MEDICARE BENEFITS SCHEDULE HEALTH INSURANCE COMMISSION DATA FOR CHRONIC CONDITIONS AND RISK FACTORS

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CHAPTER 1: EXECUTIVE SUMMARY

The North West Adelaide Health Study (NWAHS), a collaboration between the Central Northern Adelaide Health Service, the South Australian Department of Health, The University of Adelaide, the University of South Australia and the Institute of Medical & Veterinary Science, provides a comprehensive health assessment of the entire adult community. The study conceptualises a chronic disease continuum, in which participants are segmented based on their stage of disease, with the stages including no condition, undiagnosed condition and diagnosed condition. One of the objectives of the NWAHS is to describe the costs of certain health conditions through linkage with the Health Insurance Commission (HIC).

In this report, HIC data, in addition to questionnaire responses and clinical measurements, were used to describe segments of the disease continuum for diabetes, asthma and chronic obstructive pulmonary disease (COPD) in terms of Medicare Benefits Schedule (MBS) service use and benefits paid. MBS service use and benefits paid were also examined with the presence of risk factors associated with chronic disease.

People with risk factors or diagnosed chronic conditions used significantly more MBS resources than people who did not have these risk factors or conditions. The exceptions to this were people with diagnosed COPD, whose MBS resource use did not significantly differ from those without COPD, and people who were current smokers who used significantly less MBS resources than non-smokers or ex-smokers. Details of these findings are summarised below.

Overall

- HIC MBS data for the period starting July 1997 to the end of June 2002 were successfully matched for 93.2% of study participants.
- The mean number of MBS rebates paid over the five years was 66 rebates per person.
- The mean value of MBS rebates paid over the five years was $2293 per person.

Diabetes

- People with diagnosed diabetes used a mean of 133 MBS services over the five years, with a mean total value of rebates paid of $5027.
- People who did not have diabetes used a mean of 61 MBS services, with a mean total value of rebates paid of $2121.
- MBS use by people with diagnosed diabetes was significantly higher than use by people who did not have diabetes, as was the value of the rebates paid for this use.
- People who had diabetes, but who had not been diagnosed by a doctor as having the condition, used a mean of 82 MBS services, with a mean total rebate value of $2714, but this was not significantly different to the mean service use and rebate value for people without diabetes.

Asthma

- People with diagnosed asthma used a mean of 90 MBS services, with a mean total value of $3287 over the five years.
- People who did not have asthma used a mean of 62 MBS services, with a mean total value of $2148.
- MBS use by people with diagnosed asthma was significantly higher than MBS use by people who did not have asthma, as was the value of the rebates paid for this use.
- People who had asthma, but who had not been diagnosed by a doctor as having the condition, used a mean of 101 MBS services, with a mean total value of $3767. This was significantly higher than the use by people without asthma.

COPD

- People with diagnosed COPD used a mean of 131 MBS services, with a mean total value of $4776.
- People did not have COPD used a mean of 64 MBS services, with a mean total value of $2235.
- MBS use and its related value by people with diagnosed COPD was significantly higher than MBS use and its related value by people without COPD.
- People who had COPD, but who had not been diagnosed by a doctor as having the condition, used a mean of 96 MBS services, with a mean total value of $3368. This was significantly higher than the use and the value of the use by people without COPD.

Quality of life

- Higher MBS service use and cost was associated with lower SF-36 scores, and thus lower quality of life, for all eight dimensions of the SF-36 quality of life measure.

Risk Factors

- Ex-smokers used significantly more services than non-smokers and both ex-smokers and non-smokers used significantly more MBS services than current smokers.
- People who consumed high risk levels of alcohol did not use a significantly different number of MBS services than people whose alcohol consumption was of low or no health risk.
- People who were physically active used significantly fewer MBS services than those who were sedentary.
- People who were overweight or obese used more MBS services than people with a body mass index within the acceptable range.
- People with high blood pressure used significantly more MBS services than people whose blood pressure was not high.
- There was no significant difference in MBS service use between people with high blood cholesterol, and those whose blood cholesterol was not high.
- People with one or more of the above mentioned risk factors used significantly more MBS services than people who did not have any risk factors.

CHAPTER 2: BACKGROUND AND METHODOLOGY

2.1 Introduction

The North West Adelaide Health Study (NWAHS) is a collaboration between Central Northern Adelaide Health Service (including The Queen Elizabeth Hospital & Health Service and the Lyell McEwin Health Service), the South Australian Department of Health, The University of Adelaide, the University of South Australia and the Institute of Medical & Veterinary Science. The study provides a comprehensive health assessment of an adult community.

This study has been designed to allow segmentation of a large representative population sample according to stage of disease, to identify the characteristics of each segment and determine how they change over time. This segmentation will allow interventions to be targeted to those who will benefit most in terms of better health outcomes and to make the most efficient use of resources. Effective interventions for chronic disease need to be evidence-based if they are to succeed by design rather than by serendipity. The better those with specific health problems or diseases are described, the more precisely they can be targeted by designing policy and interventions that consider a range of appropriate characteristics.

The study addresses two of the six conditions identified as National Health Priority Areas, namely asthma and diabetes, because of the significant burden they place on the community in terms of health, social, economic and quality of life costs. It also investigates chronic obstructive pulmonary disease (COPD), which includes bronchitis and emphysema, as these add to the burden of respiratory disease and as many risk factors associated with asthma are common to bronchitis and emphysema.

In addition to data from self-reported questionnaires and clinical measurements, this report uses Health Insurance Commission (HIC) data to describe segments of the continuum for diabetes, asthma, and COPD in terms of Medicare Benefit Scheme (MBS) service use and benefits paid.

2.2 Methods

2.2.1 Recruitment

All households in the north western area of Adelaide with a telephone connected and the telephone number listed in the Electronic White Pages (EWP) were eligible for selection in the North West Adelaide Health Study[1]. Within each household, the person who had the most recent birthday, and was 18 years or older, was selected for interview and invited to attend the clinic. Questions asked during the recruitment interview included demographics, self-reported health conditions, smoking status, and where appropriate, reason for not wanting to participate in the clinic.

2.2.2 Self-reported and clinic data collection

Participants who agreed to attend a clinical assessment were sent an information folder containing details about the study and their clinic appointment, and a self report questionnaire, which included questions on diabetes, asthma and COPD, physical activity, alcohol risk, smoking, family history of diabetes, heart attack and stroke, quality of life, health service use, and socio-demographics.

Quality of life was assessed using the Short Form 36 (SF-36). The SF-36 is comprised of 36 questions that are summarised to eight dimensions as listed in Table 2.1:

Table 2.1: Dimensions of the SF-36

PF	Physical Functioning	Limitations in physical activities because of health problems
RP	Role Physical	Limitations in usual role activities because of physical health problems
BP	Bodily Pain	Intensity of bodily pain or discomfort
GH	General Health	General health perceptions
VT	Vitality	Energy and fatigue
SF	Social Functioning	Limitations in social activities due to physical or emotional problems
RE	Role Emotional	Limitations in usual role activities because of emotional problems
MH	Mental Health	Psychological distress and well-being

The clinic tests included height and weight measurement, waist and hip circumference measurement, blood pressure, a fasting blood sample for glucose, lipid profile and glycated haemoglobin, skin allergy tests, and lung function tests.

2.2.3 Consent

Informed, written consent was obtained from participants at their clinic appointment, both for bio-medical measurements to be taken and for their personal information to be sent to the HIC for matching.

2.2.4 Matching HIC data

The process of matching North West Adelaide Health Study participants with HIC data was performed in two ways, depending on the data supplied to HIC. Method 1 involved matching Medicare enrolment details using the supplied surname, first name, second initial (if it existed), date of birth and sex. Alternatively, Method 2 involved matching Medicare enrolment details using Medicare card number, date of birth and sex. Method 2 generally results in a higher match rate. Where available, names were included in data supplied for Method 2 matching. This enabled the matching program to differentiate between same-sex twins.

2.2.5 HIC data obtained

Data obtained from HIC for each participant included date of service, MBS item number, and benefit paid, for each visit within the five-year period from 1 July 1997 to 30 June 2002.

Medicare claims data include only those services that qualify for a Medicare Benefit and for which a claim has been processed. They do not include services provided by hospital doctors to public patients in hospitals, or services that qualify for a benefit under the Department of Veteran's Affairs National Treatment Account.

2.2.6 Data analyses

Data analyses were performed using SPSS Version 11.

The data were weighted by region (western or northern health regions) age groups, sex, and probability of selection in the household to the Australian Bureau of Statistics 1999 Estimated Residential Population. The weighting of the data results in occasional rounding effects on the numbers. In all instances, the means should be the point of reference rather than the actual numbers of respondents. The means presented in this report have been processed on the figures pre-rounding.

Mean values, 95% confidence intervals (CI), and ranges were obtained for the total number of rebates claimed and benefit paid for the five-year period 1st July 1997 to 30th June 2002. Mean values were also examined by each financial year period. Statistically significant differences between means ($p<0.05$) were determined using *t*-tests.

CHAPTER 3: RESULTS

3.1 Sample

Medicare data was sent to HIC for matching for 95.4% (n=2408) of participants who attended the clinic. Of these, HIC data was matched and supplied for 97.7% (n=2352) of participants. It could not be determined whether data for the remaining 56 participants were unable to be matched, or whether these participants did not use MBS services in this time period. The following results are therefore based on the 2352 participants for whom HIC data were supplied.

3.1.1 Overall number of rebates claimed and benefit paid

The mean number of rebates claimed and benefit paid for the five-year period from July 1997 to June 2002 for the 2352 participants are shown in Table 3.1, by year in Figure 3.1, and by demographic factors in Table 3.2 and Table 3.3.

Table 3.1: Mean number of rebates claimed and total benefit paid for July 1997 to June 2002

	n	Mean	95% CI	Range
Number of rebates (n)	2352	66	63 – 68	1 to 878
Benefit paid ($)	2352	$2293	$2181 – $2406	$8 to $39047

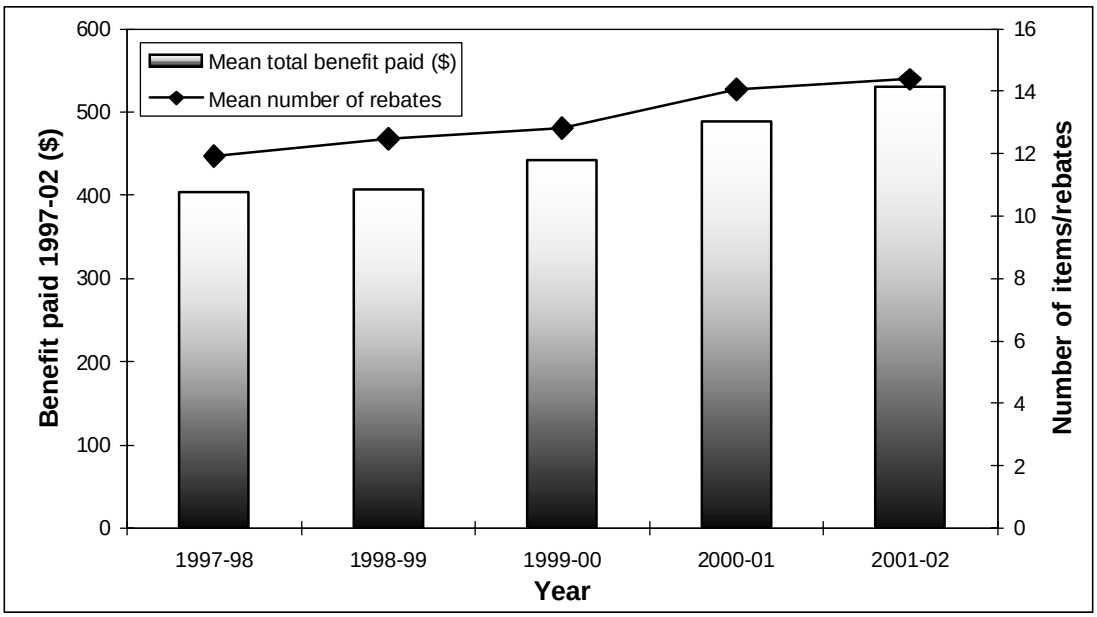

Figure 3.1: Mean number of rebates and mean total benefit paid, by year

Table 3.2: Mean total number of rebates for July 1997 to June 2002, by demographic factors

	n	Mean	(95% CI)
Sex			
Male	1129	51 ↓	(48 – 55)
Female	1223	79 ↑	(75 – 83)
Age group			
18 to 29 years	603	45 ↓	(41 – 48)
30 to 39 years	429	48 ↓	(43 – 54)
40 to 49 years	426	52 ↓	(48 – 57)
50 to 59 years	334	71	(64 – 78)
60 to 69 years	258	98 ↑	(89 – 107)
70 years and over	303	118 ↑	(108 – 128)
Area of residence			
Western suburbs	923	72 ↑	(67 – 76)
Northern suburbs	1430	62 ↓	(59 – 65)
Highest education level obtained			
Secondary	1049	70 ↑	(66 – 75)
Trade/Apprenticeship/Certificate/Diploma	939	65	(61 – 69)
Bachelor degree or higher	269	48 ↓	(42 – 54)
Not stated	96	69	(54 - 84)
Gross household income			
Up to $20,000	552	93 ↑	(87 – 100)
$20,001- 40,000	611	65	(60 – 71)
$40,001- 60,000	543	49 ↓	(45 – 53)
$60,001 and over	502	48 ↓	(44 – 52)
Not stated	144	84 ↑	(70 – 98)
Country of birth			
Australia	1627	63 ↓	(60 – 66)
UK or Ireland	413	72	(67 – 78)
Europe/USSR/Baltic States	198	77 ↑	(69 – 86)
Asia/Other	102	51 ↓	(40 – 61)
Not stated	13	142 ↑	(88 – 197)
Marital status			
Married or living with partner	1481	69	(65 – 72)
Separated/Divorced	187	70	(62 – 78)
Widowed	137	108 ↑	(92 – 123)
Never married	531	44 ↓	(40 – 48)
Not stated	15	86	(55 – 117)
Work status			
Full time employed	862	43 ↓	(40 – 45)
Part time/casual employed	390	60	(55 – 66)
Unemployed	108	56	(47 – 65)
Home duties/Retired	752	100 ↑	(94 – 106)
Student/Other	209	47 ↓	(40 – 54)
Not stated	31	85	(69 – 102)
OVERALL	2352	66	(63 – 68)

↑↓ Statistically significantly higher or lower than the mean of all other categories within the demographic characteristic combined.

Table 3.3: Mean total benefit paid ($) for July 1997 to June 2002, by demographic factors

	n	Mean ($)	(95% CI)
Sex			
Male	1129	1818 ↓	(1673 – 1963)
Female	1223	2732 ↑	(2566 – 2898)
Age group			
18 to 29 years	603	1376 ↓	(1261 – 1492)
30 to 39 years	429	1611 ↓	(1370 – 1851)
40 to 49 years	426	1792 ↓	(1622 – 1961)
50 to 59 years	334	2662	(2298 – 3026)
60 to 69 years	258	3572 ↑	(3193 – 3952)
70 years and over	303	4296 ↑	(3881 – 4712)
Area of residence			
Western suburbs	923	2557 ↑	(2352 – 2762)
Northern suburbs	1430	2123 ↓	(1994 – 2251)
Highest education level obtained			
Secondary	1049	2380	(2219 – 2542)
Trade/Apprenticeship/Certificate/Diploma	939	2310	(2131 – 2490)
Bachelor degree or higher	269	1853 ↓	(1505 – 2200)
Not stated	96	2404	(1728 – 3080)
Gross household income			
Up to $20,000	552	3194 ↑	(2944 – 3444)
$20,001- 40,000	611	2334	(2094 – 2574)
$40,001- 60,000	543	1635 ↓	(1476 – 1793)
$60,001 and over	502	1767 ↓	(1554 – 1980)
Not stated	144	2988 ↑	(2382 – 3593)
Country of birth			
Australia	1627	2199	(2061 – 2336)
UK or Ireland	413	2476	(2249 – 2703)
Europe, USSR, Baltic States	198	2711	(2354 – 3068)
Asia / Other	102	1764	(1164 – 2365)
Not stated	13	5937 ↑	(2488 – 9387)
Marital status			
Married or living with partner	1481	2449 ↑	(2300 – 2598)
Separated/Divorced	187	2471	(2071 – 2872)
Widowed	137	3731 ↑	(3151 – 4311)
Never married	531	1410 ↓	(1259 – 1561)
Not stated	15	2814	(1591 – 4038)
Work status			
Full time employed	862	1489 ↓	(1378 – 1599)
Part time/casual employed	390	2055	(1801 – 2308)
Unemployed	108	1738 ↓	(1421 – 2054)
Home duties / Retired	752	3605 ↑	(3346 – 3863)
Student / Other	209	1551 ↓	(1241 – 1861)
Not stated	31	2761	(2109 – 3413)
OVERALL	2352	2293	(2181 – 2406)

↑↓ Statistically significantly higher or lower than the mean of all other categories within the demographic characteristic combined.

3.2 Diabetes

People with diagnosed diabetes were those who reported having been told by a doctor that they had diabetes. People with previously undiagnosed diabetes were defined as having a fasting plasma glucose level of at least 7.0mmol/L[2], but who did not report having been told by a doctor that they had diabetes.

The mean number of rebates and benefit paid for the five-year period of July 1997 to June 2002 segmented by the diabetes continuum is shown in Table 3.4. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people with diagnosed diabetes than people without diabetes.

Table 3.4: Mean number of rebates and total benefit paid for people with no diabetes, previously undiagnosed diabetes, and diagnosed diabetes, July 1997 to June 2002

	n	Mean	(95% CI)	Range
No diabetes				
Number of rebates	2185	61	59 – 64	1 to 878
Benefit paid	2185	$2121	$2014 – $2228	$8 to $39047
Previously undiagnosed diabetes				
Number of rebates	30	82	60 – 103	14 to 262
Benefit paid	30	$2714	$1803 – $3625	$336 to $12625
Diagnosed diabetes				
Number of rebates	132	133 ↑	117 – 149	9 to 589
Benefit paid	132	$5027 ↑	$4254 – $5801	$160 to $30308

↑ Statistically significantly higher than people without diabetes

Note: missing cases n=6.

The mean number of rebates and benefit paid for the diabetes continuum are shown by year in Figure 3.2 and Figure 3.3.

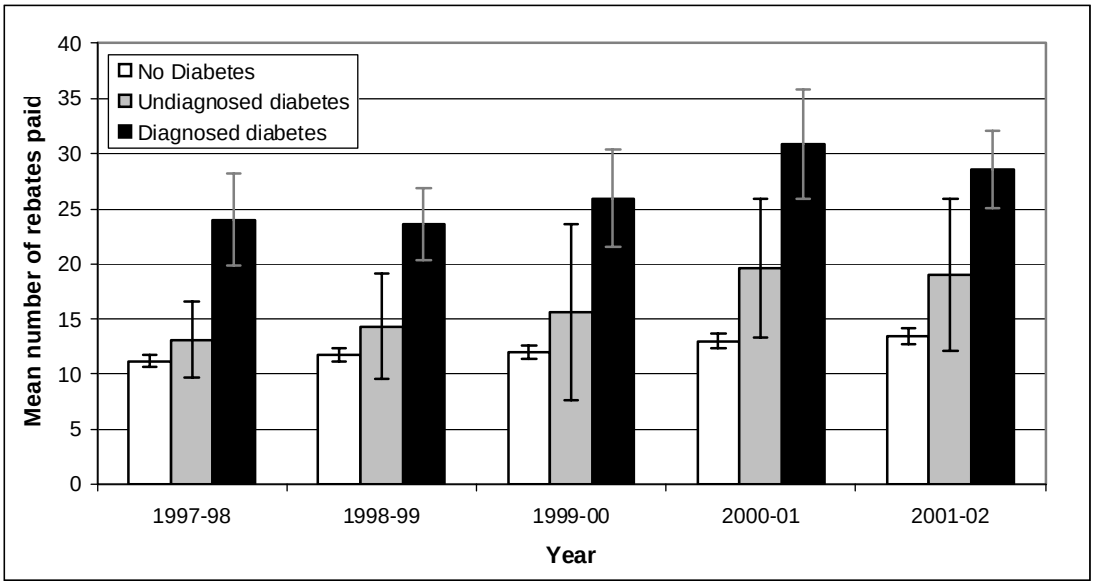

Figure 3.2: Mean number of rebates paid for people with no diabetes, previously undiagnosed diabetes, and diagnosed diabetes, by year

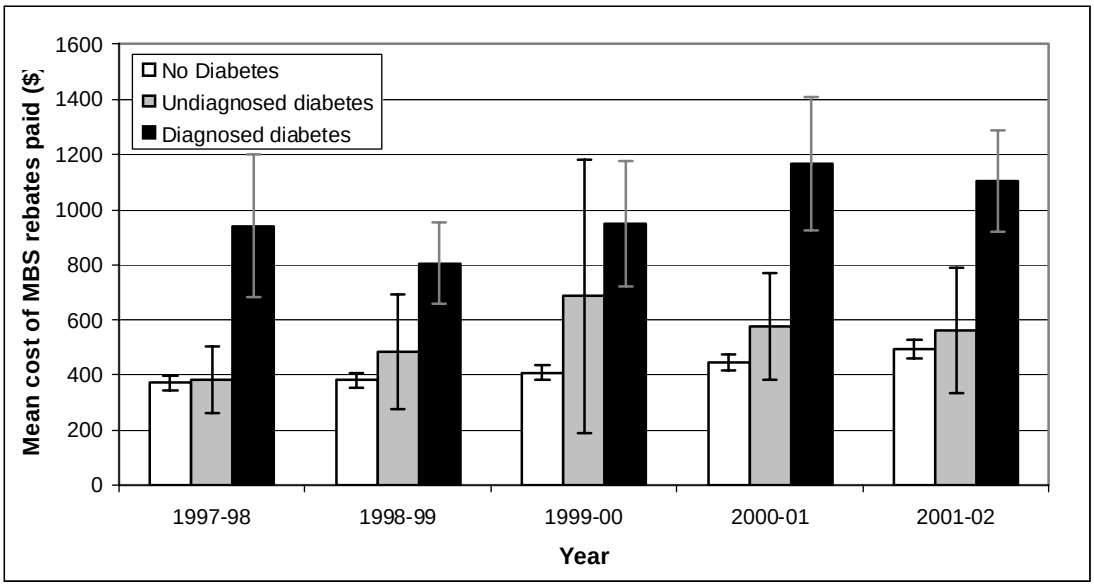

Figure 3.3: Mean total benefit paid for people with no diabetes, previously undiagnosed diabetes, and diagnosed diabetes, by year

3.3 Asthma

People with diagnosed asthma were those who reported having been told by a doctor that they had asthma. People with previously undiagnosed asthma were defined as having a 15% increase in FEV_1 (forced expiratory volume in one second) from pre-Ventolin to post-Ventolin, or a 12% increase in FEV_1 from pre-Ventolin to post-Ventolin with an absolute difference in FEV_1 greater than 200ml, and who did not report a previous diagnosis.

The mean number of rebates and benefit paid for the five-year period of July 1997 to June 2002 segmented by the asthma continuum is shown in Table 3.5. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people with asthma, including both those who were diagnosed and undiagnosed, than people without asthma.

Table 3.5: Mean number of rebates and total benefit paid for people with no asthma, previously undiagnosed asthma, and diagnosed asthma, July 1997 to June 2002

	n	Mean	95% CI	Range
No asthma				
Number of rebates	2075	62	60 – 65	1 to 634
Benefit paid	2075	$2148	$2039 – $2256	$8 to $30308
Previously undiagnosed asthma				
Number of rebates	54	101 ↑	82 – 119	5 to 340
Benefit paid	54	$3767 ↑	$2994 – $4541	$143 to $13488
Diagnosed asthma				
Number of rebates	224	90 ↑	76 – 103	1 to 878
Benefit paid	224	$3287 ↑	$2716 – $3859	$21 to $39047

↑ Statistically significantly higher than people without asthma

The mean number of rebates and benefit paid for the asthma continuum are shown by year in Figure 3.4 and Figure 3.5.

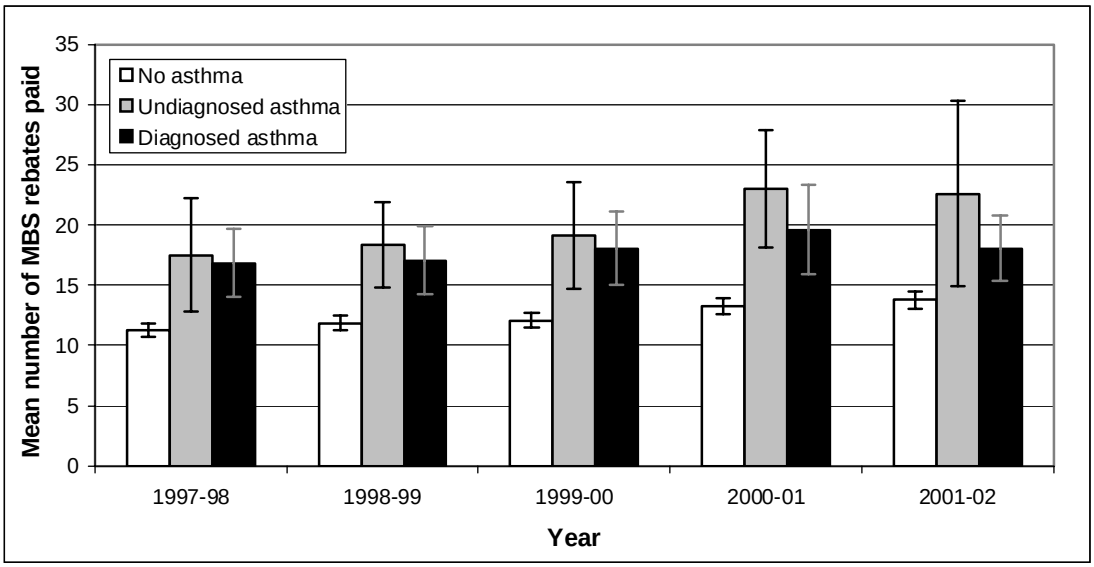

Figure 3.4: Mean number of rebates for people with no asthma, previously undiagnosed asthma, and diagnosed asthma, by year

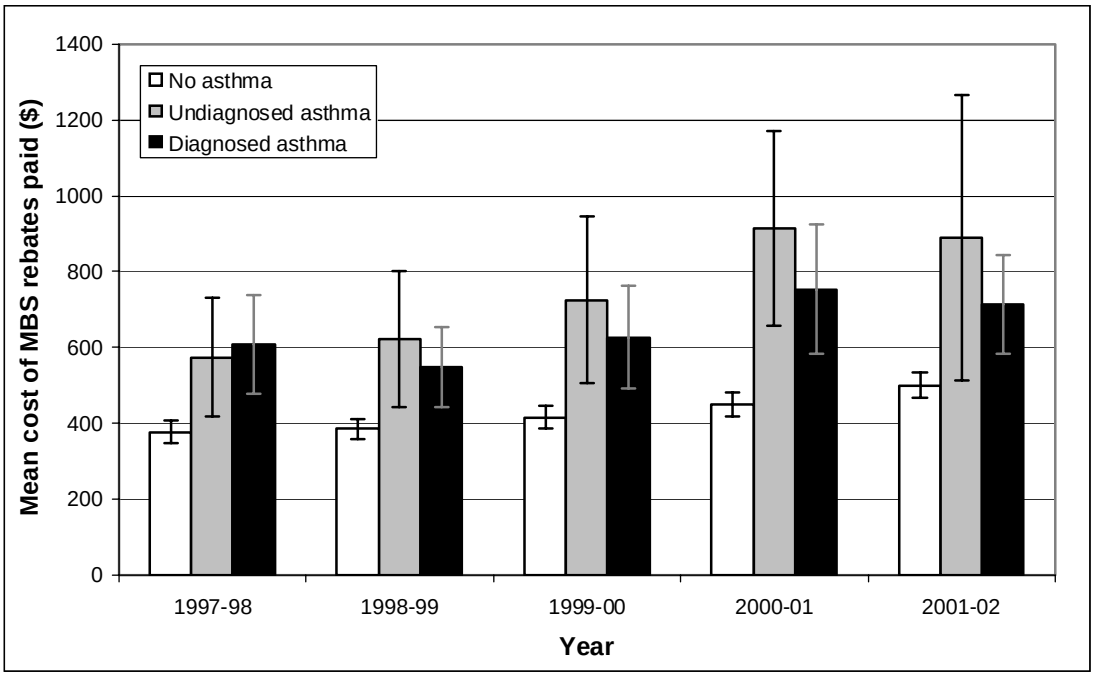

Figure 3.5: Mean total benefit paid for people with no asthma, previously undiagnosed asthma, and diagnosed asthma, by year

3.4 Chronic Obstructive Pulmonary Disease

People with COPD were defined as those with a measured FEV1:FVC ratio less than the result of the formula (87.21 - (0.18 x age) * 0.882) for males, and (89.10 - (0.19 x age) * 0.893) for females[3,4]. In this formula, 0.882 and 0.893 represent one minus two standard deviations from the predicted mean for males and females, respectively. People with previously undiagnosed COPD were defined as having COPD according to the above criteria, but who did not report having been told by a doctor that they had COPD (chronic bronchitis or emphysema).

The mean number of rebates and benefit paid for the five-year period of July 1997 to June 2002 segmented by the COPD continuum is shown in Table 3.6. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people with previously undiagnosed and diagnosed COPD than people without COPD.

Table 3.6: Mean number of rebates and total benefit paid for people with no COPD, previously undiagnosed, and diagnosed COPD, July 1997 to June 2002

	n	Mean	95% CI	Range
No COPD				
Number of rebates	2250	64	62 – 67	1 to 678
Benefit paid	2250	$2235	$2126 – $2344	$8 to $30308
Previously undiagnosed COPD				
Number of rebates	60	96 ↑	65 – 127	2 to 878
Benefit paid	60	$3368 ↑	$2037– $4698	$88 to $39047
Diagnosed COPD				
Number of rebates	16	131 ↑	105 – 156	35 to 217
Benefit paid	16	$4776 ↑	$3584– $5967	$979 to $8993

↑ Statistically significantly higher than people without COPD

Note: missing cases n=27.

The mean number of rebates and benefit paid for the COPD continuum are shown by year in Figure 3.6 and Figure 3.7.

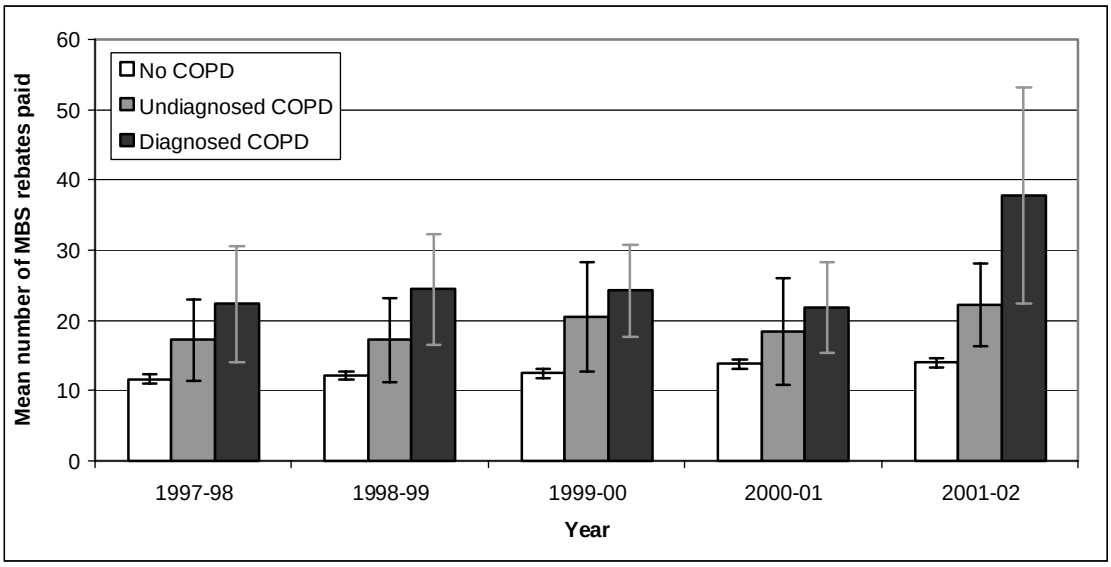

Figure 3.6: Mean number of rebates for people with no COPD, previously undiagnosed COPD, and diagnosed COPD, by year

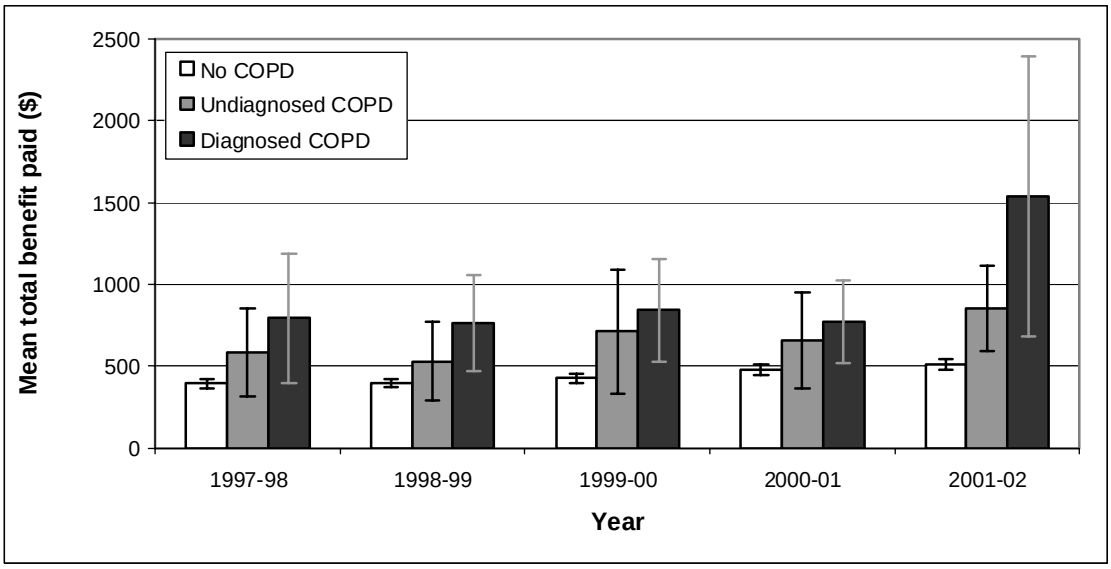

Figure 3.7: Mean total benefit paid for people with no COPD, previously undiagnosed COPD, and diagnosed COPD, by year

3.5 Quality of life

Study participants were categorised into quartiles based on their MBS service use. Participants who were in the top 25th percentile for the number of MBS rebates paid over the period 1st July 1997 to 31st June 2002 scored significantly less on all dimensions of the SF-36 quality of life measure compared to those who had fewer MBS rebates paid. This relationship remains when controlled for age and sex, and also holds for the value of the rebates paid. SF-36 scores for the four MBS service use quartiles are shown in Figure 3.8.

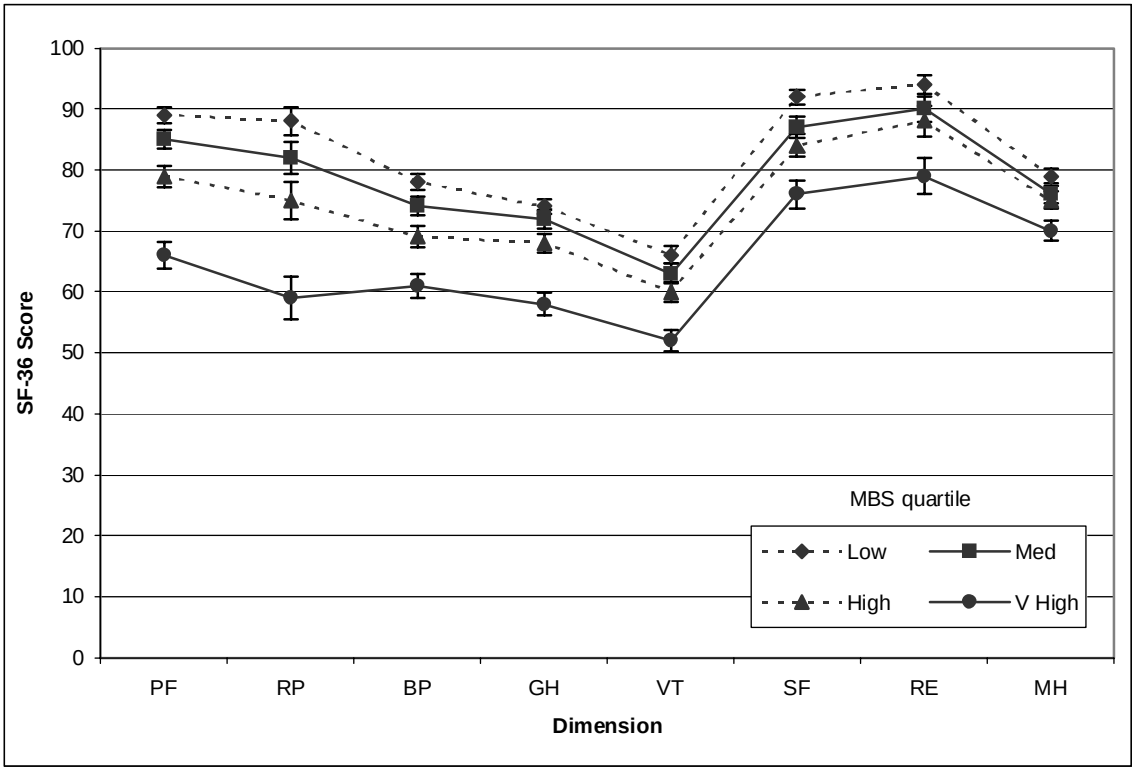

Figure 3.8: Mean SF-36 scores for quartiles of MBS rebates paid

3.6 Risk Factors

In this section, MBS service use is shown based on risk factors. The risk factors reported in this section are: smoking status, alcohol risk, level of physical activity, body mass index (BMI), blood pressure and blood cholesterol level.

3.6.1 Smoking

Self reported smoking status was used to classify study participants into the mutually exclusive groups: non-smoker, ex-smoker or current smoker. The mean number of MBS rebates paid for the five year period July 1997 to June 2002, segmented by smoking status is shown in Table 3.7. MBS resource use, in terms of both the number and value of rebates, was statistically significantly lower among people with previously undiagnosed COPD than people without COPD. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among ex-smokers than non-smokers, and statistically significantly lower among current smokers than both ex-smokers and non-smokers.

Table 3.7: Mean number of rebates and total benefit paid for non-smokers, ex-smokers, and current smokers, July 1997 to June 2002

	n	Mean	95% CI	Range
Non-Smoker				
Number of rebates	1070	66	62 – 71	1 to 878
Benefit paid	1070	$2344	$2158 –$2531	$8 to $39047
Ex-Smoker				
Number of rebates	657	77 ↑	72 – 82	1 to 498
Benefit paid	657	$2774 ↑	$2550 – $2997	$21 to $25903
Current Smoker				
Number of rebates	616	51 ↓	48 – 55	1 to 352
Benefit paid	616	$1676 ↓	$1541 – $1810	$21 to $14217

↑ Statistically significantly higher than non-smokers
↓ Statistically significantly lower than non-smokers and ex-smokers

The mean number of MBS rebates paid per year, segmented for smoking status, is shown in Figure 3.9, while the mean cost of rebates paid per year, segmented for smoking status is shown in Figure 3.10.

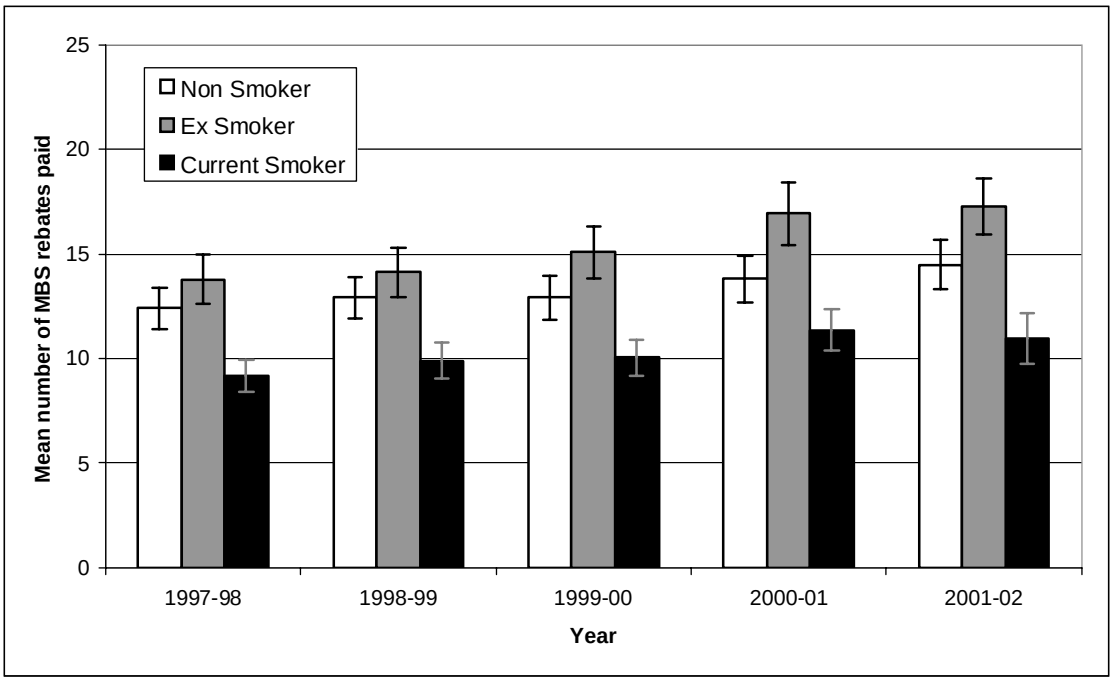

Figure 3.9: Mean number of MBS rebates paid for non smokers, ex smokers and current smokers, by year

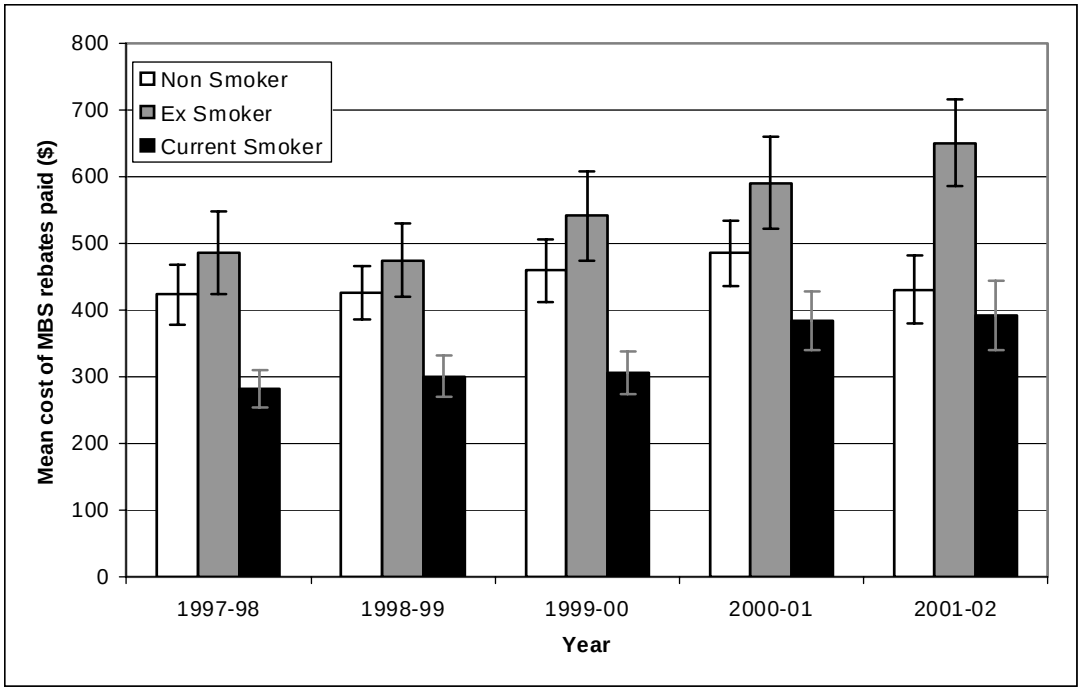

Figure 3.10: Mean cost of MBS rebates paid for non smokers, ex smokers and current smokers, by year

3.6.2 Alcohol Consumption

Alcohol risk was calculated through self reported alcohol consumption, with the number of standard drinks usually consumed on a weekly and daily basis being used to categorise participants. Participants were categorised into non drinkers, no risk drinkers, low risk drinkers, intermediate risk drinkers, high risk drinkers and very high risk drinkers[5]. For this risk factor analysis, the categories non drinker/ no alcohol risk, low alcohol risk, and intermediate to very high alcohol risk were used.

The mean number of MBS rebates and benefit paid for the five year period July 1997 to June 2002, segmented by alcohol risk is shown in Table 3.8. MBS resource use, in terms of either the number or value of rebates, was not statistically significantly different between people with no, low, or intermediate to very high alcohol risk.

Table 3.8: Mean number of rebates and total benefit paid for people with no alcohol risk, low alcohol risk and intermediate to very high alcohol risk, July 1997 to June 2002

	n	Mean	95% CI	Range
Non drinker/ No risk				
Number of rebates	1255	72	68 – 76	1 to 609
Benefit paid	1255	$2566	$2399 – $2732	$8 to $30308
Low risk				
Number of rebates	962	72	68 – 77	1 to 878
Benefit paid	962	$2572	$2389 – $2755	$21 to $39047
Intermediate to very high risk				
Number of rebates	134	61	51 – 71	4 to 351
Benefit paid	134	$2220	$1746 – $2694	$77 to $21303

The mean number of MBS rebates paid per year, segmented for alcohol risk, is shown in Figure 3.11, while the mean cost of rebates paid per year, segmented for alcohol risk is shown in Figure 3.12.

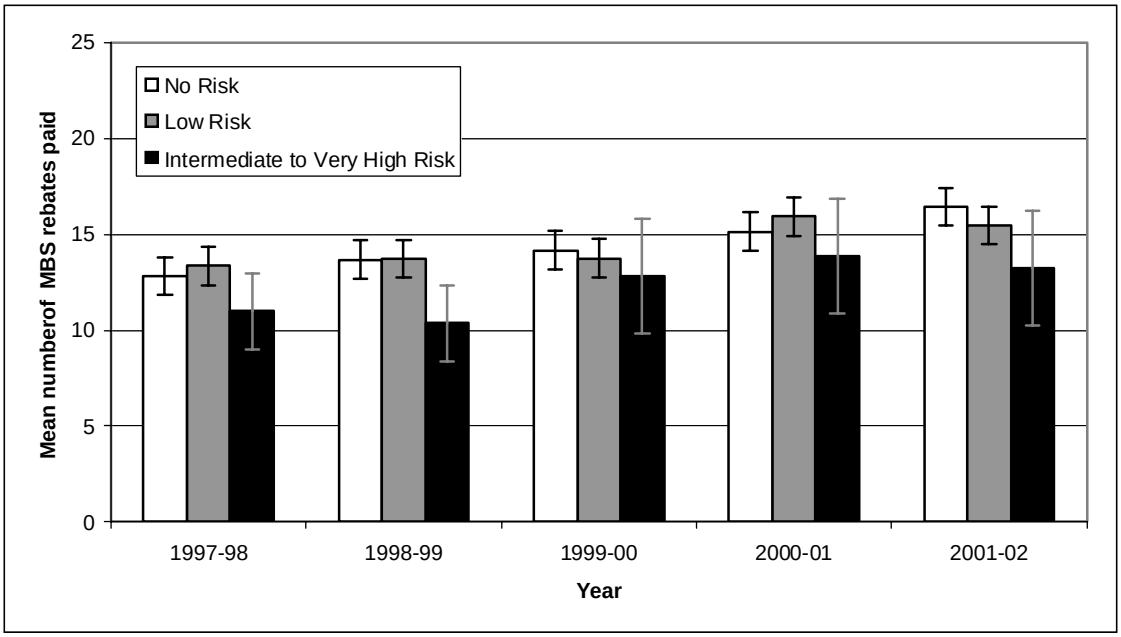

Figure 3.11: Mean number of MBS rebates paid for people with no alcohol risk, low alcohol risk and intermediate to very high alcohol risk, by year

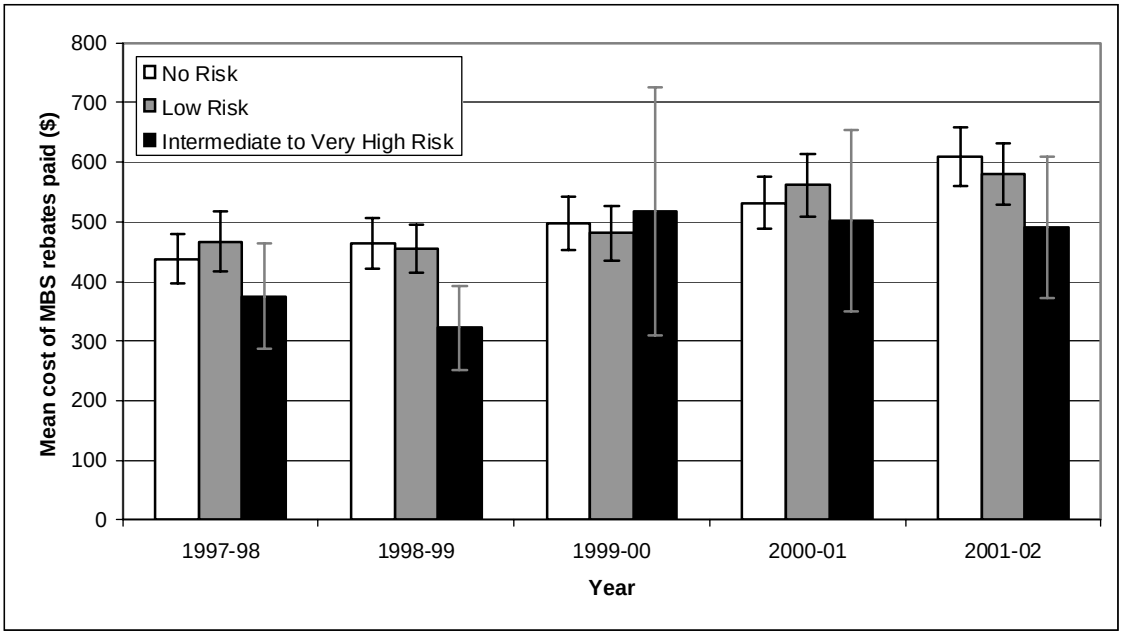

Figure 3.12: Mean cost of MBS rebates paid for people with no alcohol risk, low alcohol risk and intermediate to very high alcohol risk, by year

3.6.3 Physical Activity

Self reported physical activity was used to classify participants into those who were sedentary (undertake no physical activity), and those who are physically active (low, medium, or high level of activity).

The mean number of MBS rebates and benefit paid for the five year period July 1997 to June 2002, segmented by physical activity is shown in Table 3.9. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people who were sedentary than among those who were physically active.

Table 3.9: Mean number of rebates and total benefit paid for people who were sedentary and who were physically active, July 1997 to June 2002

	n	Mean	95% CI	Range
Physically Active				
Number of rebates	625	62	65 – 77	1 to 878
Benefit paid	625	$2152	$2016 - $2288	$8 to $30308
Sedentary				
Number of rebates	1499	71 ↑	58 - 65	1 to 634
Benefit paid	1499	$2465 ↑	$2235 - $2695	$21 to $39047

↑ Statistically significantly higher than physically active

The mean number of MBS rebates paid per year, segmented by level of physical activity, is shown in Figure 3.13, while the mean cost of rebates paid per year, segmented by level of physical activity is shown in Figure 3.14.

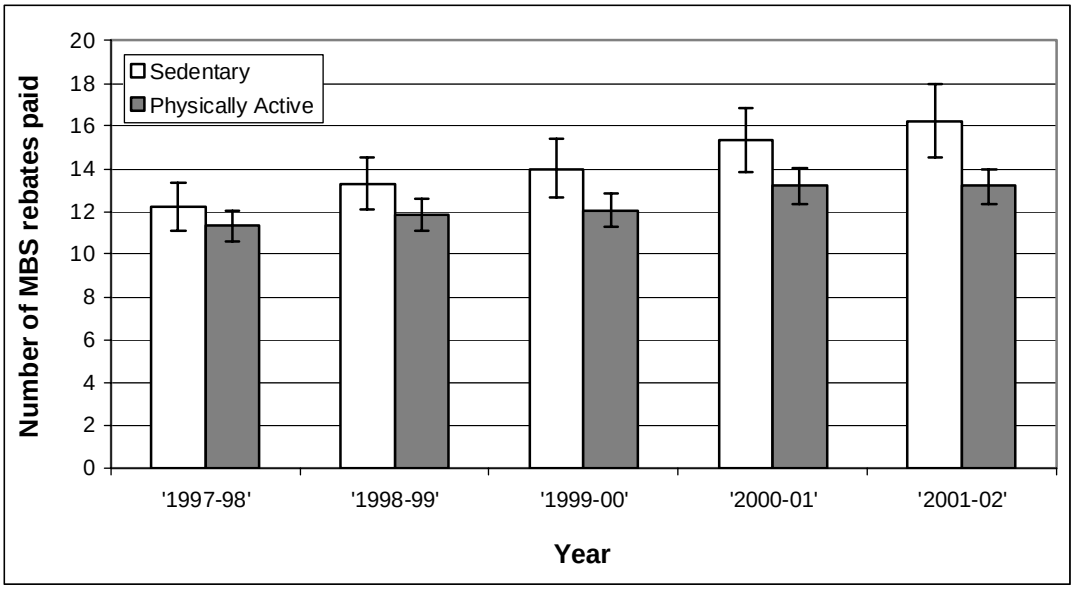

Figure 3.13: Mean number of MBS rebates paid for people who undertake sufficient physical activity and those who undertake insufficient physical activity, by year

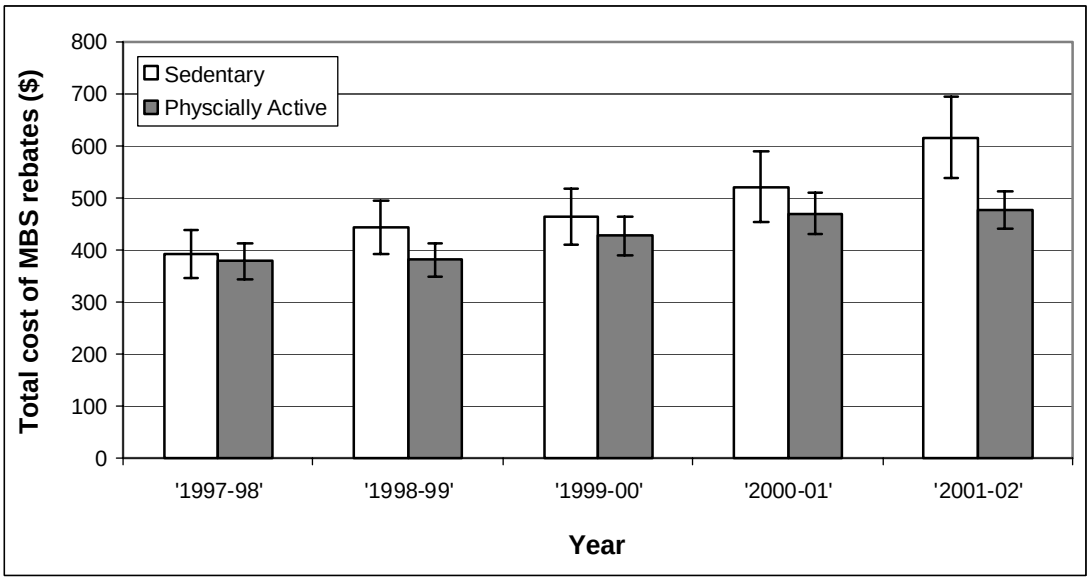

Figure 3.14: Mean cost of MBS rebates paid for people who undertake sufficient physical activity and those who undertake insufficient physical activity, by year

3.6.4 Body Mass Index

Body mass index (BMI) was calculated by dividing weight (in kilograms) by height (in metres) squared. Measurements were taken in the clinic using calibrated instruments and standard methods. Study participants were then classified based on their BMI as underweight (<18.50), acceptable (18.50-24.99), overweight (25.00-29.99) or obese (≥30)[6].

The mean number and cost of MBS rebates paid for the five year period July 1997 to June 2002, segmented by BMI is shown in Table 3.10. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people who were overweight or obese than people who had a BMI within the acceptable range. In addition, obesity was associated with statistically significantly higher resource use and cost than overweight BMI.

Table 3.10: Mean number of rebates and total benefit paid for people who were underweight, acceptable, overweight and obese, July 1997 to June 2002

	n	Mean	95% CI	Range
Underweight				
Number of rebates	23	65	42 – 89	8 to 234
Benefit paid	23	$2085	$1271 – $2899	$169 to $7281
Acceptable				
Number of rebates	809	56	52 – 61	1 to 878
Benefit paid	809	$1884	$1716 – $2053	$38 to $39047
Overweight				
Number of rebates	840	65 ↑	61 – 69	1 to 634
Benefit paid	840	$2298 ↑	$2121 – $2476	$8 to $28192
Obese				
Number of rebates	679	78 ↑	72 – 83	1 to 678
Benefit paid	679	$2781 ↑	$2536 – $3027	$21 to $30308

↑ Statistically significantly higher than acceptable BMI
Note: 2 cases missing

The mean number of MBS rebates paid per year, segmented for BMI, is shown in Figure 3.15, while the mean cost of rebates paid per year, segmented for BMI is shown in Figure 3.16.

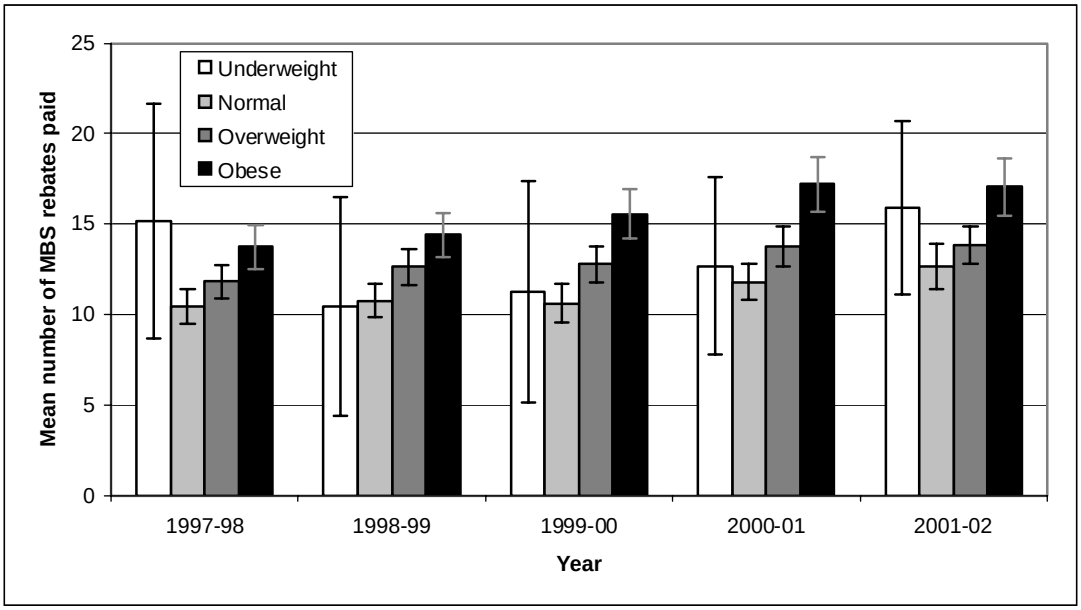

Figure 3.15: Mean number of MBS rebates paid for people who are underweight, normal, overweight or obese, by year

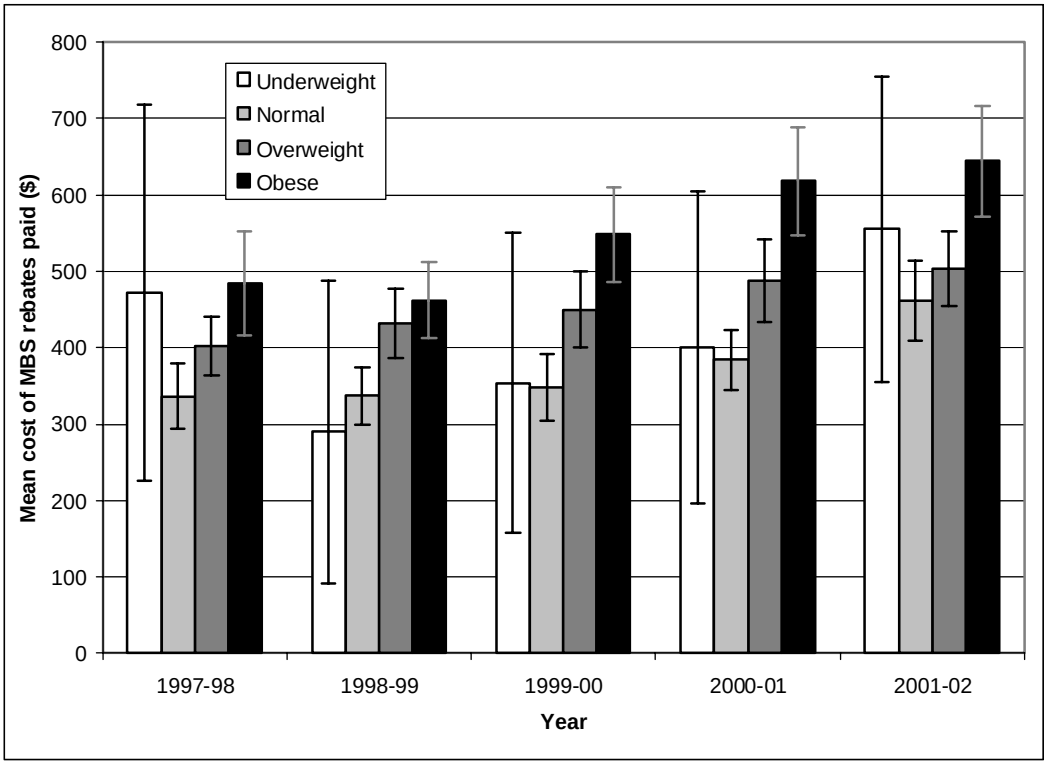

Figure 3.16: Mean cost of MBS rebates paid for people who are underweight, normal, overweight or obese, by year

3.6.5 Blood Pressure

Blood pressure was measured in the clinic using a standard, calibrated blood pressure sphygmomanometer. High blood pressure was defined as systolic blood pressure greater than or equal to 140mmHg and/or diastolic blood pressure greater than or equal to 90mmHg.

The mean number and cost of MBS rebates paid for the five year period July 1997 to June 2002, segmented by blood pressure is shown in Table 3.11. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people with high blood pressure than people without high blood pressure.

Table 3.11: Mean number of rebates and total benefit paid for people with and without high blood pressure, July 1997 to June 2002

	n	Mean	95% CI	Range
No high blood pressure				
Number of rebates	1683	59	56 – 62	1 to 878
Benefit paid	1683	$2015	$1895 – $2134	$8 to $39047
High blood pressure				
Number of rebates	669	83 ↑	77 – 89	1 to 678
Benefit paid	669	$2994 ↑	$2744 –$3243	$21 to $30308

↑ Statistically significantly higher than no high blood pressure

The mean number of MBS rebates paid per year, segmented for blood pressure, is shown in Figure 3.17, while the mean cost of rebates paid per year, segmented for blood pressure is shown in Figure 3.18.

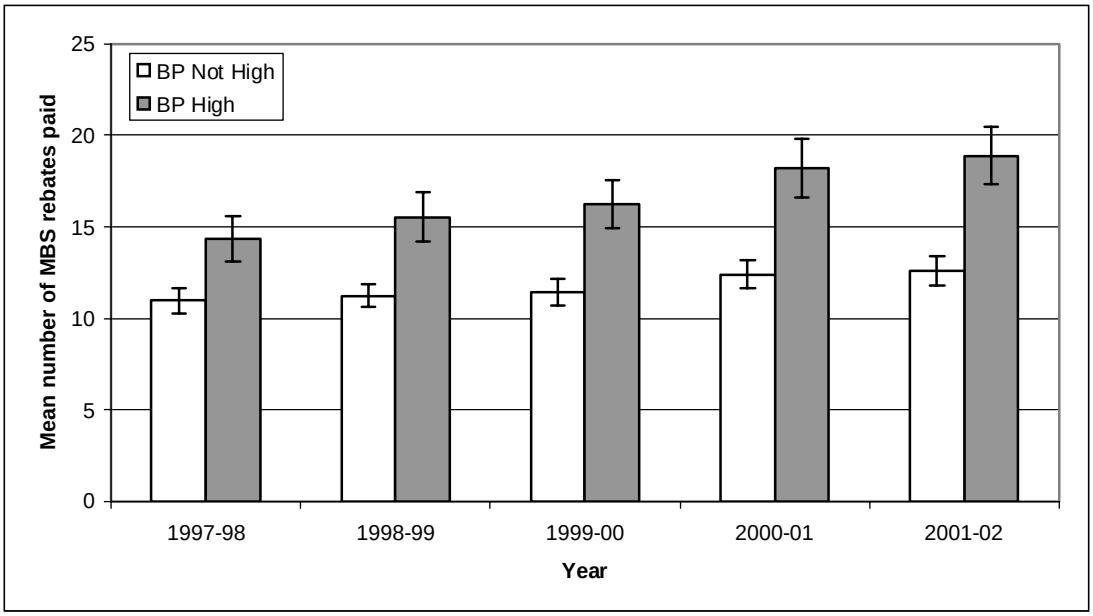

Figure 3.17: Mean number of MBS rebates paid for people who have high blood pressure and those who do not, by year

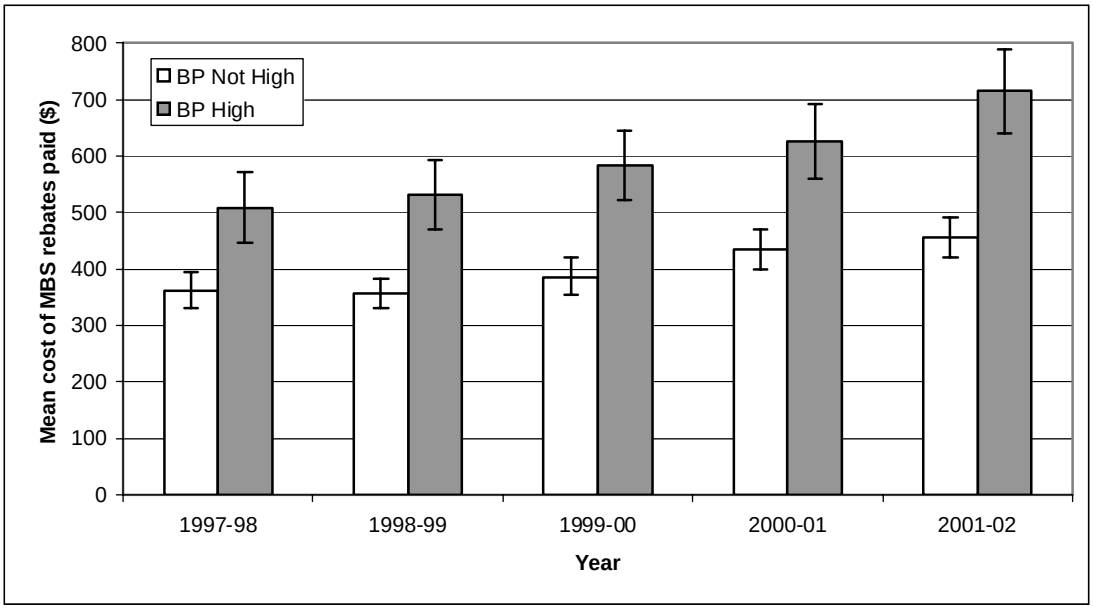

Figure 3.18: Mean cost of MBS rebates paid for people who have high blood pressure and those who do not, by year

3.6.6 Cholesterol

Cholesterol was assessed through a fasting blood sample, which was taken at the clinic. Participants were classified into those who had high blood cholesterol and those who did not. High cholesterol was defined as total blood cholesterol greater than or equal to 5.5 mmol/L[7] or a ratio of low density lipids to high density lipids greater than five[8].

The mean number and cost of MBS rebates paid for the five year period July 1997 to June 2002, segmented by blood cholesterol is shown in Table 3.12. MBS resource use, in terms of both the number and value of rebates, was not statistically significantly different between people with and without high cholesterol.

Table 3.12: Mean number of rebates and total benefit paid for people who have high blood cholesterol and those who do not, July 1997 to June 2002

	n	Mean	95% CI	Range
Not high cholesterol				
Number of rebates	1409	65	61 – 68	1 to 878
Benefit paid	1409	$2247	$2100 – $2393	$21 to $39047
High cholesterol				
Number of visits	872	69	64 – 73	1 to 558
Benefit paid	872	$2430	$2242 – $2617	$8 to $28192

Note: 72 cases missing

The mean number of MBS rebates paid per year, segmented for blood cholesterol, is shown in Figure 3.19, while the mean cost of rebates paid per year, segmented for blood cholesterol is shown in Figure 3.20.

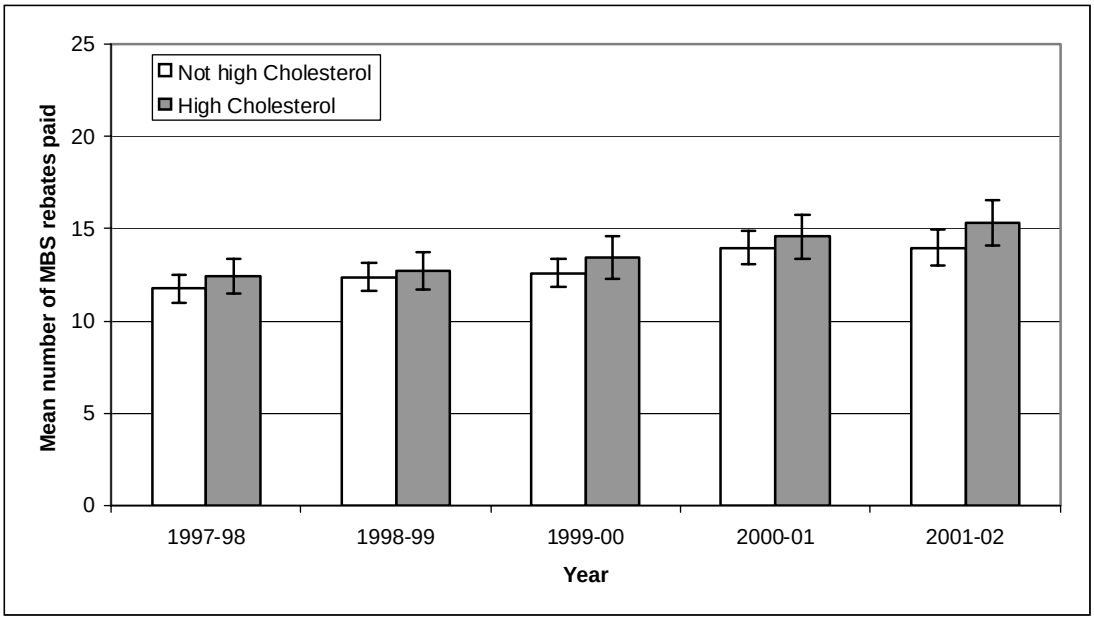

Figure 3.19: Mean number of MBS rebates paid for people who have high blood cholesterol and those who do not, by year

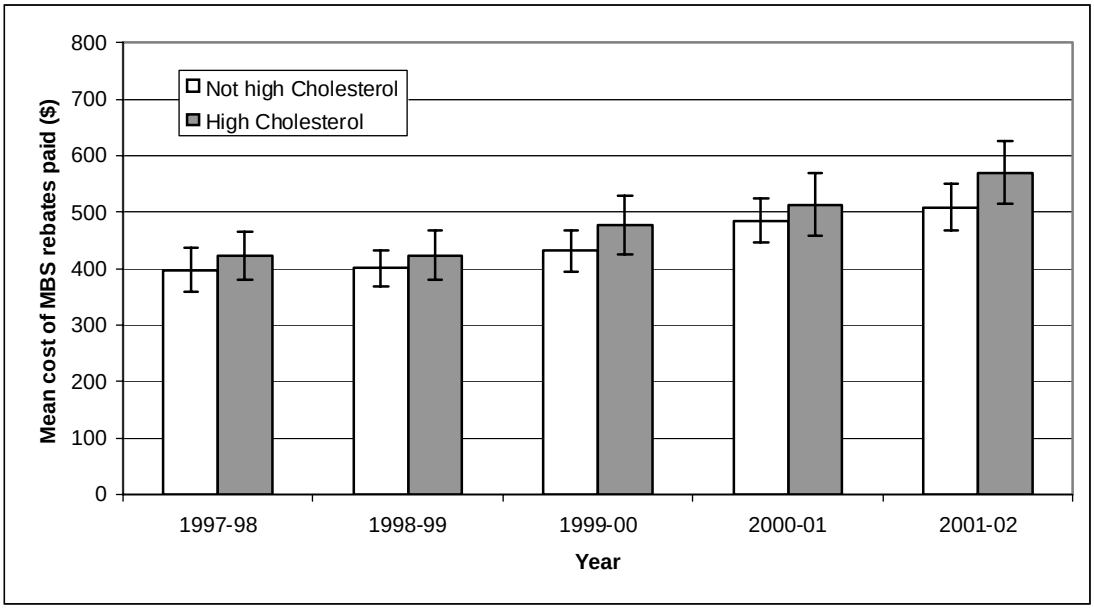

Figure 3.20: Mean cost of MBS rebates paid for people who have high blood cholesterol and those who do not, by year

3.6.7 Multiple Risk Factors

Participants were classified according to the number of risk factors that they had. The six risk factors included in this analysis were current smoking, intermediate to very high alcohol risk, no or insufficient physical activity, overweight or obesity, high blood pressure and high cholesterol.

The mean number and cost of MBS rebates paid for the five year period July 1997 to June 2002, segmented by number of risk factors present is shown in Table 3.13. MBS resource use, in terms of both the number and value of rebates, was statistically significantly higher among people with one or more of these risk factors than those who did not have any of these risk factors.

Table 3.13: Mean number of rebates and total benefit paid for people based on the number of risk factors present, July 1997 to June 2002

	n	Mean	95% CI	Range
No risk factors				
Number of rebates	202	43	37 – 48	2 to 609
Benefit paid	202	$1398	$1175 – $1620	$57 to $13388
1 risk factor				
Number of rebates	531	62 ↑	56 – 68	1 to 878
Benefit paid	531	$2165 ↑	$1916 – $2414	$22 to $39047
2 risk factors				
Number of rebates	748	67 ↑	62 – 72	1 to 589
Benefit paid	748	$2294 ↑	$2103 – $2486	$21 to $30308
3 risk factors				
Number of rebates	594	71 ↑	66 – 77	1 to 678
Benefit paid	594	$2554 ↑	$2325 – $2782	$8 to $25909
4 or more risk factors				
Number of rebates	278	73 ↑	65 – 81	1 to 448
Benefit paid	278	$2629 ↑	$2254 – $3004	$21 to $28192

↑ Statistically significantly higher than no risk factors

The mean number of MBS rebates paid per year, segmented for number of risk factors, is shown in Figure 3.21, while the mean cost of rebates paid per year, segmented for number of risk factors is shown in Figure 3.22.

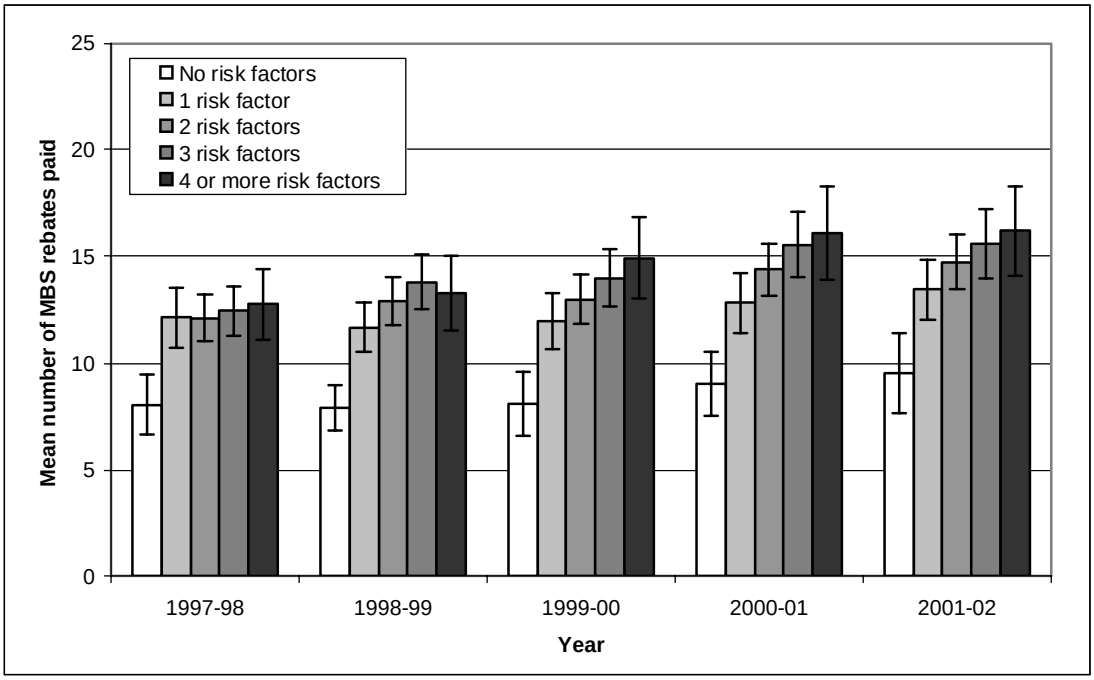

Figure 3.21: Mean number of MBS rebates paid for people based on the number of risk factors present, by year

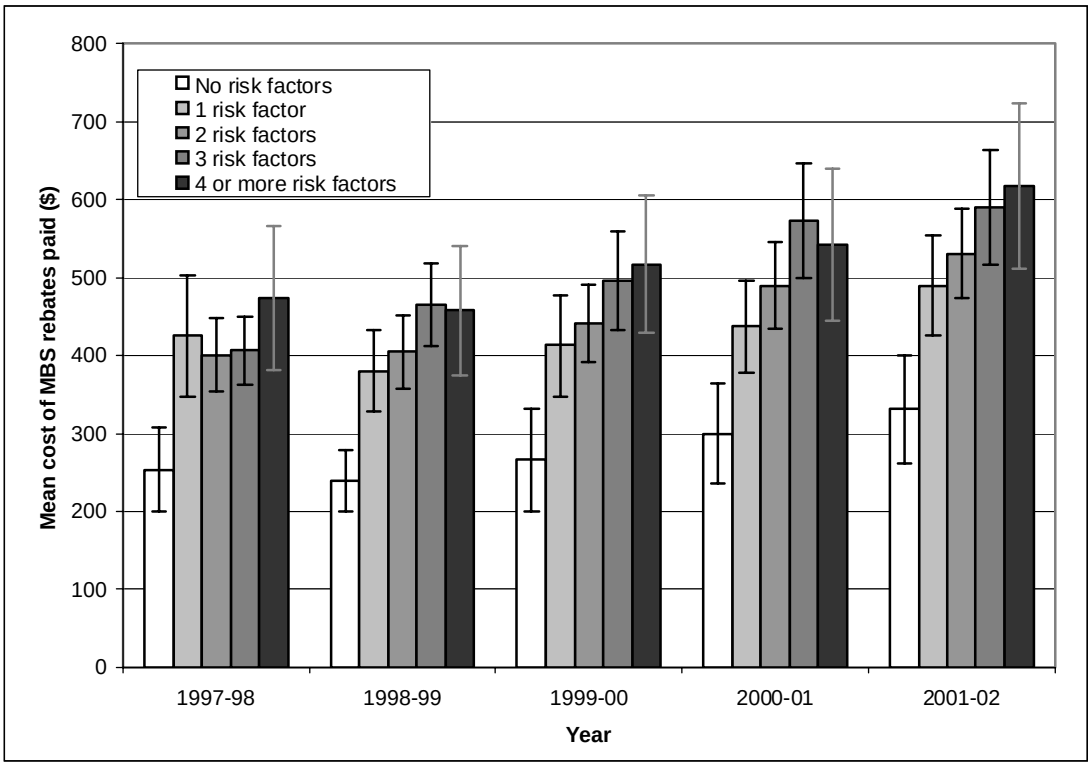

Figure 3.22: Mean cost of MBS rebates paid for people based on the number of risk factors present, by year

CHAPTER 4: CONCLUSIONS

This report provides information on the MBS costs associated with chronic conditions and associated risk factors. People with diagnosed diabetes used significantly more MBS resources than people who did not have diagnosed diabetes. MBS resource use among people with undiagnosed diabetes was higher than among those who did not have diabetes. Although this did not reach statistical significance, point estimates suggest that diabetes has an effect on health service use even before the condition has been diagnosed. Similar patterns were shown for people with diagnosed and undiagnosed asthma and COPD. In addition to diagnosed asthma being costly in terms of MBS resource use, people with undiagnosed asthma were also using significantly more MBS resources than people without asthma. Furthermore, those with diagnosed and undiagnosed COPD used significantly more MBS resources and were more costly in terms of service use than those without COPD. Prevention and early detection of these conditions is therefore imperative for reducing complications and related costs.

Current smokers used significantly less MBS resources than non-smokers or ex-smokers. Reasons for this phenomenon were not investigated in this study but may be related to knowing that they are likely to be told to quit smoking if they see a doctor. A different pattern was apparent for other risk factors. Those people who were sedentary, were overweight or obese, or had high blood pressure used significantly more MBS resources than those who were physically active, had a BMI in the normal range, or who did not have high blood pressure, respectively. It is assumed that higher MBS use is equated with poorer health, but the direction of causality cannot be determined from these analyses. For example, it is unknown whether those people who use more MBS resources are too ill to undertake physical activity, or whether it is because people do not undertake physical activity that they are less healthy and therefore use more health services.

MBS resource use among people with high blood pressure is likely to be related to age, with older people also using significantly more MBS resources than younger people. Having any of the identified risk factors is associated with higher MBS service use. It is interesting to note that the effect of these risk factors on MBS service use does not appear to be cumulative. People with one risk factor used significantly more MBS services than people with no risk factors, but did not use a significantly different number of MBS services than people with two or more risk factors. The finding that females use significantly more MBS resources than males is not new[9]. That low-income earners use significantly more MBS resources indicates how health and health service use is also influenced by socioeconomic position.

In summary, chronic conditions such as asthma, COPD and diabetes are associated with high MBS resource use, and this is only part of the overall direct and indirect costs of these conditions. Preventing or delaying the development of these conditions, together with early diagnosis and effective management to reduce the prevalence of related complications, are important aspects in reducing the health system costs.

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