.99
	Aged 65 - 79	11,059	486	420	432	1.16
	Aged 80 and over	4,640	606	364	397	1.67
	Sub-Total (N=)	34,544	778,242	(without Diabetes)		
Grand Total (N=)	71,857	1,389,522	(without Diabetes)			

Table 9: Claims Rate - All Claims 'Has Coronary Heart Disease' Compared to 'No CHD', July/ June 2008/09 Financial Year

Coronary Heart Disease: <u>All Claims</u>			Claim Rate: Number of claims per 1000 people, in July / June 2008/09 Year & for whom ACC has an NHI number			Claim Rate Ratio CHD / No CHD
Sex	Age Group	No. of Claims With CHD	Has CHD	Does not have CHD	Total	
Female	Aged under 15	172	385	432	432	0.89
	Aged 15 -24	128	394	445	445	0.88
	Aged 25 - 44	967	509	425	426	1.20
	Aged 45 - 64	6,573	529	461	463	1.15
	Aged 65 - 79	13,401	577	458	476	1.26
	Aged 80 and over	15,692	706	395	463	1.79
	Other	1				
	Sub-Total	36,934	611,659			
Male	Aged under 15	294	475	500	500	0.95
	Aged 15 -24	228	564	637	637	0.89
	Aged 25 - 44	1,386	523	519	519	1.01
	Aged 45 - 64	10,393	504	477	478	1.06
	Aged 65 - 79	14,305	506	412	432	1.23
	Aged 80 and over	9,024	647	314	397	2.06
	Other	5				
	Sub-Total (N=)	35,635	777,151	(without CHD		
Grand Total (N=)	72,569	1,388,810	(without CHD			

Figure 2: Comparison All Claim Rates, per 1000 people by Age and Sex with Record of Diabetes to those Without Diabetes, July / June 2008/09 Financial Year

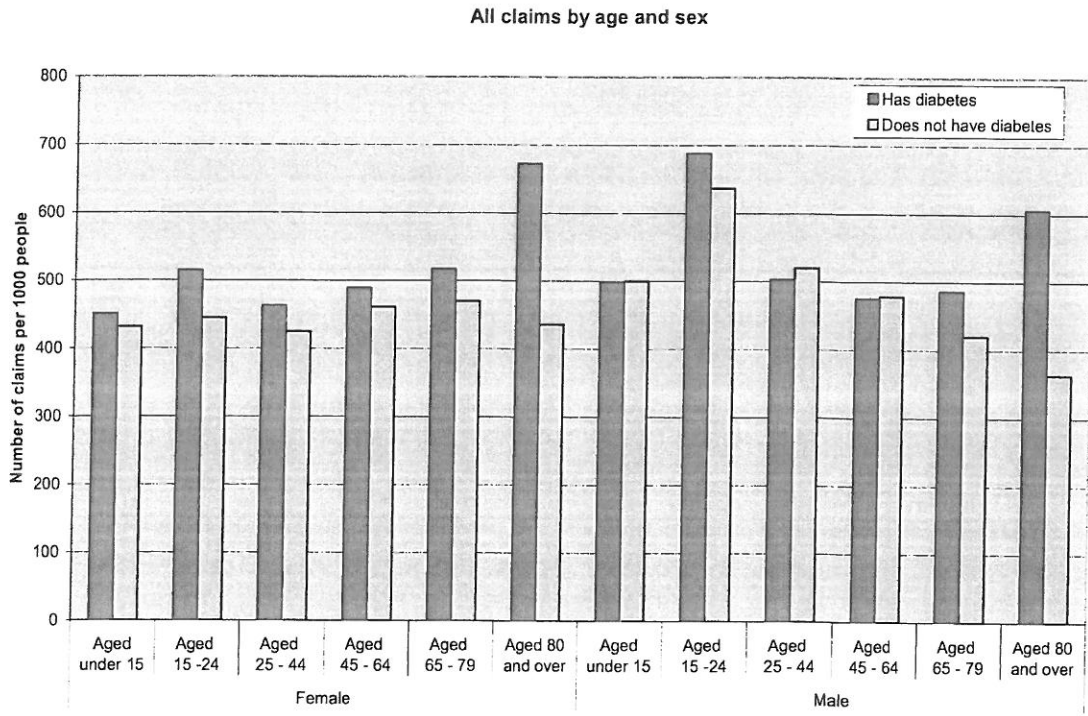
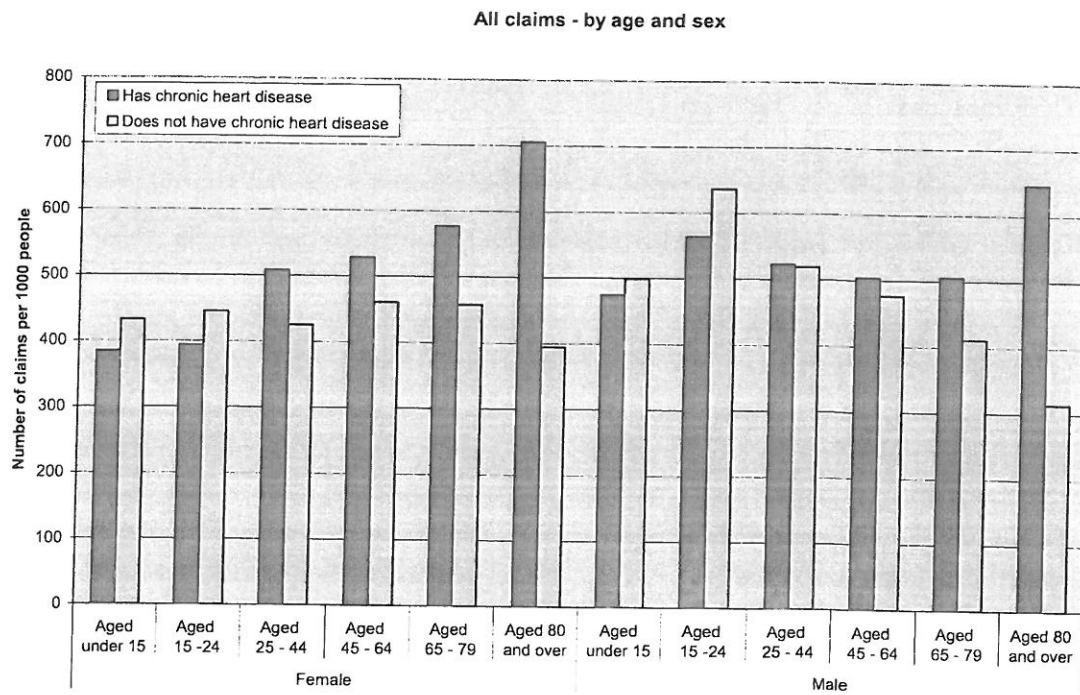


Figure 3: No CHD related All Claims per 1000 People by Age and Sex, July/June 2008/09 Financial Year



Entitlement Claims

It is often more helpful to limit the analysis to Entitlement Claims. This is sometimes used as a proxy for more serious claims, and they are the claims that often result in significant long-term liability to the Scheme. Entitlement claims include payments for some sort of entitlement, for example compensation for loss of earnings or payment for attendant care, rather than just payments for medical treatment. This is not perfect as sometimes it merely reflects that the client was working at the time of the injury, however it does indicate that at least 5 days off work were required.

Diabetes

Figure 4 shows the rate of Entitlement claims for those with and without diabetes together with confidence intervals to show whether the rates are significantly different for the two groups.

It can be seen that the pattern of claims utilisation for males and females is different with the claim rate for females aged over 45 years with diabetes significantly higher than for the corresponding groups without the disease. It is particularly marked for those aged 80 years or more, as was also seen for All Claims. For males the only significant difference is in the oldest age group, with the claim rates for the younger age groups being very similar or slightly higher for those without diabetes.

The number of extra Entitlement Claim utilisation is described in Table 10 on the next page. Note the numbers are relatively small, with extra utilisation particularly associated with those over 80 years of age where the rate of claiming is at least 50% higher where diabetes is present.

Figure 4: No Diabetes related Entitlement Claims Per 1000 People, By Age and Sex, 95% Confidence Intervals, 2008/09 Financial Year

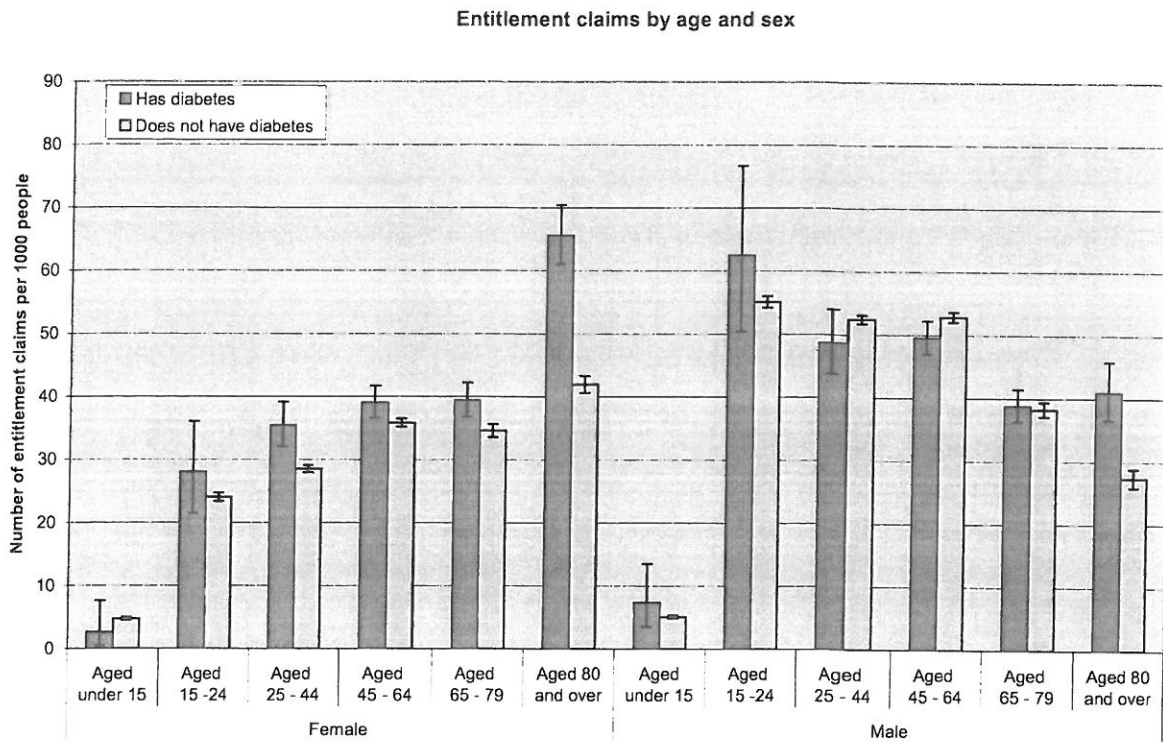


Table 10: Number of Entitlement Claims, Per 1000 People with record (with ACC NHI) With and Without Diabetes, by Sex and Age Group, 2008/09 Financial Year

Diabetes: Entitlement Claims		Number of claims made in July / June 2008/09 Year, for whom ACC has an NHI number		Number of claims per 1000 people, for whom ACC has an NHI number		Claim Rate Ratio Diabetes / No Diabetes
Sex	Age Group	Has diabetes	Does not have diabetes	Has diabetes	Does not have diabetes	
Female	Aged under 15	3	1395	3	5	0.6
	Aged 15 -24	61	4628	28	24	1.17
	Aged 25 - 44	394	10269	36	29	1.24
	Aged 45 - 64	942	11528	39	36	1.09
	Aged 65 - 79	833	4373	39	35	1.14
	Aged 80 and over	762	3734	66	42	1.56
	Other	0	1			
	Sub-Total	2995	35928	Ratio Sub total		1.03
Male	Aged under 15	10	1803	7	5	1.43
	Aged 15 -24	92	14274	63	55	1.13
	Aged 25 - 44	362	21813	49	52	0.93
	Aged 45 - 64	1397	17354	50	53	0.94
	Aged 65 - 79	883	4263	39	38	1.02
	Aged 80 and over	314	1332	41	27	1.50
	Other	0	2	Ratio Sub total		1.16
	Sub-Total	3058	60841	Ratio Total		1.14
Grand Total		6,053	96,769			

Coronary Heart Disease

Figure 5 and

Table 11 show that women 25 years of age and over with CHD have significantly higher Entitlement claim rates compared to women without CHD. In contrast only men over 45 years have significantly higher claim rates than their counterparts.

The Claims Rate ratio shows a clear age gradient particularly after 45 years of age, as one would expect. (It should be noted that the numbers under 15 years are small and should be discarded for analytical purposes.) Overall the presence of CHD results in an extra Entitlement claims utilisation of 23%, however this hides the substantive differences between population groups by age and sex.

It is interesting to note that male Entitlement claim rates in the working age group (15-64 years) both for those with and without CHD are substantially higher than women in the same age group. However, in the over 80 years age group, female rates are substantially higher than males. The differences are not unique. Women’s risk of CHD tends to increase after menopause. Given the life-cycle age groups used in this analysis, it is expected that there would be increased claims utilisation in the 65+ age groups.

Figure 5: No CHD related Entitlement Claims per 1000 People by Sex and Age, 95% Confidence Intervals, July/June 2008/09 financial year

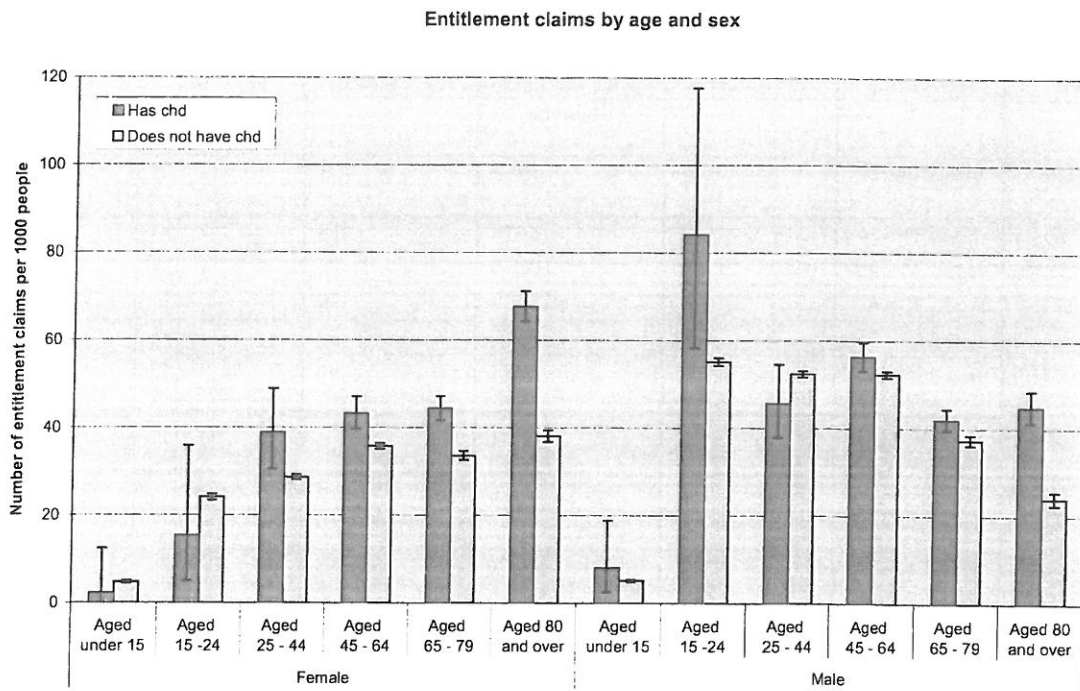


Table 11: Number of Entitlement Claims, Per 1000 People With and Without CHD, by Sex and Age Group, 2008/09 Financial Year

Coronary Heart Disease: Entitlement Claims		Number of Entitlement Claims July / June 2008/09 Year, where ACC has an NHI number		Number of claims per 1000 people, for whom ACC has an NHI number			Claim Rate Ratio CHD / No CHD	
Sex	Age Group	Has CHD	Does not have CHD	Has CHD	Does not have CHD	Total		
Female	Aged under 15	1	1,397	2	5	5	0.47	
	Aged 15 -24	5	4,684	15	24	24	0.64	
	Aged 25 - 44	74	10,589	39	29	29	1.36	
	Aged 45 - 64	538	11,932	43	36	36	1.21	
	Aged 65 - 79	1,030	4,176	44	34	35	1.32	
	Aged 80 and over	1,505	2,991	68	38	45	1.78	
	Other	-	1					
	Sub-Total		3,153	35,770		Ratio Sub total		1.05
Male	Aged under 15	5	1,808	8	5	5	1.57	
	Aged 15 -24	34	14,332	84	55	55	1.53	
	Aged 25 - 44	121	22,054	46	52	52	0.87	
	Aged 45 - 64	1,162	17,589	56	52	53	1.08	
	Aged 65 - 79	1,188	3,958	42	37	38	1.12	
	Aged 80 and over	627	1,019	45	24	29	1.87	
	Other	1	1		Ratio Sub total		1.34	
	Sub-Total		3,138	60,761		Ratio Total		1.23
Grand Total		6,291	96,531					

Claims costs and duration first 6 & 12 months (incl. Public Health Acute Services PHAS))

Diabetes All Claim Costs

Table 12 and Figure 6 shows, by sex and age the mean cost of All Claims in the first 6 months where the claimant has diabetes compared to those with no diabetes for the July/June 2008/09 financial Year. The mean cost is the sum of all costs divided by the number of all claims in the period.

While the mean cost of All claims is generally higher for those with diabetes, the mean difference between those with and without diabetes is not significantly different when comparing age groups. However, it can be observed that there is a sizable difference between females and males in both comparison groups. In the under 65 age groups, males have higher mean costs (but not duration) compared to females. However, this changes after the working age, where females over 65 years have higher mean costs compared to males in the same age groups. This suggests the higher costs are associated with complications of treatment rather than rehabilitation, and whether the claimant is participating in the workforce.

While statistically there is little difference in terms of mean costs, the combination of higher claims utilisation and extra cost, adds up to a sizable additional cost to the Scheme overall that can be attributed to diabetes. The table shows that the extra cost of All Claims associated with treating and rehabilitating clients with diabetes at the 6 month point is estimated to be approximately \$36 million in the 2008/09 financial year. At the 12 month point the costs continue to increase, and are estimated to reach approximately \$41 million at that time point.

Table 12: Mean Cost (incl PHAS) and mean duration of All Claims Diabetes related, First 6 months, July/June 2008/09 Financial year

Diabetes: <u>All Claims</u>		Mean cost in first 6 months incl PHAS		Extra Mean Cost Diabetes First 6 mth	Average duration of medical payments 6 mth	
Sex	Age Group	Has diabetes	Does not have diabetes		Has diabetes	Does not have diabetes
Female	Aged under 15	\$252	\$277	-\$25	34	29
	Aged 15 -24	\$544	\$497	\$47	56	49
	Aged 25 – 44	\$764	\$651	\$113	72	70
	Aged 45 – 64	\$902	\$779	\$123	80	84
	Aged 65 – 79	\$1,224	\$1,017	\$207	71	76
	Aged 80 and over	\$2,628	\$2,331	\$297	55	53
	Other	\$2,215	\$394	\$1,821	109	105
	Sub-Total	\$1,319	\$725	\$594	70	62
Male	Aged under 15	\$364	\$308	\$56	33	27
	Aged 15 -24	\$739	\$759	-\$20	47	45
	Aged 25 – 44	\$1,103	\$1,022	\$81	63	63
	Aged 45 – 64	\$1,265	\$1,163	\$102	79	78
	Aged 65 – 79	\$1,234	\$1,129	\$105	71	77
	Aged 80 and over	\$1,782	\$1,986	-\$204	49	53
	Other	\$809	\$1,960	-\$1,151	42	181
	Sub-Total	\$1,274	\$862	\$412	69	55
Total Cost		\$ 93,224,903	\$1,114,022,604			
Excess <u>All Claim</u> Costs Attributable to Diabetes, First 6 months*				\$ 36,396,050		
				@ 12 months	\$ 40,964,302	
* Excess is Sum of: Mean Extra Cost x Sub-total of Claims in each Group						