



He Kainga Oranga/Housing and Health Research Programme

**Housing, Crowding and Health Study:
Characteristics of cohort members and their
hospitalisations**

February 2003 to June 2005

Interim Report, 26 July 2006

**Michael Baker
Jane Zhang
Philippa Howden-Chapman
Tony Blakely
Kay Saville-Smith
Julian Crane**

***He Kainga Oranga / Housing and Health Research Programme*
Wellington School of Medicine & Health Sciences**

Contents

CONTENTS	2
1 EXECUTIVE SUMMARY	13
2 INTRODUCTION	22
3 METHODS	24
3.1 Data Collection	24
3.2 Data transfer and linking to hospitalisation records	26
3.3 Data analysis	27
3.3.1 Construction of applicant and tenant cross-section	27
3.3.2 Key variables	27
3.3.3 Crowding Measures	28
3.3.4 Analysis of hospitalisation data	30
4 QUALITY AND COMPLETENESS OF DATA	39
4.1 Needs assessment interviews	39
4.1.1 Interviews by month	39
4.1.2 Response to the ethnicity question in the NA interview	42
4.2 IRR assessment	42
4.2.1 Interviews by month	43
4.2.2 Completeness of the data	44
4.2.3 Voluntary response to the smoking question	44
4.2.4 Response to the ethnicity question	46
4.3 Quality of data matching	46
4.3.1 Completeness of data matching	47
4.3.2 Potential errors with data matching and the NHI	48
4.3.3 Characteristics of matched and un-matched participants	49
4.4 Other data issues	49
4.4.1 Data entry errors	49
4.4.2 Comparison of ethnicity data from multiple sources	50
5 CHARACTERISTICS OF THE APPLICANTS	52
5.1 Household Demographics	52
5.1.1 Age Distribution of the <i>housing applicants</i>	52
5.1.2 Sex distribution of the <i>housing applicants</i>	53
5.1.3 Ethnic Characteristics of the <i>housing applicants</i>	53
5.2 Household Structure and income	54

5.2.1	Structure of the applicant households	54
5.2.2	Income of the applicant households.....	55
5.3	Crowding Level.....	56
5.3.1	Household Size	56
5.3.2	Number of bedrooms in the applicant house	59
5.3.3	Crowding levels of the applicant dwelling.....	60
5.3.4	Self reported duration in current situation.....	63
5.3.5	Duration as <i>housing applicant</i>	65
5.4	Characteristics of high and moderate priority applicants.....	66
6	CHARACTERISTICS OF THE TENANTS	69
6.1	Household demographics.....	69
6.1.1	Age distribution of the tenants.....	69
6.1.2	Sex distribution of the tenants	70
6.1.3	Ethnic characteristics of the tenants.....	70
6.2	Household structure and income.....	71
6.2.1	Structure of the tenant households	71
6.2.2	Income of the tenant households.....	72
6.3	Tobacco smoking.....	73
6.3.1	Active smoking	73
6.3.2	Smoking households	74
6.4	Crowding level	76
6.4.1	Household size	76
6.4.2	Number of bedrooms in the tenant property.....	77
6.4.3	Crowding levels of the tenant households.....	79
6.4.4	Duration in current accommodation.....	81
7	COMPARISON OF THE <i>HOUSING APPLICANTS</i> AND <i>TENANTS</i>	83
7.1	Household demographics, structure and income.....	83
7.2	Household size and crowding levels	83
8	LONGITUDINAL ANALYSIS OF APPLICANT AND TENANT POPULATIONS	88
8.1	Flows of households through HNZC processes.....	88
8.2	Repeated measurements of households.....	88
8.3	Characteristics of high and moderate priority applicants.....	91
8.4	Reasons for applicants exiting the waiting list.....	93
9	HOSPITALISATIONS IN <i>HOUSING APPLICANTS</i> AND <i>TENANTS</i>.....	94

9.1	Analytical steps in interpreting hospitalisation data	94
9.1.1	Removing non-hospitalisations and overseas visitors.....	94
9.1.2	Selecting admission types.....	94
9.1.3	Select whether to include principal and additional diagnosis.....	98
9.1.4	Selecting and removing irrelevant hospitalisations	98
9.1.5	Select whether to include repeat admissions	99
9.1.6	Select conditions of interest.....	101
9.1.7	Calculate disease rates – Duration of time in cohort.....	101
9.2	Characteristics of hospitalisations.....	103
9.2.1	Hospitalisation rates in <i>housing applicants, tenants</i> and <i>other NZ</i> population	103
9.2.2	Characteristics of those hospitalised	105
9.2.3	Comparison of hospitalisation rates by major disease categories.....	110
9.2.4	Comparison of hospitalisation rates by selected diseases	112
9.2.5	Age-ethnicity standardised causes of admissions	130
9.2.6	Comparison of applicants with recent tenants	134
9.2.7	Comparison of hospitalisation rates by duration of tenancy	136
9.2.8	Comparison of hospitalisation rates by prioritisation	140
9.2.9	Sensitivity analysis based on restricting to overnight admissions	141
9.2.10	Potentially avoidable hospitalisations	142
9.2.11	Hospitalisation rates by crowding level	143
9.2.12	Hospitalisation rates for active smoking adults	145
9.2.13	Hospitalisation rates for passive smoking children.....	148
10	DISCUSSION	151
10.1.1	Main findings.....	151
10.1.2	Implications	155
10.1.3	Limitations.....	156
10.1.4	Further work	156
11	REFERENCES	157
12	APPENDICES	158

List of Tables

Table 1.1: Summary of characteristics of <i>housing applicant</i> and <i>tenant</i> households at 30th June 2005, compared with New Zealand population (2001 census)	21
Table 2.1: Classification of factors affecting the health of HNZN applicants and tenants and their measurement as part of the <i>Housing, Crowding and Health Study</i>	23
Table 3.1: HNZN regional office structure, 2005	24
Table 3.2: The revised Jensen Index	28
Table 4.1: Number of needs assessment interviews by month, February 2003 to June 2005	40
Table 4.2: Completeness of key crowding variables from the needs assessment interview, February 2003 to June 2005	41
Table 4.3: Number of IRR forms completed by month, February 2003 to June 2005	43
Table 4.4: Completeness of key variables from the IRR form, February 2003 to June 2005	44
Table 4.5: Characteristics of people completing the smoking questions on the IRR form, April 2003 to June 2005	45
Table 4.6: Comparison of cohort members based on their NHI to see how many have multiple housing reference (ID2) numbers, (May 2003 to June 2005)	48
Table 4.7: Comparison of cohort members based on their housing reference (ID2) number to see how many have multiple NHI numbers, (May 2003 to June 2005)	48
Table 4.8: Comparison of ethnicity recording characteristics across different data sources (HNZN, NZHIS, Census)	50
Table 4.9: Characteristics of cohort participants who were matched with NHI numbers and those who were un-matched, May 2003 to June 2005	51
Table 5.1: Summary statistics for the age distribution of people in applicant households at June 2005	53
Table 5.2: Sex distribution of people in <i>housing applicant</i> households at June 2005	53
Table 5.3: Ethnicity of people in <i>housing applicant</i> households at June 2005, based on exclusive and inclusive coding	53
Table 5.4: Applicant household structure	54
Table 5.5: Applicant household numbers at June 2005	54
Table 5.6: Summary statistics of the total weekly applicant household income	55
Table 5.7: Number of households with members receiving a Government benefit	56
Table 5.8: Summary statistics for the applicant household size	57
Table 5.9: Applicant household size, including contribution from non-applicants living in the same house at June 2005	57
Table 5.10: Applicant household size comparing applicants who share with non-applicants to those who do not share at June 2005	58
Table 5.11: Number of bedrooms in house used by <i>housing applicants</i> at June 2005	59
Table 5.12: Summary statistics for the number of bedrooms in the applicant house	59
Table 5.13: Summary statistics for the number of people per bedroom in the applicant house	61
Table 5.14: Crowding levels calculated using the people per bedroom formula	61
Table 5.15: Summary statistics for the number of people per bedroom (Method 1) comparing applicants who share with other people to those who do not at June 2005	62
Table 5.16: Mean room deficit for <i>housing applicants</i> , based on CNOS, summary statistics at June 2005	63
Table 5.17: <i>Housing applicant</i> bedroom deficit measured against CNOS at June 2005	63
Table 5.18: Length of time applicants have been living in current situation i.e. with this number of people and in current house at the time of the NA interview	64
Table 5.19: Summary statistics for the duration in accommodation	64
Table 5.20: Summary statistics for the length of time the current applicants have been on the waiting list	65
Table 5.21: Prioritisation for HNZN housing	66
Table 5.22: Characteristics of high and moderate priority applicants at June 2005	68
Table 6.1: Summary statistics for the age distribution of tenants	70
Table 6.2: Sex distribution of people in tenant households at June 2005	70
Table 6.3: Ethnicity of people in tenant households, based on exclusive and inclusive coding at June 2005	71
Table 6.4: Tenant household structure	71
Table 6.5: Tenant household numbers at June 2005	72
Table 6.6: Summary statistics of the total weekly tenant household income	72
Table 6.7: Number of household members receiving a benefit	73
Table 6.8: Prevalence of reported smoking in adult tenants at June 2005	74
Table 6.9: Prevalence of reported household smoking status of tenants at June 2005	75
Table 6.10: Prevalence of reported household smoking status of tenants, by household characteristics at June 2005	75
Table 6.11: <i>Tenant</i> household size at June 2005	76
Table 6.12: Summary statistics for household size	77
Table 6.13: Number of bedrooms in tenant houses at June 2005	78
Table 6.14: Summary statistics for the number of bedrooms	78
Table 6.15: Tenant household summary statistics for the people per bedroom	79
Table 6.16: Tenant household crowding level, as measured by number of people per bedroom at June 2005	79
Table 6.17: Tenant household summary statistics for the CNOS	80
Table 6.18: Tenant household crowding level, as measured by the CNOS bedroom deficit at June 2005	80
Table 6.19: Summary statistics for the duration in accommodation	81
Table 6.20: Length of time the tenants have been living in their current accommodation, at June 2005	81

Table 7.1: Characteristics of <i>housing applicants</i> and <i>housing tenants</i> at June 2005, compared with total NZ population (2001 census).....	84
Table 7.2: Household size and crowding characteristics of <i>housing applicant</i> and <i>tenant</i> households June 2005, compared with New Zealand population (2001 census).....	85
Table 8.1: Summary of applicant and tenant movement at June 2005	89
Table 8.2: Changes for households with more than one observation at June 2005.....	90
Table 8.3: Movement of the applicants through the various states at June 2005.....	92
Table 8.4: Priority status of the applicants for the three simplest flows ¹ at June 2005	92
Table 8.5: Reasons for exiting for all applicant exit records ¹	93
Table 9.1: 'Non-hospitalisation' events filtered out of hospitalisation data, May 2003 to June 2005	94
Table 9.2: Hospitalisations classified according to admission types, May 2003 to June 2005 (Filtered to exclude non hospitalisations and overseas cases)	95
Table 9.3: Number of diagnostic codes recorded for hospitalised cases, May 2003 to June 2005 (Filtered to exclude non hospitalisations, overseas visitors and waiting list admissions)	98
Table 9.4: Selected irrelevant conditions, May 2003 to June 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions)	99
Table 9.5: Frequency of admissions, June 2003 to May 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions and irrelevant conditions)	100
Table 9.6: Proportion of hospitalisations excluded by different readmission filters, May 2003 to June 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions and irrelevant conditions)	100
Table 9.7: Number of individuals in cohort with overlapping time spent as <i>housing applicants</i> and <i>tenants</i> , May 2003 to June 2005 (based on total HNZN data)	102
Table 9.8: Summary statistics for duration of time in cohort, May 2003 to June 2005 (with adjustment for applicants and tenants with overlapping periods)	103
Table 12.1: Population used for age-ethnicity standardisation, based on age-ethnicity structure of HNZN population at June 2005, compared with NZ Census population 2001	158
Table 12.2: Distribution of admission types within DHBs for cohort study population (applicants and tenants), May 2003 to June 2005	159
Table 12.3: Distribution of admission types within DHBs for <i>other NZ</i> population, May 2003 to June 2005	160
Table 12.4: Hospitalisation numbers and age-standardised rates in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to successive levels of filtering and major admission categories, May 2003 to June 2005	161
Table 12.5: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , according to successive levels of filtering and major admission categories, May 2003 to June 2005	162
Table 12.6: Total hospitalisation numbers and crude rates in <i>housing applicants</i> , <i>housing tenants</i> and <i>other NZ</i> population, according to key demographic characteristic, May 2003 to June 2005.....	163
Table 12.7: Hospitalisation numbers and crude rates in <i>housing applicants</i> , <i>housing tenants</i> and <i>other NZ</i> population, using standard filter (excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions), according to key demographic characteristic, May 2003 to June 2005.....	164
Table 12.8: Hospitalisation numbers and age-specific or age-standardised rates in <i>cohort</i> population (applicants and tenants) compared with the <i>other NZ</i> population, based on principal diagnosis and standard filter ¹ , according to key demographic characteristic May 2003 to June 2005.....	165
Table 12.9: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , based on principal diagnosis and standard filter ¹ , according to key demographic characteristic May 2003 to June 2005.....	166
Table 12.10: Hospitalisation numbers and age-standardised rates in <i>applicants</i> compared with <i>tenants</i> , based on principal diagnosis and standard filter ¹ , according to <i>Equivalised Income</i> , May 2003 to May 2005	167
Table 12.11: Hospitalisation numbers and age-standardised rates in <i>tenants</i> , based on principal diagnosis and standard filter ¹ , according to SAU average NZDep2001, May 2003 to May 2005	167
Table 12.12: Hospitalisation numbers and age-standardised rates in <i>applicants</i> compared with <i>tenants</i> , based on principal diagnosis and standard filter ¹ , according to HNZN region, May 2003 to June 2005	168
Table 12.13: Distribution in <i>housing tenants</i> , compared with Total New Zealand residents ¹ , according to Urban and Rural	168
Table 12.14: Hospitalisation numbers and age-standardised rates in <i>applicants</i> , compared with the <i>tenants</i> , based on principal diagnosis and standard filter ¹ , according to Seasons, May 2003 to May 2005	169
Table 12.15: Hospitalisation numbers and age-standardised rates in <i>cohort</i> population (applicants and tenants) compared with the <i>other NZ</i> population, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005.....	170
Table 12.16: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	171
Table 12.17: Hospitalisation numbers and age-standardised rates ¹ in <i>cohort</i> population (applicants and tenants) compared with the <i>other NZ</i> population, according to selected diseases of interest, based on principal diagnosis and standard filter ² , May 2003 to June 2005.....	172
Table 12.18: Hospitalisation numbers and age-standardised rates ¹ in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected diseases of interest, based on principal diagnosis and standard filter ² , May 2003 to June 2005... ..	176
Table 12.19: Comparison of rates and rate ratios for <i>housing applicants</i> and <i>housing tenants</i> with the <i>other NZ</i> population, using different measures of rate, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	180

Table 12.20: Hospitalisation numbers and age-ethnicity-standardised rates in <i>cohort</i> population (applicants & tenants) compared with Other New Zealand population, according to major disease categories, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	181
Table 12.21: Hospitalisation numbers and age-ethnicity-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , according to major disease categories, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	182
Table 12.22: Hospitalisation numbers and age-ethnicity-standardised rates ¹ in <i>cohort</i> population (applicants and tenants) compared with the <i>other NZ</i> population, according to selected diseases of interest, based on principal diagnosis and standard filter ² , May 2003 to June 2005	183
Table 12.23: Hospitalisation numbers and age-ethnicity-standardised rates ¹ in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected diseases of interest, based on principal diagnosis and standard filter ² , May 2003 to June 2005	187
Table 12.24: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> (who subsequently became tenants) compared with <i>housing tenants</i> (during their first 12 months of tenancy time), according to major disease categories, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	191
Table 12.25: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> (who subsequently became tenants) compared with <i>housing tenants</i> (during their first 12 months of tenancy time), according to major disease categories, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	192
Table 12.26: Hospitalisation numbers and age-standardised rates in <i>housing tenants</i> according to duration as tenants, for major disease categories, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	196
Table 12.27: Hospitalisation numbers and age-standardised rates in <i>housing tenants</i> according to duration as tenants, for selected diseases, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	197
Table 12.28: Age-standardised hospitalisation rates in Sub-groups of <i>housing applicants</i> (A+B, C+D) compared with Tenants and <i>other NZ</i> population, May 2003 to June 2005	203
Table 12.29: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in <i>cohort</i> population (applicants & tenants) compared with Other New Zealand population, according to major disease categories, based on principal diagnosis and standard filter ¹ and excluding all day cases, May 2003 to June 2005	204
Table 12.30: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , according to major disease categories, based on principal diagnosis and standard filter ¹ and excluding all day cases, May 2003 to June 2005	205
Table 12.31: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in <i>cohort</i> population (applicants & tenants) compared with Other New Zealand population, a according to selected diseases of interest, based on principal diagnosis and standard filter ¹ and excluding all day cases, May 2003 to June 2005	206
Table 12.32: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected diseases of interest, based on principal diagnosis and standard filter ¹ and excluding all day cases, May 2003 to June 2005	210
Table 12.33: Potentially avoidable hospitalisations (PAH), age-standardised rates in <i>housing applicants</i> compared with <i>housing tenants</i> and the <i>other NZ</i> population, based on principal diagnosis and minimal filtering ¹ , May 2003 to June 2005	214
Table 12.34: Hospitalisation numbers, standardised rates and rate ratios in crowded compared with uncrowded households, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	215
Table 12.35: Hospitalisation numbers, standardised rates and rate ratios according to crowding level, based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	216
Table 12.36: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded <i>housing applicant</i> households, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	217
Table 12.37: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded housing tenant households, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	218
Table 12.38: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded <i>cohort</i> (applicant and tenant) households, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	219
Table 12.39: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded <i>cohort</i> (applicant and tenant) households, according to specific diseases, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	220
Table 12.40: Hospitalisation numbers, standardised rates and rate ratios according to active smoking tenants (over 19 years), based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	224
Table 12.41: Hospitalisation numbers, standardised rates and rate ratios according to passive smoking (under 15 years), based on principal diagnosis and standard filter ¹ , May 2003 to June 2005	224
Table 12.42: Hospitalisation numbers, age-standardised rates and rate ratios in active smoking tenants compared with non smoking tenants, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	225
Table 12.43: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in active smoking tenants compared with nonsmoking tenants, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	226
Table 12.44: Hospitalisation numbers, age-standardised rates and rate ratios in active smoking tenants compared with nonsmoking tenants, according to specific diseases, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	227

Table 12.45: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in active smoking tenants compared with nosmoking tenants, according to specific diseases, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	231
Table 12.46: Hospitalisation numbers, age-standardised rates and rate ratios in passive smoking tenants compared with nosmoking tenants, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	235
Table 12.47: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in passive smoking tenants compared with nosmoking tenants, according to major disease categories, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	236
Table 12.48: Hospitalisation numbers, age-standardised rates and rate ratios in passive smoking tenants compared with nosmoking tenants, according to specific diseases, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	237
Table 12.49: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in passive smoking tenants compared with nosmoking tenants, according to specific diseases, based on principal diagnosis and standard filter ¹ May 2003 to June 2005	241

List of Figures

Figure 3.1: Flow of people between the <i>other NZ</i> population and <i>housing applicant</i> and <i>housing tenant</i> populations.....	25
Figure 3.2 Steps involved in the transfer of housing tenant and applicant data from HNZN to WSM, including its linking to hospitalisation data by NZHIS.....	26
Figure 3.3 Steps involved in analysis of hospital discharge data.....	31
Figure 4.1: Response rates for the key crowding variables across time	41
Figure 4.2: Response to ethnicity question on NA interview by month, February 2003 to June 2005	42
Figure 4.3: Response to smoking question on IRR form by month, February 2003 to June 2005.....	44
Figure 4.4: Response to ethnicity question on IRR form by month, February 2003 to June 2005	46
Figure 4.5: Match rate by month, May 2003 to June 2005.....	47
Figure 5.1: Age distribution of the applicant household members at June 2005	52
Figure 5.2: Income of the applicant households, based on total household income per week at June 2005.....	55
Figure 5.3: Number of people in the applicant households at June 2005	58
Figure 5.4: Number of bedrooms in the applicant house (excluding four values > 10) at June 2005	60
Figure 5.5: Crowding levels in the applicant households measured using people per bedroom at June 2005.....	62
Figure 5.6: Applicants duration in their current accommodation at the time of the NA interview at June 2005	64
Figure 5.7: Duration the cross section of applicants have been on the waiting list at June 2005.....	66
Figure 6.1: Age distribution of tenant household members at June 2005	69
Figure 6.2: Income of the tenant households per week (excluding 6 values greater than \$1500) at June 2005.....	73
Figure 6.3: Number of people in the tenant household at June 2005.....	77
Figure 6.4: Number of bedrooms in the tenant households at June 2005	78
Figure 6.5: Tenant crowding measured using people per bedroom at June 2005	80
Figure 6.6: Duration of stay in current accommodation for the tenants at June 2005.....	82
Figure 7.1: Comparison of the average people per household at June 2005.....	86
Figure 7.2: Comparison of the average number of bedrooms at June 2005.....	86
Figure 7.3: Comparison of the average people per bedroom at June 2005	87
Figure 7.4: Comparison of the percentage of households with bedrooms deficit of one or more at June 2005.....	87
Figure 8.1: Graphic representation of cohort household populations and flows between them and the New Zealand population for 29 months (February 2003 - June 2005).....	89
Figure 9.1: Distribution of admission types across DHBs for <i>cohort</i> population (applicants and tenants), May 2003 to June 2005	97
Figure 9.2: Distribution of admission types across DHBs for <i>other NZ</i> population, May 2003 to June 2005	97
Figure 9.3: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with the <i>other NZ</i> population, according to major admission categories, May 2003 to June 2005	104
Figure 9.4: Annual hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with the <i>other NZ</i> population, by age group, May 2003 to June 2005	106
Figure 9.5: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with the <i>other NZ</i> population, by sex, May 2003 to June 2005.....	107
Figure 9.6: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with the <i>other NZ</i> population, by ethnic group, May 2003 to June 2005	107
Figure 9.7: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , by equivalised income (exclude>\$5000), May 2003 to June 2005.....	107
Figure 9.8: Distribution of HNZN properties according to NZDep2001 classification of their neighbourhood (SAU), May 2003 to June 2005.....	108
Figure 9.9: Annual age-standardised hospitalisation rates in <i>housing tenants</i> , by SAU average NZDep2001, May 2003 to June 2005	108
Figure 9.10: Distribution of <i>housing tenants</i> , compared with total New Zealand residents, by urban-rural categories, May 2003 to June 2005.....	108
Figure 9.11: Annual age-standardised hospitalisation rates in <i>housing tenants</i> according to urban-rural category, May 2003 to June 2005	109
Figure 9.12: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , by HNZN region, May 2003 to June 2005.....	109
Figure 9.13: Annual age-standardised hospitalisation rates in <i>housing applicants</i> and <i>housing tenants</i> , by seasons, May 2003 to June 2005	109
Figure 9.14: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with the <i>other NZ</i> population, according to major disease categories, May 2003 to June 2005.....	110
Figure 9.15: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to major disease categories, May 2003 to June 2005.....	111
Figure 9.16: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to major disease categories, May 2003 to June 2005	111
Figure 9.17: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected infectious diseases, May 2003 to June 2005	113
Figure 9.18: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to selected infectious diseases, May 2003 to June 2005	113

Figure 9.19: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected infectious diseases, May 2003 to June 2005	114
Figure 9.20: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected respiratory diseases, May 2003 to June 2005	115
Figure 9.21: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to selected respiratory diseases, May 2003 to June 2005	115
Figure 9.22: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected respiratory diseases, May 2003 to June 2005	116
Figure 9.23: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected skin and bone infections, May 2003 to June 2005	117
Figure 9.24: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to selected skin and bone infections, May 2003 to June 2005	117
Figure 9.25: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected skin and bone infections, May 2003 to June 2005	117
Figure 9.26: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected acute and chronic diseases with partly infectious origins, May 2003 to June 2005	118
Figure 9.27: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to acute and chronic diseases with partly infectious origins, May 2003 to June 2005	119
Figure 9.28: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected acute and chronic diseases with partly infectious origins, May 2003 to June 2005	119
Figure 9.29: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected cardiovascular diseases, May 2003 to June 2005	120
Figure 9.30: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to selected cardiovascular diseases, May 2003 to June 2005	120
Figure 9.31: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to selected cardiovascular diseases, May 2003 to June 2005	120
Figure 9.32: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for categories of mental and behavioural disorders, May 2003 to June 2005	121
Figure 9.33: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, according to categories of mental and behavioural disorders, May 2003 to June 2005	122
Figure 9.34: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to categories of mental and behavioural disorders, May 2003 to June 2005	122
Figure 9.35: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for all categories of injury and poisonings, May 2003 to June 2005	123
Figure 9.36: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for specific common injuries and poisonings, May 2003 to June 2005	124
Figure 9.37: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, for all categories of injury and poisonings, May 2003 to June 2005	124
Figure 9.38: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, for specific common injuries and poisonings, May 2003 to June 2005	125
Figure 9.39: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , for all categories of injury and poisonings, May 2003 to June 2005	125
Figure 9.40: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , for specific common injuries and poisonings, May 2003 to June 2005	126
Figure 9.41: Hospitalisation age-standardised rates in <i>housing applicant</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for all categories of external cause, May 2003 to June 2005	127
Figure 9.42: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for selected external causes, May 2003 to June 2005	127
Figure 9.43: Hospitalisation age-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, for common external causes, May 2003 to June 2005	128
Figure 9.44: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, for all categories of external cause, May 2003 to June 2005	128
Figure 9.45: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, for selected external causes, May 2003 to June 2005	128
Figure 9.46: Hospitalisation age-standardised rate ratios in <i>cohort</i> population (applicants and tenants) compared with <i>other NZ</i> population, for common external causes, May 2003 to June 2005	129
Figure 9.47: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , for all categories of external cause, May 2003 to June 2005	129
Figure 9.48: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , for selected external causes, May 2003 to June 2005	129
Figure 9.49: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , for common external causes, May 2003 to June 2005	130
Figure 9.50: Comparison of crude, age-standardised and age-ethnicity-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, based on filtered hospitalisations, May 2003 to June 2005	132
Figure 9.51: Hospitalisation age-ethnicity-standardised rates in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, according to major disease categories, May 2003 to June 2005	132

Figure 9.52: Hospitalisation age-ethnicity-standardised rate ratios in <i>housing applicants</i> and <i>housing tenants</i> , compared with <i>other NZ</i> population, according to major disease categories, May 2003 to June 2005	133
Figure 9.53: Hospitalisation age-ethnicity-standardised rate ratios in <i>housing applicants</i> compared with <i>housing tenants</i> , according to major disease categories, May 2003 to June 2005	133
Figure 9.54: Hospitalisation age-standardised rates in <i>housing applicants</i> (who subsequently became tenants), compared with <i>housing tenants</i> (during their first 12 months of tenancy time) and the <i>other NZ</i> population according to major disease categories, May 2003 to June 2005.....	135
Figure 9.55: Hospitalisation age-standardised rate ratios in <i>housing applicants</i> (who subsequently became tenants), compared with <i>housing tenants</i> (during their first 12 months of tenancy time) according to major disease categories, May 2003 to June 2005	135
Figure 9.56: Total age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> and <i>other NZ</i> population, May 2003 to June 2005	136
Figure 9.57: Age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> (who become tenants) and <i>other NZ</i> population, According to major disease categories, May 2003 to June 2005	137
Figure 9.58: Age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> and <i>other NZ</i> population, for selected infectious diseases, May 2003 to June 2005.....	138
Figure 9.59: Age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> and <i>other NZ</i> population, for selected respiratory diseases, May 2003 to June 2005	139
Figure 9.60: Age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> and <i>other NZ</i> population, for selected injuries, May 2003 to June 2005	139
Figure 9.61: Age-standardised hospitalisation rates in <i>housing tenants</i> according to duration of tenancy, compared with <i>housing applicants</i> and <i>other NZ</i> population, for selected mental health conditions, May 2003 to June 2005	140
Figure 9.62: Age-standardised hospitalisation rates in sub-groups of <i>housing applicants</i> (A+B, C+D) compared with <i>housing tenants</i> and <i>other NZ</i> population, May 2003 to June 2005.....	140
Figure 9.63: Potentially avoidable hospitalisations, age-standardised hospitalisation rates in <i>housing applicants</i> , <i>housing tenants</i> and <i>Other NZ</i> population	142
Figure 9.64: Comparison of age-ethnicity-standardised hospitalisation rates in <i>housing applicants</i> , <i>housing tenants</i> and <i>cohort</i> (applicant and tenants), according to different crowding levels (uncrowded, 1-bedroom deficit, 2+ bedroom deficit), May 2003 to June 2005.....	144
Figure 9.65: Comparison of age-ethnicity-standardised hospitalisation rates in crowded and uncrowded <i>cohort</i> (applicant and tenant) households, according to major disease categories, May 2003 to June 2005.....	144
Figure 9.66: Hospitalisation age-ethnicity-standardised rate ratios in crowded and uncrowded <i>cohort</i> (applicant and tenant) households, according to major disease categories, May 2003 to June 2005.....	145
Figure 9.67: Comparison of age-standardised hospitalisation rates in active smoking and non smoking tenants (over 19 years old) , according to major disease categories, May 2003 to June 2005	146
Figure 9.68: Hospitalisation age-standardised rate ratios in active smoking and non smoking tenants (over 19 years old), according to major disease categories, May 2003 to June 2005	147
Figure 9.69: Comparison of age-ethnicity-standardised hospitalisation rates in active smoking and non smoking tenants (over 19 years old) , according to major disease categories, May 2003 to June 2005	147
Figure 9.70: Hospitalisation age-standardised rate ratios in active smoking and non smoking tenants (over 19 years old), according to major disease categories, May 2003 to June 2005	148
Figure 9.71: Comparison of age-standardised hospitalisation rates in passive smoking and non smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005	149
Figure 9.72: Hospitalisation age-standardised rate ratios in passive smoking and non smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005	149
Figure 9.73: Comparison of age-ethnicity-standardised hospitalisation rates in passive smoking and non smoking tenants (under 15 years old) , according to major disease categories, May 2003 to June 2005.....	150
Figure 9.74: Hospitalisation age-ethnicity-standardised rate ratios in passive smoking and non smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005	150

Acknowledgements

He Kainga Oranga, Housing and Health Research Programme would like to acknowledge support from Housing New Zealand Corporation (HNZC), the New Zealand Health Information Service (NZHIS) and the Health Research Council, which has enabled the establishment and operation of this study.

We wish to particularly acknowledge the following current and former staff at HNZC: Michael Lennon, Helen Fulcher, Blair Badcock, Keith Johnson, Louise Hoather, Brian Reeve, Garry Williams, Linda Watkins, Selina Gentry, Virginia Keast, Ian Bourke, Tom Bridgman, and Bernadette Doolan. Staff at NZHIS who have assisted the study include Chris Lewis and Jim Fraser.

We also wish to thank colleagues who have contributed to establishment of this study while working with us at He Kainga Oranga: Jasminka Milosevic, Robin Turner, and Charlotte Kieft.

1 Executive Summary

Introduction

The *Housing, Crowding and Health Study* aims to investigate the relationship between household crowding levels and hospitalisation rates in a large cohort of Housing New Zealand Corporation (HNZC) applicant and tenant households. This report presents study findings based on analysis of applicant and tenant data obtained over the 29-month period from February 2003 to June 2005. It also contains an analysis of linked hospitalisation data covering a 26-month period (May 2003 to June 2005).

Methods

This study is based on data collected by HNZC as part of its routine business operations. Information on *housing applicants* is recorded on a Needs Assessment (NA) record form. Most *housing tenants* complete an annual Income Related Rent (IRR) application form. These processes allow collection of information on exposure to housing conditions in a large cohort of households. They also allow for collection of information on important confounding factors, notably age, ethnicity, household income, and tobacco smoke exposure. Household crowding is measured using occupancy (number of people per household), density (people per bedroom) and according to the Canadian National Occupancy Standard (CNOS).

This research uses, as the measure of health outcomes, hospitalisations for infectious diseases and other conditions. The HNZC data are forwarded to the New Zealand Health Information Service (NZHIS) for linking to their national health index number (NHI). The data are then anonymised (including encrypting the NHI) and passed to the researchers for analysis. During establishment of the study a number of changes were made to HNZC data collection processes. These changes included:

- Expanded ethnicity recording fields, consistent with those used by Statistics New Zealand, on both the NA and IRR forms.
- Additional crowding questions on NA form (numbers of other non-applicant people living in the house, total number of bedrooms, number of other rooms being used as bedrooms, and duration of time living in this situation in this house).
- Addition of a voluntary smoking question for adults, on the IRR form.

The study commenced operation in February 2003. Currently the investigators have data on applicants and tenants from February 2003 through to June 2005 and matched hospitalisation data for May 2003 to June 2005. This report presents an analysis of both these sets of data.

Analysis of hospitalisation data requires several additional steps: filtering out non-hospitalisations and irrelevant conditions; specifying the range of conditions of interest; deciding whether to include just principal (first listed) or additional diagnoses; filtering repeat admissions; identifying events and person days that occurred during the time the person was in the cohort; and calculating disease rates. The standard filter removed 'non-hospitalisations' and overseas visitors, waiting-list admissions, and 'irrelevant conditions' (day-case diagnostic procedures, day case treatment of chronic conditions such as renal dialysis, maternity, perinatal, and disability support service (DSS) admissions). The analysis was based on

principal diagnosis with a one-month readmission exclusion (filtering out of hospitalisations occurring within one month of the original admission and having the same 3-digit ICD.10 clinical code recorded as the principle diagnosis). Age-standardised rates were calculated to take account of the different age structures of *housing applicant* and *housing tenant* populations compared with the New Zealand population not in this cohort (*other NZ*). Analyses were repeated using age-ethnicity standardised rates to further adjust for the relatively high proportion of Maori and Pacific People in the cohort population. Rate ratios (RR) and 95% confidence intervals (95%CI) were calculated using standard method for age-standardised and age-ethnicity standardised data.

Results

Response rates: By June 2005 the new ethnicity field on the IRR form was being completed by 95% of tenants (an increase from 90% in July 2004). The voluntary smoking question on the IRR was filled in for 63% of adults (an increase from 57% in July 2004). Both response rates appear to be levelling off at around these levels. The additional key crowding variables added to the NA interview had response rates of 100% following a modification to the Rentel database (released on 22 August 2004).

Characteristics of housing applicants and housing tenants: Cross sectional comparisons were made between *housing applicants*, *housing tenants* and the total New Zealand population (see summary table 1.1). There are differences in demographics, income and crowding levels between these three groups:

- Half of the people living in applicant and tenant households are less than 20 years of age.
- Maori and Pacific people make up 60.2% of applicant and 70.4% of tenant households.
- One adult with children households make up 42.7% of the applicant households, compared with 35.5% of the tenant households.
- Seventy-five percent of the applicants have an equivalised household income less than or equal to \$315 per week. Seventy-five percent of the tenants have an income of \$353 or less per week.
- In 78.7% of applicant households, at least one household member is receiving a benefit, compared with 91.1% of tenants.
- About a third of tenants (31.7%) and a half of NZ Maori tenants (49.7%) smoke, compared with a quarter of the NZ population. About 44.5% of households include one or more smokers, based on those that provided such information.
- *Housing applicants* had larger households and higher levels of crowding (46.1% one or more bedrooms short) than *housing tenants* (23.6%), and both groups had higher crowding levels than the total New Zealand population (5.1%).
- About 37.9% of *housing applicants* were living with other families ('double-ups') and they reported particularly high levels of household crowding (79.8% of these 'double-up' households were classified as crowded using the CNOS, compared with 26.1% of applicant households who were not sharing).
- The average length of time living in this situation (i.e. in this house with this number of people) for applicants on the waiting list was 73 weeks.

Longitudinal trends for cohort: During the observation period, 43% (9032/21212) of A and B priority applicants were housed compared with 17% (2738/16269) of C and D priority applicants. The majority (61.6%) of applicants who became tenants decrease their level of

household crowding in the process. This was an average decrease of 1.45 people per bedroom (from 2.64 people per bedroom as applicants, to 1.19 people per bedroom as tenants).

Quality of data matching: The overall match rate over this 26-month period was 92%. Electronic matching achieved 65% with the remaining 37% by manual matching. The matching rate was slightly higher for *housing tenants* (92.5%) compared with *housing applicants* (91.2%) and for those aged 30-69 years and Europeans. As well as the 8% of unmatched cohort members, a further 7% had to be excluded because their time in the cohort could not be accurately assigned.

Analysis of hospitalisations: This analysis confirmed that a considerable proportion (11%) of hospitalisations represent 'administrative' events and overseas visitors and can be filtered out. A large group are also of low relevance to this research, notably 'waiting list' cases (16%) and 'irrelevant conditions' (32%). A further 5% can be excluded as probable readmissions for the same disease episode. This leaves 50% of 'standard filtered' hospitalisation data which can provide the numerator for the subsequent analyses. Applicants spent a mean of 229 days and tenants 638 days as part of the cohort during the 26 months (792 days) observation period (May 2003 to June 2005). These person-days provided the denominator for the analysis.

Hospitalisation rates for cohort population: The analysis of hospitalisation data identified a number of important characteristics of the *cohort* populations:

- *Housing applicants* and *housing tenants* have very high rates of recorded contact with the hospital system. These events are equivalent to 399/1000/year for *housing applicants* and 348/1000 for *housing tenants*, compared with 218/1000 for the *other NZ* population.
- The *standard filter* (excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions) removes 50% of recorded hospital contacts. After this filter is applied, hospitalisations remain markedly higher for the *housing applicants* (223/1000) and *housing tenants* (210/1000) compared with the *other NZ* population (127/1000).
- The *cohort* population have significantly higher hospitalisations rates than the *other NZ* population for all age groups, and for males and females. They also have higher rates for European, Maori, and Pacific people.
- Surprisingly, hospitalisation rates were significantly higher for the highest income quintile of *housing applicants*, whereas there was a slight negative gradient for *housing tenants* with higher income associated with a lower hospitalisation rate. Similarly, there was a modest increase in hospitalisation rates for *housing tenants* living in the most deprived neighbourhoods where these properties are concentrated (42% are in NZDep 2001 category 10).
- There are significant differences in hospitalisation rates between HNZC regions. HNZC properties are disproportionately located in urban areas compared with rural areas. Hospitalisations rates are lower for those in satellite urban areas, and non-significantly higher in rural areas. Hospitalisations follow a familiar seasonal pattern with higher rates in winter, particularly for *housing applicants*.
- Age-standardised rates for the *cohort* population in total (*housing applicants* and *tenants*), compared with the *other NZ* population, were significantly elevated for every disease grouping except for *congenital diseases*. Such differences were largest for *endocrine, nutritional and metabolic diseases, mental and behavioural conditions, respiratory diseases, and skin and subcutaneous diseases*.
- Age-standardised rates for the *cohort* population were also elevated for virtually every specific disease included in the analysis. Specific examples where rates were elevated two

fold or more included: *Infectious diseases (tuberculosis, meningococcal disease, septicaemia, all forms of viral hepatitis); Respiratory diseases (pneumonia, bronchitis, chronic obstructive pulmonary disease, other lower respiratory infections, asthma); Skin and bone infections (impetigo, cutaneous abscess, cellulitis, lymphadenitis, osteomyelitis); Other diseases with an infectious origin (acute rheumatic fever, acute and unspecified nephritis syndrome); Cardiovascular diseases (hypertensive diseases, heart failure); Injuries (from contact with heat, assault, pedestrian injuries, dog bites, sharp glass); and Mental and behavioural disorders (most categories, plus intentional self-harm).*

- Potentially avoidable hospitalisations were almost twice as high in the *cohort population* compared with the *other NZ population*, with injuries and poisonings about 35% higher.

Hospitalisation rates for housing applicants compared with housing tenants:

- *Housing applicants* and *housing tenants* generally had similar rates of hospitalisation for most groups of diseases and specific diseases. However, *housing applicants* had significant higher rates of hospitalisation for some diseases: *Respiratory diseases* (notably *acute pharyngitis, acute bronchitis, acute bronchiolitis* and *asthma*); *Mental and behavioural disorders* (particularly *mood disorders, neurotic and stress related disorders, mental disorders due to psychoactive substance use, plus intentional self harm,*); and certain *injuries* (notably *poisonings and toxic effects*)
- *Housing applicants* had lower hospitalisation rates for some conditions, notably some skin infections (*abscess, furuncle and carbuncle*)
- Carrying out the analysis using age-ethnicity standardised rates removed some of the effects that were related to the different ethnic composition of the *housing applicant* and *housing tenant* populations compared with the *other NZ population*.
- The use of age-ethnicity-standardised results reduced the rate ratio different between the *cohort population* and the *other NZ population* by about 30% suggesting that some of this difference could be explained by the relatively high proportion of Maori and Pacific people in the cohort population. Even with this additional adjustment, *housing applicants* and *housing tenants* continued to experience significantly higher hospitalisation rates than the *other NZ population* for all major disease categories except *congenital diseases*. For some specific diseases, this form of standardisation reduced the difference to non-significance, notably *meningococcal disease, acute bronchitis, and malignant neoplasms of the stomach*. For a minority of diseases, this standardisation resulted in an increase in rates.
- Age-ethnicity-standardisation also increased the hospitalisation rate in the *housing applicants* compared with the *housing tenant* populations (from RR 1.06 to 1.10) which is understandable, given the higher proportion of Pacific people who are *housing tenants* compared with the *housing applicant* population. This standardisation resulted in rates becoming significantly higher for *housing applicants* in some disease categories, particularly *infectious and parasitic diseases* and *respiratory diseases*. This standardisation resulted in rates becoming significantly higher for *housing applicants* for several specific diseases, including *viral infection of unspecified site, other chronic obstructive pulmonary disease, and burns and corrosions*.
- Restricting the definition of hospitalisation to overnight hospitalisation removed about 25% of events that involved attending as a day case. This restriction had little effect on the findings.

Hospitalisation rates in relation to duration of tenancy:

- A better indication of the health effects of social housing can be obtained by comparing hospitalisation rates in the sub-group of applicants who subsequently became tenants, compared with tenants during their first year of hospitalisation. These populations had

exactly the same overall hospitalisation rates (rate ratio 1.00, 95%CI 0.93, 1.07). This finding suggests no immediate health effects are associated with the move from waiting list to tenant. However, this finding will be investigated more fully in the future using longitudinal analysis. These populations had very similar rates of hospitalisation for major disease categories and specific diseases. The only differences were that hospitalisations for *nervous system conditions* were significantly more common among *housing applicants*. *Acute bronchiolitis* had markedly higher rates among *housing applicants*. Hospitalisations were significantly lower for *cutaneous abscess, furuncle and carbuncle* among the *housing applicants*.

- Extending this analysis, it is also useful to look at hospitalisation rates according to duration of tenancy. This analysis shows that hospitalisation rates are highest among *housing tenants* during their first year as tenants (277 per 1,000 per year). Hospitalisation rates decline over the subsequent 1-3 years as tenants, and then reach a plateau for those who are tenants for 4 or more years (about 182 per 1,000 per years). This hospitalisation rate remains significantly higher than that seen for the *other NZ* population (about 127 per 1,000 per year). The pattern seen for major disease categories is broadly similar, with a decline from highest rates as *housing tenants* during the first year of the tenancy to lower rates with longer periods spent as HNZC tenants. The only exceptions are *neoplasms* and *congenital conditions* where rates remain relatively constant with duration of tenancy. The pattern seen for selected diseases is more mixed. Some diseases have a very pronounced decline in hospitalisation rates with duration of tenancy. This is particularly the case with *mental health conditions, intentional self-harm, assault, and poisonings and toxic effects* (some of which will be self-inflicted). Several of the infectious diseases also show a decline in hospitalisation rates with duration of tenancy. This decline is most marked for the *intestinal infectious diseases, acute bronchiolitis, and chronic obstructive pulmonary disease*. It is also evident for *asthma*.

Hospitalisation rates in relation to HNZC prioritisation: This analysis also reviewed the health outcomes associated with the HNZC prioritisation system, which distinguished higher priority *housing applicants* (A+B) from lower priority *housing applicants* (C+D). This analysis shows that the population prioritised for social housing has a 44% higher hospitalisation rate (266 per 1000 per year) compared with those assigned a lower priority (185 per 1000 per year). However, even the lower priority applicants have a markedly higher hospitalisation rate than the *other NZ* population (about 127 per 1,000 per year).

Hospitalisation rates in relation to household crowding level: This report includes a preliminary analysis of hospitalisation rates in relation to household crowding level of *housing applicants* and *housing tenants*. To simplify the analysis, each cohort participant was assigned the crowding level recorded in their most recent NA or IRR. Because levels of household crowding are already known to be highly associated with ethnicity, this analysis used age-ethnicity standardised rates. This analysis showed the following:

- For *housing applicants*, hospitalisation rates were similar for those classified as crowded as for those who were uncrowded.
- For *housing tenants*, hospitalisation rates were significantly higher for those classified as crowded, and considerably elevated for those with a 2 or more bedroom deficit (RR 1.19, 95%CI 1.14, 1.26).
- For combined *housing applicants* and *housing tenants*, hospitalisation rates were significantly elevated for those classified as crowded for several major disease categories, particularly *neoplasms, musculoskeletal and connective tissue diseases* and *skin and*

subcutaneous diseases. Conversely, hospitalisation rates for crowded households were significantly less than for uncrowded households for *mental and behavioural disorders*.

- For specific diseases, hospitalisation rates were significantly elevated in those households classified as crowded for some infectious diseases, including *bacterial infection of unspecified site, shingles (zoster), acute bronchiolitis* and most forms of skin infection (*cutaneous abscess, furuncle and carbuncle, other local infection of skin and subcutaneous tissue, and osteomyelitis*). Of note were the significantly higher rates for *acute myocardial infarction and heart failure*. *Injuries to wrist and hand* and *injuries to hip and thigh* were all significantly more common causes of hospitalisation in crowded households. External causes that were also significantly more common were *falls* and *exposure to inanimate mechanical forces*. Interestingly, hospitalisations for *mental disorders due to psychoactive substance use* and *manic episode or bipolar disorder* were significantly less common in crowded households, whereas the opposite pattern was seen for admissions diagnoses as *adult personality disorders*.

Hospitalisation rates for active smoking adults and children in smoking households: This report includes a preliminary analysis of hospitalisation rates in relation to active and passive smoking.

- Smoking data was reported by 69.1% of tenants >19 years. This group had significantly higher hospitalisation rates than non-smokers. Age-standardised hospitalisation rates were significantly elevated for *neoplasms, respiratory diseases, skin and subcutaneous diseases, mental and behavioural disorders* and *external causes*. Using age-ethnicity standardised rates, the association with smoking was less marked, and only persisted for *neoplasms, mental and behavioural disorders* and *injuries and poisonings*. Conversely, age standardised and age-ethnicity standardised hospitalisation rates for smokers were significantly less than for non-smokers for *infectious and parasitic diseases, diseases of the eye and adnexa, and diseases of the circulatory system*. For specific diseases, age-standardised and age-ethnicity standardised hospitalisations rates were significantly elevated for *acute tonsillitis, chronic obstructive pulmonary disease, cutaneous abscess, furuncle and carbuncle*, most groups of *mental and behavioural disorders, poisonings and toxic effects, fracture to wrist and hand, intentional self harm* and *assault*.
- The smoking status of households was reported for 42.1% of tenant children <15 years. Overall age-standardised and age-ethnicity standardised hospitalisation rates were not significantly elevated for children in smoking compared with non-smoking households. Age-standardised and age-ethnicity standardised hospitalisation rates were significantly elevated for children in smoking households compared with non-smoking households for *diseases of the blood and immune system* and *musculoskeletal and connective disorders*. For specific diseases, hospitalisations rates were significantly elevated for *cellulitis* and some specific injuries.

Discussion

The 29 months operation of the *Housing Crowding and Health Study* has demonstrated that the study is technically feasible and likely to be able to investigate all of its planned objectives. In particular:

- HNZA administrative data can be successfully transferred via NZHIS in a form that enables detailed analysis of the characteristics of individuals and households.
- Most (91.7%) applicants and tenants can be matched to their NHI number, which is the key to linking to hospitalisation records.

- New and modified questions on the NA and IRR forms are being successfully completed in the majority of cases.
- Applicants are exposed to significantly higher levels of household crowding than tenants, who are in turn living in more crowded conditions than the New Zealand population generally. Crowding levels are particularly high for *housing applicants* sharing houses with non-applicant households.
- The majority (61.6%) of applicants who become tenants decrease their level of household crowding in the process, and this decrease is marked.

This analysis also provides useful information on the health status of *housing applicants* and *housing tenants*:

- *Housing applicants* and *housing tenants* have relatively high rates of recorded contacts with the hospital system overall and for virtually every major disease grouping compared with other New Zealanders. These findings have implications for the effective delivery of health services to this population.
- This population also has high rates of hospitalisation for many groups of diseases that are at least partly preventable (e.g. most forms of infectious disease). This observation suggests that there could be health gain for this population, and possibly also efficiency gains for the health system, by use of a range of prevention measures.
- Some of the diseases with particularly high rates in this population have well defined environmental causes (e.g. asthma, injuries), which suggests the potential for specific prevention programmes.
- The initial analysis of the role of household crowding supports continuing efforts by HNZZ to reduce levels of household crowding in its properties.

These findings need to be interpreted with considerable caution for a number of reasons:

- Limitations with the numerator – Hospitalisations will only capture a proportion of all diseases cases. For severe diseases, such as meningococcal disease, this proportion will be high, but for less severe diseases, such as mumps, this proportion will be low and possibly biased.
- Limitations with the denominator – Accurately assigning participants (and their person-time) to the study is prone to a number of sources of error. Some of these errors reflect the limitations of using administrative data which is collected for applicant and tenant management purposes.
- Confounding – The analysis of hospitalisation data uses age-standardised rates to manage confounding by age. However, there are other confounders that have not yet been considered in the analysis (e.g. tobacco smoke exposure). There are also other unmeasured confounders that cannot be included in the analysis (e.g. there are probably unmeasured differences between tenants living in HNZZ houses for <1 year compared with those who stay longer).
- Study size – Some of the diseases reported here are still relatively uncommon so findings need to be interpreted with caution. This limitation will diminish with time as the cohort size increases.
- Causal inference – This analysis treats the cohort as three cross-sections (*housing applicants*, *housing tenants*, and *other NZ*). The finding that some diseases have higher rates in one or other of these populations does not necessarily imply a causal association. For some conditions ‘reverse’ causality is operating in that those with some chronic diseases seek and are prioritised to receive social housing (e.g. multiple sclerosis). Future analyses will exploit the longitudinal nature of this cohort study to try to answer questions

about whether a change in housing status is associated with a change in health status. Such analyses have much greater potential to answer such causal questions and will be the key analyses of this study.

The next stage of the analysis will investigate the role of household crowding using multivariable methods and also the contribution of environmental tobacco smoke. It will also use longitudinal analysis to assess the effects of a change in household crowding level over time.

Table 1.1: Summary of characteristics of *housing applicant* and *tenant* households at 30th June 2005, compared to New Zealand population (2001 census)

Characteristic	<i>Housing applicants</i> ¹	<i>Housing tenants</i> ²	NZ Population ³
<i>Population</i>			
Number of households	9 976	61 118	1 344 000
Number of people	26 484	197 794	3 630 000
Average duration in current situation	73 weeks		
Average duration on waiting list for <i>current applicants</i>	50 weeks		
Average duration in tenancy		387 weeks	-
<i>Demographic and SE characteristics</i>			
<i>Age and sex</i>			
Average age	25.1	27.9	34.9
Female %	57.4	54.8	51.2
<i>Ethnicity</i>			
European %	25.1	23.8	85.5
Maori %	33.5	35.3	15.0
Pacific %	26.7	35.1	5.2
Asian %	8.9	3.1	6.2
Other %	10.7	4.4	0.8
Not Stated %	2.1	7.2	--
One parent with children %	42.7	35.5	12.3
<i>Household income</i>			
Average weekly income ⁴	268.33	279.70	873.67
Receipt of income from Gov. benefit %	78.7	91.1	24.5
<i>Smoking status</i> ⁵			
Smoker in household %	--	44.5	32.9
Proportion of adults who smoke %	--	31.9	24.0
<i>Crowding levels</i>			
Sharing with another family %	37.0		2.2
Average number of people in household	4.0	3.2	2.7
Average number of bedrooms	2.4	2.5	3.1
Average people per bedroom	1.7	1.2	0.9
Short of 1 or more bedrooms %	46.1	23.6	5.1
Short of 2 or more bedrooms %	25.4	7.3	1.2

Notes:

¹ *Housing applicants* are those who have been “confirmed” and placed on the waiting list for a house

² *Housing tenants* are those who complete an IRR. This excludes 1750 HNZC tenant households not claiming this benefit (i.e. who are paying market rent).

³ Based on 2001 NZ Census. Totals include HNZC applicants and tenants. Sources: Statistics New Zealand. *What is the extent of crowding in New Zealand?* Wellington: Statistics New Zealand, 2003.

⁴ Income has been adjusted using the Jensen Equivalised Annual Household Income formula

⁵ Smoking status for the NZ population is based on 1996 census

2 Introduction

Origin of the study

This study was set up following the meningococcal disease case-control study which showed that household crowding was the strongest risk factor for meningococcal disease in Auckland children.[1] Other New Zealand work has also shown that rates of some infectious diseases are higher for people living in suburbs with a higher proportion of crowded homes.[2] Despite this evidence, some New Zealand commentators consider that “The debate about the relationship between crowding and health is long standing and inconclusive”.[3] In addition, there are no published studies on the impact of reductions in household crowding on disease risk.[4] This present study aims to fill these evidence gaps.

Aims of the study

1. To assess the relationship between levels of household crowding and rates of hospitalisation for infectious diseases in a cohort of New Zealand households.
2. To assess the impact of a reduction in household crowding on the risk of infectious disease in this cohort of households.
3. To assess the impact of household crowding and environmental tobacco smoke on respiratory diseases and other health outcomes.

Aims of this report

The first aim of this report is to describe progress with constructing the cohort and measuring health outcomes using linked hospitalisation data. This process depends on linking applicants and tenants to their hospital records and calculating their person time in the cohort and rates of hospitalisation generally and for specific diseases.

Secondly, this report aims to provide a more comprehensive description of the characteristics of the cohort members and additional information on their health status. The work summarised in this report aims to update the interim report produced in 2004.¹ That report showed that it was technically feasible to establish a well-defined study population using administrative data collected by HNZC. That report presented the cross-sectional characteristics of this population, such as age, sex, ethnicity, income, crowding levels and smoking status. It also examines longitudinal aspects of this cohort and how households move in and out of applicant and tenant states over time. This present report updates the interim analysis by including an analysis of the first 26 months of matched hospitalisation data. A further aim of this report is to provide our major partner, Housing New Zealand Corporation, with an overview of some of the health issues affecting their client population.

¹ Turner R, Baker M, Milosevic J. Housing, Crowding and Health Study: Characteristics of Applicants and Tenants for February 2003 to June 2005. Interim Report. Housing and Health Research Programme, Nov 2004.

Model of housing influences on health outcomes

This study is seeking to investigate the health effects of key ‘contextual’ housing factors in terms of their contribution to health outcomes. In doing this, the analysis needs to consider ‘compositional’ aspects of the population which also affect health outcomes. These variables, or ‘covariates’ are summarised in the table below (Table 2.1) using the levels that *He Kainga Oranga* has adopted for classifying factors in the built environment that contribute to health.

The initial analysis will consider these variables in a cross-sectional manner. It will then proceed to calculate rates for sub-populations of the cohort population who have been stratified according to these variables (notably for type and duration of tenure and crowding level). The analysis will then develop a multivariate model and apply longitudinal data analysis to assess the contribution of these variables. This model will need to take account of the fact that some of these variables change over time. Some of these contextual housing variables are amenable to change (such as household crowding and tenure) so it is particularly important to assess their independent contribution to health outcomes.

Table 2.1: Classification of factors affecting the health of HNZN applicants and tenants and their measurement as part of the *Housing, Crowding and Health Study*

Level	Factors	Variable measured (Covariate)
Region, Neighbourhood and Community	Quality of local environment & access to services	HNZN region will be included in model DHB and/or neighbourhood could potentially be included
House (physical)	Quality of housing, including safety, warmth and dryness	No measure available though composite value could potentially be generated from RENTEL data in future
Household	Household crowding level	Range of measures will be calculated including household occupancy, bedroom deficit
	Type of tenure and duration of tenancy	<i>Housing applicant or tenant</i> Duration of tenancy (<1 year, 1-3 years, etc)
	Household income	Equivalised household income (but uniformly low compared with NZ population)
	Passive smoke exposure	Assigned based on voluntary smoking question
Individual	Age	Date of birth allows age to be calculated at any point in time for longitudinal analysis
	Ethnicity	Recorded
	Sex	Recorded
	Socioeconomic status	Not specifically measured for individuals (but assumed to be low based on the HNZN social allocation system) NZDep of neighbourhood could be used as a proxy
	Established chronic disease and disability	Not specifically measured for individual (but likely to have high prevalence based on the HNZN social allocation system)
	Active smoking	Voluntary reporting by <i>housing tenants</i>

3 Methods

3.1 Data Collection

This study is based on collaboration with Housing New Zealand Corporation (HNZC), which is the largest provider of social housing in New Zealand. HNZC manages approximately 66,000 tenancies and each year assesses and places about 16,000 households on a waiting list for social housing. Its operational structure is organised into 11 regions and 46 neighbourhood units. Table 3.1 lists the HNZC regions and the number of area offices and properties in each.

Table 3.1: HNZC regional office structure, 2005

Region	Neighbourhood Units (No.)	Properties (No.)
Bay of Plenty	3	2,687
Central Auckland	5	9,365
Chch/Nelson/Marlborough	5	6,702
East Cape/Hawkes Bay	3	4,323
Manawatu/Taranaki/Wairarapa	4	4,419
Northland	1	2,063
South Auckland	6	13,360
Southern	4	3,248
Waikato/Coromandel/King Country	4	4,115
Wellington/Hutt Valley	6	8,718
West & North Auckland	5	6,001
Community Group Housing	N/A	1,521
Total	46	66,522

In the process of allocating and managing these properties, HNZC collects information about these applicants and tenants. Figure 3.1 shows diagrammatically the movement of applicants and tenants. The first main point where information is collected is the Needs Assessment (NA) interview when applicants apply for a house and their housing need is assessed according to current housing policy. The second main point is when the tenant applies for an Income Related Rent (IRR) usually a year after the tenancy begins unless a change of circumstance occurs. An initial IRR form is effectively filled out by HNZC when an applicant is first allocated to a house. After that, the IRR is filled out as a self completed form each year. In addition, applicants on the waiting list and tenants are required to provide information to HNZC if their circumstances change.

The Needs Assessment information is collected via a semi-structured interview so fields are likely to be completed if the Housing Support Manager asks all the questions or prompts for an answer for each question.

The IRR is self-reported so missing values occur more regularly on the fields that are not mandatory for the calculation of the IRR. In addition, the field on smoking behaviour is specifically identified as voluntary.

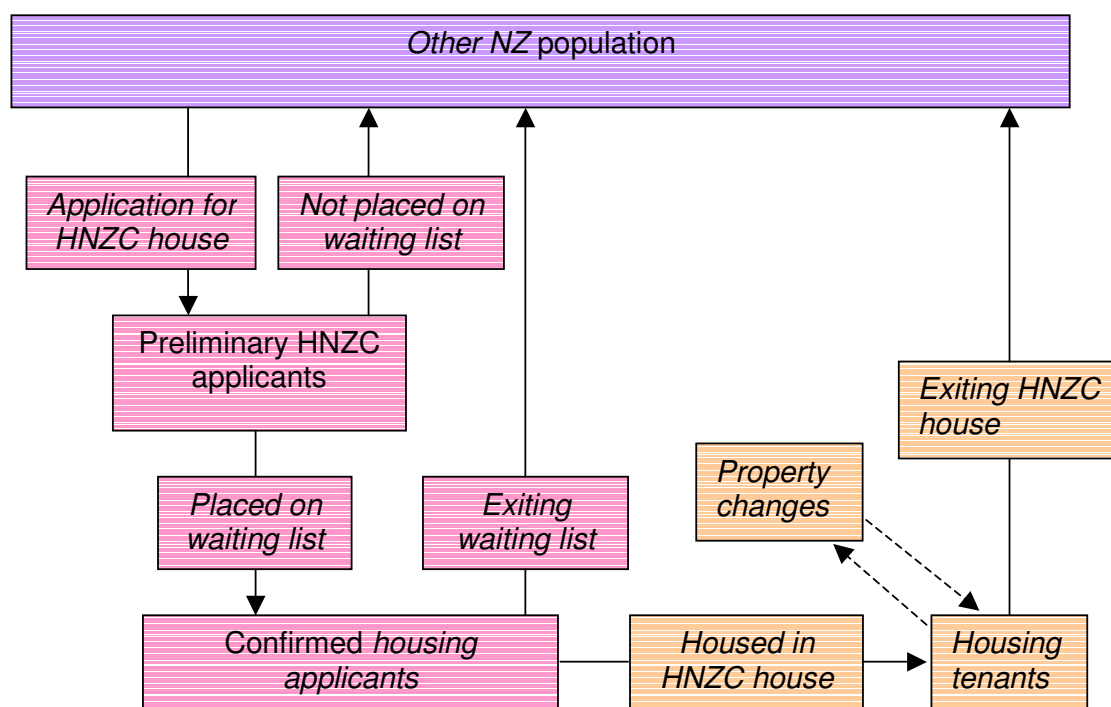
Information is obtained from households about their circumstances at several key points:

- Applicant Needs Assessment interview
- Applicant change of circumstances
- Tenant annual Income Related Rent application
- Tenant change of circumstances

There are also 'observations' that record applicant and tenant moves

- Applicant exits the waiting list
- Applicant becomes a tenant
- Tenant exits the HNZN tenancy
- Tenant property change

Figure 3.1: Flow of people between the *other NZ* population and *housing applicant* and *housing tenant* populations



Information on the NA and IRR forms is entered into the HNZN database (RENTEL). The HNZN staff member enters the NA information after the interview or at the end of the day. Housing managers enter the IRR data when the IRR forms are received from tenants. Particular questions that are important for HNZN, whether for the assessment of need or the

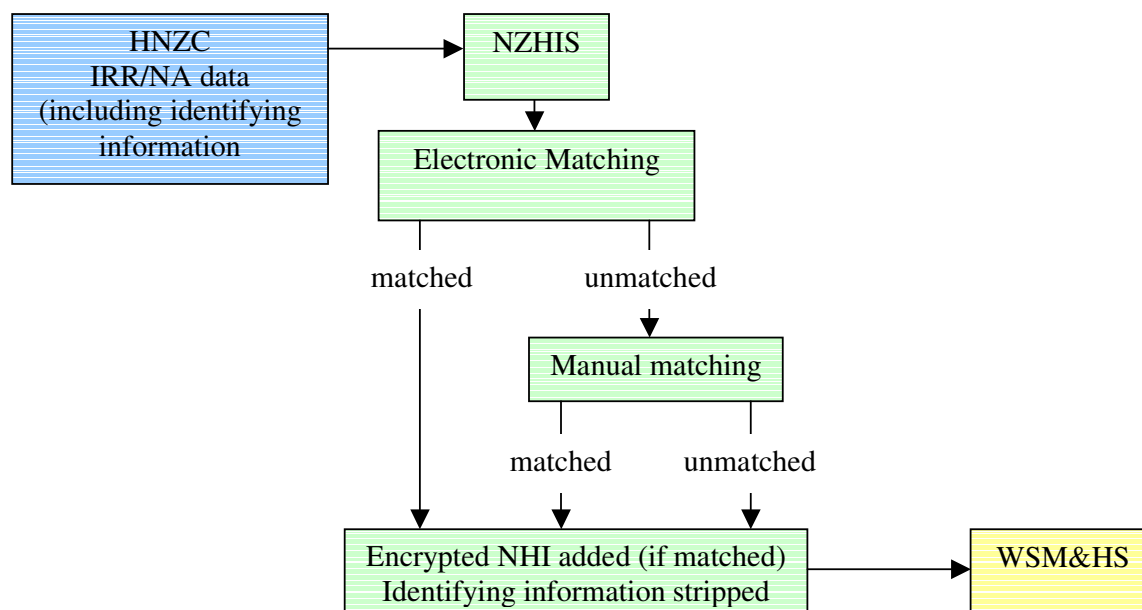
calculation of income related rent, are mandatory in RENTEL and should always be completed. RENTEL will not allow the entry process to continue until these have been completed.

The HNZN RENTEL database also includes detailed information about their housing stock, notably the number of bedrooms in each house. These data are linked to tenants' records and in turn to the IRR databases.

3.2 Data transfer and linking to hospitalisation records

HNZN applicant and tenant information collected each month is transferred to the New Zealand Health Information Service (NZHIS) for matching to the National Health Index (NHI). The data arrives at NZHIS in monthly batches of IRR and NA records for the preceding month and is in a series of linked tables that are mainly tenancy based. An encrypted version of the NHI is subsequently used by the Wellington School of Medicine and Health Sciences (WSM&HS) researchers to identify any hospitalisations recorded for members of the cohort that occurred during the study period.

Figure 3.2 Steps involved in the transfer of housing tenant and applicant data from HNZN to WSM, including its linking to hospitalisation data by NZHIS



This process of identifying the NHI number for applicants and tenants uses electronic followed by manual matching. Electronic matching is based on the following fields: family name, first name, date of birth, and sex. Manual matching is based on looking for close matches for each unmatched record.

The confidentiality of study participants is fully protected. NZHIS strips names from the file after the NHI matching process. The NHI is replaced by an 'encrypted NHI' making the data completely anonymous. This files of NZHIS data with attached encrypted NHIs is then transferred to WSM&HS for analysis.

Researchers at WSM&HS use this encrypted NHI to track members of the cohort and link them to hospitalisations that occurred during the study period. NZHIS has separately supplied the researchers with a copy of National Minimum Dataset (NMDs). This dataset includes all hospital admissions reported by New Zealand's district health boards (DHB) with all entries including their encrypted NHI. The researchers use this file to identify hospitalisations in the cohort population that have occurred over the study period. They can also identify hospitalisations for those New Zealanders who are not in the cohort population, which allows the calculation of comparison rates.

3.3 Data analysis

The data for this analysis were collected over the period February 2003 to June 2005. The data analysis was conducted in SAS (SAS(R) Proprietary Release, Version 9.1).

3.3.1 Construction of applicant and tenant cross-section

The main description of the cohort population is based on a cross-section of data. This set of data is accumulated over time as people fill out an IRR or NA form and change their circumstances in other ways. Thus one would expect that after a year most of the tenants would be in the dataset (that is, those who fill out IRRs, which require annual renewal). The cross-section is chosen at the end of the data series so as to accumulate as many people as possible. The cross-section contains the last known record for the household and any vacated tenancies are removed. This way it is a snap shot of the population at the chosen date (in this case the 30 June 2005).

The data sets contain an inherent uncertainty in tracking people and tenancies. If the reference numbers (both for individuals and households) change for various reasons it is impossible to track the individuals/tenancies over time, without identifying information. This problem is largely resolved by linking individuals to their unique NHI number.

3.3.2 Key variables

Ethnicity

The analyses presented in this report use three sources of ethnicity data:

- HNzc tenancy data – HNzc now uses the standard Census question for recording ethnicity. This information is obtained by interview for *housing applicants* (via the Need Assessment form) and by self-completed questionnaire for tenants (via the IRR form).

- NZHIS hospital discharge data, based on details recorded on the NHI. This information is obtained from contacts with the health service (usually hospitals) during which NHI information is recorded and updated.
- Census data – Ethnicity information obtained from the 2001 Census.

To be comparable to the Census data the "New Zealander" field is coded as New Zealand European. Multiple ethnicities are allowed so two classifications have been used for ethnicity. The first is "Exclusive" coding which is also called prioritised exclusive coding. In this classification scheme only one ethnicity is allowed and is prioritised firstly for Maori, then for Pacific, Asian, New Zealand European, and Other. The inclusive coding scheme allows for multiple ethnicities so is more representative of the data. However this means that the ethnicities add to more than 100% as people can have multiple ethnicities.

Equivalised household income

The sum of income field measures total weekly household income that is relevant to the calculation of the income- related rent. Jensen (1988) equivalised income weights are used to adjust for household size and composition (adults and children). The household income is adjusted by dividing the weekly income by the appropriate weight from Table 3.2 for the number of adults and children in a household. If there are more than 4 adults or 6 children then the value of 2.44 is used. If there are no adults (people aged 18 or more) but there are independent youths on a benefit in the household then the number of adults is set to one and the number of children decreased by one.

Table 3.2: The revised Jensen Index

Number Of adults	Number of children						
	0	1	2	3	4	5	6
1	0.65	0.91	1.14	1.34	1.52	1.69	1.85
2	1.00	1.21	1.41	1.58	1.75	1.91	2.06
3	1.29	1.47	1.65	1.81	1.96	2.11	2.25
4	1.54	1.71	1.87	2.02	2.16	2.30	2.44

Based on Jensen 1988 [5]

3.3.3 Crowding Measures

Three crowding measures are used in this report namely household size, people per bedroom and the Canadian National Occupancy Standard (CNOS). These measures use two key variables, number of people in the household and the number of bedrooms in the house.

The number of bedrooms in the tenant households is recorded in the property database. There are a number of different variables that measure the bedrooms in the applicant household. HNZN in the past has recorded the number of bedrooms that the applicant household has access to and has used this to measure the crowding levels to assess the need for housing. As a result of the HC&HS, some additional fields have been added to the NA form to record the total number of bedrooms in the house and the number of other rooms (such as the lounge) that are being used as bedrooms. To calculate the number of bedrooms in the applicant house the

above variables have been incorporated in the following manner. If the "total bedrooms" is zero, then the "current bedrooms" is used instead, if the current number of bedrooms is also zero then the "other rooms used" is used instead.

Crowding Levels Measured by People Per Bedroom

One measure of crowding is to calculate the number of people per bedroom. A value more than 2 is considered crowded as it is generally accepted that there should not be more than 2 people per bedroom. Some households will be crowded at levels between 1 and 2 people per bedroom depending on the mix of occupants.

Two different methods were used to calculate the crowding levels for the applicants as follows:

1. People per bedroom =
$$\frac{\text{Total non-applicants} + \text{Total applicants}}{\text{Total Bedrooms}}$$
2. People per available bedroom =
$$\frac{\text{Total applicants}}{\text{Bedrooms applicants have Access to}}$$

This second method is the one that HNZN currently uses to measure crowding levels for applicants. As the formula shows, this method attempts to eliminate the effect of non-applicants (where an applicant household is sharing a house with a non-applicant household) by removing them from both the numerator and denominator.

Canadian National Occupancy Standard

The Canadian National Occupancy Standard (CNOS)[6] measures the bedroom deficit by calculating the number of bedrooms needed for the household and comparing this to the number of bedrooms available. This gives the degree of bedroom deficit for crowded households. This method has been widely used in New Zealand to assess levels of household crowding [7]. The standard sets the bedroom requirements of a household using the following composition criteria:

1. There should be no more than two people per bedroom.
2. Parents or couples share a bedroom.
3. Children under five years, either of the same or opposite sex, may reasonably share a bedroom.
4. Children under 18 years of the same sex may reasonably share a bedroom.
5. A child aged five to 17 years should not share a bedroom with one under five of the opposite sex.
6. Adult 18 years and over and any unpaired children require a separate bedroom.

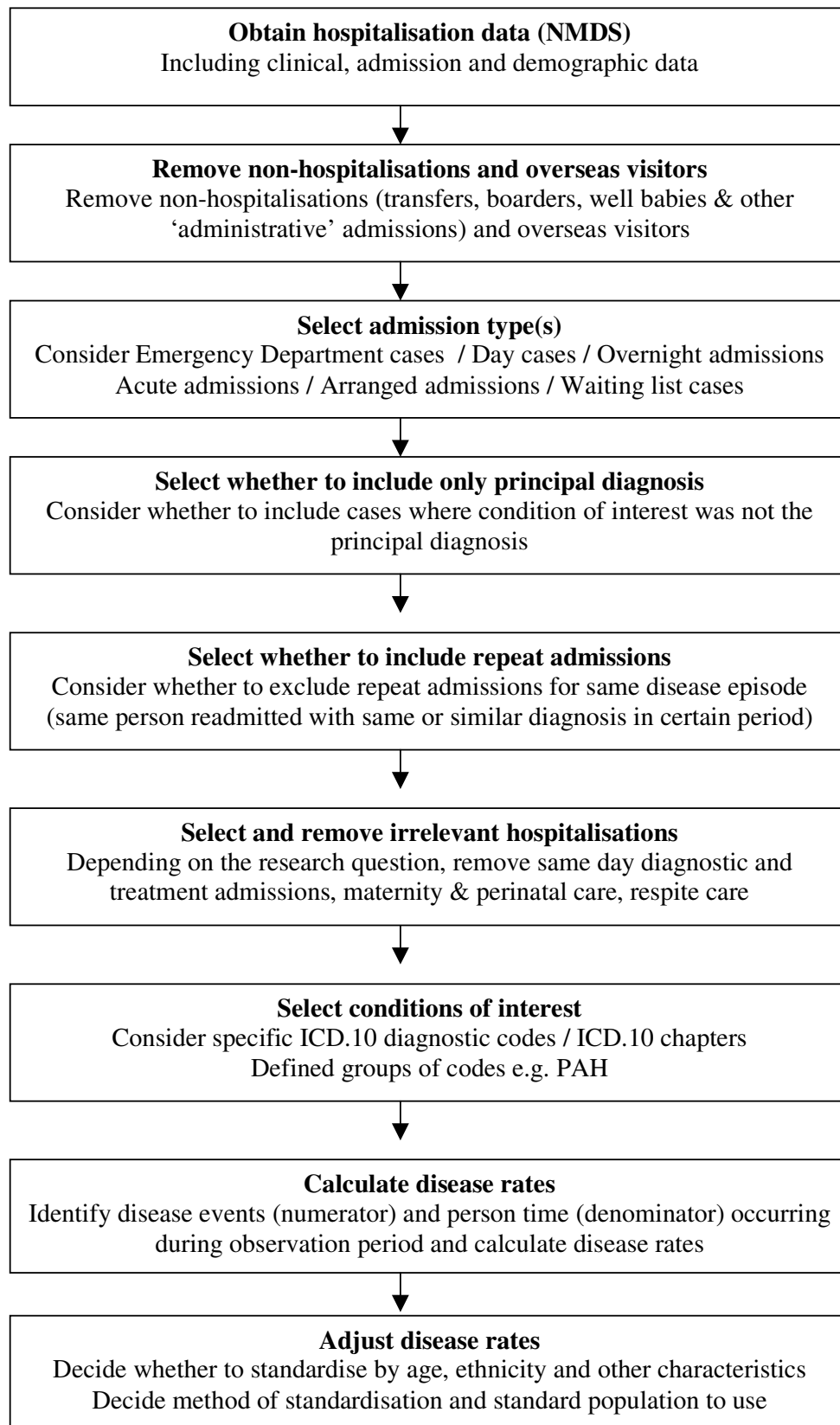
3.3.4 Analysis of hospitalisation data

This report includes an analysis of hospitalisation data obtained for the 26-month period May 2003 to June 2005.

The matching process to identify hospitalisations in the cohort population has been described above (section 3.2). The remainder of this section describes the steps involved in analysing this set of HNZN applicant and tenant data with their linked hospitalisation records.

This project uses hospitalisation data as a way of measuring health outcomes. The starting point is the NZHIS National Minimum Dataset (NMD). This dataset includes all hospital admissions reported by New Zealand's district health boards (DHB). The analysis and interpretation of hospitalisations data has several steps, each of which requires decisions that affect the resulting analysis. These steps are summarised in the following flow chart (Figure 3.3).

Figure 3.3 Steps involved in analysis of hospital discharge data
(NB. The order of some steps will not affect the end result)



Obtain hospitalisation data

The source of hospitalisation data is the National Minimum Dataset (NMDS) which is "... a national collection of public and private hospital discharge information, including clinical information, for inpatients and day patients." [8] The NMDS is managed by NZHIS which provided a data dictionary [8] to describe the data held in this collection. Several of these fields are useful for classifying and filtering events for analysis.

Clinical code

- The clinical description of a condition, injury or underlying cause of death or procedure performed. These codes are based on those specified in the international classification of diseases and related health problems, 10th Revision Australian Modification (ICD-10-AM). These codes are organised into a series of tables, including the following:

- Clinical code type A Principal diagnosis
- Clinical code type B other relevant diagnosis
- Clinical code type E external cause of injury
- Clinical code type O operation/procedure

Injury events get A, B and E codes. They also have additional place of occurrence and activity codes depending on the type of E code that has been assigned.

DRG code

- Codes based on a combination of diagnosis, age group, and procedure. There are currently 956 discrete codes. These codes are assigned to each health event by a DRG program and are meant to reflect clinically meaningful groups with similar resource consumption.

Event type

- Birth event (infants born in reporting hospitals)
- Intended day case
- Psychiatric inpatient event (include day patients)
- Non-psychiatric inpatient event (include day patients)

MDC codes

- Major diagnostic category assigned by DRG group programme (23 codes based on chapters used in ICD.9)

The NMDS also contains other codes that describe the sources of admission and health specialty providing the care. This information helps in understanding the purpose of the admission and potentially allows filtering of events that are not of interest.

Admission source code

- Routine
- Transferred

Admission type code

- Acute admission (AC)- an unplanned admission on the day of presentation at the healthcare facility (includes retired code ZC for acute ACC covered).

- Arranged admission (AA)- planned admission <7days after decision was made that the admission was necessary (includes retired code of ZC for arranged admission, ACC covered)
- Waiting list (WN)- planned admission 7+ days after decision was made that the admission was necessary (includes retired code of ZP for waiting list ACC covered), Elective admission to a private hospital
- Other admission includes elective admission of privately funded patient (AP) and psychiatric patient returning from leave>10 days (RL) (and retired code of ZP for Waiting list, ACC covered)

Health specialty code

- Codes that classify specialty based on service and qualifications of health professional providing the service.

Remove non-hospitalisations and overseas visitors

Some of the events in the NMDS have been entered for administrative reasons and so need to be removed e.g. transfers, boarders. Some represent non-hospitalisations, almost by definition e.g. cancelled operations, error DRGs. There are also some inconsistencies between DHB in what they record as a hospitalisation e.g. well babies are recorded by some DHB and not others. Overseas visitors are also generally removed, as they are not included in the New Zealand denominator population used for calculating disease rates. These events are removed using a set of filters, many of which have been adapted from those used by the Ministry of Health in analysing hospital throughput data.[9] The following filters are applied:

- Transfers – Patients may be transferred between hospitals as part of treating the same disease episode. This analysis removes events where the admission source code indicates a transfer.
- Boarders – People may be admitted for reasons other than treatment, e.g. parents accompanying children. Boarders are identified by having a primary diagnostic code in the range Z763-Z764.
- Cancelled operations – Non-acute admissions with ICD code indicating procedure not carried out (Z53)
- Well babies – Some DHB routinely admit newborn well babies and some do not. These events are excluded where the primary diagnostic code is Z38.
- Error DRGs – Events coded to an error DRG are excluded (960Z, 961Z, 962Z, 963Z).
- Overseas patients – Those patients with “N” recorded in the “NZ_RES” field of the NMDS.

Select admission type(s)

The population of events recorded as hospital discharges includes a diverse range of health events some of which provide poor indicators of disease episodes in the population e.g. elective surgery cases admitted from the waiting list. DHBs also vary in their recording practices. At the most fundamental level, even the definition of what constitutes a hospitalisation varies. Hospital “Admission” is defined as “The documentation process ... by which a person becomes resident in a healthcare facility. For the purpose of the national collections, healthcare users who attend for more than three hours should be admitted.” [10] However, it is widely known that this rule is applied inconsistently.

To produce a more consistent and meaningful set of data, it is usually necessary to select admission types that are appropriate for the research questions being investigated. This can be done in two main ways:

Firstly, by using the recorded admission 'type'.

- Acute admission – defined as unplanned admission on the day of presentation at the healthcare facility.
- Arranged admission – defined as planned admission <7days after decision was made that the admission was necessary.
- Waiting list admissions – defined as planned admission 7+ days after decision was made that the admission was necessary.

Secondly, by classifying events by their duration and/or severity.

- Emergency Department cases – These are Emergency Department (ED) / Accident and Emergency (A&E) attendees recorded as admissions.
- Over-night admissions – These are admissions that result in a hospital stay of one or more days.

As described in the results section, this present research is largely focussed on acute health events rather than elective procedures so will focus on acute and arranged admissions.

Select whether to include only principal diagnosis

This project is concerned with identifying specific disease events in the cohort population we are following. These diseases will often be coded as the principal (first listed) diagnosis for an admission, but may also be listed as an additional diagnosis.

- Principal diagnosis is defined as: “The diagnosis established after study to be chiefly responsible for causing the patient's episode of care in hospital (or attendance at the healthcare facility). The phrase "after study" in the definition means evaluation of findings to establish the condition that was chiefly responsible for the episode of care. Findings evaluated may include information gained from the history of illness, any mental status evaluation, specialist consultations, physical examination, diagnostic tests or procedures, any surgical procedures, and any pathological or radiological examination. The condition established after study may or may not confirm the admitting diagnosis.”[10] This is the ICD.10 code that appears in the first diagnostic field provided with each discharge record.
- Additional diagnosis is defined as: “A condition or complaint either co-existing with the principal diagnosis or arising during the episode of care or attendance at a healthcare facility. For coding purposes, additional diagnoses should be interpreted as conditions that affect patient management in terms of requiring any of the following: therapeutic treatment; diagnostic procedures; increased nursing care and/or monitoring.”[10] This is the ICD.10 code that appears in any of the remaining 19 diagnostic fields provided with each discharge record.

The focus of this research project is mainly on conditions that will be recorded as the “principal diagnosis”. However, some of these conditions may sometimes be recorded as additional diagnoses so there is potential to repeat these analyses based on the appearance of the ICD.10 codes of interest as either the principal diagnosis or in any of the diagnostic fields.

Select whether to allow repeat admissions

People may be admitted multiple times for the same condition, either as part of the same episode, or because of recurrences of the same condition. This project is generally concerned with identifying and counting each distinct disease episode. The NMDS data therefore need to be filtered to distinguish new health events from repeated admissions for the same illness episode. This step uses a decision rule that excludes subsequent admissions for the same person if they were discharged with the same diagnostic code within a defined period of the first admission. This analysis has been repeated to assess different combinations of filters.

- Based on ICD.10 clinical code at 3 character level – Appearing either as the same principal diagnosis (narrow exclusion) or as same principal or additional diagnosis (wide exclusion)
- Based on different readmission periods – A single disease episode may last days to months so any time rule for identifying new disease episodes must be a balance between sensitivity and specificity. This analysis will explore a range of time intervals from 1 to 12 months.

Select and remove irrelevant hospitalisations

A further filtering process is to select and remove types of hospital care that have little relationship to the research question being investigated. Commonly used groups are:

- ‘Same day’ diagnostic procedures – Same day colonoscopies, cystoscopies, ERCPs, colonoscopies, gastroscopies, bronchoscopies and overnight sleep apnoea testing.
- Same day treatment of chronic conditions – Renal dialysis, chemotherapy and radiotherapy, lithotripsy, blood transfusions
- Maternity care, which reflects demographic and reproductive, patterns in the population and healthcare policies – Those patients with a principal diagnosis in the ICD.10 chapter for “Pregnancy, childbirth and the puerperium” (O00-O99).
- Perinatal care (up to the end of the first week of life), which again reflects demographic and reproductive patterns and hospital admissions practices – Those patients with a principal diagnosis in the ICD.10 chapter for “certain conditions originating in the perinatal period” (P00-P96).
- Disability support service (DSS) admissions – Where there is an indication the person was admitted for respite care (based on having a Disability Support Services health specialty code, a Rehab DRG ('Z60A', 'Z60B', 'Z60C'), Respite care primary diagnosis code ('Z742', 'Z755'), Admission in DSS institutions and no operation or procedure performed).

Select conditions of interest

This project is using hospitalisation data as a way of measuring health outcomes, particularly those that are plausibly related to housing conditions. It is therefore necessary to specify the range of conditions that are of interest. This analysis considers hospitalisations for the following categories of diagnoses:

- Broad diagnostic groups – Classified according to ICD.10 chapters.
- Specific diseases – Classified according to specified ICD.10 codes at the 3-character level.
 - Specific diseases with a known link to crowding, including infectious diseases, respiratory infections and asthma, skin and bone infections, other diseases with infectious causes

- Other diseases where housing conditions may be important, including cardiovascular diseases and mental and behavioural disorders
- Injuries and poisonings and their associated external causes. These conditions can be selectively filtered to include only those with a place of occurrence coded as “home.”
- Specialised groups of diseases – These are collections of diseases with certain underlying common characteristics. Examples include Potentially Avoidable Hospitalisations (PAM). [11]. These are usually defined based on specified ICD.10 codes.

Calculate disease rates

Disease occurrence is generally measured by incidence rate which is usually expressed as cases per 100 000 population per year. Much of the analysis is concerned with comparing rates between populations with different housing circumstances (e.g. applicants vs. tenants, more crowded households vs. less crowded households). These populations are invariably of different size, so it is necessary to compare rates, rather than numbers of cases.

Calculation of hospitalisation rates in this study requires correctly identifying hospitalisations that occur while subjects are either *housing applicants* or tenants (the numerator), and correctly counting time that they spend as applicants or tenants (the denominator). Comparison rates for the NZ population who are not in the cohort can be calculated by deducting these figures from the total NZ population.

Subjects can only be contributing to the study (i.e. recorded as having a hospitalisation or adding person time to the study denominator) while they are known to be a *housing applicant* or tenant. It is necessary to carefully assess whether the person can be correctly assigned to being in the study as an applicant or tenant.

This analysis used the following general rules:

- Subjects start contributing to the applicant population from the date of their Needs Assessment application to HNZC, plus time before that that they indicated they were living in this situation i.e. with this number of people in this house (up to a maximum of 12 months). They stop contributing as applicants as soon as they are recorded as exiting ie become a tenant or are removed from applicant list.
- For tenants, their time in the cohort study starts from either (i) For new tenants, from the date they became a tenants or (ii) For existing tenants at the start of the study period, from June 2003, plus up to 12 months prior to that date (ie June 2002) or less if they became a tenant during that period.
- This analysis also identified a proportion of individuals (based on encrypted NHI number) with overlapping time spend as applicants and tenants. These situations have sets of rules for their treatment, which are summarised in the results section (9.1.7).

This analysis of hospitalisations created the following variables:

- *Applicant* hospitalisations = Hospitalisations occurring while an *applicant*
- *Tenant* hospitalisations = Hospitalisations occurring while a *tenant*
- *Other NZ* hospitalisations = Total NZ hospitalisations – *cohort* hospitalisations (*applicant* hospitalisations + *tenant* hospitalisations)

To calculate the rate at which hospitalisations occur, it was also necessary to calculate the amount of time people spent in these three groups (denominators):

- *Applicant* days = Days spent as an applicant
- *Tenant* days = Days spent as a tenant
- *Other NZ* days = Total NZ days (based on census) – *Cohort* days (*applicant* days + *tenant* days)

$$\text{Applicant hospitalisation rate} = \frac{\text{Applicant hospitalisations} \times 100\,000}{\text{Applicant days} / 365.3}$$

$$\text{Tenant hospitalisation rate} = \frac{\text{Tenant hospitalisations} \times 100\,000}{\text{Tenant days} / 365.3}$$

$$\text{Other NZ hospitalisation rate} = \frac{\text{Other NZ hospitalisations} \times 100\,000}{\text{Other NZ days} / 365.3}$$

These rates are expressed as hospitalisations per 100 000 people per year, hence the multiplier of 100 000 in the numerator and the divisor of 365.3 in the denominator to convert days to years.

Calculate adjusted rates

Where populations are very different, particularly if they have different age structures, we expect their disease rates to be very different. This is because age is such a strong predictor of health. It is therefore common practice to convert “crude rates” to “age-standardised rates”. This process effectively removes the confounding effects of age from the comparison. This process can be further extended to calculate age-ethnicity standardised rates. This standardisation can be justified on the basis that the ethnicity composition of the HNZZC population is quite different to the total New Zealand population and ethnicity is a strong independent predictor of health.

Most analyses used in this report converts crude rates into age-adjusted rates by direct standardisation. Standardisation is to the age structure of the total New Zealand population at the time of the 2001 census. This standardisation uses the following age bands: 0-4, 5-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70+.

For the age-ethnicity standardised rates, the age-ethnicity structure of the cohort population was used. This standardisation used age groups in 10-year bands up to 69 years, then 70+. Ethnicity was divided into 5 groups used prioritised ethnicity: Maori, Pacific, Asian and Other, European, Not Stated.

Confidence intervals for standardised rates are calculated using the method described by Rothman and Greenland.[12]

Other analyses

This project is concerned with whether housing circumstances are contributing to the risk of disease, independent of other characteristics, and will use additional methods to control for a range of other confounding effects.

The administrative data used in this report is based on RENTEL data collected and entered by HNZN staff. There are inevitably some errors in this process. Except for missing values and obvious data entry errors, the researchers cannot identify or assess the extent of such errors. To do this would require a separate validation study (or studies). The need for such a study will be assessed by conducting sensitivity analyses of final results.

4 Quality and completeness of data

4.1 Needs assessment interviews

The Needs Assessment interview collects information on various factors that are important for deciding the need for housing and the income related rent if re-housed. Several fields were added to the NA form to support operation of the cohort study, notably questions on the number of other people in the house, total number of bedrooms in the house and duration of living in this situation i.e. with this number of people in this current house.

4.1.1 Interviews by month

The total number of Needs Assessment interviews conducted in the 12-month period from July 2003 to June 2004 was 29970 and from July 2004 to June 2005 was 30344. There were, on average, around 2510 interviews conducted each month with a range from 1993 to 2938. Note that this includes change of circumstances where another full interview may not be necessary.

Table 4.1 presents the number of Needs Assessment interviews conducted each month by HNZN (where the status of the application has been confirmed). The percentage for that month out of the total for the year is shown in the third column.

It was expected that the information for *housing applicants* would be fairly complete as it was obtained from an interview. However, there were initially a large number of missing values for some variables. After discussion with HNZN front line staff and management it appeared that most of the missing values were in fact zeros (i.e. none or zero recorded on the Needs Assessment form) but were being recorded as missing values through a lack of understanding of the difference and through the computer system allowing missing values. Table 4.2 shows the response rates for the five variables that were added to the NA interview. The response rates have been analysed for seven time periods (shown in the first column). The groupings were chosen to represent points in time that should have some impact on the response rate. The first grouping is the first two months of data collection when the new Needs Assessment form was being introduced – consequently these months have the lowest response rate.

Table 4.1: Number of needs assessment interviews by month, February 2003 to June 2005

Month	Number of Interviews	Percent (of total for the 12 months)
February (2003)	2598	Not included*
March	2669	Not included
April	2467	8.3
May	2522	8.5
June	2235	7.5
July	2618	8.7
August	2410	8.0
September	2542	8.5
October	2562	8.5
November	2399	8.0
December	2257	7.5
January (2004)	2150	7.2
February	2524	8.4
March	2917	9.7
April	2536	8.5
May	2594	8.6
June	2461	8.2
Total (for 12 months)	29970	100.0
July	2468	8.1
August	2792	9.2
September	2924	9.6
October	2873	9.5
November	2938	9.7
December	2209	7.3
January (2005)	1993	6.6
February	2526	8.3
March	2544	8.4
April	2403	7.9
May	2424	8.0
June	2250	7.4
Total (for 12 months)	30344	100.0

*Note February and March 2003 are not included in the analysis as the study and new forms were being phased in over that period.

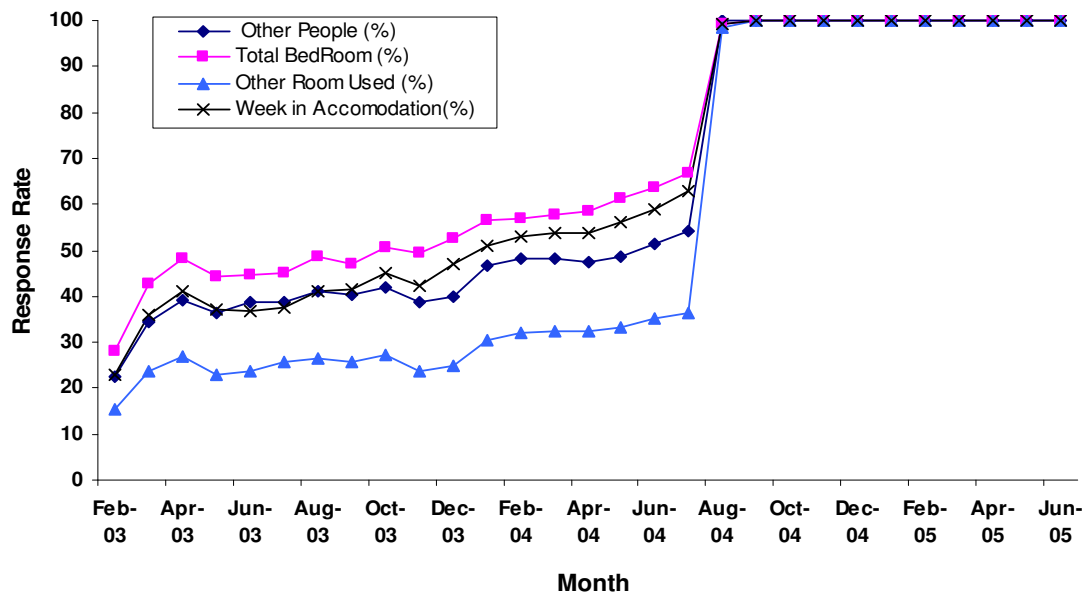
Table 4.2: Completeness of key crowding variables from the needs assessment interview, February 2003 to June 2005

Months	Response Rates (%)			
	Other People	Total Bedrooms	Other Rooms	Weeks in Accommodation
Feb-Mar 2003	31.9	39.5	21.8	33.2
Apr-Jul 2003	37.9	44.6	24.2	37.1
Aug-Dec 2003	40.5	49.5	25.7	43.4
Jan-Mar 2004	47.7	57.1	31.7	52.8
Apr-Jul 2004	50.4	62.4	34.3	57.9
Aug-Dec 2004	100.0	99.9	99.7	99.8
Jan-Jun 2005	100.0	100.0	100.0	100.0

HNZC took steps to improve the completeness of this data by establishing the housing variables as mandatory fields in a new release of RENTEL that became active in August 2004. In preparation for this change an email was sent in late December 2003 to all front line staff outlining how the four variables above should be handled and warning that they will, in the near future, become mandatory fields. The response rate from December to January shows a slight increase for these four variables (see Figure 4.1.) The response rate increased to 100% from August 2004 after HNZC set the four crowding variables as mandatory fields.

The other variables from the Needs Assessment have negligible numbers of missing values.

Figure 4.1: Response rates for the key crowding variables across time

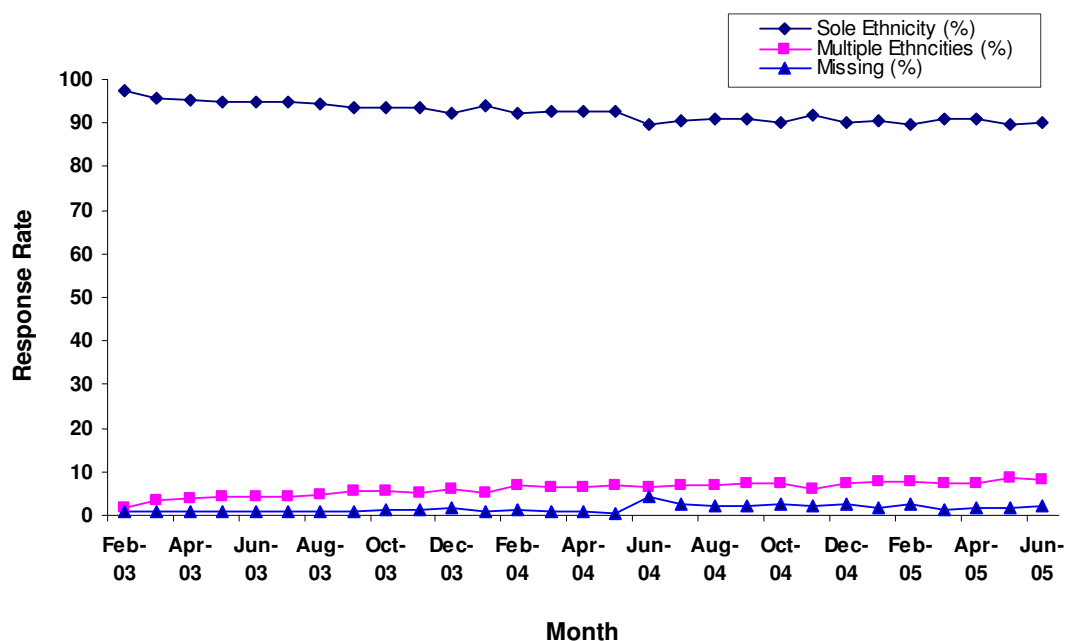


4.1.2 Response to the ethnicity question in the NA interview

Use of the ethnicity field is more complex. This field was extensively modified in the revised Needs Assessment questionnaire released in February 2003, making ethnicity recording comparable to the method used by Statistics NZ (Census 2001). In particular, the revised form provided the ability to enter multiple ethnicities for each *housing applicant*.

Figure 4.2 shows that the response rate to this question remained high. A particular change over time is that more applicants are reporting multiple ethnicities. Note that the "other" ethnic group is counted only once even if multiple ethnicities were entered into the comment within this field.

Figure 4.2: Response to ethnicity question on NA interview by month, February 2003 to June 2005



4.2 IRR assessment

The following section looks at information for the HNZN tenants based on completed IRR forms entered by HNZN from February 2003 to June 2005. These data exclude tenants not claiming an IRR, i.e. those paying market rent. This number is estimated at approximately 1750 tenancies.²

² Data provided by Derek Adams, Information Analyst, HNZN, October 2004.

4.2.1 Interviews by month

The total number of IRR forms entered into RENTEL over the 12-month period from July 2003 to June 2004 was 75041 and from July 2004 to June 2005 was 75881. The number of completed forms each month averaged about 6269 ranging from a minimum of 5059 to a maximum of 7598. Table 4.3 shows the monthly number of IRRs completed.

Table 4.3: Number of IRR forms completed by month, February 2003 to June 2005

Month	Number of IRRs	Percent (of total for the 12 months)
February (2003)	7082	Not included
March	6242	Not included
April	5059	6.8
May	6618	8.9
June	5883	7.9
July	7160	9.5
August	6290	8.4
September	6785	9.0
October	5455	7.3
November	5265	7.0
December	6382	8.5
January (2004)	6036	8.0
February	5679	7.6
March	7598	10.1
April	6052	8.1
May	6205	8.3
June	6134	8.2
Total (for 12 months)	75041	100.0
July	6544	8.6
August	6246	8.2
September	6383	8.4
October	5177	6.8
November	6452	8.5
December	6445	8.5
January (2005)	5458	7.2
February	6541	8.6
March	6862	9.0
April	6185	8.2
May	7182	9.5
June	6406	8.4
Total (for 12 months)	75881	100.0

4.2.2 Completeness of the data

Table 4.4 shows results for two new fields added to the revised IRR form released in February 2003: ethnicity, and a voluntary smoking question. These results show that by June 2005, the ethnicity field was being completed by 95% and the voluntary smoking field by 63%. These trends are described in more detail below.

Table 4.4: Completeness of key variables from the IRR form, February 2003 to June 2005

Months	Response Rates (%)	
	Ethnicity	Smoking (Adult tenants only)
Feb-Mar 2003	70.0	24.4
Apr-Jul 2003	79.7	46.4
Aug-Dec 2003	84.6	50.6
Jan-Mar 2004	87.7	55.4
Apr-Jul 2004	89.8	57.4
Aug-Dec 2004	92.6	60.1
Jan-Mar 2005	94.0	62.0
Apr-Jun 2005	95.1	62.5

4.2.3 Voluntary response to the smoking question

Figure 4.3 shows the monthly trend for increasing response rates to the smoking question. The number answering this question [the line with □] increased initially but is now flattening off. The current response rate is now about 63%.

Figure 4.3: Response to smoking question on IRR form by month, February 2003 to June 2005

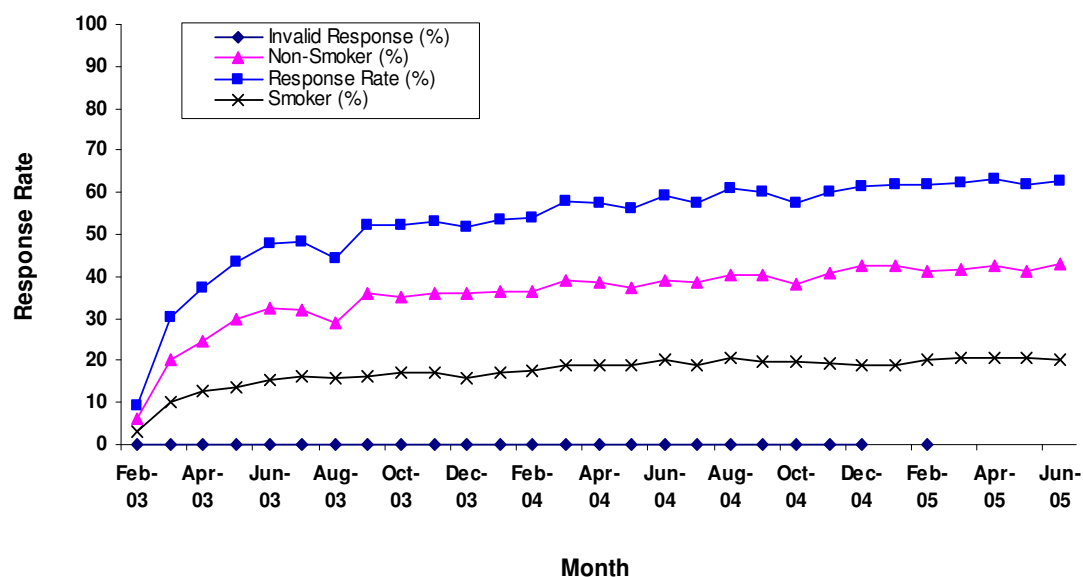


Table 4.5 shows that the voluntary smoking question was most likely to be completed by those aged 50 years or more. It was least likely to be completed by those aged 18-29 years. Females had a slightly higher response rate than males and NZ Europeans were the ethnic group with the highest response rate. Those who did not state their ethnicity were also poor responders to the smoking question. The response rate appears particularly low (37.2%) for people recorded as “Other People” i.e. non-tenants and non-partners, as expected.

Table 4.5: Characteristics of people completing the smoking questions on the IRR form, April 2003 to June 2005

Characteristic	Total Number Adults IRRs ¹	Smoking			
		Yes	No	Not stated	Response rate %
18-29 years	75429	9963	16487	48960	35.1
30-49 years	124719	29199	47047	48426	61.1
50-69 years	62837	11297	29671	21862	65.2
70+ years	25337	1895	14986	8453	66.6
Male	114662	20176	40176	54270	52.6
Female	173658	32177	68015	73430	57.7
NZ European ²	79188	16882	32971	29312	63.0
Maori ³	85890	23710	23376	38767	54.8
Pacific ⁴	80445	9882	37169	33377	58.5
Other	29157	2961	13149	13045	55.3
Not Stated	26053	1844	5596	18610	28.6
Tenants	266206	51345	105277	109509	58.8
Partners ⁵	4613	576	1827	2210	52.1
Other People	82847	10718	20065	52035	37.2
Total	288322	52354	108191	127701	55.7

¹ The number of smokers, non-smokers and not stated do not add to the total due to the small number of invalid observations.

² The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

³ This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

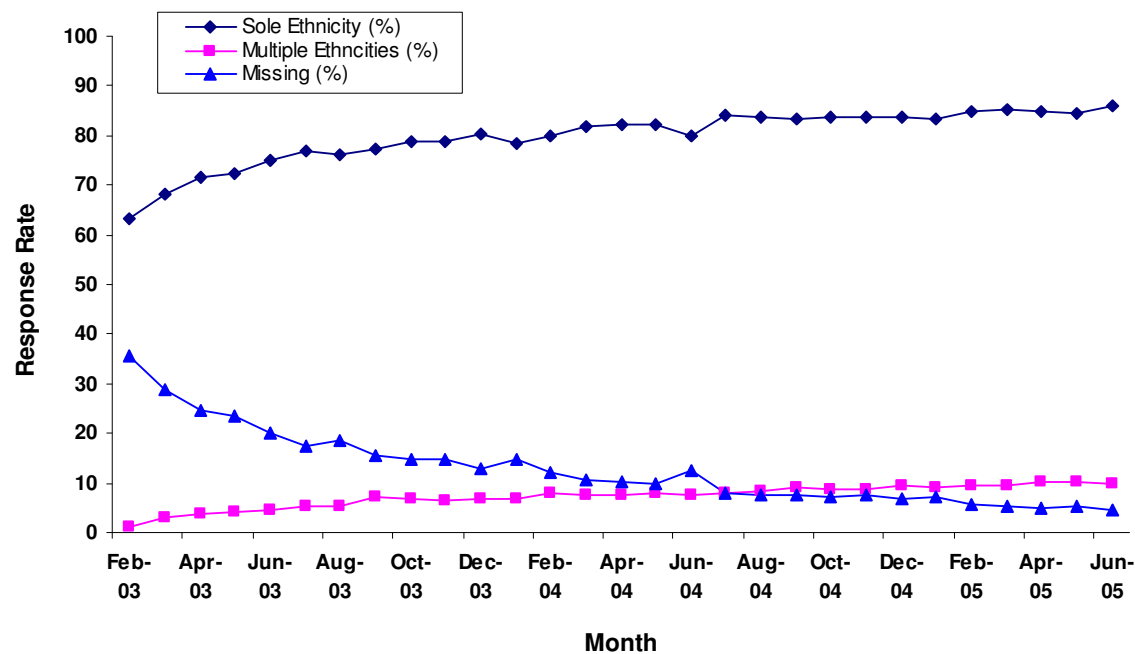
⁴ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁵ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form.

4.2.4 Response to the ethnicity question

Figure 4.4 shows the response to the ethnicity question for the tenants. There has been a steady increase in the number of people reporting both sole and multiple ethnicities and a corresponding reduction in the number of missing values.

Figure 4.4: Response to ethnicity question on IRR form by month, February 2003 to June 2005



4.3 Quality of data matching

The data from May 2003 to June 2005 have been matched with hospital discharge records. As described, NZHIS uses four data fields (first given name, surname, sex, and date of birth) to identify the National Health Index (NHI) number for members of the cohort. This process uses electronic matching, followed by manual matching. The NHI is supplied in an encrypted version with each cohort record. The researchers use this number to identify hospitalisations in the national hospitalisations file.

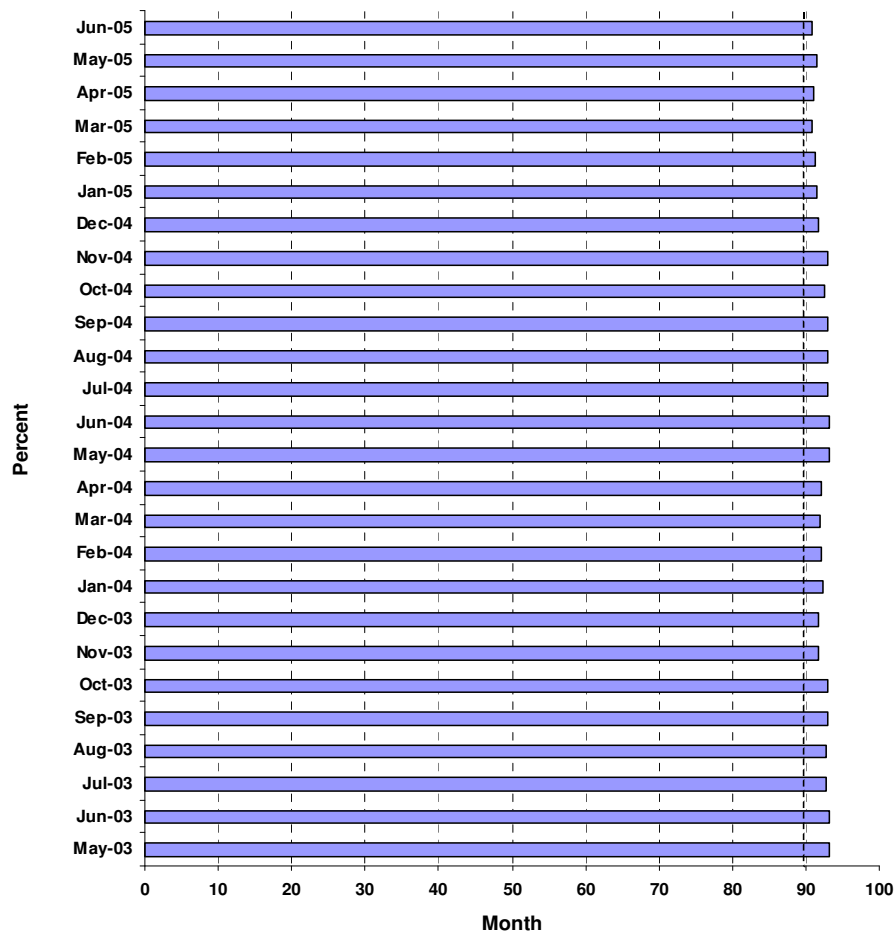
This section reviews the completeness and quality of this data matching process and potential errors that this process could introduce into the study.

4.3.1 Completeness of data matching

The overall proportion matched for the 26-month period May 2003 to June 2005 was 91.7%. Electronic matching was achieved for approximately 65% of records, based on an exact match with the 4 fields used. A further 35% of records were manually matched by trained NZHIS clerical staff.

Figure 4.5 shows the proportion matched by month over the 26-month period. The total proportion of matched records changes little over this period.

Figure 4.5: Match rate by month, May 2003 to June 2005



4.3.2 Potential errors with data matching and the NHI

Two identification keys can be used to identify unique individuals in the cohort study population:

- The NHI number, which is assigned by NZHIS based on identifying information provided by HNZC. This is recorded as an encrypted NHI so that it is not possible for researchers to identify the person even if they have access to NHI codes.
- A housing identification (ID2) number generated by the research team for each person in the HNZC applicant and tenant data supplied via NZHIS. The ID2 number is generated by combining the tenant reference number (irr_tnnt_ref, a unique reference number that HNZC assigns to each household within the four main regions (comp_ref)) and the household reference number (hhld_ref, a unique reference number that HNZC assigns to each person within a household). Concatenating these three numbers gives ID2.

Potential errors with data matching can be assessed by comparing these two numbers. In a stable tenancy situation with perfect matching each NHI should correspond to a single ID2. However, conflict exists in the merged dataset.

The following tables compared NHI to ID2. Firstly by using the NHI as the reference field and seeing how ID2 numbers match to this. Then by using the ID2 as the reference field and seeing how the NHI numbers match to this.

Table 4.6: Comparison of cohort members based on their NHI to see how many have multiple housing reference (ID2) numbers, (May 2003 to June 2005)

Pattern	Number	%
1 ID2 to 1 NHI	206560	79.58
2 ID2 to 1 NHI	43700	16.84
3 ID2 to 1 NHI	7664	2.95
4 ID2 to 1 NHI	1342	0.52
5 ID2 to 1 NHI	217	0.08
6 ID2 to 1 NHI	51	0.02
7 ID2 to 1 NHI	8	0.00
8 ID2 to 1 NHI	4	0.00

Table 4.7: Comparison of cohort members based on their housing reference (ID2) number to see how many have multiple NHI numbers, (May 2003 to June 2005)

Pattern	Number	%
1 NHI to 1 ID2	317 777	90.35
2 NHI to 1 ID2	4657	1.32
3 NHI to 1 ID2	45	0.01

This analysis shows that while individuals identified by NHI numbers sometime (20% of the time) have multiple ID2 numbers, the converse is not true. i.e. Individuals identified by ID2 numbers rarely (1.3% of the time) have multiple NHI numbers linked to them.

The population of individuals where the NHI number links to multiple ID2 numbers represent people who supplied information to HNZN more than once during the year (through NA, IRR, change in circumstances), and

- Changed tenancies and received a new tenant reference number in the process; or
- Exited from being a HNZN tenant and then re-entered during the same year receiving a new tenant reference number in the process.

The much smaller group of individuals represented by ID2 numbers with multiple (usually just two) NHI numbers represents:

- People who supplied information to HNZN more than once during the year (NA, IRR, change in circumstances); and
- Were subject to a data matching error (the same person was matched to NHI for two different people); or
- The same person had more than one NHI number.

4.3.3 Characteristics of matched and un-matched participants

Table 4.9 shows the characteristics of people who were and were not matched with NHI numbers, based on a year of data provided by NZHIS. As this analysis shows, matching was more complete for subjects with the following characteristics: 30-69 years of age, female, New Zealand European and tenants (some of these characteristics are related to one another, so further analysis would be required to determine the separate contribution of each).

4.4 Other data issues

4.4.1 Data entry errors

A number of fields have problems with obvious data entry errors i.e. contain values that are implausible. The recording of other people in the applicant household along with the total number of bedrooms and duration in accommodation has already been discussed in detail in the previous section. The income field at times records spurious values that are obvious data entry errors. There does not appear to be any system check to limit the size of the weekly income entered or to warn if unlikely values are being entered.

The Canadian National Occupancy formula relies on knowing the number of couples in the household. This information is recorded poorly for both the applicants and tenants. The IRR household structure field is not necessarily a true reflection of couple status as this field is used to determine whether they are viewed as a couple for income purposes. The partner code in the signatory relate field is only used if the individual is not a signatory. The combination of these

two fields does not appear to distinguish adequately households with couples from say two single adults or households with more than one couple.

Disposable income provides a measure of the socio-economic status of the household. Presently the tenant's disposable income can be measured using the income- related rent, however this same measure cannot be calculated for the applicants as the current rent or housing costs are not in the WSM&HS datasets. The disposable income and change in disposable income may have an impact on both the crowding levels and health status of the occupants and will be of interest in the shift from applicant status to tenant.

4.4.2 Comparison of ethnicity data from multiple sources

As noted in the methods section (3.3.2), the analyses presented in this report use ethnicity data from 3 different sources. The following table presents these data according to key characteristics that affect their comparability: Proportions in different categories, notably “Other” and “Not stated” and the proportion using non-ethnicity categories such as “New Zealander”. This presentation is based on inclusive coding, which means that individuals are represented in all of the categories in which they record themselves. It also notes the proportion using multiple ethnicities.

Table 4.8: Comparison of ethnicity recording characteristics across different data sources (HNZC, NZHIS, Census)

	<i>Housing applicants (HNZC)</i>		<i>Housing tenants (HNZC)</i>		<i>Hospital discharges (NZHIS)</i>		<i>NZ population (Census)</i>	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
New Zealand	6639	25.1	47055	23.8	1263562	70.0	2871423	76.8
European								
Maori	8869	33.5	69823	35.3	300106	16.6	516278	13.8
Pacific	7074	26.7	69357	35.1	129708	7.2	231785	6.2
Asian	2352	8.9	6213	3.1	87971	4.9	237459	6.4
Other	2822	10.7	8772	4.4	58063	3.2	24984	0.7
Not Stated	567	2.1	14279	7.2	27173	1.5	140512	3.8
Total	28323	107.0	215517	108.9	1805012	103.9	3737025	107.6

Table 4.9: Characteristics of cohort participants who were matched with NHI numbers and those who were un-matched, May 2003 to June 2005

Characteristic	Direct match (%)	Manual match (%)	Total match (%)	Un-matched (%)
Age group				
0-17 years	65.41	25.34	90.75	9.25
18-29 years	67.77	23.35	91.12	8.88
30-49 years	67.59	25.90	93.50	6.50
50-69 years	61.20	32.35	93.56	6.44
70+ years	50.35	40.11	90.45	9.55
	0.00	0.00		
Sex				
Male	65.32	25.63	90.94	9.06
Female	65.09	27.21	92.30	7.70
Ethnicity ¹				
NZ European	69.69	25.68	95.36	4.64
Maori ²	66.49	25.80	92.30	7.70
Pacific ³	63.39	26.43	89.83	10.17
Asian	59.52	28.12	87.64	12.36
Other	63.05	27.90	90.95	9.05
Not Stated	60.68	28.28	88.95	11.05
<i>Housing applicants (NA)</i>				
Tenants (IRR)	68.31	22.89	91.19	8.81
• Tenants	65.09	30.84	95.93	4.07
• Partners ⁴	63.98	23.49	87.47	12.53
• Dependent children	66.45	25.72	92.16	7.84
• Other People	58.31	25.98	84.29	15.71
• Total	64.68	27.82	92.50	7.50
Total	65.19	26.50	91.69	8.31

¹ The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

² This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

³ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁴ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form

5 Characteristics of the applicants

The cross section of applicant data as at the 30th of June 2005 contains a total of 9976 households with 26484 individuals. The following section presents the characteristics of this cross section of applicant data including an analysis of the crowding measures.

5.1 Household Demographics

The following sections present analyses of the household demographics of the applicants (all household members). Section 5.1.1 presents the age distribution, Section 5.1.2 the sex distribution and ethnicity is presented in Section 5.1.3.

5.1.1 Age Distribution of the *housing applicants*

The age distribution of the applicants (all household members) is presented in Figure 5.1. This histogram shows there are a large number of young people (aged less than 18 years) in the applicant households. There is a small peak in the number of mid- thirty year olds. The distribution has a long tail to the right with maximum age of 106 years. The mean and five number summary are presented in Table 5.1. The mean age is 25 years and the median age is 19 years reflecting the skew in the data. The relatively small number of infants (<1 year of age) is an artefact caused by the fact that babies born into applicant households after the date of the Needs Assessment interview would not be counted.

Figure 5.1: Age distribution of the applicant household members at June 2005

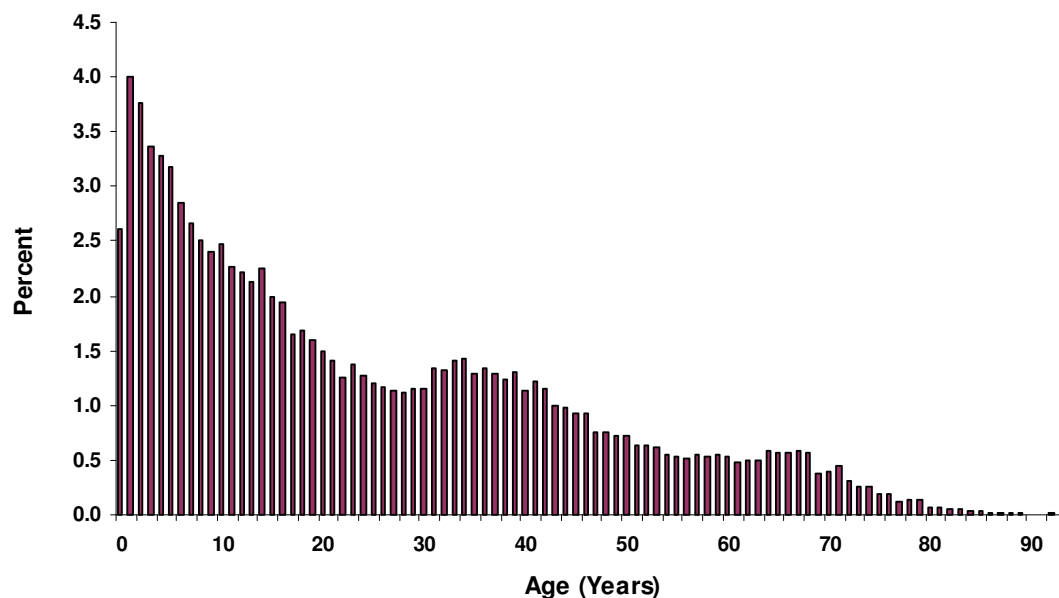


Table 5.1: Summary statistics for the age distribution of people in applicant households at June 2005

Summary Statistics	Age
N	26484
Mean	25.1
Min	0.1
Lower Quartile	7.7
Median	19.5
Upper Quartile	38.9
Max	105.6

5.1.2 Sex distribution of the *housing applicants*

Table 5.2 presents the sex distribution for the applicants. There are slightly more females (57.4%) than males (42.6%) possibly related to the high proportion of one parent households in the applicant population. This variable had no missing values.

Table 5.2: Sex distribution of people in *housing applicant* households at June 2005

Sex	Frequency	Percent
Female	15195	57.4
Male	11289	42.6
Total	26484	100.0

5.1.3 Ethnic Characteristics of the *housing applicants*

The ethnic composition, both exclusive (prioritised) and inclusive, is presented in Table 5.3 (see methods section for an explanation of these classification systems). The inclusive coding increases the number of NZ European and to a lesser degree the number of Pacific Island people, Asian and Other. The numbers of Maori and Not Stated remain the same. The largest ethnic group is Maori followed by Pacific People and NZ European.

Table 5.3: Ethnicity of people in *housing applicant* households at June 2005, based on exclusive and inclusive coding

Ethnicity	Exclusive coding		Inclusive coding	
	Frequency	Percent	Frequency	Percent
New Zealand European	5561	21.0	6639	25.1
Maori	8869	33.5	8869	33.5
Pacific	6664	25.2	7074	26.7
Asian	2283	8.6	2352	8.9
Other	2540	9.6	2822	10.7
Not Stated	567	2.1	567	2.1
Total	26484	100.00	28323	107.0

5.2 Household Structure and income

The following analyses describe the household structure and income of the applicant households. Jensen (1988) equivalised income weights are used to adjust for household size and composition (See methods section).

5.2.1 Structure of the applicant households

The composition for the applicant households is presented in Table 5.4. One adult with children households make up 42.7% of the applicant households. Very few applicants are single and aged less than 24 years with no children. Couples without children also make up a relatively small number of the applicants (11%).

Table 5.4: Applicant household structure

Household Structure	Frequency	Percent
One adult, 24 or under, No children	284	2.8
One adult, 25 or over	2524	25.3
One adult, 1 child	1924	19.3
One adult, 2 or more children	2338	23.4
Couple, No children	1127	11.3
Couple, 1 or more children	1779	17.8
Total	9976	100.0

The percentage of households with varying numbers of children and adults are shown in Table 5.5. The first row shows that 69% of the applicant households have one adult and 27% have two adults. 62% of the households have one or more children.

Table 5.5: Applicant household numbers at June 2005

Number of Adults	Number of Children							Total
	0	1	2	3	4	5	6+	
1	26.3	19.7	12.8	5.9	2.8	1.3	0.5	68.6
2	10.2	5.6	4.6	2.9	1.7	0.8	0.5	26.5
3	1.3	1.0	0.6	0.4	0.3	0.1	0.1	3.8
4+	0.3	0.3	0.2	0.2	0.1	0.0	0.1	1.1
Total	38.1	26.2	18.1	9.4	4.8	2.2	1.1	100.0

5.2.2 Income of the applicant households

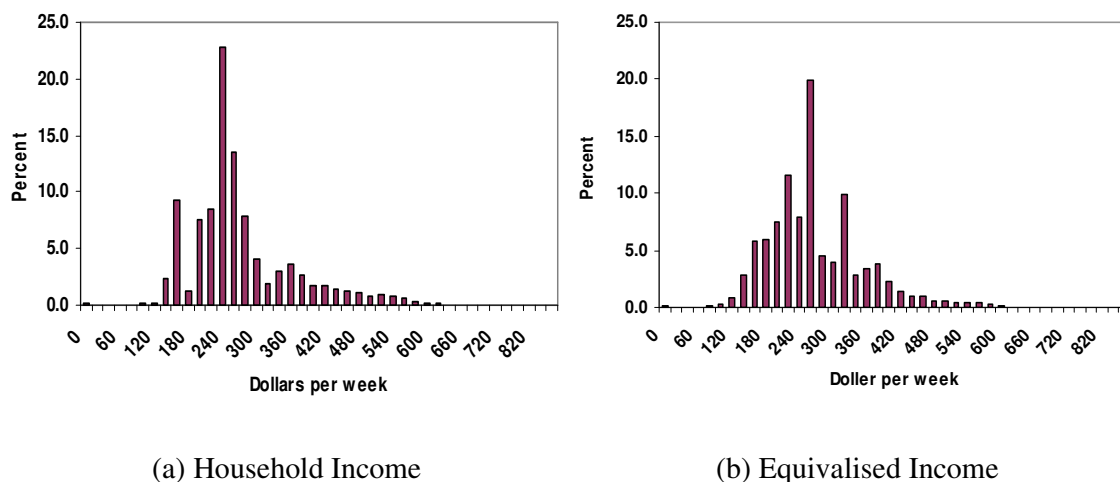
Table 5.6 presents summaries of the total weekly household income and the equivalised total weekly household income. The average total weekly income of the applicant households is \$270 and this reduces to \$268 when equivalised for household size. The income equivalisation does not affect the bottom fifty percent of the income distribution to any large degree. The income equivalisation has spread the distribution out whilst reducing the highest values as shown by the increase in the interquartile range (\$81 before equivalisation increased to \$104 after equivalisation) and the reduction in the maximum weekly income from \$1000 per week to \$784 per week. This table also shows that 75% of the applicants have an equivalised income less than or equal to \$315 per week.

Histograms of the weekly income for the applicant households are shown in Figure 5.2. The total weekly income is presented in Figure 5.2 (a) and the equivalised income in Figure 5.2(b). These histograms show the effect of the income equivalisation, which spreads the distribution out more and reduces the upper tail.

Table 5.6: Summary statistics of the total weekly applicant household income

Summary Statistics	Income (n=9976)	Equivalised Income (n=9976)
Mean	270.01	268.33
Min	0.00	0.00
Lower Quartile	213.12	211.82
Median	245.30	258.37
Upper Quartile	290.72	315.66
Max	1000.00	784.62

Figure 5.2: Income of the applicant households, based on total household income per week at June 2005



The number of people in each household receiving a Government benefit is presented in Table 5.7. The first column shows the number of household members receiving a benefit, the second column the number of households followed by the percent. For the applicants the maximum number of family members receiving a benefit was observed to be 4, with 2 households in this situation. Twenty-one percent of the applicant households had no family member receiving a benefit. The most common situation, 64% of households, is for one household member to be receiving a benefit.

Table 5.7: Number of households with members receiving a Government benefit

Number receiving a Benefit	Number of Households	Percentage of Total Households
0	2128	21.3
1	6378	63.9
2	1419	14.2
3	49	0.5
4	2	0.0
Total Households	9976	100.0

5.3 Crowding Level

This section investigates the crowding levels of the applicant households using three measures: household size, people per bedroom and the Canadian National Occupancy Standard (CNOS). These measures use two key variables, number of people in the household and the number of bedrooms in the house. The household sizes are presented in Section 5.3.1, the number of bedrooms in Section 5.3.2, and the crowding levels in Section 5.3.3. The reported length of time that people have been living in those circumstances is presented in Section 5.3.4.

5.3.1 Household Size

The total size of the households is determined by both the size of the applicant household, and the size of any non-applicant household they are staying with at the time. The average number of people living in the house and the five number summary are shown in Table 5.8. The mean household size is 4.0 people. Seventy-five percent of households consisted of five people or less. The maximum value of 53 appears to be a data entry error.

Table 5.8 also shows a breakdown between applicants who are sharing with non-applicants and applicants who are not sharing (i.e. the whole household is waiting to be housed). About a third of the applicant households are sharing with non-applicants. The average total household size for non-sharers is 2.8 compared with 6.1 for those who are sharing with non-applicants. The five number summary is also smaller for those who are not sharing.

Table 5.8: Summary statistics for the applicant household size

Summary Statistics	Applicants Not Sharing	Applicants Sharing with Other People	All Applicants
N	6281	3695	9976
Mean	2.8	6.1	4.0
Min	1	2	1
Lower Quartile	1	4	2
Median	2	6	3
Upper Quartile	4	8	5
Max	10	53	53

Table 5.9: Applicant household size, including contribution from non-applicants living in the same house at June 2005

Household Size	Applicants		Non-Applicants ¹		Total	
	Number of Households	Percent of Households	Number of Households	Percent of Households	Number of Households	Percent of Households
0 or missing	--	--	6281	62.9	--	--
1	2634	26.4	717	7.2	1617	16.2
2	2928	29.4	708	7.1	1957	19.6
3	1956	19.6	631	6.3	1672	16.8
4	1179	11.8	509	5.1	1366	13.7
5	670	6.7	415	4.2	983	9.8
6	349	3.5	248	2.5	759	7.6
7	155	1.6	157	1.6	519	5.2
8	71	0.7	123	1.2	367	3.7
9	23	0.2	64	0.6	216	2.2
10	10	0.1	47	0.5	182	1.8
11			26	0.3	102	1.0
12			18	0.2	75	0.8
13			5	0.1	60	0.6
14			4	0.0	32	0.3
15			7	0.1	20	0.2
16+			16	0.1	48	0.5
Total	9976	100.0	9976	100.0	9976	100.0

¹ Note this is using the field that records the total number of other people living in the house with the applicants and may not match the total number of other people described in the characteristics.

As can be seen from Table 5.9, 37% of applicant households are living with non-applicants. This breakdown of household size shows that very few households are larger than 10 people. This Table shows the household size versus applicant or non-applicant status and the total distribution. The distribution of applicants has a much smaller maximum than the non-applicants. It must be noted that the number of non-applicants in this table is calculated from the "total other people in the house" variable, which does differ from the total number of non-applicants found using a sum of the characteristics. This is due to data entry errors.

The distribution of household sizes is shown in Figure 5.3 and shows a large right skew due to a number of extreme values that appear to be data entry errors rather than real data points (decided after discussion with HNZC).

Figure 5.3: Number of people in the applicant households at June 2005

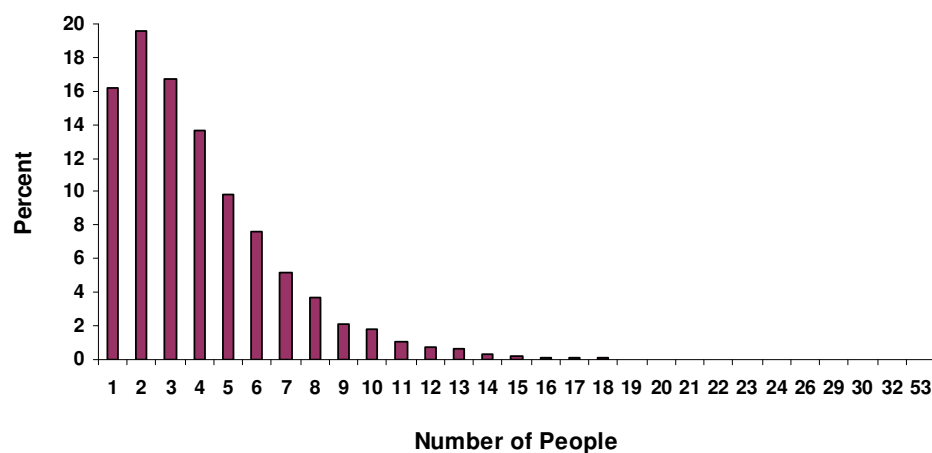


Table 5.10: Applicant household size comparing applicants who share with non-applicants to those who do not share at June 2005

Household Size	Applicants Not Sharing		Applicants Sharing with Other People		All Applicants	
	Number of Households	Percent of Households	Number of Households	Percent of Households	Number of Households	Percent of Households
1	1617	25.7	--	--	1617	16.2
2	1654	26.4	303	8.2	1957	19.6
3	1227	19.6	445	12.0	1672	16.8
4	847	13.5	519	14.0	1366	13.7
5	479	7.6	504	13.6	983	9.8
6	257	4.1	502	13.6	759	7.6
7	117	1.8	402	10.9	519	5.2
8	56	0.9	311	8.4	367	3.7
9	18	0.3	198	5.3	216	2.2
10	8	0.1	174	4.7	182	1.8
11			102	2.8	102	1.0
12			75	2.0	75	0.8
13			60	1.6	60	0.6
14			32	0.9	32	0.3
15			20	0.6	20	0.2
16+			48	1.3	48	0.5
Total	6281	100.0	3695	100.0	9976	100.0

Table 5.10 presents the household sizes for applicants sharing with non-applicants, applicants not sharing and for all applicants. Again this table demonstrates the larger household sizes, as would be expected, for the applicants sharing with non-applicants.

5.3.2 Number of bedrooms in the applicant house

To calculate the number of bedrooms in the house for the crowding levels, the above variables have been incorporated in the following manner. If the "total bedrooms" is zero, then the "current bedrooms" is used instead, if the current number of bedrooms is also zero then the "other rooms used" is used instead. There are 263 records where all of these variables are either missing or zero.

The distribution of bedroom numbers across *housing applicant* households is shown in Figure 5.4. Most (87.4%) houses have one to three bedrooms (or one to three rooms being used as bedrooms). Few (9.8%) have four or more bedrooms.

Table 5.12 presents the summary statistics for the number of bedrooms in the current accommodation of the applicants. The mean number of bedrooms is 2.4. Seventy-five percent of the houses have three bedrooms or less. The maximum number of recorded bedrooms is 86 and is assumed to be a data entry error.

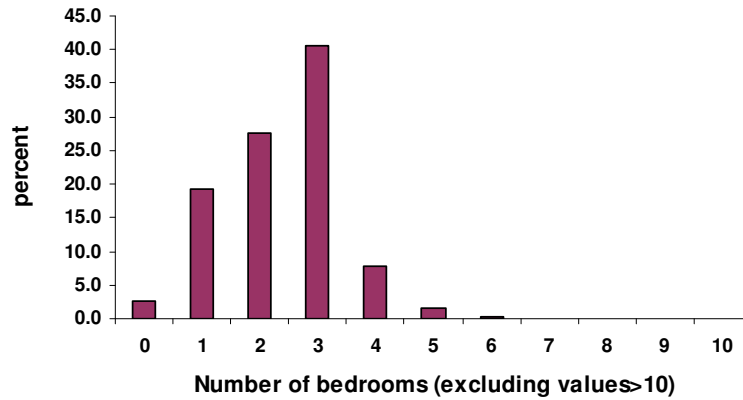
Table 5.11: Number of bedrooms in house used by *housing applicants* at June 2005

Number of Bedrooms in House	Number of Households	Percent of Households
0	263	2.6
1	1914	19.2
2	2748	27.5
3	4059	40.7
4	786	7.9
5	143	1.4
6+	63	0.6
Total	9976	100.0

Table 5.12: Summary statistics for the number of bedrooms in the applicant house

Summary Statistics	Number of Bedrooms
N	9976
Mean	2.4
Min	0
Lower Quartile	2
Median	3
Upper Quartile	3
Max	86

Figure 5.4: Number of bedrooms in the applicant house (excluding four values > 10) at June 2005



5.3.3 Crowding levels of the applicant dwelling

The following tables present two measures of household crowding: household density based on people per bedroom, and bedroom deficit measured using the Canadian National Occupancy Standard (CNOS).

Crowding levels measured by people per bedroom

One measure of crowding is to calculate the number of people per bedroom. A value of more than 2 is considered crowded as it is generally accepted that there should not be more than 2 people per bedroom. Some households will be crowded at levels between 1 and 2 people per bedroom depending on the mix of occupants. Two methods were used to calculate the people per bedroom for the applicants (see Section 3.3.3). The first method includes the number of non-applicants in the household and the total number of bedrooms. The second method uses the number of applicants only and the number of bedrooms to which they have access.

Table 5.13 shows the summary statistics for the number of people per bedroom calculated by the two different methods. The mean (1.7 people per bedroom) and median (1.5 people per bedroom) are higher for the first method than for the second method.

Table 5.14 shows the crowding levels calculated using the people per bedroom formula. The first method, which takes into account the non-applicants as well as applicants, estimates the proportion living in crowded conditions to be 36%. In comparison, method 2 only looks at the applicants and the bedrooms to which they have access. The proportion overcrowded is smaller with 30% living in conditions with 2 or more people per bedroom.

Table 5.13: Summary statistics for the number of people per bedroom in the applicant house

Summary Statistics	Method 1	Method 2
#Bedrooms=0	263	1349
N	9713	8627
Mean	1.7	1.6
Min	0.0	0.1
Lower Quartile	1.0	1.0
Median	1.5	1.3
Upper Quartile	2.0	2.0
Max	30.0	10.0

Table 5.14: Crowding levels calculated using the people per bedroom formula

People per bedroom	Percent of Households Method 1	Percent of Households Method 2
0-0.99	14.3	23.6
1-1.99	49.7	46.0
2-2.99	23.3	19.1
3-3.99	8.2	6.8
4-4.99	2.8	2.5
5-5.99	0.9	1.3
6+	0.8	0.7
Total	100.0	100.0

Figure 5.5 shows the distributions of crowding in the applicant households using the two different measures discussed above. Due to the problems with recording of the other people in the house there are some extreme values of crowding levels with well over 30 people per bedroom recorded in some instances. These implausible values have been excluded from the histograms.

Housing applicant households can be divided into those who are sharing with others (62.1%) and those who are not (37.9%).

Table 5.15 presents a comparison of the crowding levels, using Method 1, between applicants sharing with non-applicants and those not sharing. The average people per bedroom is higher for those who share (2.3 people per bedroom) than for those who do not share with non-applicants (1.4 people per bedroom). This is also shown in the 5-number summary.

Figure 5.5: Crowding levels in the applicant households measured using people per bedroom at June 2005

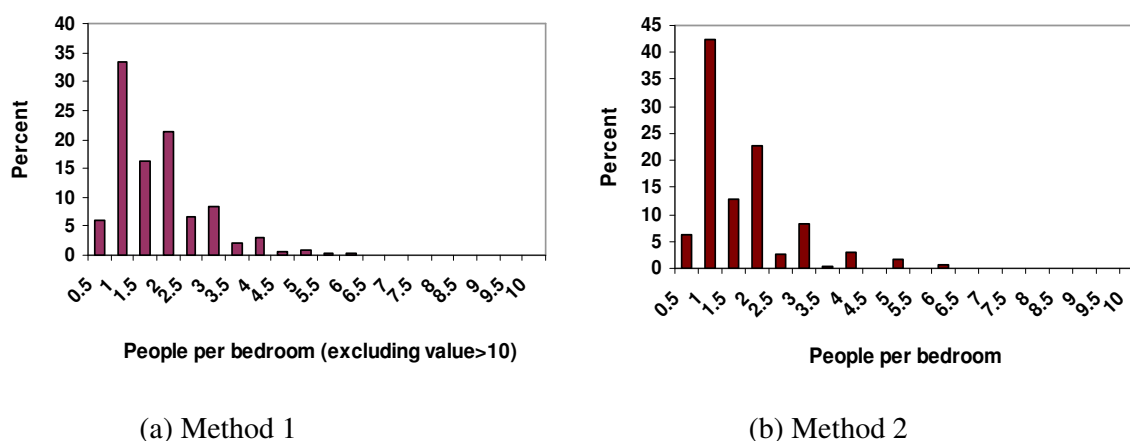


Table 5.15: Summary statistics for the number of people per bedroom (Method 1) comparing applicants who share with other people to those who do not at June 2005

Summary Statistics	Applicants Not Sharing	Applicants Sharing with Other People	All Applicants
#Bedrooms=0	250	13	263
N	6031	3682	9713
Mean	1.4	2.3	1.7
Min	0.0	0.1	0.0
Lower Quartile	1.0	1.5	1.0
Median	1.0	2.0	1.5
Upper Quartile	1.7	2.7	2.0
Max	8.0	30.0	30.0

Crowding levels measured by the Canadian National Occupancy Standard

Summary statistics for the CNOS are presented in Table 5.16. The Table shows a break down into applicants who share with non-applicants and those who do not. The applicants sharing have a higher mean room deficit and the same median as the applicants who do share with non-applicants.

Table 5.17 shows the CNOS distributions for all applicants, applicants sharing with non-applicants and applicants not sharing. This shows that 46.1% of *housing applicants* overall are living in crowded households based on CNOS of a one or more bedroom deficit. Crowding levels are much higher for applicant households sharing with others (79.8%) compared with those who are not (26.1%).

Table 5.16: Mean room deficit for housing applicants, based on CNOS, summary statistics at June 2005

Summary Statistics	Applicants Not Sharing	Applicants Sharing with Other People	All Applicants
N	6281	3695	9976
Mean	0.0	2.1	0.7
Min	-85	-41	-85
Lower Quartile	-1	1	0
Median	0	2	0
Upper Quartile	1	3	2
Max	9	21	21

Table 5.17: Housing applicant bedroom deficit measured against CNOS at June 2005

Bedroom Deficit	Applicants Not Sharing		Applicants Sharing with Other People		All Applicants	
	Number	Percent	Number	Percent	Number	Percent
2 or more room surplus	438	7.0	30	0.8	468	4.7
1 room surplus	1360	21.6	161	4.3	1521	15.2
0	2841	45.2	558	15.1	3399	34.0
1 room deficit	1189	18.9	880	23.8	2069	20.7
2 room deficit	328	5.2	789	21.4	1117	11.2
3 room deficit	81	1.3	576	15.6	657	6.6
4 room deficit	23	0.4	294	8.0	317	3.2
5 or more room deficit	21	0.3	407	11.0	428	4.3
Total	6281	100.0	3695	100.0	9976	100.0

5.3.4 Self reported duration in current situation

HNZC added a question to the NA interview about the length of time that the applicants had spent in their current housing situation. “How long, in weeks, have you been living in this situation, i.e. with this number of people in your current house.” This question was being answered by 100% of the sample by June 2005 (compared with 51% in July 2004).

Table 5.18 shows the distribution of time the applicants report living in their current situation. Two categories show large groupings, that is the group that have spent 1 to 4 weeks in their current situation and the other group are those who have spent more than 52 weeks in their current situation. Duration of time in current situation can be used to define the time period for calculating hospitalisation rates in the applicant population.

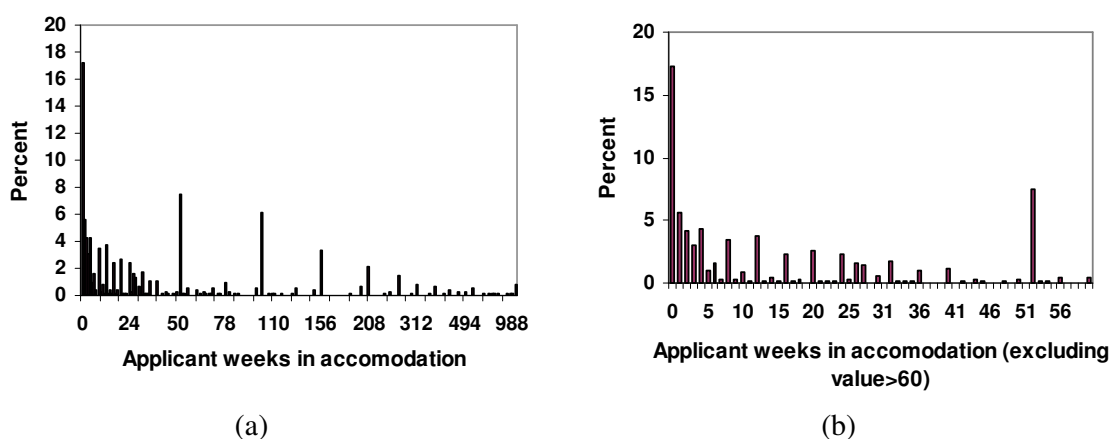
Table 5.18: Length of time applicants have been living in current situation i.e. with this number of people and in current house at the time of the NA interview

Weeks in current accommodation	Frequency	Percent
Missing	764	7.7
0	1589	15.9
1-4	1583	15.9
5-12	1055	10.6
13-24	831	8.3
25-52	1545	15.5
53+	2609	26.2
Total	9976	100.0

Table 5.19: Summary statistics for the duration in accommodation

Summary Statistics	Weeks in Accommodation
Missing Values	764
N	9212
Mean	73.0
Min	0
Lower Quartile	2
Median	20
Upper Quartile	78
Max	999

Figure 5.6: Applicants duration in their current accommodation at the time of the NA interview at June 2005



Of those who answered this question, the average length in their current situation was 73 weeks but the median was 20 weeks indicating the degree to which the data is right skewed (see Table 5.19). The lower quartile is 2 weeks so twenty five percent of the applicants, who answered the question, have spent 2 weeks or less in their current situation. The upper quartile is 78 weeks. Twenty five percent of the applicants, who answered the question, have spent more than 78 weeks in their current situation. The maximum value of 999 weeks is the database limit for this field (corresponding to 19.2 years).

Figure 5.6 shows the distribution of time spent in the current accommodation. Figure 5.6(a) shows the full distribution. The distribution is very skewed and gives no sense of what is happening within the low range so the distribution is replotted in Figure 5.6(b) for values less than 53 weeks. There is a large peak in the duration times of about one to six weeks then the distribution declines until there is a large peak at a duration of 52 weeks indicating that people may tend to round their duration in accommodation to about one year when their duration in accommodation is just above or below one year.

5.3.5 Duration as *housing applicant*

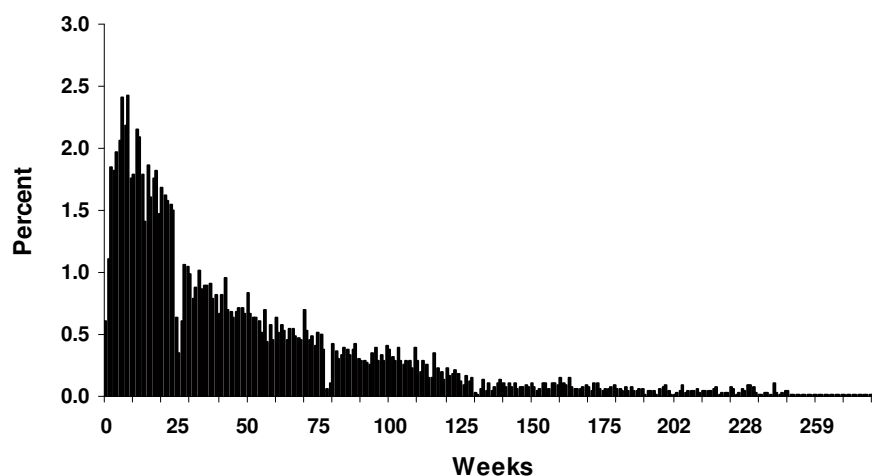
The length of time the current applicants have been on the waiting list was calculated using the difference between the cross section date and the application-registered date. Table 5.20 shows that the average length of time on the waiting list for the current applicants is 50 weeks. The median is 32 weeks. Figure 5.7 presents the distribution of time spent on the waiting list for the current applicants. Most of the applicants have only been on the waiting list a short period of time but a few applicants have a duration of more than two years creating a long tail to the right of the distribution.

Note that this is not the average time it takes an applicant to get housed. The figure presented here is just the average length of time the current applicants have been on the waiting list. We would expect that the cross section will have few high need applicants that are housed quickly so to calculate the average time to housing these high turnover applicants would need to be taken into account along with the lower need applicants.

Table 5.20: Summary statistics for the length of time the current applicants have been on the waiting list

Summary Statistics	Time on Waiting List
N	9976
Mean	49.5
Min	0.0
Lower Quartile	13.0
Median	32.5
Upper Quartile	70.2
Max	437.4

Figure 5.7: Duration the cross section of applicants have been on the waiting list at June 2005



5.4 Characteristics of high and moderate priority applicants

Confirmed *housing applicants* are prioritised for housing based on information obtained during the Needs Assessment interview. The HNZN Social Allocation System aims to allocate housing according to need. It is based on accessing the level of risk the household faces across 5 categories (affordability, adequacy, suitability, accessibility, sustainability). Households are assigned a waiting list priority on an A to D scale. Table 5.21 shows the distribution of applicant households using this approach. Only a very small percentage of the applicants have been classed as the highest priority (2% classed as an A). The majority are classed as either a B or C. This finding is to be expected as a cross-section shows only ‘prevalent’ households that were priority ‘A’ at 30th June 2005, rather than all of those households who moved through this category (the longitudinal analysis in section 8 provides more information on the numbers of households who moved through these categories over the 18 month observation period).

Table 5.21: Prioritisation for HNZN housing

Priority	Number of Households	Percent of Households
A	198	2.0
B	3911	39.2
C	3843	38.5
D	2024	20.3
Total	9976	100.0

HNZC considers those in categories A and B to be a high priority and those in categories C and D to have a moderate priority for housing. The characteristics of the high and moderate priority applicants are shown in Table 5.22 in comparison to the applicants as a whole. Forty one percent of the cross section of applicants were considered a high priority, that is 4112 households with 11672 people. The high priority applicants have spent a shorter time in their current accommodation at the time of the needs assessment and on average they have spent less time on the waiting list at the time of the cross section. A higher proportion of high priority applicants (44%) are sharing with non-applicants compared with the moderate priority applicants (32% sharing).

The high priority applicant household members are, on average, younger than the moderate priority applicants. The inclusive ethnicity shows that Maori are over represented in the high priority group. There is a greater proportion of one-parent households in the high priority group. The high priority group also have lower incomes on average.

The final section of the table shows the crowding characteristics of the high and moderate priority applicants. The crowding measures show that the high priority group have, on average, more people in the household, more people per bedroom and a larger proportion short 1 or more bedrooms than the moderate priority group.

Table 5.22: Characteristics of high and moderate priority applicants at June 2005

Characteristic	High Priority Applicants (A+B)	Moderate Priority Applicants (C+D)	Total <i>housing applicants</i>
<i>Population</i>			
Number of households	4112	5868	9 976
Number of people	11672	14811	26484
Average duration in current situation	67 weeks	77 weeks	73 weeks
Average duration on waiting list for <i>current applicants</i>	41 weeks	56 weeks	50 weeks
<i>Age</i>			
Average age	22.5	27.1	24.6
Median age	16.7	22.1	19.3
<i>Sex</i>			
Female %	57.4	57.4	57.4
<i>Ethnicity</i>			
European %	23.3	26.5	25.1
Maori %	40.3	28.1	33.5
Pacific %	29.7	24.5	26.7
Asian %	6.2	11.0	8.9
Other %	7.0	13.5	10.7
Not Stated %	1.7	2.5	2.1
<i>Household structure</i>			
One adult %	25.3	30.1	28.1
Couple %	7.9	13.7	11.3
Couple with children %	18.0	17.7	17.8
One parent with children %	48.8	38.4	42.7
<i>Household income</i>			
Average weekly income ¹	255.01	277.60	268.33
Median weekly income ¹	252.55	258.37	258.37
Receipt of income from Government benefit %	80.2	77.6	78.7
<i>Crowding levels</i>			
% Sharing with non-applicants	44.1	32.1	37.0
Average number of people in household	4.7	3.6	4.0
Median number of people in household	4.0	3.0	3.0
Average number of bedrooms	2.4	2.4	2.4
Median number of bedrooms	3.0	2.0	3.0
Average people per bedroom	2.0	1.5	1.7
Short of 1 or more bedrooms (%)	56.9	38.3	48.7
Short of 2 or more bedrooms (%)	35.8	17.8	25.7

6 Characteristics of the tenants

The characteristics of the HNZN tenants are presented in this section. This report uses the term “tenant” to cover all of those who are living in a HNZN property (tenants, partners, dependent children and other people). This analysis was done on the cross section of HNZN tenants as at June 2005. Section 6.1 describes the demographics of the tenants. Household structure and income are presented in Section 6.2. The smoking status of the tenants and active and passive smoking characteristics are examined in Section 6.3 and the crowding levels are analysed in Section 6.4.

6.1 Household demographics

The following section investigates the demographics of the HNZN tenants. Age, sex and ethnicity are presented.

6.1.1 Age distribution of the tenants

Figure 6.1 shows the distribution of ages of all the household members in the tenancy. There are two peaks to the right skewed distribution. The first and largest peak is for children aged between four and sixteen years. The second much smaller peak is for adults aged in their late thirties and early forties.

Figure 6.1: Age distribution of tenant household members at June 2005

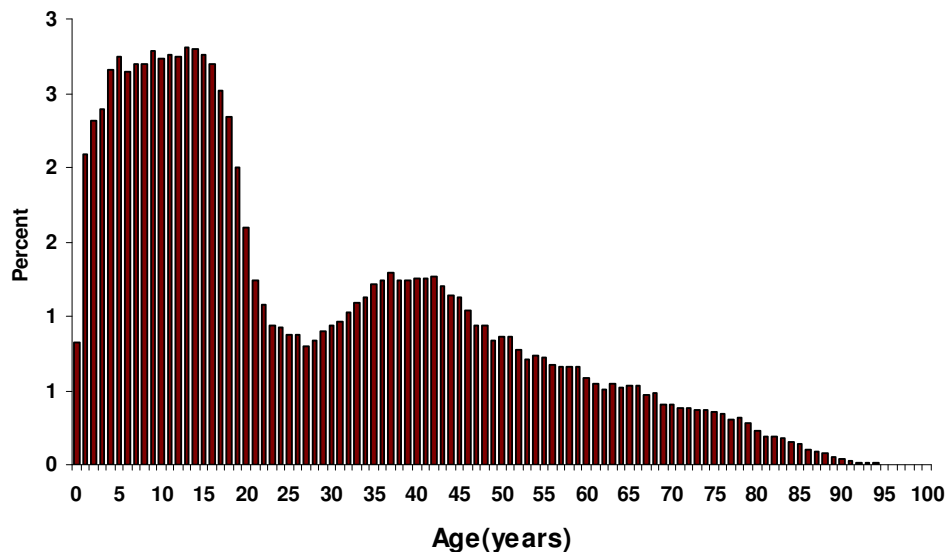


Table 6.1 has the summary statistics for the age distribution of tenants. The average age is 28 and the median age 20 years, demonstrating the right skew of the data. The upper quartile is 43 years so seventy-five percent of the tenants are aged less than 43 years.

Table 6.1: Summary statistics for the age distribution of tenants

Summary Statistics	Age
Missing Values	3
N	197791
Mean	27.9
Min	0.1
Lower Quartile	10.4
Median	20.0
Upper Quartile	42.9
Max	105.6

6.1.2 Sex distribution of the tenants

Table 6.2 shows the sex distribution of tenants. Like the applicants there are more females (54.8%) than males (45.2%). There is one missing value.

Table 6.2: Sex distribution of people in tenant households at June 2005

Sex	Frequency	Percent
Female	108336	54.8
Male	89458	45.2
Total	197794	100.0

6.1.3 Ethnic characteristics of the tenants

The ethnic distribution of tenants, both coded exclusively and inclusively, is shown in Table 6.3. There are similar proportions of Maori and Pacific tenants (both about 35%) and these two groups make up the majority of the tenants. The next largest group is New Zealand Europeans followed by those not stating any ethnicity. The difference between exclusive and inclusive coding mainly shows as an increase in the numbers of NZ Europeans and Pacific people in the inclusive coding. We can see that Asians make up a very small number of tenants, though with the moderate number of Not Stated this could have an impact on these numbers.

Table 6.3: Ethnicity of people in tenant households, based on exclusive and inclusive coding at June 2005

Ethnicity	Exclusive coding		Inclusive coding	
	Frequency	Percent	Frequency	Percent
New Zealand European	36507	18.5	47055	23.8
Maori	69823	35.3	69823	35.3
Pacific	64479	32.6	69357	35.1
Asian	5469	2.8	6213	3.1
Other	7237	3.7	8772	4.4
Not Stated	14279	7.2	14279	7.2
Total	197794	100.0	215517	108.9

6.2 Household structure and income

This section investigates the household structure and income of the HNZN tenants using information used to calculate the income related rent.

6.2.1 Structure of the tenant households

The household structure of the tenants using the classifications for the income related rent is shown in Table 6.4: Just over half the tenants have children in the household. One-parent households make up 35.5% of the tenant population using the IRR classification.

Table 6.4: Tenant household structure

Household Structure	Frequency	Percent
Couple, 1 or more Children	10968	17.9
Couple, No Children	5627	9.2
One parent, 24 or under	330	0.5
One parent, 25 or over	22434	36.7
One parent, 1 Child	7736	12.6
One parent, 2 or more Children	14023	22.9
Total	61118	100.0

Table 6.5 presents the percentage of households with varying numbers of adults and children. Of the tenant population a quarter (24.8%) have one adult and no children. Fifty-two percent of the households contain only one adult with or without children and 40.6% of all the households have no children. Very few households (5.8%) have four or more adults and very few (2.8%) have six or more children.

Table 6.5: Tenant household numbers at June 2005

Number of Adults	Number of Children							Total
	0	1	2	3	4	5	6+	
1	24.8	8.6	8.3	5.8	2.9	1.2	0.8	52.4
2	11.4	5.3	5.3	4.4	2.8	1.5	1.3	32.0
3	2.9	2.1	1.8	1.3	0.9	0.4	0.4	9.8
4+	1.4	1.2	1.2	0.8	0.6	0.3	0.3	5.8
Total	40.6	17.2	16.5	12.3	7.1	3.4	2.8	100.0

6.2.2 Income of the tenant households

The following section presents both total household income (total income relevant to the calculation of the IRR) and equivalised household income per week (equivalised using the Revised Jensen Scale) for tenants. Table 6.6 presents summary statistics for the household income both total per week and equivalised for household size. The average income is \$305.55 per week and this reduces to \$279.70 after equivalisation. Seventy-five percent of the tenants have an income of \$351.22 or less per week. The upper quartile of the equivalised income is \$354.74 per week.

Table 6.6: Summary statistics of the total weekly tenant household income

Summary Statistics	Income	Equivalised Income
Missing Values		
N	61118	61118
Mean	305.55	279.70
Min	0.00	0.00
Lower Quartile	232.70	190.15
Median	256.52	255.60
Upper Quartile	351.22	353.74
Max	2213.35	3076.92

Figure 6.2 presents histograms of the total household weekly income per week and the equivalised income per week. Both distributions have a long right tail. The income equivalisation increases this long tail.

Table 6.7 shows the number of household members receiving a benefit in each tenancy. Only 8.9% of the tenant households have no members receiving a benefit. The majority of households (71.8%) have one member receiving a benefit. Very few households have more than two members receiving a benefit.

Figure 6.2: Income of the tenant households per week (excluding 6 values greater than \$1500) at June 2005

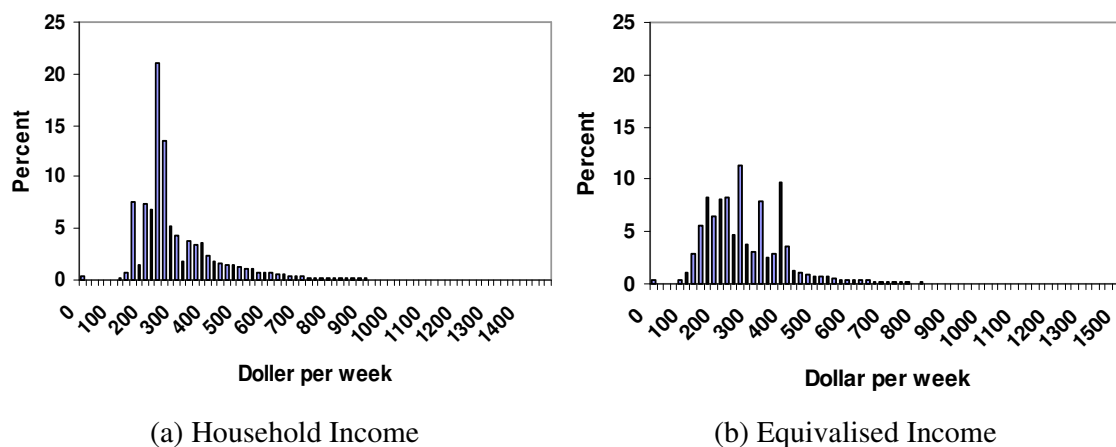


Table 6.7: Number of household members receiving a benefit

Number receiving Benefit	Humber of Households	Percent of Households
0	5412	8.9
1	43858	71.8
2	11564	18.9
3	244	0.4
4	35	0.1
5	4	0.0
6	1	0.0
Total Households	61118	100.0

6.3 Tobacco smoking

The following section reports the information gained from the smoking question that was added to the IRR form. The response rate to the question has been increasing with time.

6.3.1 Active smoking

Table 6.8 shows the reported prevalence of smoking (1 or more cigarettes per day), for the cross section of tenants at 30th June 2005. Currently around 63% of tenants (aged 18 or over) answer the 'smoking question'. The overall reported rates of smoking among those who answered this question was 31.7%.

The breakdown of smoking prevalence by age group showed that those aged 18 - 29 years and 30 - 49 years had the highest prevalence (around 38%) and those aged 70 or more had a very low prevalence of smoking of 10.9%. Males and females have similar smoking prevalences of around 31%. Of the ethnic groups Maori showed a relatively high prevalence of 49.7%, much higher than the next group NZ European with a 31.5% prevalence. Tenants and "other people" had smoking prevalences of around 30% and people listed as partners were lower at 24%. These numbers must be viewed with caution as 37% did not answer the smoking question and these people may have a different smoking profile to that presented in the table.

Table 6.8: Prevalence of reported smoking in adult tenants at June 2005

Characteristic	Total Number of Adults	Smoking			
		Yes	No	Not stated	Percentage Smoking ¹
18-29 years	27074	3673	6285	17108	36.9
30-49 years	44139	11202	18389	14537	37.9
50-69 years	24000	4755	12745	6498	27.2
70+ years	9873	809	6644	2419	10.9
Male	41704	7912	16360	17419	32.6
Female	63382	12527	27703	23143	31.1
NZ European	26376	5746	12491	8136	31.5
Maori	32080	9235	9249	13312	49.7
Pacific	31845	4084	15698	12059	20.7
Asian	3644	174	2177	1239	7.4
Other	4645	513	2290	1842	18.3
Not Stated	6496	597	1978	3920	23.2
Tenants	73540	16127	35396	22005	31.3
Partners	581	70	224	287	23.8
Other People	30965	4242	8443	18270	34.1
Total	105086	20439	44063	40562	31.7

¹ Prevalence among those reporting smoking behaviour i.e. excluding not stated

6.3.2 Smoking households

Table 6.9 summarises the smoking status of households. From the smoking information for individuals, household smoking status was calculated. Note that only those aged 18 or over were asked about smoking behaviour therefore the household results do not allow for children who may actually be smoking.

About thirty percent of the households had complete information and the adults were all non-smokers. Another 21.4% of households had complete information and at least one smoker. Six percent of households had at least one smoker and some unknowns. The remaining households were either all unknown or a mix of non-smokers and unknowns. In total there are 38155 (62%) households that can be classified as either smoking or non-smoking households.

Table 6.9: Prevalence of reported household smoking status of tenants at June 2005

Smoking status	Number of Households	Percent of Households
Non smoking household	21170	34.6
Smoking household, total		
• One or more reported smoking adults, no unknowns	13100	21.4
• One or more reported smoking adults, and one or more unknown	3885	6.3
One or more non-smokers and the rest unknown	6025	9.9
All Unknown household / not stated	16938	27.7
Total	61118	100.0

The structure of households according to their household smoking status is presented in Table 6.10. With the large degree of missing information on smoking status the results presented are not necessarily representative of the true distribution of smoking in the tenant population. For those with information available, the highest household smoking prevalences were found for one-parent households followed by couples with children. The lowest household smoking prevalence was in households with one adult aged 25 or more with no children.

Table 6.10: Prevalence of reported household smoking status of tenants, by household characteristics at June 2005

Household type	Smoking household	Non smoking household	Unknown status	Percentage with at least one smoker in household ¹
Couple, 1 or more children	3051	3174	4743	49.0
Couple, no children	1383	2225	2019	38.3
One parent, 24 or under	72	77	181	48.3
One parent, 25 or over	5481	9628	7325	36.3
One parent, 1 child	2454	2179	3103	52.9
One parent, 2 or more children	4539	3892	5592	53.8
Total	16985	21170	22963	44.5

¹ Prevalence among households where smoking behaviour was stated i.e. excluding unknown. However the smoking households do include households where there was at least one smoker and the status of the others were unknown.

6.4 Crowding level

The following section investigates the crowding levels of the tenant households. The crowding measures are the same as those used for the applicants, namely total household size, people per bedroom and the Canadian National Occupancy Standard.

6.4.1 Household size

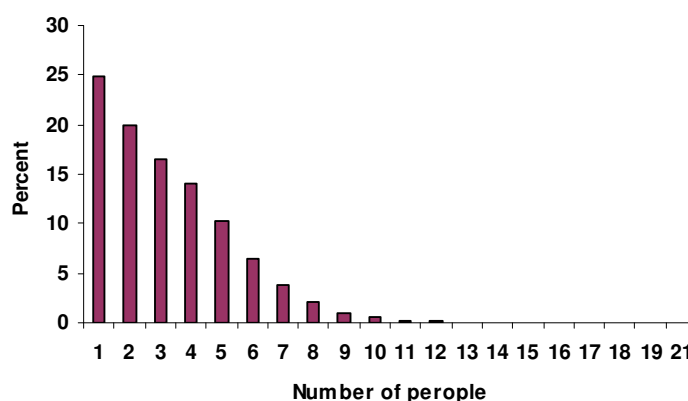
The distribution of household sizes is shown in Table 6.11. A quarter of the tenancies have one person. Very few households have more than five people in them, though there are some households with large numbers (sixteen or more). The average household size is 3.2 and the median is 3 (see Table 6.12). Seventy five percent of the tenancies have less than five people. The maximum number of people in one tenancy is 21. Figure 6.3 shows the distribution of household sizes. There is a steady decrease in frequency as household size increases.

Table 6.11: *Tenant household size at June 2005*

Household Size	Frequency	Percent
1	15169	24.8
2	12237	20.0
3	10058	16.5
4	8635	14.1
5	6279	10.3
6	3954	6.5
7	2307	3.8
8	1284	2.1
9	626	1.0
10	298	0.5
11	142	0.2
12	60	0.1
13	26	0.0
14	20	0.0
15	8	0.0
16+	15	0.0
Total	61118	100.0

Table 6.12: Summary statistics for household size

Summary Statistics	Household Size
N	61118
Mean	3.2
Min	1
Lower Quartile	2
Median	3
Upper Quartile	4
Max	21

Figure 6.3: Number of people in the tenant household at June 2005

6.4.2 Number of bedrooms in the tenant property

The number of bedrooms in the house, recorded in the property details, is presented in Table 6.13. This breakdown also includes the number of single and double bedrooms. Note that there are some properties that are considered to have no bedrooms and these are the pensioner/unit properties with no separate bedroom ('bed-sits'). The majority of properties have two or three bedrooms (82%). Some properties have four bedrooms but this is only seven percent of the properties being used at 30th June 2005. Very few properties have more bedrooms than this. The average number of bedrooms is 2.5 and the median is 3 (see Table 6.14). The maximum number of bedrooms is 7. The distribution is shown in Figure 6.4.

Table 6.13: Number of bedrooms in tenant houses at June 2005

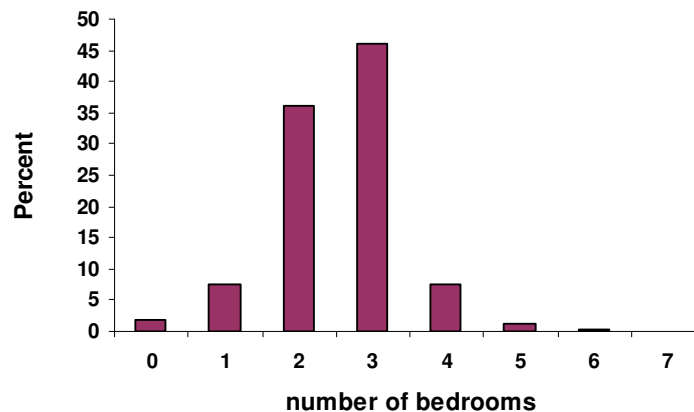
Number of Bedrooms	Single		Double		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	41423	67.8	1230	2.0	1040	1.7
1	18089	29.6	10797	17.7	4594	7.5
2	1477	2.4	28067	45.9	22010	36.0
3	116	0.2	17757	29.0	28095	46.0
4	9	0.0	2684	4.4	4567	7.5
5	3	0.0	508	0.8	671	1.1
6	1	0.0	57	0.1	115	0.2
7			18	0.0	26	0.0
Total	61118	100.0	61118	100.0	61118	100.0

Note: "0" bedrooms includes pensioner housing with no separate bedroom ('bed-sits')

Table 6.14: Summary statistics for the number of bedrooms

Summary Statistics	Number of Bedrooms
N	61118
Mean	2.5
Min	0
Lower Quartile	2
Median	3
Upper Quartile	3
Max	7

Figure 6.4: Number of bedrooms in the tenant households at June 2005



6.4.3 Crowding levels of the tenant households

The following tables present two measures of household crowding: household density based on people per bedroom and bedroom deficit measured against the Canadian National Occupancy Standard (CNOS).

The average number of people per bedroom is 1.2 and the median is 1.0 (see Table 6.15). Table 6.16 presents the distribution of crowding levels as measured by people per bedroom for the *housing tenants*. The majority (59%) have 1-1.99 people per bedroom. Very few households have four or more people per bedroom. The distribution of people per bedroom is shown in Figure 6.5. The distribution peaks at a crowding level of about 1.25 people per bedroom.

The distribution of households according to Canadian National Occupancy Standard crowding levels is shown in Table 6.18:. The majority (76%) are not living in crowded conditions. The remaining 24% of households are classified as crowded as they have a one-room deficit or more.

Table 6.15: Tenant household summary statistics for the people per bedroom

Summary Statistics	Number of Bedrooms
#Bedrooms=0	1040
N	61118
Mean	1.2
Min	0.2
Lower Quartile	1.0
Median	1.0
Upper Quartile	1.6
Max	6.5

Table 6.16: Tenant household crowding level, as measured by number of people per bedroom at June 2005

People per bedroom	Percent of Households
0-0.99	25.5
1-1.99	59.3
2-2.99	13.7
3-3.99	1.3
4-4.99	0.2
5-5.99	0.0
Total	100.0

Figure 6.5: Tenant crowding measured using people per bedroom at June 2005

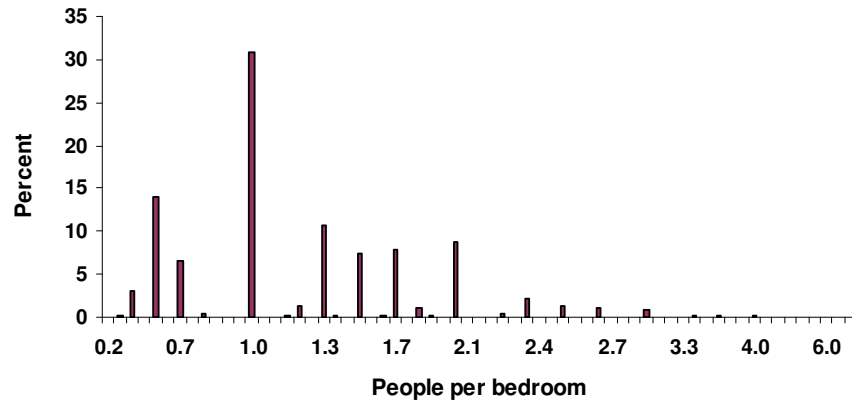


Table 6.17: Tenant household summary statistics for the CNOS

Summary Statistics	CNOS
N	61118
Mean	-0.1
Min	-4
Lower Quartile	-1
Median	0
Upper Quartile	0
Max	12

Table 6.18: Tenant household crowding level, as measured by the CNOS bedroom deficit at June 2005

Bedroom Deficit	Number of Households	Percent of Households
2 + room surplus	3320	5.4
1 room surplus	17659	28.9
0	25719	42.1
1 room deficit	9972	16.3
2 room deficit	2964	4.9
3 room deficit	1008	1.7
4 room deficit	330	0.5
5 + room deficit	146	0.3
Total	61118	100.0

6.4.4 Duration in current accommodation

The duration in the current accommodation is calculated as the difference between 30th June 2005 and the lease start date (measured using the anniversary date for technical reasons). The average tenancy length is 387 weeks (7 years) and the median is 246 weeks (4 years) (see Table 6.19:). The maximum length of accommodation recorded was 3395 weeks (65 years). The length of time spent in the tenancy is presented in Table 6.20:.. The vast majority of tenants (84.5%) have spent a year or more in their current house. Figure 6.6 shows the distribution of the time spent in the current accommodation. There is a large peak at the beginning of the distribution and then a long tail to the right.

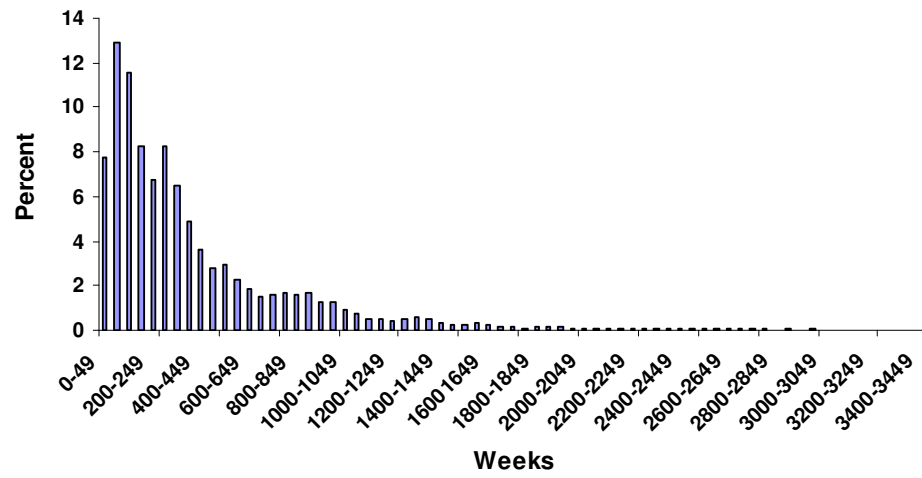
Table 6.19: Summary statistics for the duration in accommodation

Summary Statistics	Length of tenancy in weeks
N	61118
Mean	387.0
Min	-1.0
Lower Quartile	96.0
Median	245.9
Upper Quartile	505.7
Max	3395.0

Table 6.20: Length of time the tenants have been living in their current accommodation, at June 2005

Weeks in current accommodation	Number of Households	Percent of Households
0	226	0.4
1-4	786	1.3
5-12	1522	2.5
13-24	2214	3.6
25-52	4738	7.8
53+	51632	84.5
Total	61118	100.0

Figure 6.6: Duration of stay in current accommodation for the tenants at June 2005



7 Comparison of the *housing applicants and tenants*

7.1 *Household demographics, structure and income*

Table 7.1 summarises the characteristics of the applicants and tenants and compares these two groups to the NZ population using 2001 census data. The applicants and tenants are, on average, younger than the NZ population. They are commonly one-parent families or one adult households. Maori and Pacific people are over represented in the applicant and tenant populations compared with the NZ population. The applicants and tenants have a relatively low household income with a high proportion receiving their income from a Government benefit.

Recall that the ethnicity for the applicants is recorded in an interview but is self reported for the tenants resulting in a much higher rate of missing values (NS - Not Stated) for the tenants. This high *not stated* rate for the tenants makes comparisons more difficult as the not stated could have a significant impact on the shape of the distribution.

7.2 *Household size and crowding levels*

Table 7.2 summarised measures of household size, house size and crowding of applicant and tenant populations and compares these with the New Zealand census population at the time of the 2001 census. On average the applicants have more people in the household and fewer bedrooms than the tenants and the tenants likewise have more people and fewer bedrooms than the total NZ population. The median number of people in the house is three for both applicants and tenants which is one more than the NZ population median. The median number of bedrooms for the applicants is two, which is one less than the median number of bedrooms for the tenants and NZ population.

The average people per bedroom is highest for applicants at 1.7 and lowest for the NZ population at 0.9. The table shows that the proportion in crowded households (both 1 or more bedrooms short and 2 or more bedrooms short) is higher for applicants than tenants and both are higher than for the total NZ population.

Table 7.1: Characteristics of *housing applicants* and *housing tenants* at June 2005, compared to total NZ population (2001 census)

Characteristic	<i>Housing applicants</i> ¹	<i>Housing tenants</i> ²	Total NZ Population ³
<i>Population</i>			
Number of households	9 976	61 118	1 344 000
Number of people	26 484	197 794	3 630 000
Average duration in current situation	73 weeks		
Average duration on waiting list for <i>current applicants</i>	50 weeks		
Average duration in tenancy		387 weeks	
<i>Age</i>			
Average age	25.1	27.9	34.9
Median age	19.5	20.0	34
<i>Sex</i>			
Female %	57.4	54.8	51.2
<i>Ethnicity</i>			
European %	25.1	23.8	85.5
Maori %	33.5	35.3	15.0
Pacific %	26.7	35.1	5.2
Asian %	8.9	3.1	6.2
Other %	10.7	4.4	0.8
Not Stated %	2.1	7.2	--
<i>Household structure</i>			
One adult %	28.1	37.2	Not comparable at this stage.
Couple %	11.3	9.2	
Couple with children %	17.8	17.9	
One parent with children %	42.7	35.5	
<i>Household income</i>			
Average weekly income ⁴	268.33	279.70	873.67
Median weekly income ⁴	258.37	255.6	667.10
Receipt of income from Government benefit %	78.7	91.1	24.5
<i>Smoking status</i> ⁵			
Smoker in household %	--	44.5	32.9
Proportion of adults who smoke %	--	31.9	24

¹ *Housing applicants* are those who have been "confirmed" and placed on the waiting list for a house

² *Housing tenants* are those who complete an IRR. This excludes 1750 HNZN tenant households not claiming this benefit (i.e. who are paying market rent).

³ Based on 2001 NZ Census. Totals include HNZN applicants and tenants. Sources: Statistics New Zealand. *What is the extent of crowding in New Zealand?* Wellington: Statistics New Zealand, 2003.

⁴ Income has been adjusted using the Jensen Equivalised Annual Household Income formula

⁵ Excludes missing information for the tenants and smoking status for the NZ population is based on 1996 census

Table 7.2: Household size and crowding characteristics of *housing applicant* and *tenant* households June 2005, compared to New Zealand population (2001 census)

Characteristic	<i>Housing applicants</i>	<i>Housing tenants</i>	NZ Population ³
Sharing with another family %	37.0	--	2.2
<i>Household size</i>			
Average number of people in household	4.0	3.2	2.7
Median number of people in household	3	3	2
<i>House size</i>			
Average number of bedrooms	2.4	2.5	3.1
Median number of bedrooms	3	3	3
<i>Crowding measures</i>			
Average people per bedroom	1.7	1.2	0.9
Short of 1 or more bedrooms %	46.1	23.6	5.1
Short of 2 or more bedrooms %	25.3	7.4	1.2

Figures 7.1 to 7.4 present household size and crowding characteristics graphically for *housing applicant* and *tenant* households compared with the New Zealand population. These graphs also further split applicants into those who are sharing with other non-applicants and those who are not.

Figure 7.1 shows that applicants have the highest average household size, particularly those who are sharing with others. The applicants who are not sharing have a smaller average household size than the tenants but still larger than the average for the NZ population.

Figure 7.2 shows the average number of bedrooms for the applicants, tenants and New Zealand population. The applicants who are not sharing with others have the smallest number of bedrooms.

Figure 7.3 shows the average people per bedroom, which effectively combines the information presented in Figure 7.1 and

Figure 7.2. The graph shows that the applicants have the highest crowding by this measure and the tenants have higher crowding on average than the NZ population. The applicants who are sharing with other non-applicants have the highest crowding levels. Whilst the applicants who share have more bedrooms on average this is outweighed by their larger household size. The applicants not sharing had on average smaller households than the tenants but also had fewer bedrooms on average causing the overall average crowding by this measure to be higher than the tenants.

Figure 7.4 presents the percentage of households with a bedroom deficit of one or more. The graph shows a similar pattern but more pronounced trend to that shown by average people per bedroom. The applicants who are sharing with non-applicants have the highest crowding and

³ Statistics New Zealand. *What is the extent of crowding in New Zealand?* Wellington: Statistics New Zealand, 2003.

the tenants have the lowest crowding for the HNZC groups. All these groups have higher crowding than the NZ population.

Figure 7.1: Comparison of the average people per household at June 2005

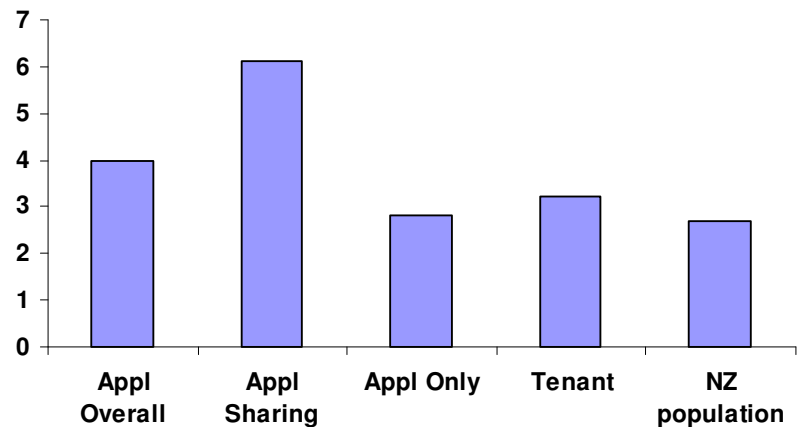


Figure 7.2: Comparison of the average number of bedrooms at June 2005

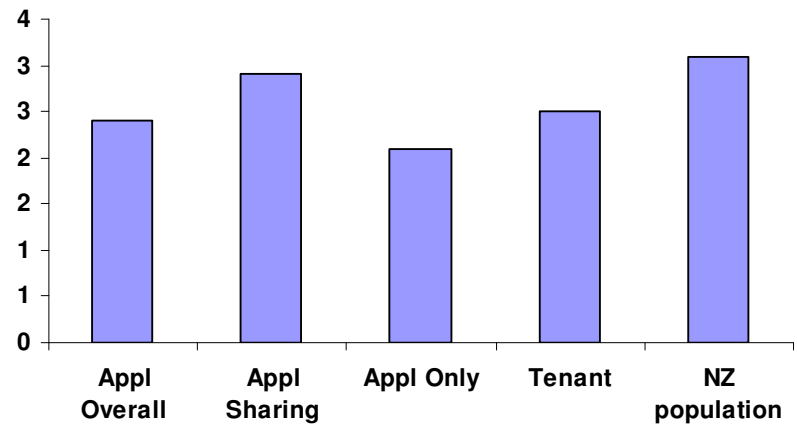


Figure 7.3: Comparison of the average people per bedroom at June 2005

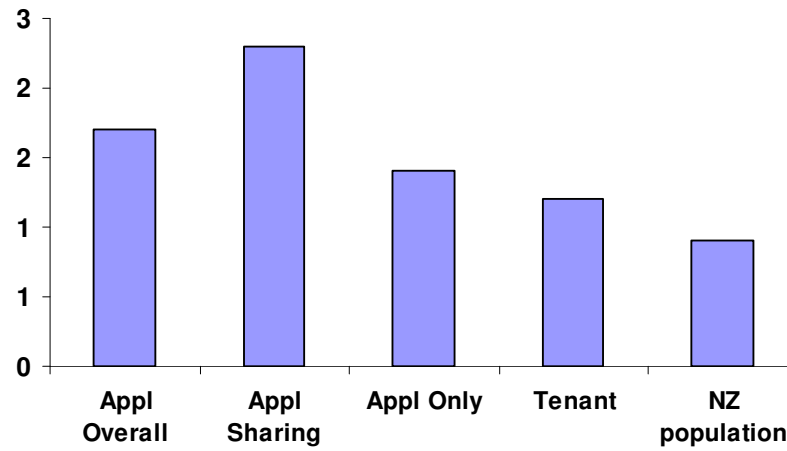
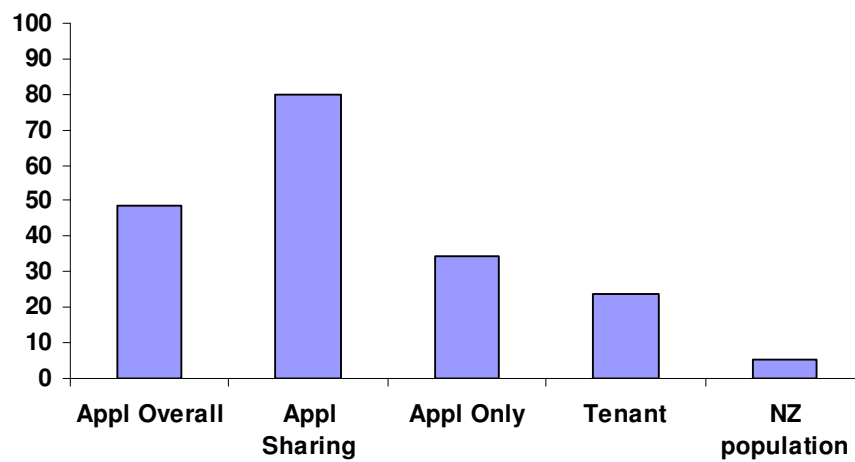


Figure 7.4: Comparison of the percentage of households with bedrooms deficit of one or more at June 2005



8 Longitudinal analysis of applicant and tenant populations

8.1 Flows of households through HNZN processes

Figure 8.1 shows the cohort populations and potential flows between this and the New Zealand population. According to the 2001 NZ census there were 1 344 267 households in New Zealand on census night, implying a total of about 1 280 000 households if HNZN applicant and tenant households are excluded.

During February 2003 - June 2005, 37 481 households were placed on the list of confirmed applicants. In that same 29-month period, 13 224 households recorded as applicants were housed. The actual number of applicants housed will be larger than this because the study does not record households who applied before the start date in February 2003. The newly housed applicants that we did not see as applicants first will reduce over time. Over this period there were at least 10720 exits from the tenants and at least 14281 exits from the applicant waiting list. The cross-section of applicants on the 30th June 2005 contained 9979 households (data from February and March 2003 were excluded for reasons explained previously) and the cross section of tenants included 61 118 households (data from before June 2003 was excluded for reasons explained previously). A further group of households excluded from this analysis are those tenants not claiming an IRR, which is estimated at about 1750 (2.9% of total tenant household) in October 2004.

8.2 Repeated measurements of households

As described in Section 3.1, information is obtained from households about their circumstances at several key points:

- Applicant Needs Assessment interview
- Applicant Change of Circumstance
- Tenant Annual Income Related Rent application
- Tenant Change of Circumstance

Table 8.1 describes the number of observations obtained for each household in the study population during the first 29 months operation, ignoring the exit data. Multiple tenant or applicant observations are not shown. Of the observed households, the majority are tenants during the study period (61.3%) followed by applicants (24.5%). The next largest group is those seen going from applicant to tenant (13.3%). The study has been running long enough that a very small number of households have been through the process of applicant to tenant twice (68 households).

Figure 8.1: Graphic representation of cohort household populations and flows between them and the New Zealand population for 29 months (February 2003 - June 2005)
Note that households who move through the HNZC applicant-tenant flow-chart more than once are counted once only

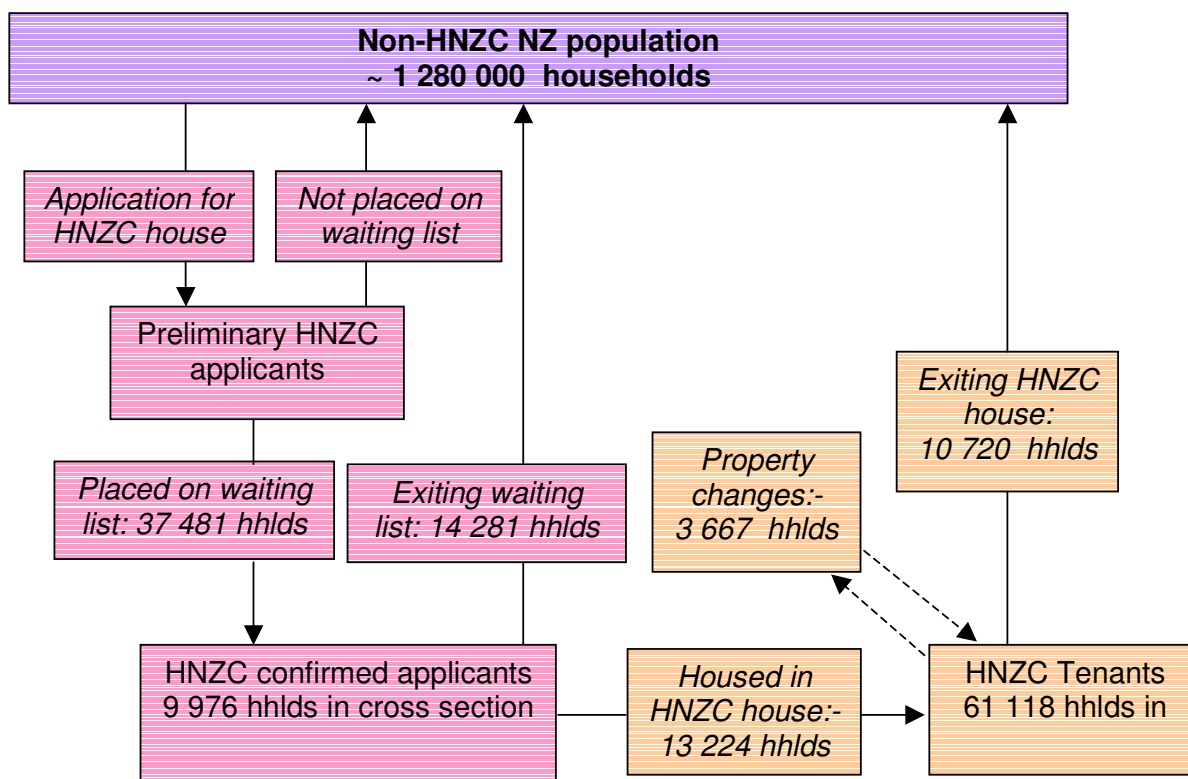


Table 8.1: Summary of applicant and tenant movement at June 2005

Group APPL = Applicant; TNNT = Tenant	Number of Households		Percent of Households	Average annual numbers
APPL	23733		24.5	9820.6
1 Observation	12597		13.0	5212.6
> 1 Observation	11136		11.5	4608.0
TNNT	59418		61.3	24586.7
1 Observation	7580		7.8	3136.5
> 1 Observation	51838		53.3	21450.2
APPL – TNNT	12880		13.3	5329.7
Changes during APPL phase	5645		5.8	2335.7
Changes during TNNT phase	7806		8.1	3230.0
TNNT – APPL	417		0.4	172.6
APPL - TNNT – APPL	107		0.1	44.3
TNNT - APPL – TNNT	273		0.3	113.0
APPL - TNNT – APPL - TNNT	68		0.0	28.1
Total	96896		100.0	40094.9

Table 8.2: Changes for households with more than one observation at June 2005

Group	Households with <i>no</i> change in variable* value		Households with an <i>increase</i> in variable* value			Households with a <i>decrease</i> in variable* value		
	Number	Percent	Number	Percent	Average Change ¹	Number	Percent	Average Change
APPL > 1 Obs								
<i>N= 11136</i>								
<i>46.9% of APPL Households</i>								
Household size	8698	78.1	1555	14.0	2.3	885	7.9	-2.5
Number of bedrooms	9559	85.8	920	8.3	1.6	657	5.9	-1.1
Crowding people/bedroom	8465	76.0	1537	13.8	0.9	1134	10.2	-1.0
Income	7059	63.4	2920	26.1	51.2	1175	10.5	-581.4
TNNT > 1 Obs								
<i>N=51838</i>								
<i>87.2% of TNNT Households</i>								
Household size	34246	66.1	8914	17.2	1.5	8876	16.7	-1.5
Number of bedrooms	49898	96.2	1275	2.5	1.3	665	1.3	-1.2
Crowding people/bedroom	33565	64.8	8888	17.1	0.5	9385	18.1	-0.5
Income	895	1.9	38802	74.8	49.2	12177	23.5	-128.7
APPL - TNNT								
<i>Changes APPL - TNNT phase</i>								
<i>N=12880</i>								
<i>100% of APPL - TNNT Households</i>								
Household size	7447	57.8	190	1.5	1.2	5243	40.7	-4.0
Number of bedrooms	4698	36.5	4862	37.8	1.4	3320	25.8	-1.8
Crowding people/bedroom	3809	29.5	1139	8.8	0.5	7932	61.6	-1.5
Income	10354	80.3	1755	13.6	41.8	771	6.0	-76.2
APPL - TNNT								
<i>Changes during APPL phase</i>								
<i>N=5645</i>								
<i>41.9% of APPL - TNNT Households</i>								
Household size	4090	72.5	1098	19.5	2.8	457	8.1	-2.3
Number of bedrooms	4667	82.7	484	8.6	1.8	494	8.7	-1.6
Crowding people/bedroom	4043	71.6	1094	19.4	1.2	508	9.0	-1.0
Income	3224	57.1	1725	30.6	45.9	696	12.3	-85.1
<i>Changes during TNNT phase</i>								
<i>N=7806</i>								
<i>58.0% of APPL - TNNT Households</i>								
Household size	5361	67.4	2056	26.3	1.4	489	6.3	-1.2
Number of bedrooms	7576	97.5	166	2.1	1.2	64	0.8	-1.0
Crowding people/bedroom	5200	66.6	2025	25.2	0.5	581	7.4	-0.5
Income	424	5.4	5315	68.1	56.5	2067	26.5	-77.3s

*Variables covered in this analysis are: household size (number of people in household), number of bedrooms, crowding level (based on people/bedroom) and household income.

Households where there were repeat observations (Table 8.1) provide us with an opportunity to investigate changes in crowding and other variables, such as income, over time.

Table 8.2 shows the subset of households from Table 8.1 where there were multiple observations. The analysis focuses on the variables of household size (number of people), number of bedrooms, crowding level (based on people/bedroom) and household income. To simplify the analysis the first and last observation for each phase (applicant or tenant phases) were used to assess the change (final observation minus initial observation).

Table 8.2 shows three main change categories across the columns. The first category is households where no change in the particular variable was observed between first and last observation. The second category is where an increase in the variable was observed across time and the last category is where a decrease occurred. For the last two categories the average change (increase or decrease) has been calculated.

The first group of households tabulated are those who remained as applicants during the study period and had more than one observation. For this group the majority had no change in the four variables of interest. Small groups showed increases or decreases on these variables.

The second group are households who were tenants for the length of the study period. The majority showed no change on the three crowding measures, but most households had an increase in income.

The third group are applicants who have been housed and they are the most important for looking at changes in crowding levels (“APPL-TNNT with Changes in APPL-TNNT phase” in the table). Over a third (40.7%) have a decrease in household size and this matches with a third of the cross section sharing with non-applicants. A similar proportion (37.8%) has an average increase in the number of bedrooms upon housing of around 1.4 bedrooms. The combination of these two changes led to 61.6% of the applicants who were housed having a reduction in crowding, as measured by people per bedroom. The average reduction was 1.45 people per bedroom (from 2.64 people per bedroom as applicants to 1.19 people per bedroom at tenants). This group is important for the investigation of one of the main hypotheses of the study, which is that a change in crowding level gives a change in disease risk.

Table 8.3 also has two further groups for comparison. The applicants who were housed were also investigated for changes during either their phase as applicants or their phase as tenants. Again most of the households did not change their crowding levels in either of these stages.

8.3 Characteristics of high and moderate priority applicants

This report contains a brief analysis of the differences between priority groups A, B, C, and D as they move through the HNZC applicant-tenant process. Table 8.3 shows the possible trajectories. The main categories consist of being an applicant for the duration of the observation period, being an applicant then getting housed, or being an applicant then exiting the waiting list. The majority of applicants (89%) fall into one of these three categories. The rest have more complex flows, with some moving through these populations more than once and others moving on and off the waiting list more than once.

For the simplest flows (89% of applicants) Table 8.4 shows the priority assigned to the applicants. The first column are the applicants who remained as applicants throughout the

observation period (includes some who had just been placed on the waiting list as well as those placed on it during the previous 28 months). The second column shows the applicants who exited the waiting list and the third shows the applicants who were housed. The final column shows the priority status of all the applicants no matter the flow or complexity of movement. For this analysis the information on each applicant's priority was taken from their first observation so any changes in priority rating are not taken into account.

The table shows that over this 29 month observation period a higher proportion of applicants were housed who were A (66.3% of the total classified as A were housed) and B priority (40.3%) compared with C (18.7%) and D (11.9%) priority. Conversely, a higher proportion of C (41.2%) and D (42.1%) priority applicants exited the waiting list than did A (18.3%) and B (30.8%). We would expect these differences to become more pronounced if these populations were followed for a longer period of time.

Table 8.3: Movement of the applicants through the various states at June 2005.

Types of Applicant Flows	Number of Households	Percent of Households	Average annual numbers
<i>Three simplest flows:</i>			
APPL	8537	22.8	3532.6
APPL - TNNT	11770	31.4	4870.3
APPL - Exit W.L.	13048	34.8	5399.1
<i>More complex flows:</i>			
APPL - with moves on and off W.L.	2148	5.7	888.8
APPL with moves on and off W.L. - TNNT	1110	3.0	459.3
APPL - TNNT - APPL with moves on and off W.L.	107	0.3	44.3
APPL-TNNT-APPL-TNNT	68	0.2	28.1
TNNT-APPL with moves on and off W.L.	417	1.1	172.3
TNNT- APPL with moves on and off W.L. - TNNT	276	0.7	114.2
Total	37481	100.0	15509.4

Table 8.4: Priority status of the applicants for the three simplest flows¹ at June 2005

Priority	APPL only		APPL - EXIT		APPL - TNNT		All APPL no matter what flow	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
A	156	1.8	340	2.6	1233	10.5	1860	5.0
B	3390	39.7	5962	45.7	7799	66.3	19352	51.6
C	3369	39.5	4862	37.2	2207	18.8	11799	31.5
D	1622	19.0	1884	14.4	531	4.5	4470	11.9
Total	8537	100.0	13048	100.0	11770	100.0	37481	100.0

¹ Note this is using the first applicant observation and does not investigate whether the priority level has changed over multiple applicant observations.

8.4 Reasons for applicants exiting the waiting list

Table 8.5 shows the reasons for the applicant exits using the HNZN codes. The majority (three quarters) of exits are recorded as an "Exit no response". This category includes applicants who had not responded to an application review request and who could not be contacted after multiple attempts to reach them using all known contact details. It also includes those applicants who did not verify their circumstances with the required documentation. In the remaining quarter of cases applicants were removed from the waiting list at the request of the applicant.

Table 8.5: Reasons for exiting for all applicant exit records¹

Exit Code	Reason	Number of Households	Percentage of Households	Annually Rate
XHN	Exit no response	10225	72.0	4231.0
XAC	Appl cancelled by customer	3806	26.7	1574.9
XHI	Ineligible income/assets	164	1.2	67.8
XCM	Exit to Case Management	7	0.1	2.9
XHR	Ineligible residency	4	0.0	1.6
Total		14026	100.0	5803.9

¹ If there was more than one exit per household only the first exit was considered for this analysis.

9 Hospitalisations in *housing applicants* and *tenants*

This section provides an analysis of hospitalisations in the cohort of *housing applicants* and *housing tenants* compared with New Zealanders not identified as members of the cohort population (*other NZ*). The first part of this section describes the effects of different approaches used to filter the hospitalisation data before more detailed analysis (as described in the methods section). The second part presents the results of the analysis of these filtered data.

9.1 Analytical steps in interpreting hospitalisation data

9.1.1 Removing non-hospitalisations and overseas visitors

This initial filtering (Table 9.1) removes events that have been entered for administrative reasons and therefore do not reflect disease events in the subject population. Overseas visitors are also removed as they are not part of the denominator population. This step takes out about 11% of events in the *cohort* (applicant and tenant) population.

Table 9.1: ‘Non-hospitalisation’ events filtered out of hospitalisation data, May 2003 to June 2005

Event type	Cohort population		Other NZ Population	
	Average annual numbers	Percent (%)	Average annual numbers	Percent (%)
Transfers	3636.5	4.46	47046.0	6.26
Boarders	493.4	0.61	3948.0	0.53
Cancelled operations	595.8	0.73	5261.1	0.70
Well babies	2549.5	3.13	35461.4	4.72
Error DRGs	165.2	0.20	1215.2	0.16
Overseas patients	1694.8	2.08	18381.7	2.45
Remainder	72587.1	89.01	642145.8	85.44
Total	81545.5	100.22	751536.9	100.26

Total adds up to >100% because some events are removed for more than one reason

9.1.2 Selecting admission types

Most analyses of hospitalisation data need to focus on specific types of hospital admission as described in the methods section. This section divides hospital events into the following categories:

- Acute admissions, being unplanned admission on the day of presentation at the healthcare facility. These can be divided into:
 - Emergency Department. (ED) admissions being acute cases seen in the emergency department and sent home on the same day

- Other acute admissions
- Arranged admissions, being planned admission <7days after the decision was made that the admission was necessary
- Waiting list admissions, being planned admissions with an admission date 7 days or more from assessment,
- Other admissions included elective admission to private hospitals and psychiatric patients returning from leave after >10 days

The distribution of hospitalisations according to these categories is show in Table 9.2. As these data show, about 56% of *cohort* admissions are recorded as acute. Specific groups of acute admissions include emergency department acute admissions (7.0% of total admissions in *cohort* population), and day acute admissions (14.0%). Arranged admissions also include both day cases and overnight admissions in about equal proportions.

Table 9.2: Hospitalisations classified according to admission types, May 2003 to June 2005 (Filtered to exclude non hospitalisations and overseas cases)

Classification by admission type	Cohort population		Other NZ population	
	Average annual numbers	Percent (%)	Average annual numbers	Percent (%)
ED Acute admissions	5083.4	7.0	33336.0	5.2
Other Acute admission	35928.9	49.5	311742.9	48.5
Arranged admission	20069.5	27.6	154637.5	24.1
Waiting list admission	11485.4	15.8	142146.5	22.1
Other admission	19.8	0.0	282.9	0.0
Total	72587.1	100	642145.8	100
Day acute	10137.7	14.0	76317.7	11.9
Other acute	30797.1	42.4	268107.2	41.8
Day arranged	10441.8	14.4	71009.5	11.1
Other arranged	9627.7	13.3	83628.0	13.0

The use of these categories does not appear consistent across DHBs as shown for the *cohort* population in Figure 9.1 (and Table 12.2 in the appendix) and for the *other* NZ population in Figure 9.2(and

Table 12.3 in the appendix). In particular, district health boards (DHB) in the northern half of the North Island as well as Whanganui and Otago tend to record emergency department cases in the NMDS whereas other DHB do not. Other categories, such as arranged and waiting list admissions, also make up variable proportions of recorded hospitalisations for different DHB. The implications of including or excluding these different categories of hospitalisations will be explored further using a sensitivity analysis of the study findings.

The majority of the analyses reported here will include acute and arranged admissions on the basis that these admissions correspond in time to disease or injury onset or exacerbation. Waiting list events, on the other hand, are considered to be more strongly influenced by health service factors so are excluded from the main analyses.

Figure 9.1: Distribution of admission types across DHBs for *cohort* population (applicants and tenants), May 2003 to June 2005

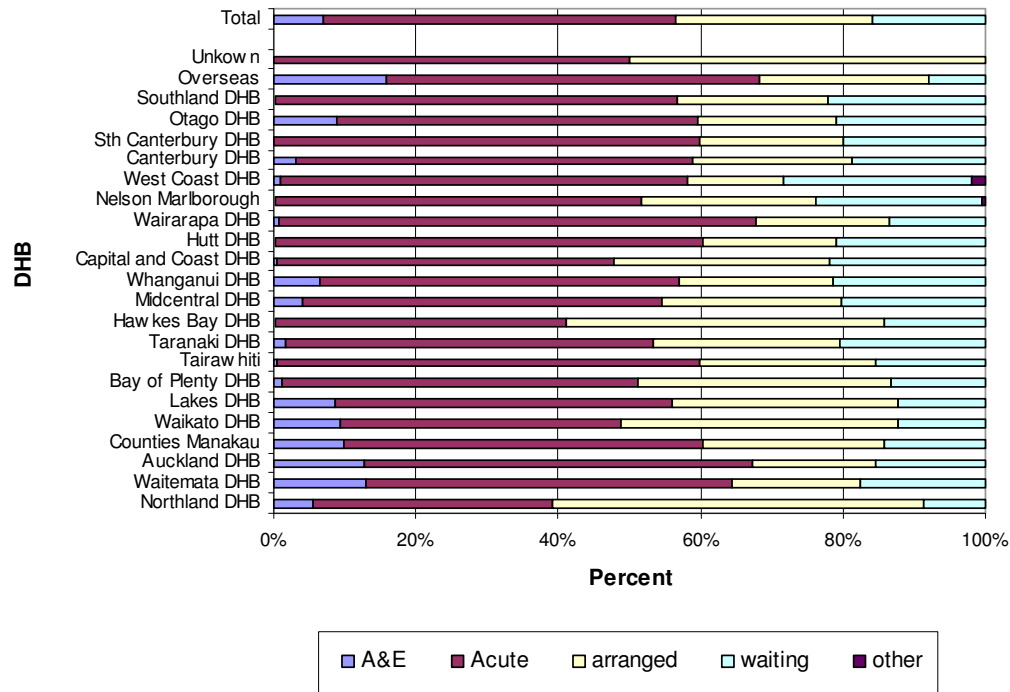
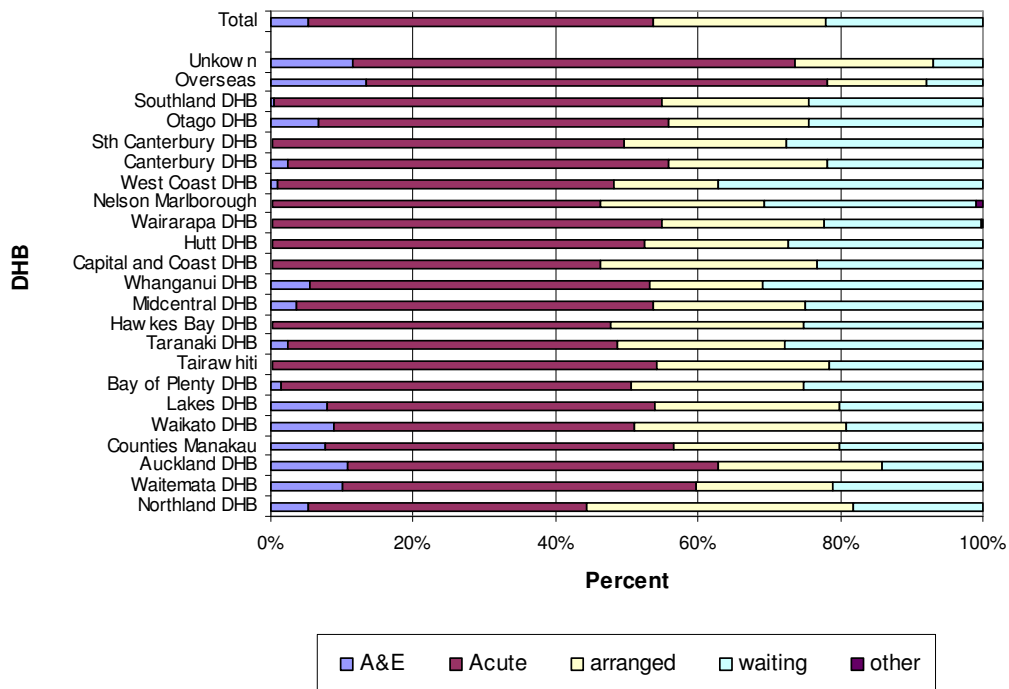


Figure 9.2: Distribution of admission types across DHBs for *other NZ* population, May 2003 to June 2005



9.1.3 Select whether to include principal and additional diagnosis

Patients may be discharged with up to 20 diagnostic codes recorded. As Table 9.3 shows, about three quarters of patients are discharged with a principal and one or more additional diagnoses. There are circumstances where it is useful to count a condition when the clinical code appears as an additional diagnosis as well as the principal diagnosis. The analysis reported here will use only the principal diagnosis.

Table 9.3: Number of diagnostic codes recorded for hospitalised cases, May 2003 to June 2005 (Filtered to exclude non hospitalisations, overseas visitors and waiting list admissions)

Number of diagnostic codes	Cohort population		Other NZ population	
	Average annual numbers	(%)	Average annual numbers	(%)
1	16121.5	22.2	221244.5	29.4
2	21389.1	29.5	198708.9	26.4
3	13284.5	18.3	116499.2	15.5
4	7267.4	10.0	70618.2	9.4
5	4674.5	6.4	45617.1	6.1
6	3076.2	4.2	30199.4	4.0
7	2082.5	2.9	20734.6	2.8
8	1432.6	2.0	14175.2	1.9
9	982.2	1.4	9927.7	1.3
10+	2276.8	3.1	23699.1	3.2
Total	72587.1	100	751423.8	100

9.1.4 Selecting and removing irrelevant hospitalisations

Table 9.4 shows conditions that could be excluded from some analyses. These include *same-day* diagnostic procedures and *same-day* treatment of chronic conditions, which account for 9.7 % of the hospitalisation events (of the acute and arranged admission in the *cohort* population). A further 18.4% of maternity and 2.2% perinatal events and 1.5% of disability support service (DSS) admissions could also be removed. These excluded events are collectively called *irrelevant conditions* for the purpose of this research.

Table 9.4: Selected irrelevant conditions, May 2003 to June 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions)

Classification by functional group	Cohort population		Other NZ population	
	Average annual numbers	Percent (%)	Average annual numbers	Percent (%)
'Same day' diagnostic procedures				
• Colposcopies	0.5	0.00	28.6	0.01
• Cystoscopies	7.4	0.01	180.0	0.04
• ERCPs	12.0	0.02	238.6	0.05
• Colonoscopies	25.8	0.04	455.5	0.09
• Gastrosopies	18.5	0.03	397.8	0.08
• Bronchoscopies	67.4	0.11	723.7	0.14
• Overnight sleep apnoea testing	98.3	0.16	609.2	0.12
Total	229.8	0.4	2633.5	0.5
'Same day' treatment of chronic conditions				
• Renal dialysis	5088.5	8.33	15714.5	3.15
• Chemotherapy and radiotherapy	332.8	0.54	4804.6	0.96
• Lithotripsy	0.5	0.00	9.7	0.00
• Blood transfusions	265.4	0.43	5575.8	1.12
• Transplant (Liver, Heart, Lung, Multiple Organs, Bone marrow)	6.5	0.01	46.6	0.01
Total	5693.5	9.3	26151.2	5.2
Maternity care	11211.7	18.36	71954.8	14.40
Perinatal care	1231.4	2.02	15247.4	3.05
Disability support service (DSS) – including admissions for respite care	896.8	1.47	12559.8	2.51
Remainder	41824.6	68.48	371222.8	74.31
Total	61076.8	100.00	499583.5	100.00

9.1.5 Select whether to include repeat admissions

Table 9.5 shows the frequency of hospitalisations in this cohort during the 26-month observation period. As this analysis demonstrates, about 20.3% of the cohort population were recorded as being admitted to hospital during their time in the cohort (already filtered to exclude non hospitalisations, overseas visitors and waiting list admissions and irrelevant conditions). A significant minority of cohort members (7.1 %) had 2 or more hospitalisations recorded. Some of these admissions would have been readmissions for continuing treatment of the same disease or injury episode. The following analysis (Table 9.6) explores the effect of using different readmission filters. These filters range from narrow readmission exclusions (e.g. same 3-character principal clinical code within one month) to wide exclusions (e.g. same principal or additional clinical code within 12 months).

Most of the analyses reported here will use a one-month filter based on the same individual (NHI number) readmitted with the same 3-character ICD.10 diagnostic code recorded as the

principal diagnosis. This filter is chosen on the basis that a high proportion of such events represent continuing treatment of the same disease or injury episode. These admissions are therefore strongly influenced by factors such as the initial severity of the illness or injury, the method and effectiveness of treatment, and patient compliance and response. These factors have little relationship to the research hypotheses under investigation.

Table 9.5: Frequency of admissions, June 2003 to May 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions and irrelevant conditions)

Hospitalisation count	<i>Cohort</i> population		<i>Other NZ</i> population	
	Number	(%)	Number	(%)
0	192264	79.7	3002741	85.90
1	31911	13.2	343875	9.84
2	9123	3.8	86067	2.46
3	3523	1.5	30540	0.87
4	1734	0.7	13663	0.39
5	875	0.4	7013	0.20
6	557	0.2	3945	0.11
7	360	0.1	2399	0.07
8	243	0.1	1464	0.04
9	174	0.1	984	0.03
10+	608	0.3	2962	0.08
Total	241372	100.0	3495653	100.00

Table 9.6: Proportion of hospitalisations excluded by different readmission filters, May 2003 to June 2005 (filtered to exclude non hospitalisations, overseas visitors and waiting list admissions and irrelevant conditions)

Filter codes	Interval	<i>Cohort</i> population		<i>Other NZ</i> population	
		Average annual Number excluded	% of Total events	Average annual Number excluded	% of Total events
Same code as principal clinical code	Within 1 month	3279.7	7.8	27860.3	7.5
Same code as principal clinical code	Within 3 months	5050.2	12.1	39309.7	10.6
Same code as principal clinical code	Within 12 months	7023.2	16.8	51400.6	13.8
Same code as principal or additional clinical code	Within 1 month	9444.0	22.6	75853.4	20.4
Same code as principal or additional clinical code	Within 3 months	12414.5	29.7	97003.4	26.1
Same code as principal or additional clinical code	Within 12 months	15790.6	37.8	120762.0	32.5

9.1.6 Select conditions of interest

The next section (9.2) presents results for a range of conditions of interest.

9.1.7 Calculate disease rates – Duration of time in cohort

The first step in this process is to calculate the duration of person-time in the cohort. The analyses in this section record the person time subjects contribute as applicants or tenants over the observation period (June 2003 to May 2005). Subjects can only be contributing to the study (i.e. recorded as having a hospitalisation or adding person time to the study denominator) while they are known to be a *housing applicant* or *housing tenant*.

Encrypted NHI numbers were used to identify unique individuals. As expected, this analysis identified many individuals with multiple inclusions in HNZN datasets corresponding to being applicants and tenants. In a relatively small proportion (14.1%), these periods overlapped. These situations are summarised in Table 9.7.

Some of these patterns have implications for how the events and person-time are treated, as described below:

- The person was recorded as a *housing applicant* then became a tenant while still being recorded as an applicant (#1). Time as a tenant retained, but time as an applicant removed while any overlap occurred.
- The person was recorded as a tenant then became a *housing applicant* while still being recorded as a tenant (#2). Time as a tenant retained, but time as an applicant removed while any overlap occurred.
- The person was included in two applications at the same time (#3a). Second application was assumed to supersede first which was exited at the time the second application was made.
 - A subset of these overlapping applications are those with the same start date (#3b). Because it is difficult to know which application to assign the person to, these subjects are excluded.
- The person was included in three or more applications at the same time (#4). These subjects are excluded from the study because of the high level of uncertainty around which household to assign them to.
- The person was included in two tenancies at the same time (#5a). The second tenancy was assumed to supersede the first, which was exited at the time the second tenancy, started.
 - A subset of these overlapping tenancies are those with the same start and finish date (#5b). Because it is difficult to know which tenancy to assign the person to, these subjects are excluded.
 - A further subset of these overlapping tenancies are those where one is included within the other i.e. the second one has a later start date and an earlier finish date than the other (#5c). Because it is difficult to know which tenancy to assign the person to, these subjects are excluded.
- The person was simultaneously included in three or more tenancies(#6). These subjects are excluded from the study because of the high level of uncertainty around which household to assign them to.

- The person was simultaneously included in a mix of multiple applications and tenancies (#7). These subjects are excluded from the study because of the high level of uncertainty around which household to assign them to.

Collectively, these exclusions resulted in the loss of 6.7% of individuals recorded in the cohort population (Table 9.7). It is likely that at least some of these apparent overlaps are caused by the care of shared custody children who may be recorded as members of two different households simultaneously. This filtering removed 12.5% of shared custody children, 7.0% of other children and 6.1% of adults.

Table 9.7: Number of individuals in cohort with overlapping time spent as *housing applicants* and *tenants*, May 2003 to June 2005 (based on total HNZC data)

Category of overlap	Shared Custody Children (<7 days)		Other Children		Adults		Total Number	%
	Number	%	Number	%	Number	%		
No overlap	7725	72.6	96211	86.3	116553	86.7	220489	85.9
• Tenant once	5876	55.2	59053	53.0	78447	58.3	143376	55.9
• Tenant more times without overlap	91	0.9	1587	1.4	1458	1.1	3136	1.2
• Applicant once	882	8.3	18292	16.4	20947	15.6	40121	15.6
• Applicant more times without overlap	107	1.0	2540	2.3	2589	1.9	5236	2.0
• Applicant + tenant without overlap	496	4.7	11364	10.2	10358	7.7	22218	8.7
• Applicant + tenant (more than 3)	196	1.8	2580	2.3	2088	1.6	4864	1.9
• Tenant + applicant without overlap	35	0.3	328	0.3	314	0.2	677	0.3
• Tenant + applicant (more than 3)	42	0.4	467	0.4	352	0.3	861	0.3
Overlap	2913	27.4	15267	13.7	17951	13.3	36131	14.1
• Applicant then tenant (#1)	149	1.4	478	0.4	522	0.4	1149	0.4
• Tenant then applicant (#2)	183	1.7	2348	2.1	2250	1.7	4781	1.9
• 2 applications at same time (#3a)	13	0.1	210	0.2	192	0.1	415	0.2
• 2 applications at same time with same start date (#3b)*	3	0.0	166	0.1	159	0.1	328	0.1
• 3+ applications at same time (#4)*	8	0.1	58	0.1	57	0.0	123	0.0
• 2 tenancies at same time (#5a)	1238	11.6	4473	4.0	6835	5.1	12546	4.9
• 2 tenancies at same time, same start and finish dates (#5b)*	391	3.7	2814	2.5	3109	2.3	6314	2.5
• 2 tenancies at same time, one included in other (#5c)*	187	1.8	361	0.3	519	0.4	1067	0.4
• Three or more tenancies at same time (#6)*	372	3.5	1046	0.9	1297	1.0	2715	1.1
• Multiple overlaps (#7)*	369	3.5	3313	3.0	3011	2.2	6693	2.6
Total	10638	100.0	111478	100.0	134504	100.0	256620	100.0

*Indicates categories excluded from the analysis

After applying these data editing principles, the duration of time in the cohort was subsequently analysed, with results shown in Table 9.8. As these data show, the mean duration of time as an applicant was 229 days, and as a tenant was 639 days during this 26 months (total 792 days) observation period (from June 2003 to May 2005).

Table 9.8: Summary statistics for duration of time in cohort, May 2003 to June 2005 (with adjustment for applicants and tenants with overlapping periods)

Summary Statistics	<i>Applicants</i>	<i>Tenants</i>	Total
N	75159	192527	238271
Mean	229.3	638.7	587.6
Min	1	1	1
Lower Quartile	70	489	364
Median	151	792	792
Upper Quartile	330	792	792
Max	792	792	792

9.2 Characteristics of hospitalisations

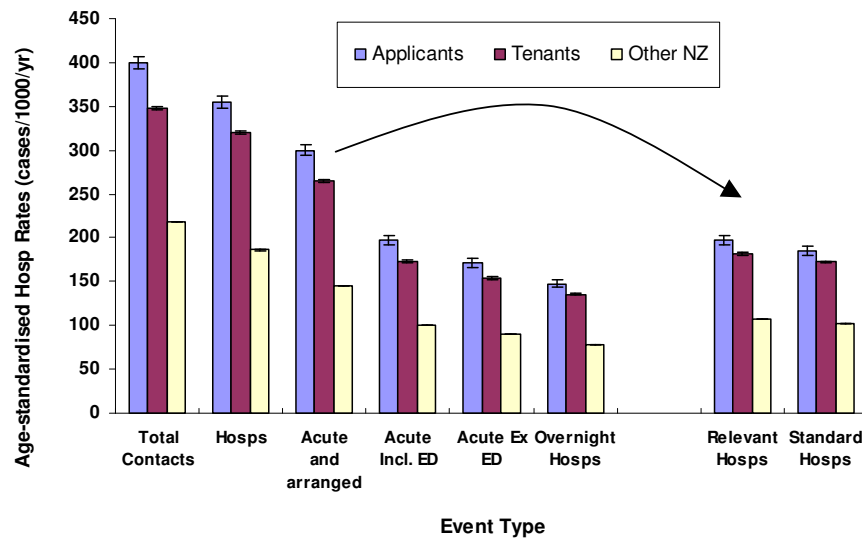
9.2.1 Hospitalisation rates in *housing applicants, tenants and other NZ population*

The following graph (Figure 9.3) and tables in the appendix (Table 12.4, Table 12.5) show hospitalisation numbers and rates for *housing applicants, housing tenants* and the *other NZ population* based on different categories of hospitalisation and filtering approaches.

- Total Contacts = Total hospital contacts recorded in NMDS dataset
- Hosps = Hospitalisations, being total contacts minus non-hospitalisations and overseas visitors
- Acute and Arranged = Hospitalisations minus waiting list cases
- Acute = Hospitalisations minus arranged and waiting list cases
- Acute Ex ED = Acute hospitalisations minus emergency department cases
- Overnight Hosps = Acute hospitalisations minus day cases
- Relevant Hosps = Acute and arranged hospitalisations minus ‘irrelevant hospitalisations’ (see list of irrelevant conditions Table 9.4)
- Standard Hosps = Relevant Hosps excluding one-month readmissions (those readmitted with the same 3-character ICD.10 principal diagnosis within one month)

This analysis confirms that the *cohort* population (applicants and tenants) have markedly higher rates of hospital contact for all categories of event than the *other NZ population*. Similarly, *housing applicants* have higher hospitalisation rates than *housing tenants* for all categories of hospitalisation.

Figure 9.3: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, compared with the *other NZ* population, according to major admission categories, May 2003 to June 2005



The subsequent analyses in this section will focus on analysis based on the ‘standard hosps’ population shown in (Figure 9.3) which has the following characteristics:

- Based on principal diagnosis.
- Excludes non-hospitalisations and overseas visitors (~11% of events) – See description in previous section (Table 9.1), for these events.
- Excludes waiting list cases (~16% of remaining events) – This category of event strongly reflects availability of hospital services.
- Excludes ‘irrelevant conditions’ (~32% of remaining events) – This category included events that are determined by patterns of child-bearing (maternity and perinatal events) and by access and use of specific day-patient diagnostic and treatment services (particularly renal dialysis).
- Excludes readmissions within one month (~5% of remaining events) - Most of these events reflect continuing care of the same incident episode of illness or injury. They are likely to be strongly influenced by health service factors and patient compliance.
- This leaves 50% of total hospital events in the cohort population (see Table 12.4 and Table 12.5 for exact numbers).

In addition, this analysis also excludes a proportion of subjects, being

- Those HNZC applicants and tenants who could not be matched with an NHI number (~8%). See section 4.3.1.
- Subjects whose time in the cohort could not be accurately assigned to specific applicant or tenant households (~7% of total subjects). See section 9.1.7.

This analysis will work through the following sequence:

- Characteristics of those hospitalised.
- Comparison of age-standardised rates of hospitalisation among *housing applicants*, *housing tenants* and the *other NZ* population.

- Analysed by major ICD.10 chapters.
 - Analysed by selected diseases.
- Comparison of age-ethnicity standardised rates of hospitalisation among *housing applicants*, *housing tenants* and *other NZ* population.
 - Analysed by major ICD.10 chapters.
 - Analysed by selected diseases.
- Hospitalisation rates according to time as a HNZN tenant
 - Comparison of *housing applicants* (who will later become tenants) with *housing tenants* during their first year as tenants.
 - Comparison of *housing applicants* with *housing tenants* who have been re-housed for varying lengths of time for selected diseases.
- Sensitivity analysis to test the effects of different assumptions.
 - Restricting analysis to overnight admissions.

9.2.2 Characteristics of those hospitalised

This section reports on hospitalisation rates of *housing applicants*, *housing tenants* and the *other NZ* population, according to person, place and time characteristics. The main focus of this analysis has been on hospitalisations identified by applying the ‘standard’ filter (removes overseas, non-hospitalisations, waiting list cases, irrelevant conditions, and those readmitted within one-month with the same condition).

- These results are shown graphically by age (Figure 9.4), sex (Figure 9.5) and ethnicity (Figure 9.6).
- An indication of socio-economic position of individual households can be obtained from their equivalised income (Figure 9.7). HNZN provides the Statistical Area Unit (SAU codes) of their properties. This SAU code can be used to assign a deprivation level (NZDep2001⁴) to each area which provides an indication of the socioeconomic position of the neighbourhood (Figure 9.8). Hospitalisation rates can be calculated according to the deprivation level (Figure 9.9).
- HNZN provides HNZN region codes with its data. The SAU codes allow the urban-rural distribution of *housing tenants* to be assigned (Figure 9.10) and hospitalisation rates calculated according to urban-rural classification (Figure 9.11).
- This analysis has also looked at hospitalisation rates according to year and season (Figure 9.13).
- Results are also tabulated in the appendix (Table 12.7 to Table 12.14)
- This analysis has also been carried out for total hospital contacts, as a comparison with the filtered results (Table 12.6).

This analysis shows the following:

- The *cohort* population (applicants and tenants) have significantly higher hospitalisation rates than the *other NZ* population for all age groups, and for males and females. They also have higher rates for European, Maori and Pacific people. However, this is not the case for those of “Other ethnicity” and “Not Stated” ethnicity. Rates for these populations have been distorted because of the way in which ethnicity information is gathered for these groups (see 4.4.2). One consequence is that the denominator population used to calculate the rates

⁴ [http://www.moh.govt.nz/moh.nsf/Files/CAU-deprivation-2001/\\$file/CAU_deprivation_2001.txt](http://www.moh.govt.nz/moh.nsf/Files/CAU-deprivation-2001/$file/CAU_deprivation_2001.txt)

for those of “Other ethnicity”, in the *other NZ* population is artificially small, resulting in the excessively high rate calculated for this population (Figure 9.6).

- *Housing applicants* had a higher overall hospitalisation rate than *housing tenants*. This relationship also applied for most age groups (except for children 5-9 years and those aged 60+), for males and females, and for European, Maori and Pacific people. Amongst those of Asian ethnicity, hospitalisation rates appeared highest among *housing tenants*.
- Surprisingly, hospitalisation rates were significantly higher for the highest income quintile of *housing applicants* and lowest for the lowest income quintile. By contrast, there was a slight negative gradient for *housing tenants* with higher income associated with a lower hospitalisation rate.
- Similarly, there was a modest increase in hospitalisation rates for *housing tenants* living in the most deprived neighbourhoods where these properties are concentrated (42% are in NZDep 2001 category 10). Rates for NZDep 1 and 2 are based on very small numbers.
- There are significant regional differences in hospitalisation rates for both *housing applicants* and *housing tenants*. Hospitalisations rates are particularly high for *housing applicants* in the Northern HNZN region.
- A disproportionate number of HNZN properties are in urban areas (particularly main urban areas) compared with rural areas. Hospitalisations rates are lower for those in satellite urban areas, and non-significantly higher in rural areas.
- Hospitalisations follow a familiar seasonal pattern with higher rates in winter, particularly for *housing applicants*.

Figure 9.4: Annual hospitalisation rates in *housing applicants* and *housing tenants*, compared with the *other NZ* population, by age group, May 2003 to June 2005

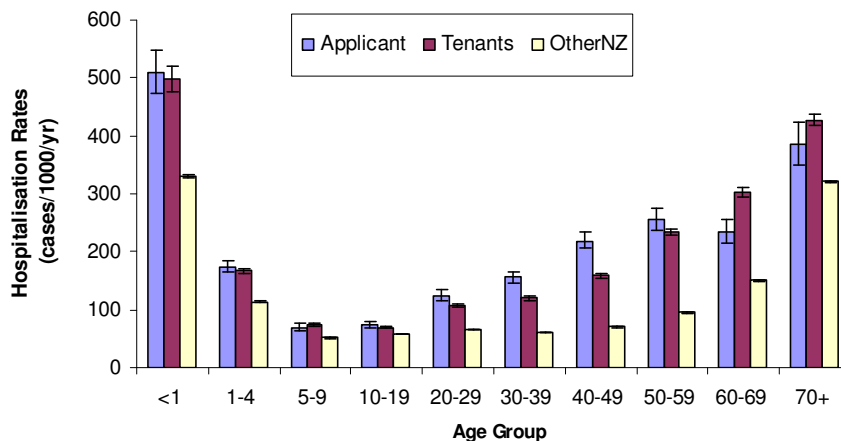


Figure 9.5: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, compared with the *other NZ* population, by sex, May 2003 to June 2005

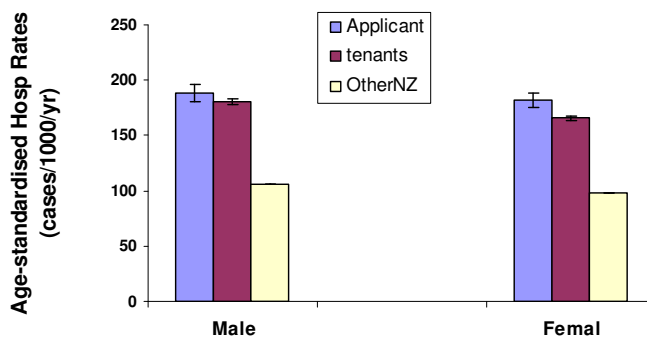


Figure 9.6: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, compared with the *other NZ* population, by ethnic group, May 2003 to June 2005

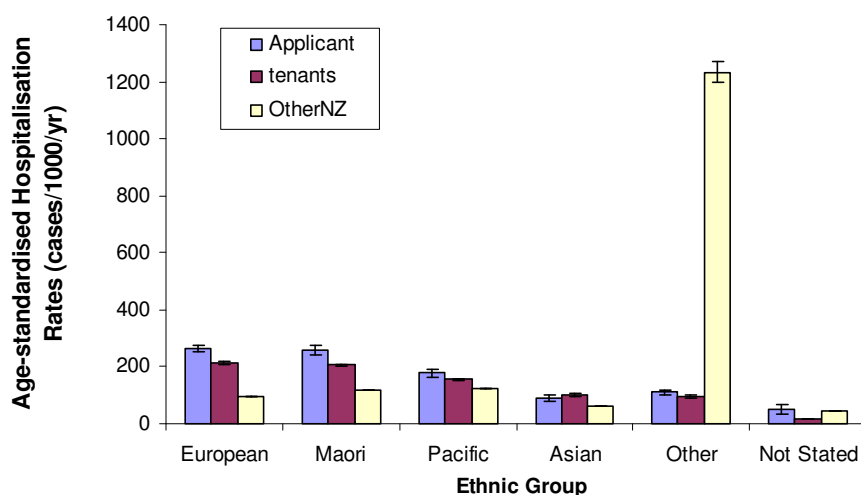


Figure 9.7: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, by equivalised income (exclude >\$5000), May 2003 to June 2005

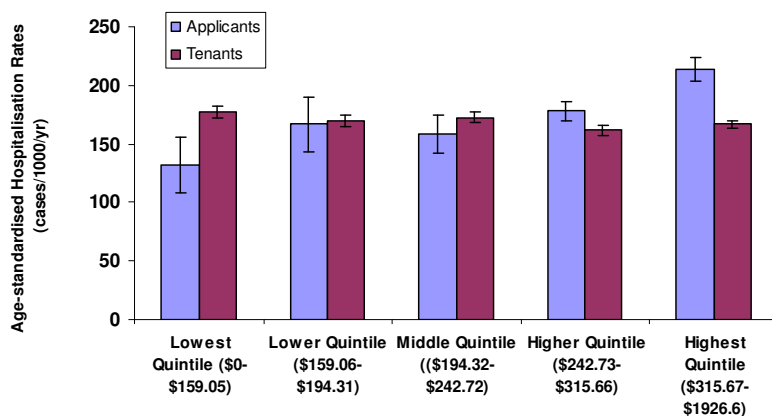


Figure 9.8: Distribution of HNZC properties according to NZDep2001 classification of their neighbourhood (SAU), May 2003 to June 2005

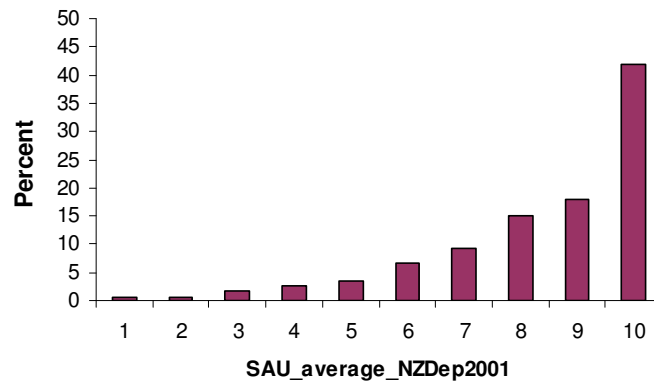


Figure 9.9: Annual age-standardised hospitalisation rates in *housing tenants*, by SAU average NZDep2001, May 2003 to June 2005

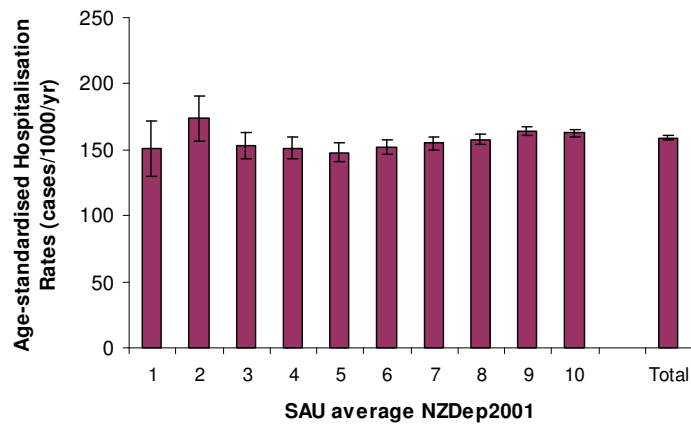


Figure 9.10: Distribution of *housing tenants*, compared with total New Zealand residents, by urban-rural categories, May 2003 to June 2005

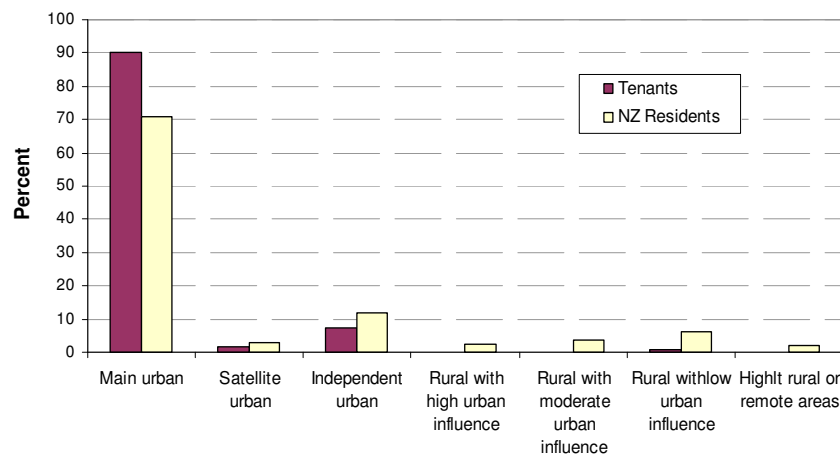


Figure 9.11: Annual age-standardised hospitalisation rates in *housing tenants* according to urban-rural category, May 2003 to June 2005

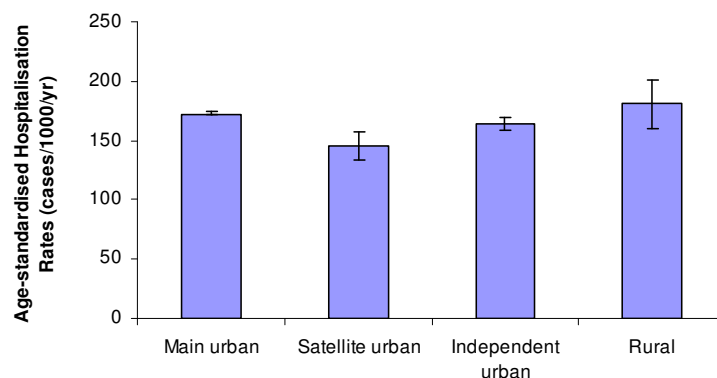


Figure 9.12: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, by HNZC region, May 2003 to June 2005

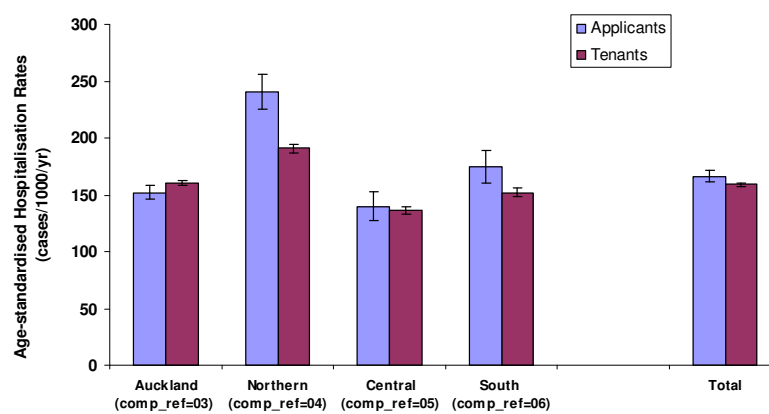
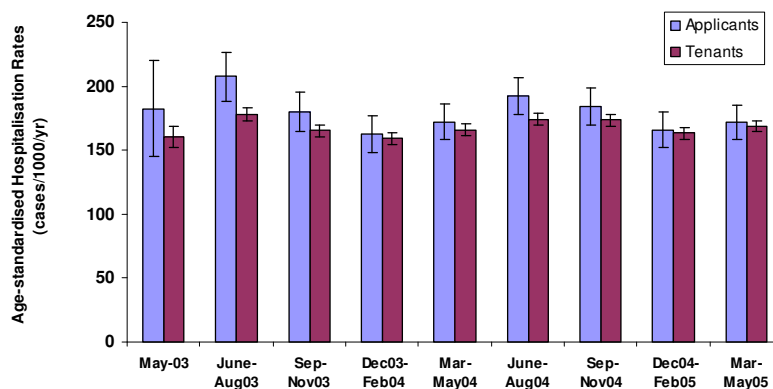


Figure 9.13: Annual age-standardised hospitalisation rates in *housing applicants* and *housing tenants*, by seasons, May 2003 to June 2005



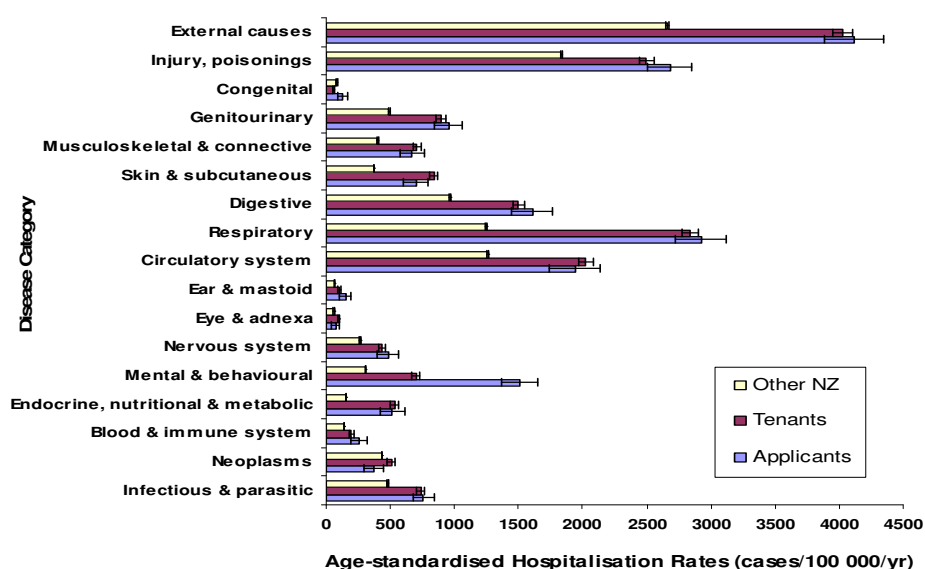
9.2.3 Comparison of hospitalisation rates by major disease categories

This section presents an analysis of hospitalisations according to the major ICD.10 category of their principal diagnosis. Hospitalisation rates were calculated and age-standardised to the population structure of NZ at the time of the 2001 census. These analyses again used the standard filter (based on principal diagnosis with exclusion of non-hospitalisations, overseas visitors, waiting-list admissions, irrelevant conditions and one-month readmissions).

These results are presented in graphical and tabular form.

- Age-standardised disease rates according to broad ICD.10 categories (Figure 9.14)
- A comparison of hospitalisation rates in the *cohort* population compared with the *other NZ* population (Figure 9.15, Table 12.15).
- A comparison of hospitalisation rates in *housing applicants* compared with *housing tenants* (Figure 9.16, Table 12.16).

Figure 9.14: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with the *other NZ* population, according to major disease categories, May 2003 to June 2005



These comparisons (Figure 9.15) show that the *cohort* population (*housing applicants* and *tenants* combined) have significantly higher hospitalisation rates than the *other NZ* population for all major disease categories except congenital diseases. By contrast, hospitalisation rates for *housing applicants* and *housing tenants* were similar for major disease categories (Figure 9.16) except for *mental and behavioural disorders*, *diseases of the ear and mastoid* and *congenital conditions* where *housing applicants* had significantly higher rates of hospitalisation than *housing tenants*. There were also disease categories where *housing applicants* had significantly lower hospitalisation rates than *tenants*, notably for *neoplasms* and *skin and subcutaneous diseases*.

Figure 9.15: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to major disease categories, May 2003 to June 2005

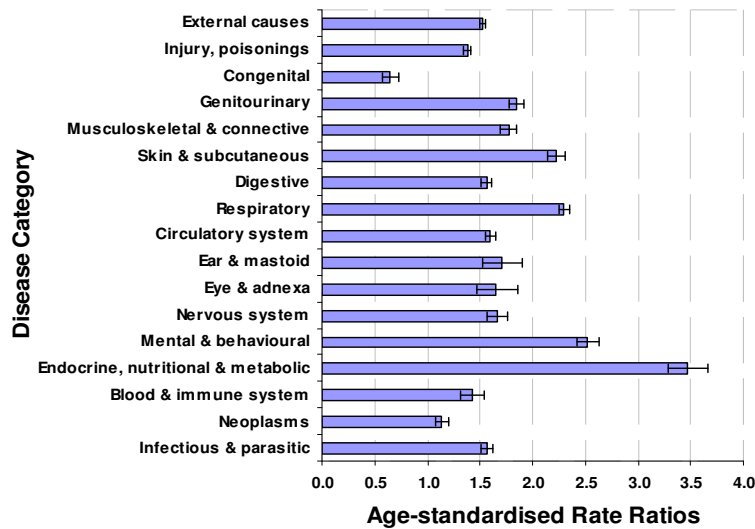
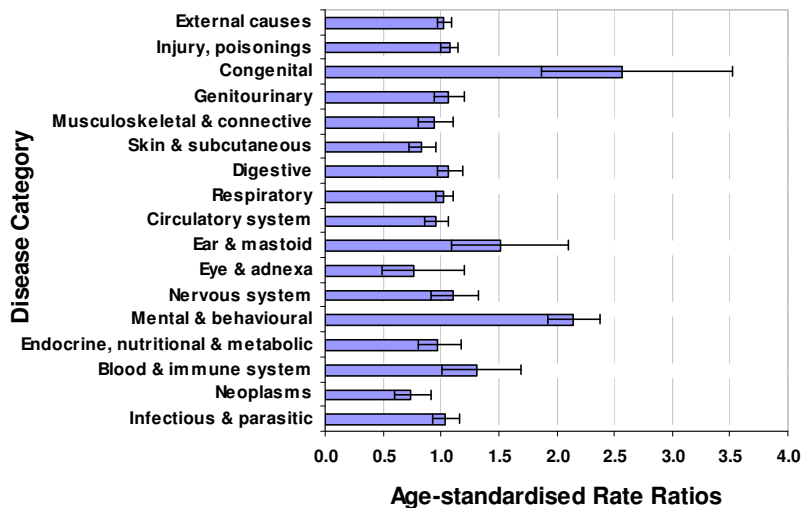


Figure 9.16: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to major disease categories, May 2003 to June 2005



9.2.4 Comparison of hospitalisation rates by selected diseases

This section presents an analysis of hospitalisations according to selected diseases, based on their principal diagnosis. Hospitalisation rates were calculated and age-standardised to the population structure of NZ at the time of the 2001 census. These analyses again used the standard filter (based on principal diagnosis with exclusion of non-hospitalisations, overseas visitors, waiting-list admissions, irrelevant conditions and one-month readmissions).

These results are again presented in graphical and tabular form.

- A comparison of hospitalisation rates in the *cohort* population compared with the *other NZ* population (Table 12.17).
- A comparison of hospitalisation rates in *housing applicants* compared with *housing tenants* (Table 12.18)
- Graphical presentation of disease rates and relative risks based on functional groupings of diseases.

Infectious diseases

The following figures show age-standardised rates of hospitalisation for important infectious diseases and groups of diseases.

- The first figure (Figure 9.17) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population.
- The second figure (Figure 9.18) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.22) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- Some of these diseases are uncommon causes of hospitalisation in New Zealand, so it is hard to draw conclusions from the data presented here (notably hepatitis A, hepatitis B, mumps).
- For most of the specific infectious diseases and groups of diseases analysed, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. The only exceptions were *pertussis*, which had the same rates in both, and the category of *other viral infection of skin and membranes*, which had a non-significantly higher rate in the *cohort* population. Diseases which seemed particularly concentrated in the *cohort* population were *tuberculosis*, *hepatitis A* and *Hepatitis B* where rates were >3 times higher than in the *other NZ* population.
- When comparing rates between *housing applicants* and *housing tenants*, rates were fairly similar. There was a lower rate of *other septicaemia* in the *housing applicants* though this was statistically marginal.

Figure 9.17: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected infectious diseases, May 2003 to June 2005

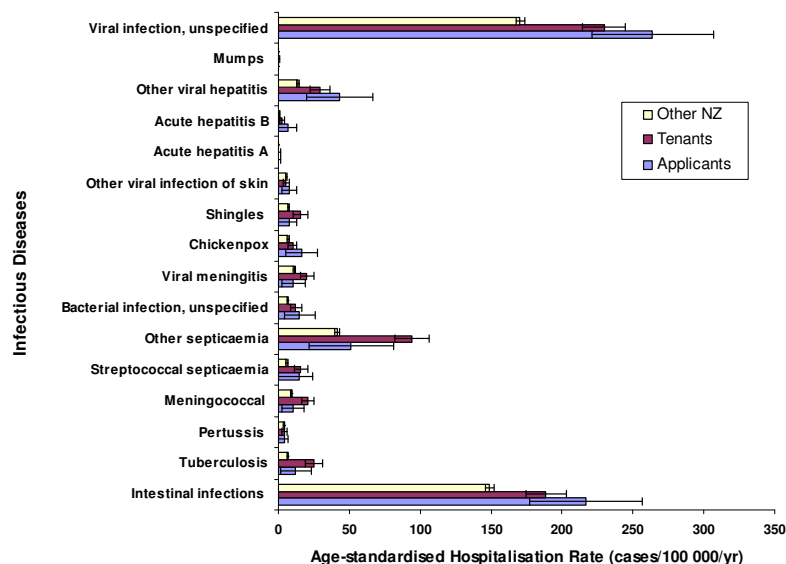


Figure 9.18: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to selected infectious diseases, May 2003 to June 2005

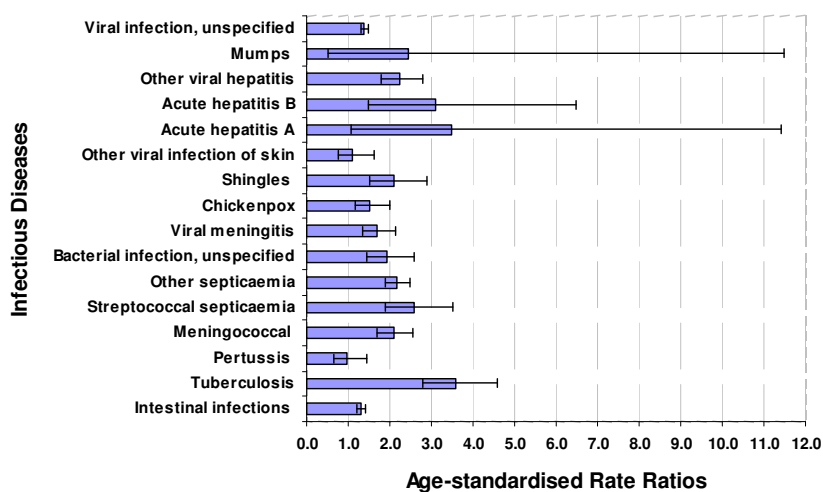
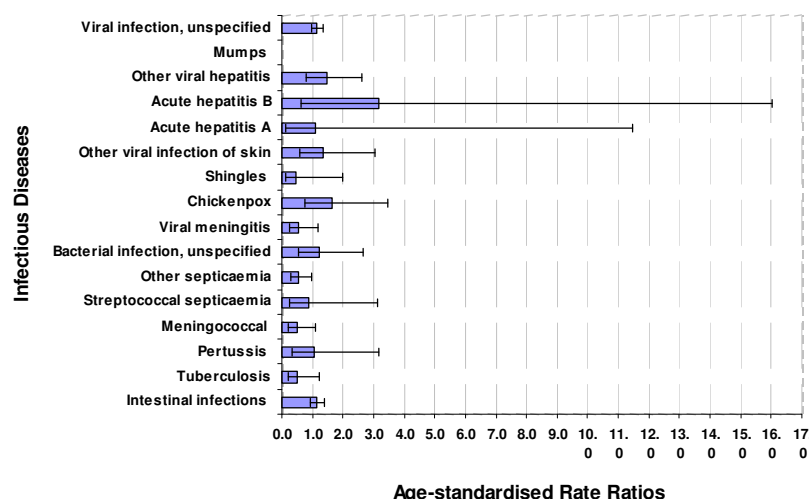


Figure 9.19: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to selected infectious diseases, May 2003 to June 2005



Respiratory infections and asthma

The following figures show age-standardised rates of hospitalisation for important respiratory infections and asthma.

- The first figure (Figure 9.20) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population.
- The second figure (Figure 9.21) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.22) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- For almost all of these respiratory diseases, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. The only exception was *acute laryngitis, tracheitis and epiglottitis*, which had a non-significantly higher rate. Diseases which seemed particularly concentrated in the *cohort* population were *bronchitis* and *other chronic obstructive pulmonary disease* where rates were >3 times higher than in the *other NZ* population.
- When comparing rates between *housing applicants* and *housing tenants*, rates were fairly similar except for four diseases where rates were significantly higher: *acute pharyngitis, acute bronchitis, acute bronchiolitis, and asthma*.

Figure 9.20: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected respiratory diseases, May 2003 to June 2005

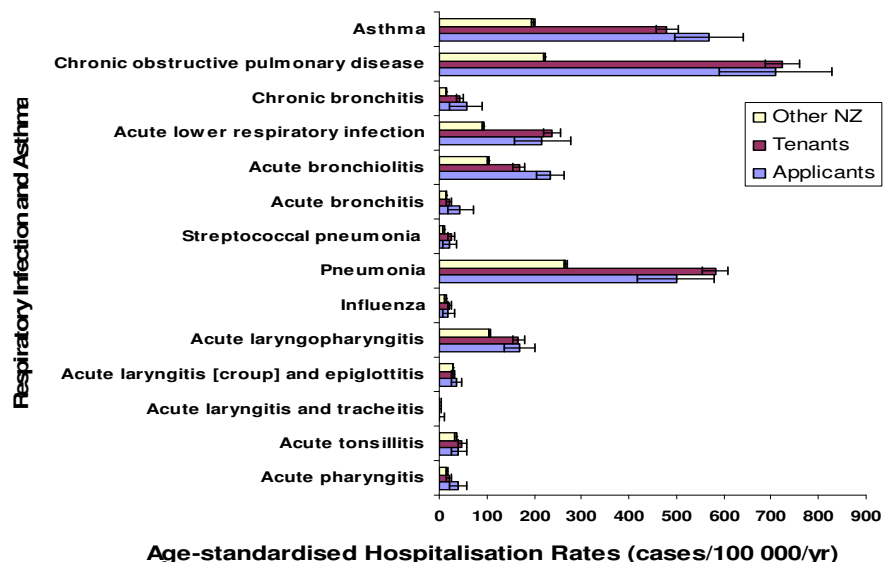


Figure 9.21: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to selected respiratory diseases, May 2003 to June 2005

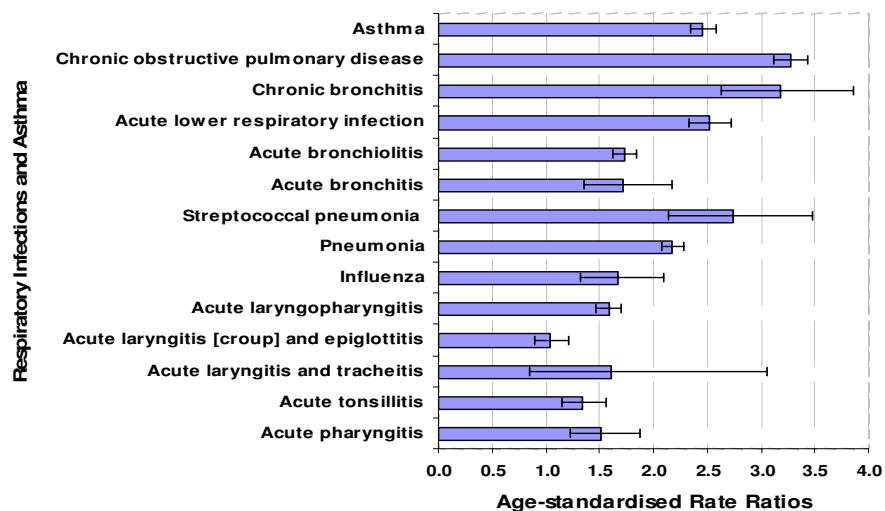
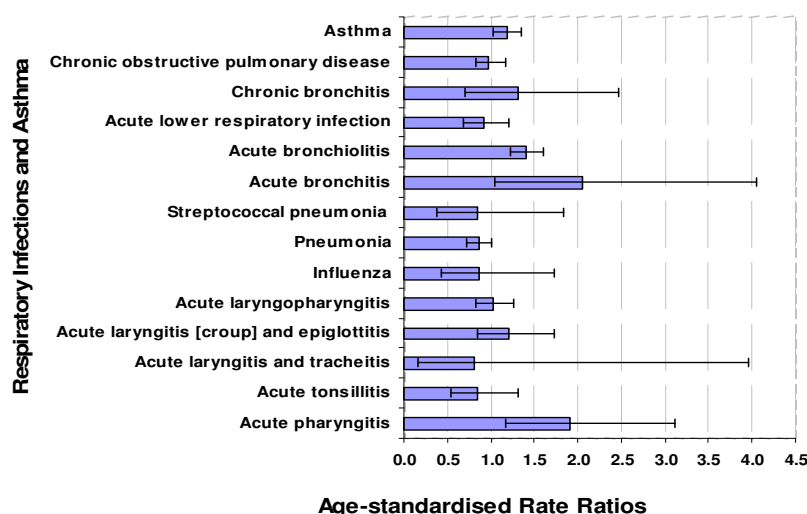


Figure 9.22: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to selected respiratory diseases, May 2003 to June 2005



Skin and bone infections

The following figures show age-standardised rates of hospitalisation for important skin and bone infections.

- The first figure (Figure 9.23) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ population*.
- The second figure (Figure 9.24) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.25) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- For all of these skin and bone infections, hospitalisation rates were marked and significantly higher in the *cohort population* compared with the *other NZ population*. A disease which seemed particularly concentrated in the *cohort* population was impetigo where rates were >3 times higher than in the *other NZ* population.
- When comparing rates between *housing applicants* and tenants, rates were generally lower in *housing applicants* compared with *housing tenants*, but this difference was only statistically significant for *cutaneous abscess*, *furuncle* and *carbuncle*.

Figure 9.23: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected skin and bone infections, May 2003 to June 2005

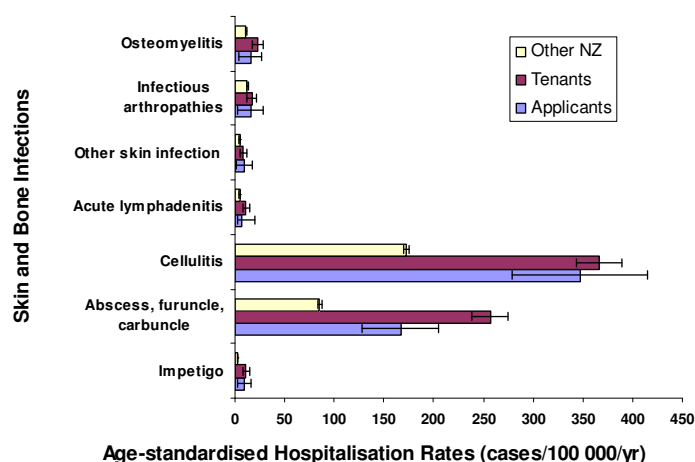


Figure 9.24: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to selected skin and bone infections, May 2003 to June 2005

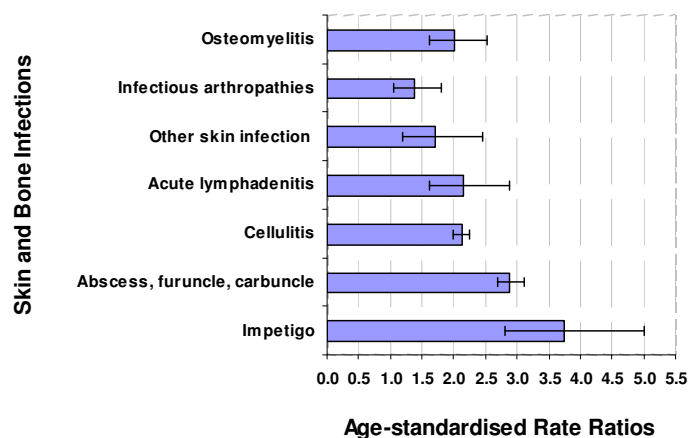
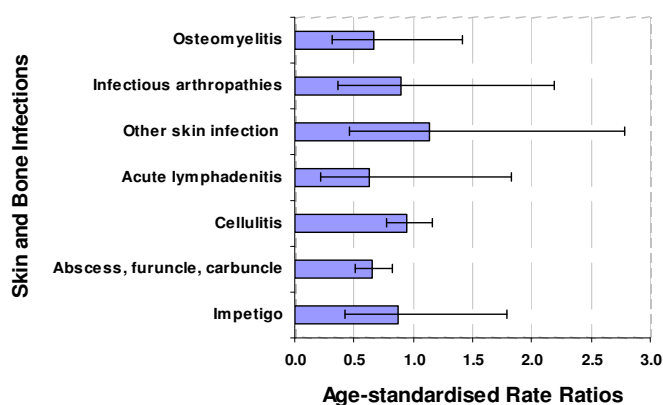


Figure 9.25: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to selected skin and bone infections, May 2003 to June 2005



Other diseases with partly infectious causes

The following figures show age-standardised rates of hospitalisation for other diseases that are thought to have an infectious cause.

- The first figure (Figure 9.26) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population.
- The second figure (Figure 9.27) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.28) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- For most of these diseases, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. Exceptions were *inflammatory diseases of the CNS* and *polyneuropathies* where rates were only slightly higher in the *cohort* population. Acute rheumatic fever was particularly concentrated in the *cohort* population where rates that were >3 times higher than in the *other NZ* population.
- When comparing rates between *housing applicants* and *housing tenants*, rates were fairly similar for all conditions.

Figure 9.26: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected acute and chronic diseases with partly infectious origins, May 2003 to June 2005

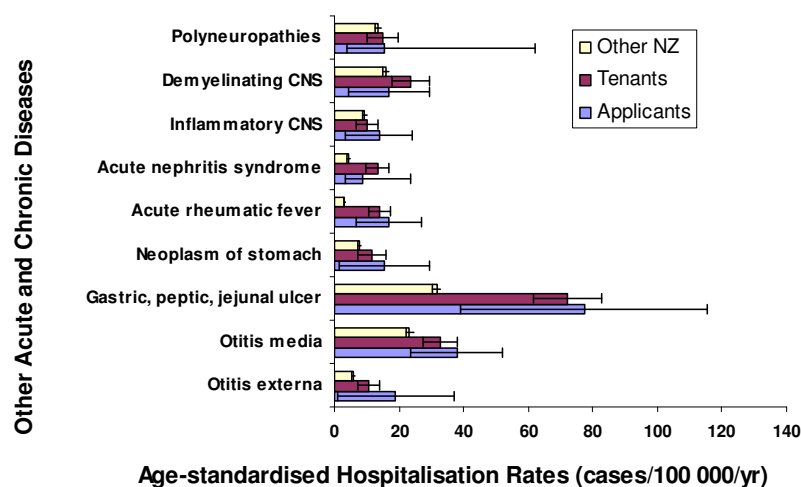


Figure 9.27: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to acute and chronic diseases with partly infectious origins, May 2003 to June 2005

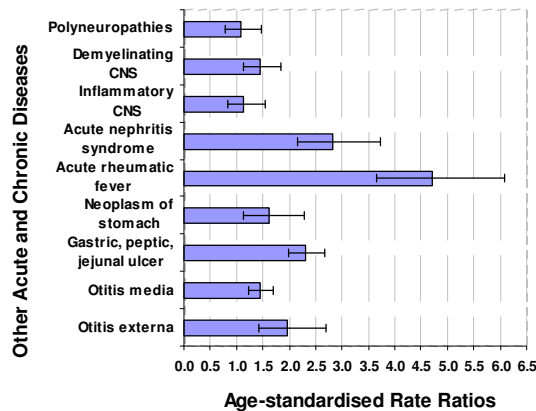
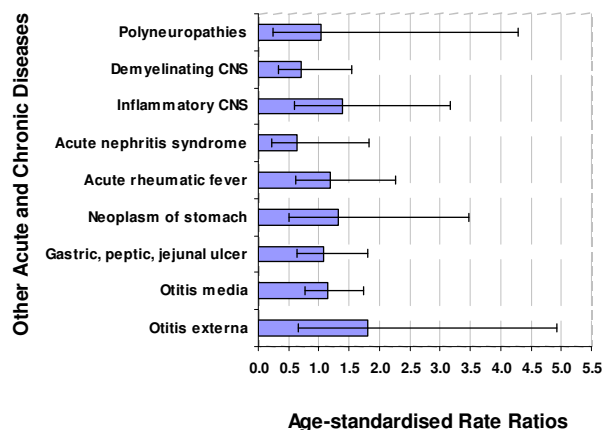


Figure 9.28: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to selected acute and chronic diseases with partly infectious origins, May 2003 to June 2005



Cardiovascular diseases

The following figures show age-standardised rates of hospitalisation for important cardiovascular diseases.

- The first figure (Figure 9.29) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population.
- The second figure (Figure 9.30) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.31) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- For all of these cardiovascular diseases, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population.

- When comparing rates between *housing applicants* and *housing tenants*, rates were fairly similar for all conditions.

Figure 9.29: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected cardiovascular diseases, May 2003 to June 2005

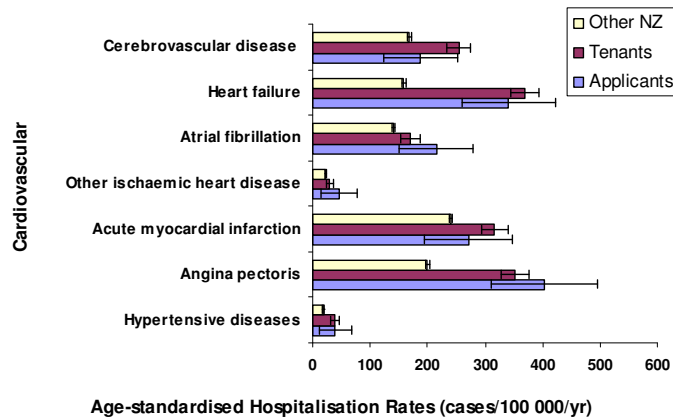


Figure 9.30: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to selected cardiovascular diseases, May 2003 to June 2005

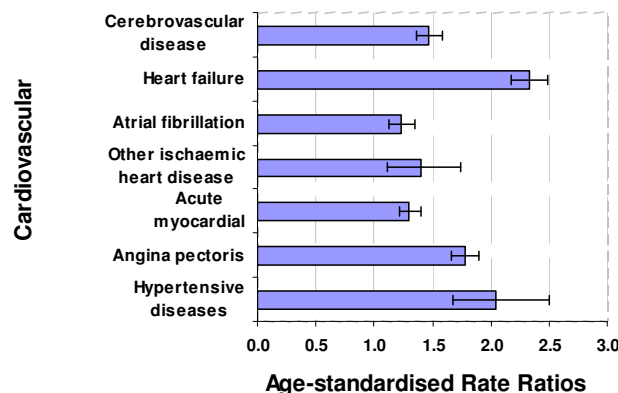
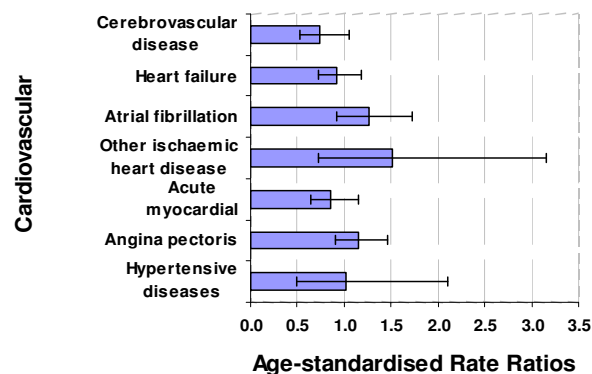


Figure 9.31: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to selected cardiovascular diseases, May 2003 to June 2005



Mental and behavioural disorders

The following figures show age-standardised rates of hospitalisation for all categories of mental and behavioural disorders.

- The first figure (Figure 9.32) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population.
- The second figure (Figure 9.33) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population.
- The third figure (Figure 9.34) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants*.

This analysis shows the following:

- For most categories of mental and behavioural disorders, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. Exceptions were *behavioural syndromes*, *mental retardation*, and *disorders of psychological development*, *disorders of childhood and adolescence* and *unspecified mental disorders* where rates were not significantly different. Mental disorders which seemed particularly concentrated in the *cohort* population were *schizophrenia* and *other delusional disorders*, *manic episode or bipolar disorder*, and *adult personality disorder* where rates were >3 times higher than in the *other NZ* population.
- When comparing rates between *housing applicants* and *housing tenants*, hospitalisation rates were marked and significantly higher in the *housing applicants* for most categories of *mental and behavioural disorders*.

Figure 9.32: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for categories of mental and behavioural disorders, May 2003 to June 2005

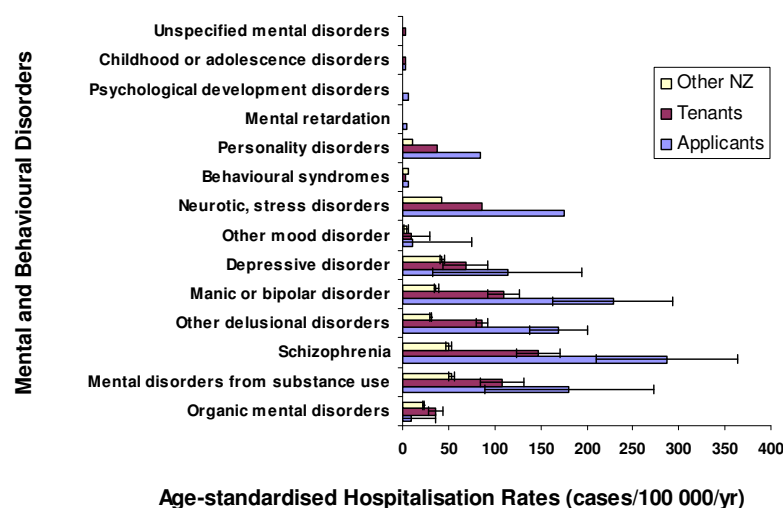


Figure 9.33: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, according to categories of mental and behavioural disorders, May 2003 to June 2005

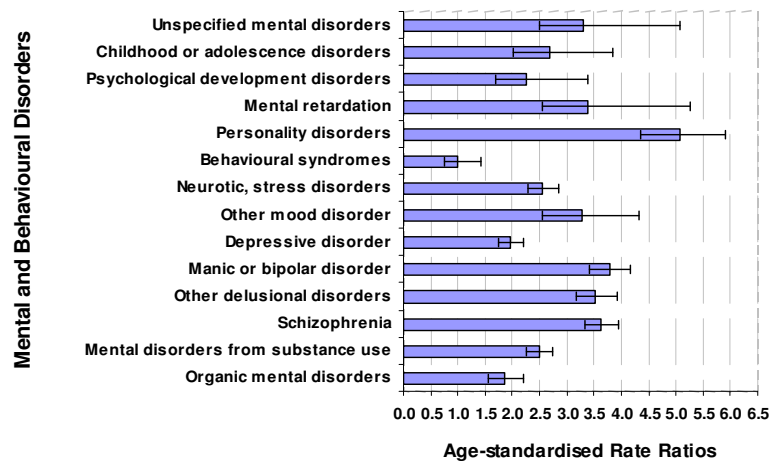
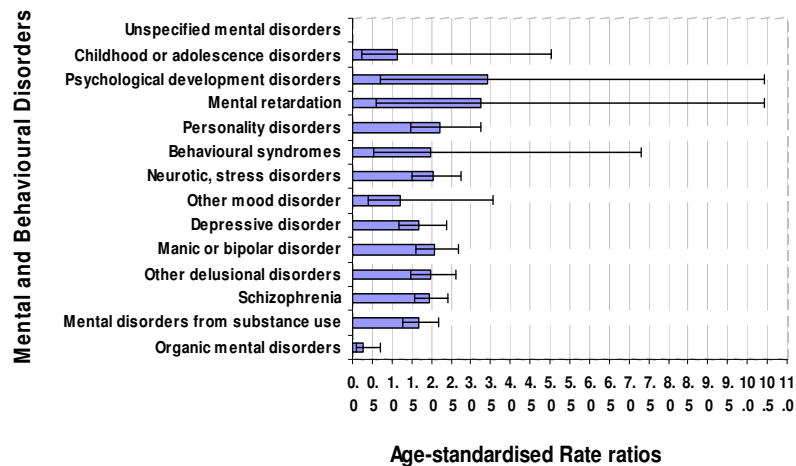


Figure 9.34: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to categories of mental and behavioural disorders, May 2003 to June 2005



Injuries and poisonings and external causes occurring at home

These categories of hospitalisation differ from others included in this analysis in two respects:

- External causes are an additional classification to that used for principal diagnosis. An individual hospitalisation event, particularly one for injury or poisoning (S00-T98), may also be assigned an “E” code (V01-Y98).
- Where an “E” code is assigned in the range W00-Y34 (except Y06 and Y07), then a place of occurrence code is also assigned. This code allows injuries in the home to be distinguished from other injuries.

The following figures show age-standardised rates of hospitalisation for important injuries and poisonings.

- The first figure (Figure 9.35) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population for all categories of injury and poisoning. The second figure (Figure 9.36) shows these rates for the most common specified injuries and poisonings.
- The third figure (Figure 9.37) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population for all categories of injury and poisoning. The fourth figure (Figure 9.38) shows these rates for the most common specified injuries and poisonings.
- The fifth figure (Figure 9.39) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants* for all categories of injury and poisoning. The sixth figure (Figure 9.40) shows these rates for the most common specified injuries and poisonings.

This analysis shows the following:

- For most categories of injury and poisoning, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. Exceptions were *injuries to hip and thigh*. Amongst specific common injuries, rates were higher in the *cohort* population for *open wound of head*, *intracranial injury*, *open wound of wrist and hand*, *fracture of wrist and hand*, *superficial injury of lower leg* and *complications of procedures*. Rates were less for *fractures of the forearm* and *fracture of femur*.
- When comparing rates between *housing applicants* and *housing tenants*, hospitalisation rates were similar for most categories of injury and poisoning and for specific common injuries. The only exceptions were significantly higher hospitalisation rates in the *housing applicants* for *poisonings and toxic effects* and significantly lower rates for *injuries to shoulder and upper arm*.

Figure 9.35: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for all categories of injury and poisonings, May 2003 to June 2005

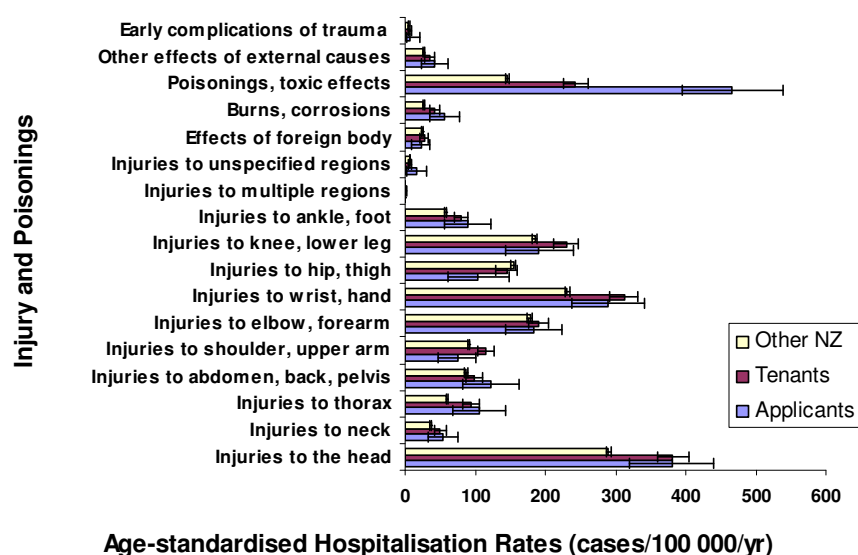


Figure 9.36: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for specific common injuries and poisonings, May 2003 to June 2005

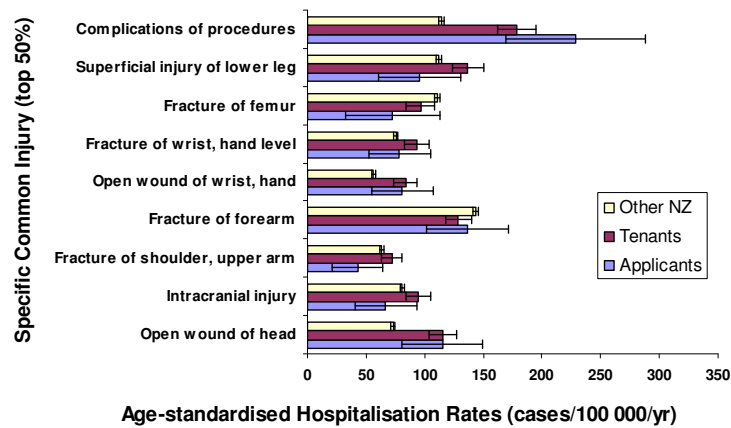


Figure 9.37: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, for all categories of injury and poisonings, May 2003 to June 2005

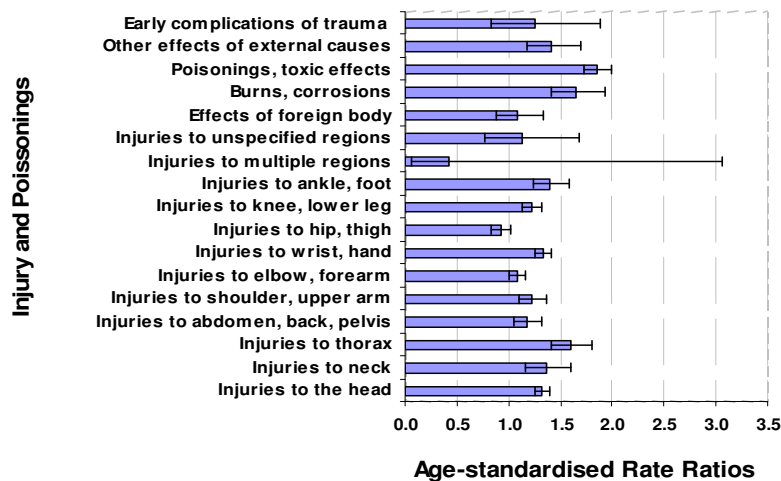


Figure 9.38: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, for specific common injuries and poisonings, May 2003 to June 2005

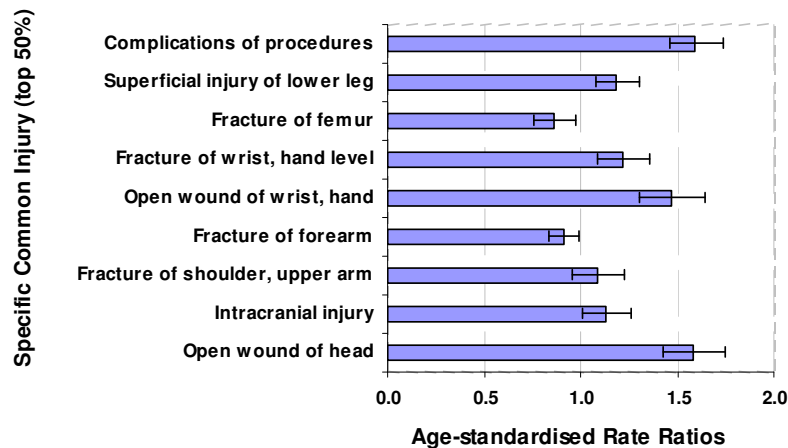


Figure 9.39: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, for all categories of injury and poisonings, May 2003 to June 2005

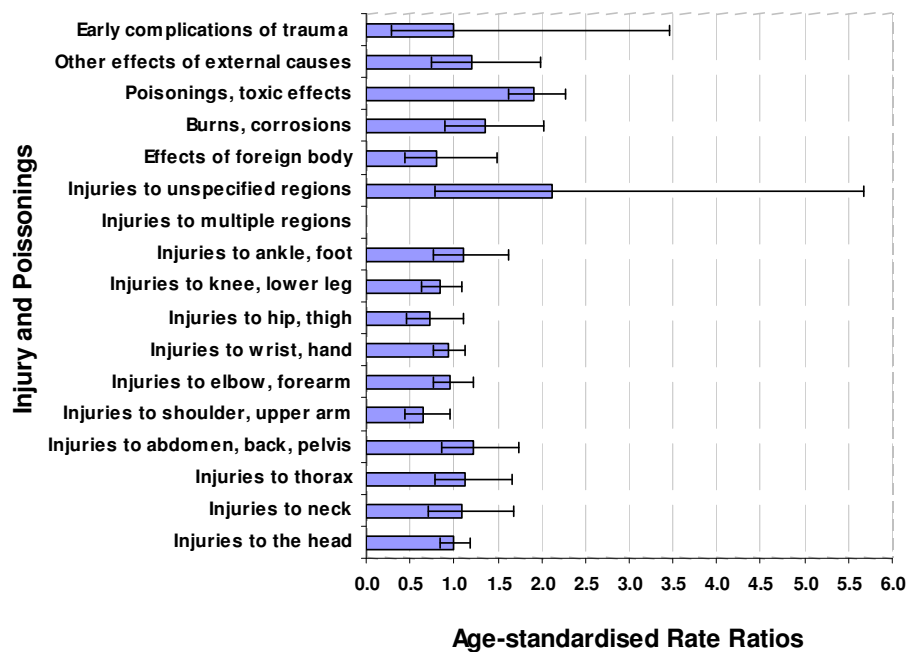
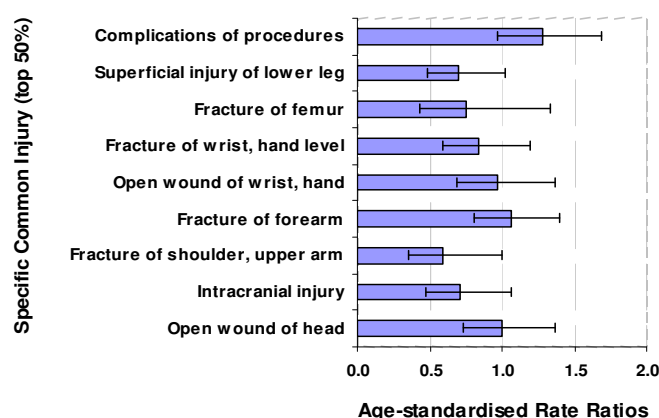


Figure 9.40: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, for specific common injuries and poisonings, May 2003 to June 2005



The following figures show age-standardised rates of hospitalisation for important external causes (E codes) of injuries and poisonings.

- The first figure (Figure 9.41) shows hospitalisation rates for *housing applicants*, *housing tenants* and the *other NZ* population for all categories of external causes. The second figure (Figure 9.42) shows these rates for selected external causes and the third (Figure 9.43) for common external causes.
- The fourth figure (Figure 9.44) shows age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population for all categories of injury and poisoning. The fifth figure (Figure 9.45) shows these rates for selected external causes and the sixth (Figure 9.46) for common external causes.
- The seventh figure (Figure 9.56) shows age-standardised rate ratios in *housing applicants* compared with *housing tenants* for all categories of external cause. The eighth figure (Figure 9.48) shows these rates for selected external causes and the ninth (Figure 9.49) for the most common external causes.

This analysis shows the following:

- For most categories of external cause, hospitalisation rates were marked and significantly higher in the *cohort* population compared with the *other NZ* population. Exceptions were *drowning and submersion*, *other accidental threats to breathing*, *exposure to electricity* and *extreme temperature*, and *exposure to smoke, fire and flames*, where rates were not significantly higher in the *cohort* population. Rates were significantly lower for *contact with venomous animals and plants*. Similarly, rates were significantly higher for most specific external causes.
- When comparing rates between *housing applicants* and *housing tenants*, hospitalisation rates were similar for most categories of external cause and specific types of external cause. The only exceptions were *intentional self-harm* which was significantly more common among *housing applicants*, and *exposure to inanimate mechanical forces* which was marginally less common among the *housing applicants*.

Figure 9.41: Hospitalisation age-standardised rates in *housing applicant* and *housing tenants*, compared with *other NZ* population, for all categories of external cause, May 2003 to June 2005

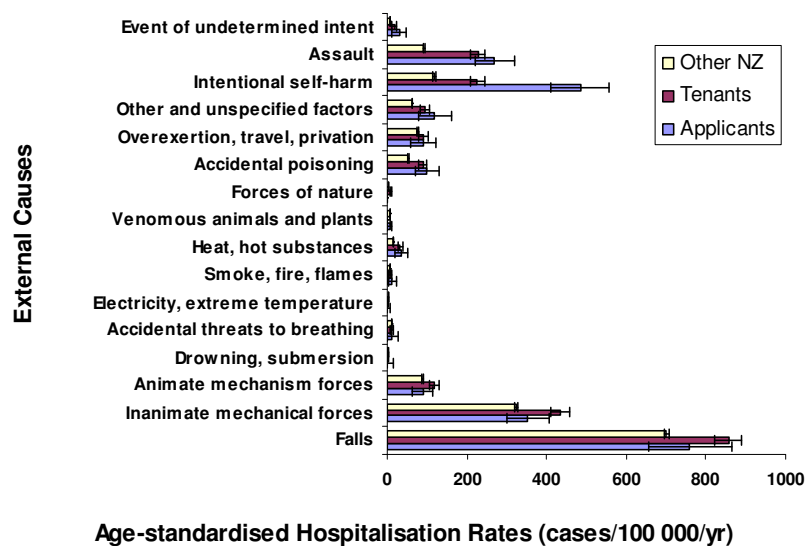


Figure 9.42: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for selected external causes, May 2003 to June 2005

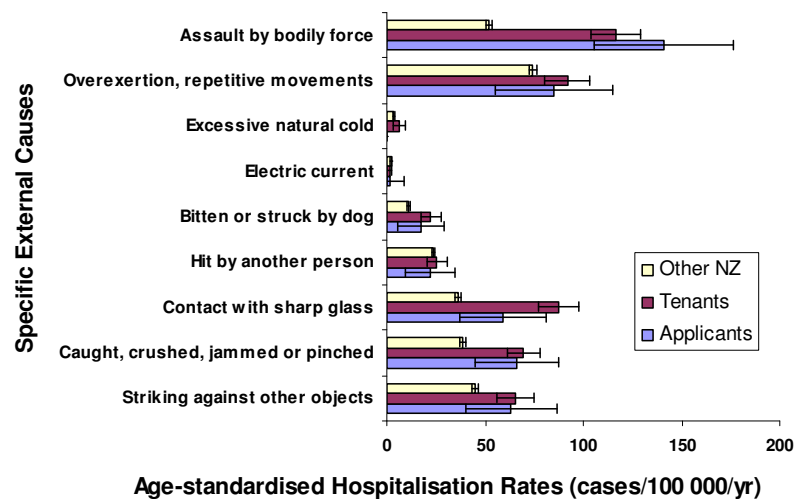


Figure 9.43: Hospitalisation age-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, for common external causes, May 2003 to June 2005

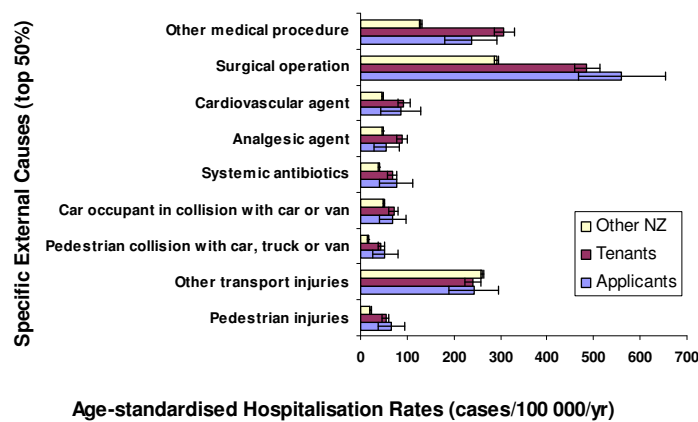


Figure 9.44: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, for all categories of external cause, May 2003 to June 2005

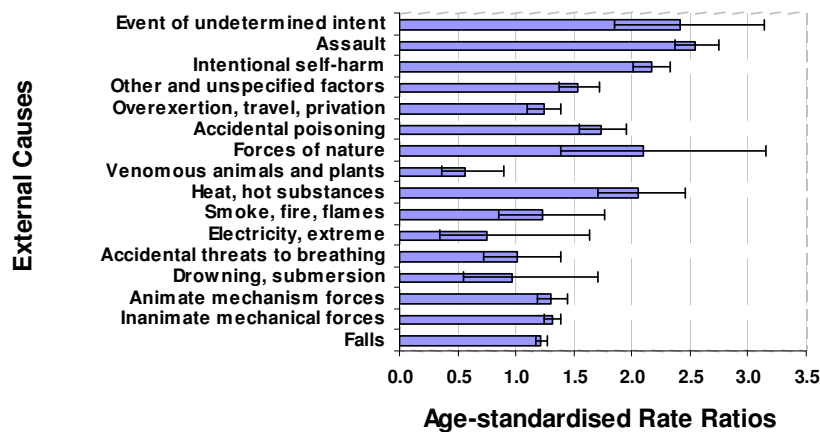


Figure 9.45: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, for selected external causes, May 2003 to June 2005

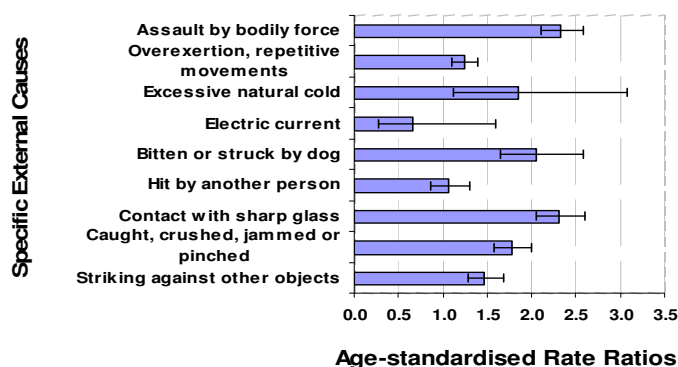


Figure 9.46: Hospitalisation age-standardised rate ratios in *cohort* population (applicants and tenants) compared with *other NZ* population, for common external causes, May 2003 to June 2005

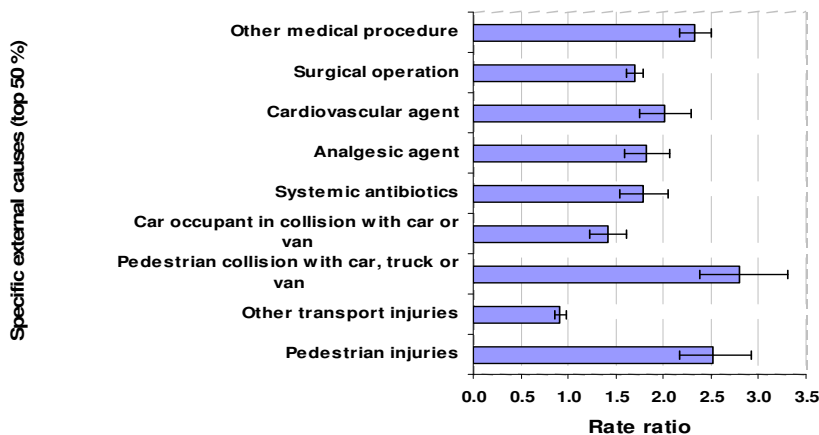


Figure 9.47: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, for all categories of external cause, May 2003 to June 2005

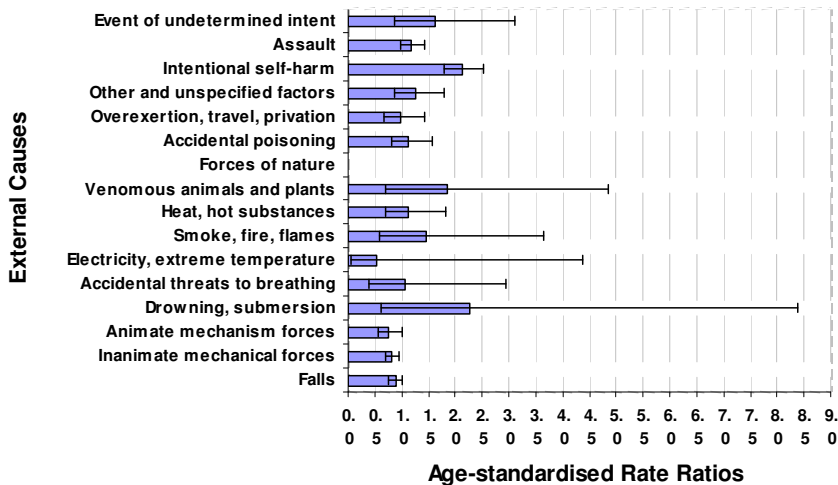


Figure 9.48: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, for selected external causes, May 2003 to June 2005

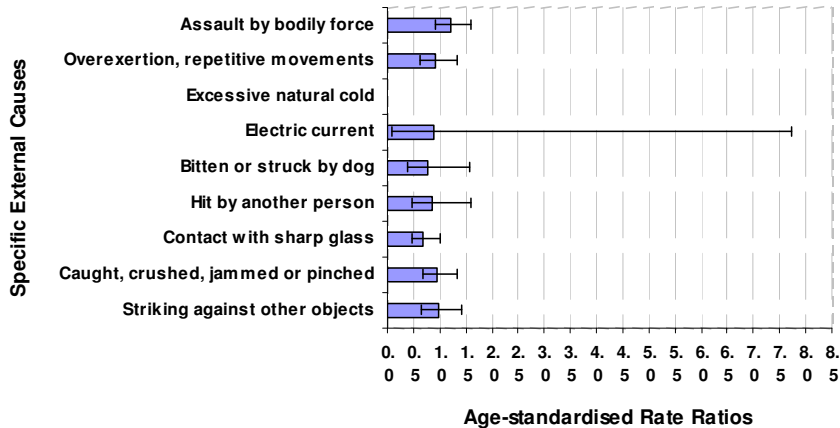
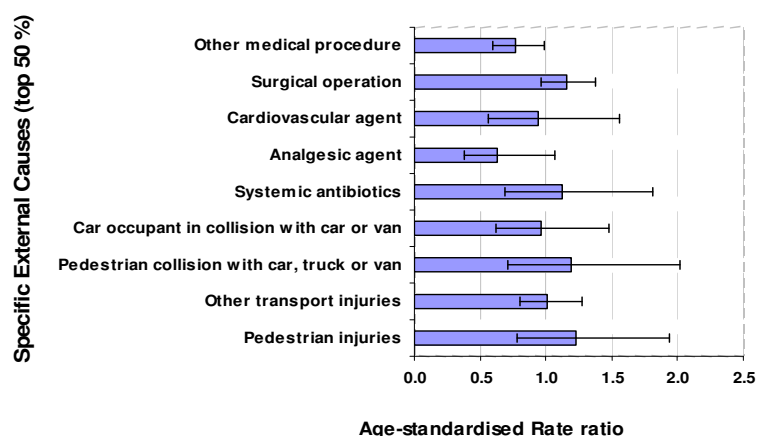


Figure 9.49: Hospitalisation age-standardised rate ratios in *housing applicants* compared with *housing tenants*, for common external causes, May 2003 to June 2005



9.2.5 Age-ethnicity standardised causes of admissions

The above analyses were repeated but with rates age-ethnicity-standardised to the population structure of the cohort study at cross section June 2005 (to improve the stability of estimates). This analysis used age in 10-year groups if under 70, then 70+. Ethnic group were: Maori, Pacific, NZ European, Asian and *other* combined, and *not stated* (see Table 12.1 for standard population used). This analysis was based on exclusive coding i.e. prioritised ethnicity. These analyses again used the standard filter (based on principal diagnosis with exclusion of non-hospitalisations, waiting-list admissions, irrelevant conditions, and one-month readmissions).

It is important to note that age-ethnicity-standardised rates may be unreliable. The population was divided into age-ethnicity groups, some of which had small or zero events (especially when analysing selected diseases in the relatively smaller *housing applicant* population). Also the ethnic response of a person may be inconsistent or change between NA and IRR forms, NMDS data and Census data (see section 4.4.2). Consequently, where the total number of cases was <10, rates have not been presented.

These results are presented in graphical and tabular form.

- The overall consequence of using age-ethnicity standardisations is shown in Figure 9.50 and Table 12.19.
- For broad ICD.10 categories, a comparison of age-ethnicity standardised hospitalisation rates in the *cohort* population compared with the *other NZ* population is shown in Figure 9.51 and Table 12.20.
- For broad ICD.10 categories, a comparison of age-ethnicity standardised hospitalisation rates in *housing applicants* compared with *housing tenants* is shown in Figure 9.53 and Table 12.21.
- For specific diseases, a comparison of age-ethnicity standardised hospitalisation rates in the *cohort* population compared with the *other NZ* population is shown in Table 12.22.
- For specific diseases, a comparison of age-ethnicity standardised hospitalisation rates in *housing applicants* compared with *housing tenants* is shown in Table 12.23.

This analysis showed the following:

- The use of age-ethnicity-standardised results reduced the rate ratio difference between the *cohort* population and the *other NZ* population (from RR 1.67 to 1.47), which suggests that a fairly substantial part (about 30%) of this difference could be explained by the relatively high proportion of Maori and Pacific people in the *cohort* population.
- When comparing the *cohort* population with the *other NZ* population according to major disease categories there was, not surprisingly, a decrease in the rate ratio difference for most disease categories. This change was particularly marked for *endocrine, nutritional and metabolic diseases, respiratory diseases* and *skin and subcutaneous diseases*, again showing that some of the differences seen in the *cohort* population are caused by the composition of this population. Rates for some major diagnostic categories stayed very similar, notably for *neoplasms, blood and immune system disorders*, and *nervous system disorders*. Even with this additional adjustment, the *cohort* population continued to experience significantly higher hospitalisation rates than the *other NZ* population for all major disease categories except *congenital diseases*.
- When comparing the *cohort* population with the *other NZ* population for specific diseases, there was again a decrease in the rate ratio difference for many specific diseases following age-ethnicity standardisation. For some diseases, this form of standardisation reduced the difference to non-significance, notably *meningococcal disease, acute bronchitis*, and *malignant neoplasms of the stomach*. In the case of *acute bronchiolitis*, this standardisation actually reversed the association so that this disease had a higher rate in the *other NZ* population compared with the *cohort* population. For a minority of diseases, this standardisation resulted in an increase in rate, notably for *intestinal infectious diseases, demyelinating diseases of the CNS*, some mental and behavioural disorders (*depressive, neurotic, personality, and disorders due to psychoactive substance use, and disorders of childhood or adolescences*) and some specific injuries (*fractures of shoulder, upper arm and fractures of the forearm*).
- Age-ethnicity-standardisation also increased the hospitalisation rate in the *housing applicants* compared with the *housing tenants* (from RR 1.06 to 1.10) which is understandable, given the higher proportion of Pacific people who are tenants compared with the applicant population.
- When comparing the *housing applicants* with the *housing tenants* according to major disease categories, this standardisation resulted in rates becoming significantly higher in some categories (Figure 9.53). In particular, *infectious and parasitic diseases* and *respiratory diseases* now had significantly higher rates in the *applicants* compared with *housing tenants*. *Applicants* now no longer had significantly lower rates for *diseases of the ear and mastoid* and *skin and subcutaneous diseases*. They also no longer had significantly higher rates of *congenital disease*. The higher rates for *mental and behavioural diseases* also decreased, though remained significantly higher in the *housing applicants*, suggesting that some of this difference was due to the ethnic composition of the *applicant* population. *Housing applicants* continued to have significantly lower rates of *neoplasms*, which was the only disease grouping where this difference was seen.
- When comparing the *housing applicants* with the *housing tenants* for specific diseases, this standardisation resulted in rates becoming significantly higher for several specific diseases, including *viral infection of unspecified site, other chronic obstructive pulmonary disease*, and *burns and corrosions*. Some other rate ratios increased to the point that previously lower rates in *housing applicants* no longer applied, notably *other septicaemia*, and *cutaneous abscess, furuncle and carbuncle*. Rate ratios dropped for *fracture of shoulder*

and upper arm, superficial injury of lower leg and for falls to the point where rates for these conditions were significantly lower in *housing applicants* (though only marginally so).

Figure 9.50: Comparison of crude, age-standardised and age-ethnicity-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, based on filtered hospitalisations, May 2003 to June 2005

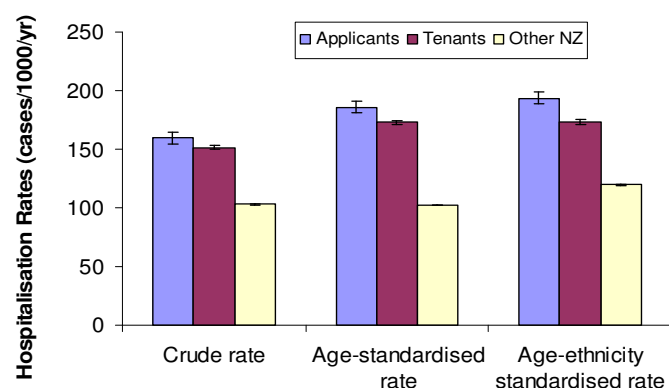


Figure 9.51: Hospitalisation age-ethnicity-standardised rates in *housing applicants* and *housing tenants*, compared with *other NZ* population, according to major disease categories, May 2003 to June 2005

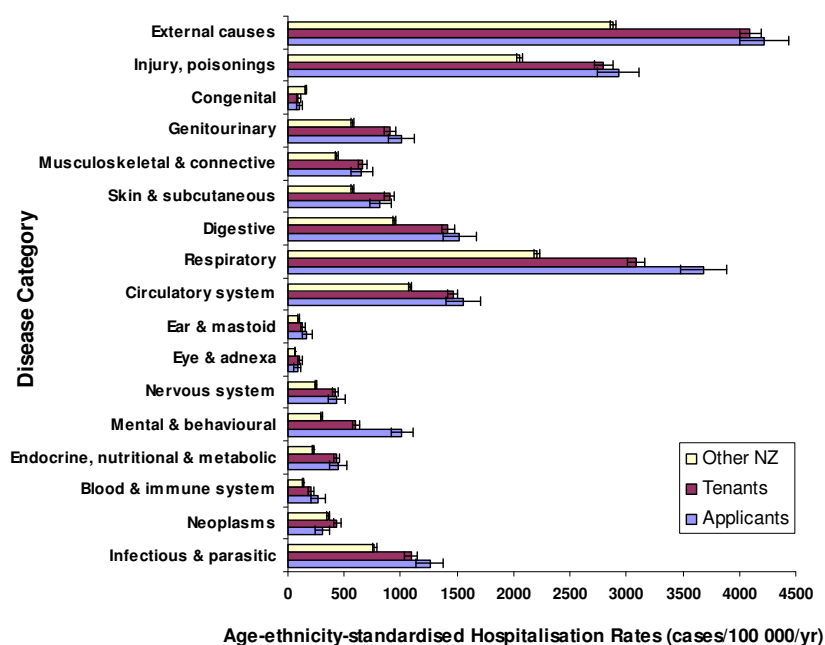


Figure 9.52: Hospitalisation age-ethnicity-standardised rate ratios in *housing applicants* and *housing tenants*, compared with *other NZ* population, according to major disease categories, May 2003 to June 2005

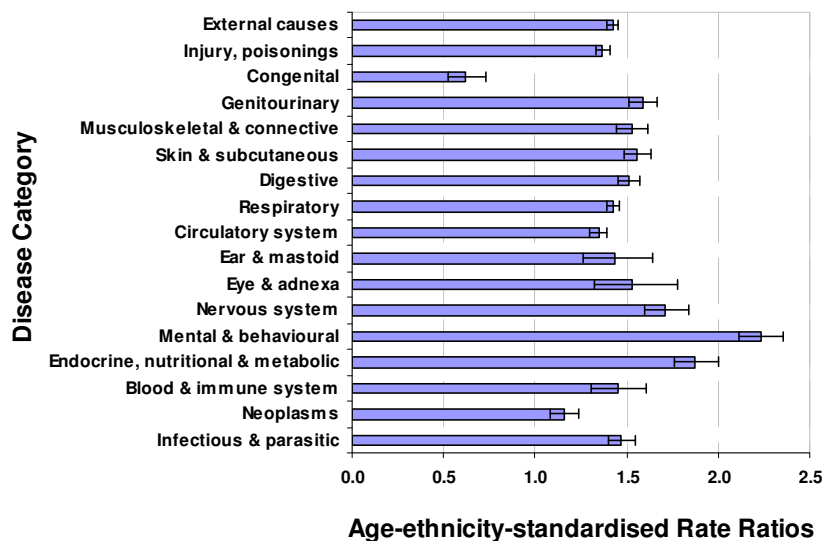
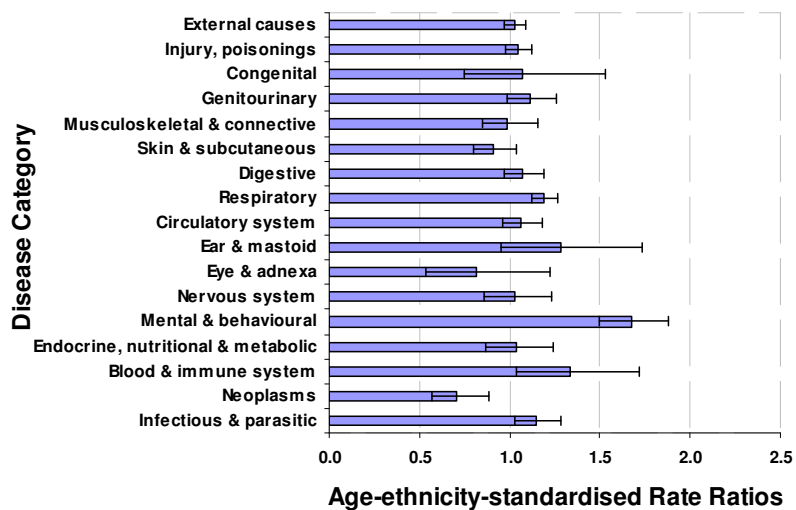


Figure 9.53: Hospitalisation age-ethnicity-standardised rate ratios in *housing applicants* compared with *housing tenants*, according to major disease categories, May 2003 to June 2005



9.2.6 Comparison of applicants with recent tenants

The above analyses were repeated for *housing applicants* and *housing tenants*, but with (a) *housing applicants* restricted to those who subsequently became tenants and (b) *housing tenants* restricted to their first 12-months (i.e. only events and person time that occurred within 12 months of becoming a HNZC tenant were counted). Rates were age-standardised to the population structure of the 2001 census, and again used the standard filter (based on principal diagnosis with exclusion of 'non-hospitalisations', waiting-list admissions, irrelevant conditions, and one-month readmissions).

These results are presented in graphical and tabular form.

- Age-standardised disease rates in *housing applicants* (who subsequently became tenants), *housing tenants* (during their first 12-months), and the *other NZ* population, according to broad ICD.10 categories (Figure 9.54).
- A comparison of age-standardised disease rate ratios in *housing applicants* (who subsequently became tenants), *housing tenants* (during their first 12-months), and the *other NZ* population, according to broad ICD.10 categories (Figure 9.55, Table 12.24).
- A comparison of age-standardised disease rate ratios in *housing applicants* (who subsequently became tenants) and *housing tenants* (during their first 12-months) according to specific diseases (Table 12.25)

This analysis showed the following:

- There is no change in the hospitalisation rate when comparing the sub-group of *housing applicants* who subsequently became tenants, and *housing tenants* during their first year of tenancy (rate ratio 1.00, 95%CI 0.93, 1.07). This finding suggests no immediate health effects are associated with the move from waiting list to tenant. However, this finding will be investigated more fully in the future using longitudinal analysis.
- In terms of major disease categories, hospitalisations for *nervous system conditions* were significantly more common among *housing applicants* (which was not the case when comparing the total *housing applicant* and total *housing tenant* populations) and *neoplasms* were significantly more common among *housing tenants* (this pattern was more marked than when comparing the total *housing applicant* and total *housing tenant* populations).
- Some specific conditions also varied. *Acute bronchiolitis* had markedly higher rates among *housing applicants*. Some conditions had marginally elevated rates in *housing applicants*, including *injuries to abdomen, back and pelvis*, and *poisonings and toxic effects*. Hospitalisations were significantly lower for *cutaneous abscess, furuncle and carbuncle* among the *housing applicants*.

Figure 9.54: Hospitalisation age-standardised rates in *housing applicants* (who subsequently became tenants), compared with *housing tenants* (during their first 12 months of tenancy time) and the *other NZ* population according to major disease categories, May 2003 to June 2005

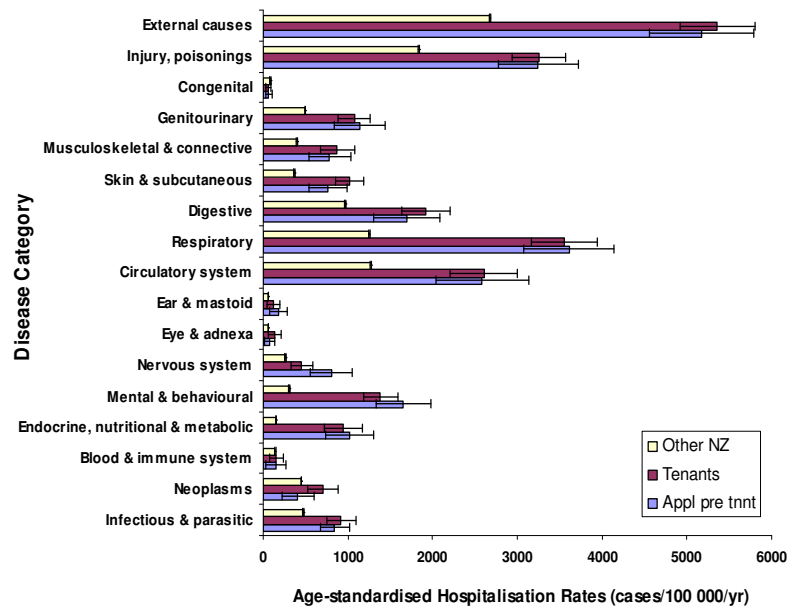
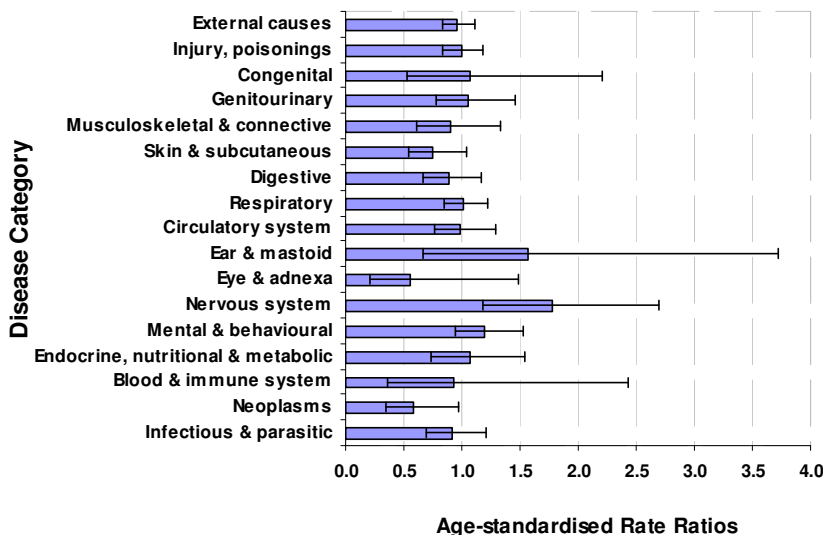


Figure 9.55: Hospitalisation age-standardised rate ratios in *housing applicants* (who subsequently became tenants), compared with *housing tenants* (during their first 12 months of tenancy time) according to major disease categories, May 2003 to June 2005



9.2.7 Comparison of hospitalisation rates by duration of tenancy

This section examines changing patterns of hospitalisation according to the duration of the tenancy.

It divides *housing tenants* into the following time periods:

- Pre-tenancy ie Applicants who become tenants
- Tenants <1 years
- Tenants 1-3 years
- Tenants 4-6 years
- Tenants 7-9 years
- Tenants 10+ years

For the *housing tenants* with multiple leases, only the last lease was considered. Rates were age-standardised to the population structure of the 2001 Census, and again used the standard filter (based on principal diagnosis with exclusion of non-hospitalisations, waiting-list admissions, irrelevant conditions, and one-month readmissions). Rates are presented for the following:

- Total hospitalisation, based on use of the standard filter (Figure 9.56, Table 12.26)
- Major disease categories (Figure 9.57, Table 12.26)
- Selected specific diseases (Figure 9.58 to Figure 9.61, Table 12.27)

This analysis shows that hospitalisation rates are highest among *housing applicants* who will become tenants and *housing tenants* during their first year as tenants (both about 277 per 1,000 per year). Hospitalisation rates are less for longer-term tenants (1-3 years) and reach a plateau for those who are *housing tenants* for 4 or more years (about 182 per 1,000 per years). This hospitalisation rate remains significantly higher than that seen for the *other NZ* population (about 127 per 1,000 per year).

The pattern seen for major disease categories is broadly similar, with a decline from highest rates as *housing applicants* or *housing tenants* during the first year of the tenancy to lower rates with longer periods spent as HNZN tenants. The only exceptions are *neoplasms* and *congenital conditions* where rates remain relatively constant with duration of tenancy.

Figure 9.56: Total age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* and *other NZ* population, May 2003 to June 2005

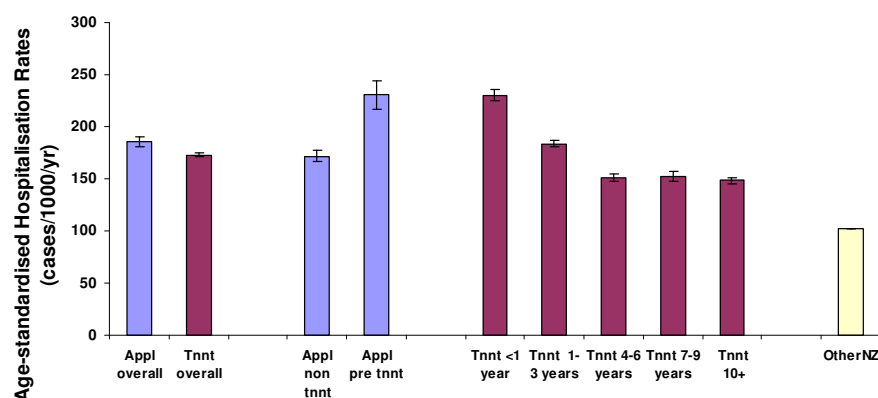
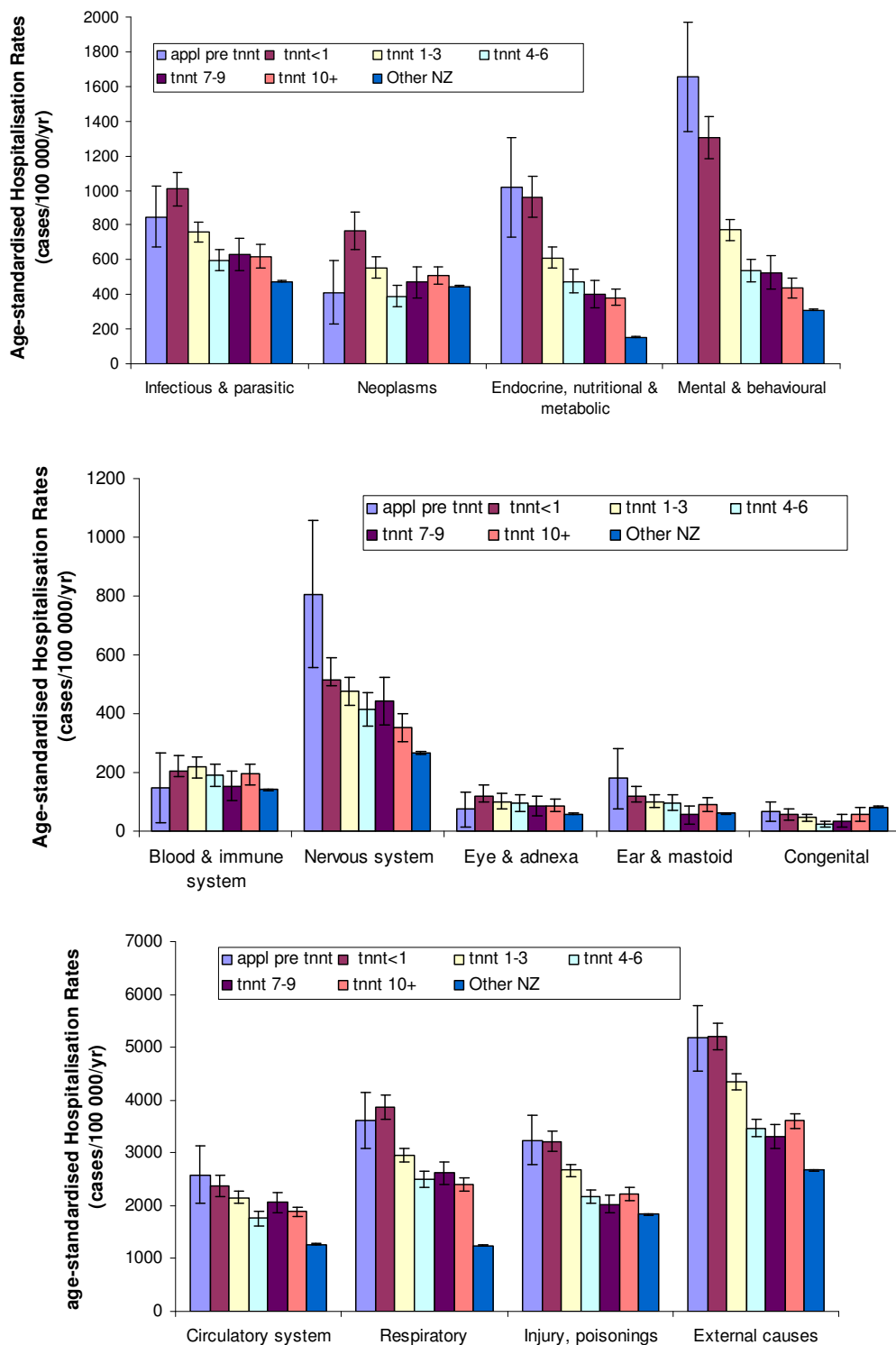
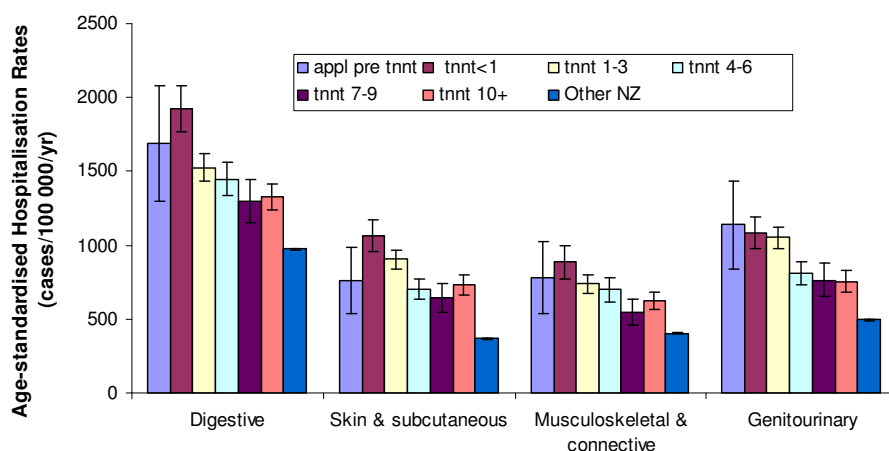


Figure 9.57: Age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* (who become tenants) and *other* NZ population, According to major disease categories, May 2003 to June 2005





The pattern seen for selected diseases is more mixed. Some diseases have a very pronounced decline in hospitalisation rates with duration of tenancy. This is particularly the case with *mental health conditions, intentional self-harm, assault, and poisonings and toxic effects* (some of which will be self-inflicted). Several of the *infectious and parasitic diseases* also show a decline in hospitalisation rates with duration of tenancy. This decline is most marked for the *intestinal infectious diseases, acute bronchiolitis, other chronic obstructive pulmonary disease, and asthma*. However, it must be noted that the population living in a HNZN rental property for >3 years will be different to short-term residents. However, it must be noted the population living in a HNZN house for ≥3 years will be different to those who stay for a shorter period. That is why the future longitudinal analyses that follow the same individuals for a longer period of time will be so important.

Figure 9.58: Age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* and *other NZ* population, for selected infectious diseases, May 2003 to June 2005

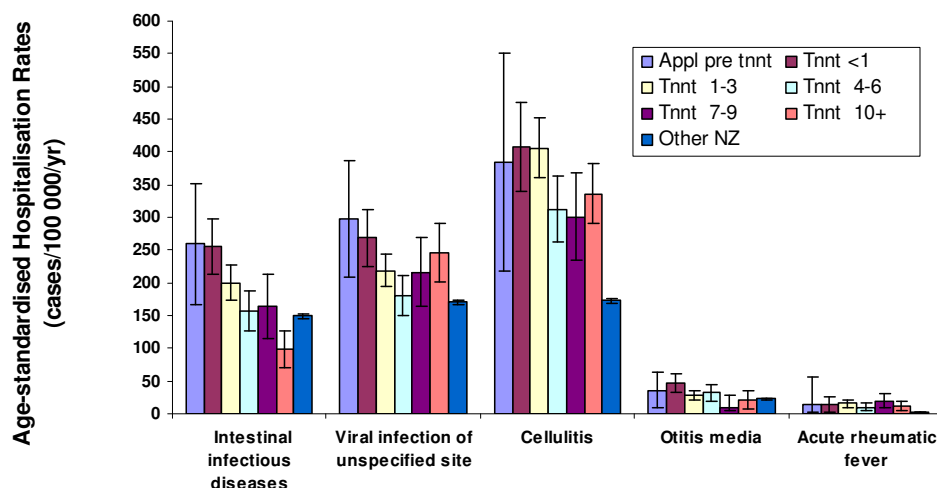


Figure 9.59: Age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* and *other NZ* population, for selected respiratory diseases, May 2003 to June 2005

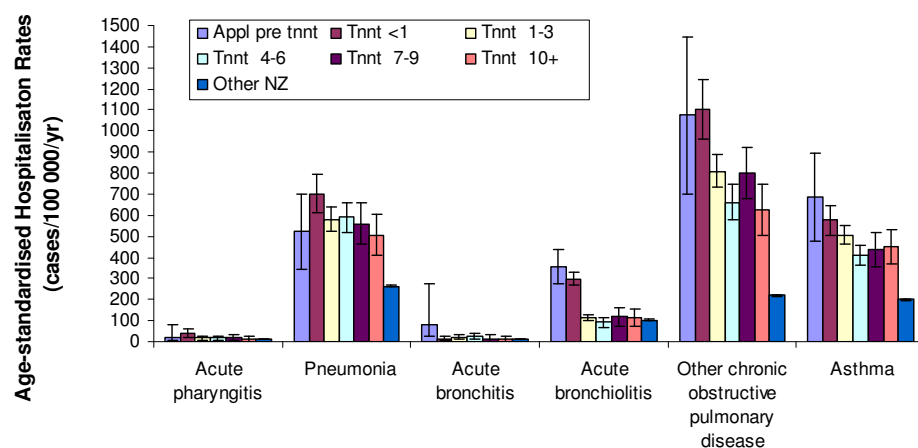


Figure 9.60: Age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* and *other NZ* population, for selected injuries, May 2003 to June 2005

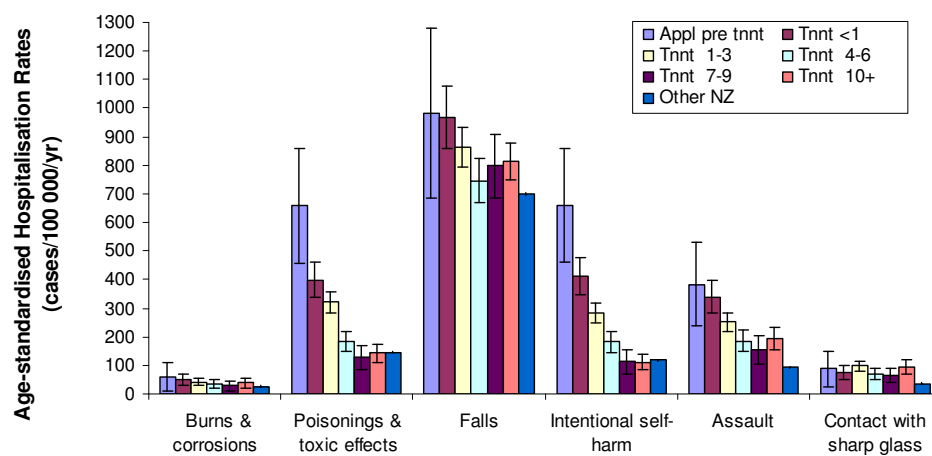
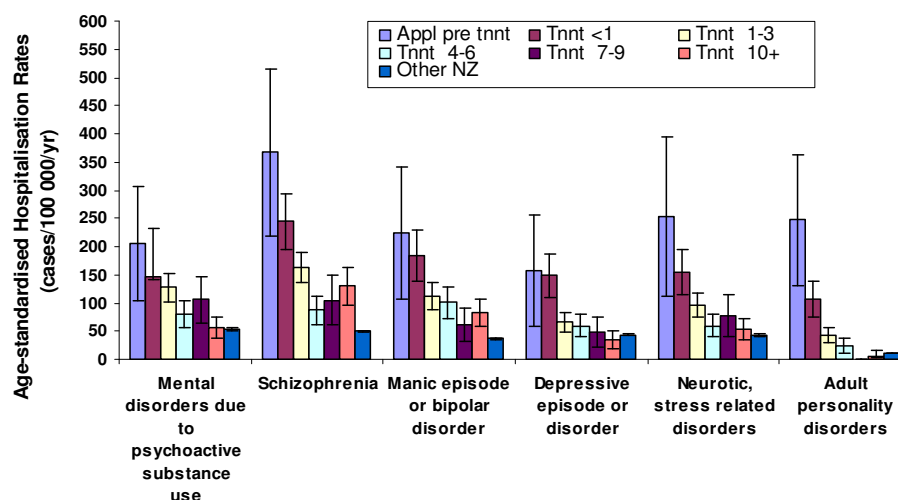


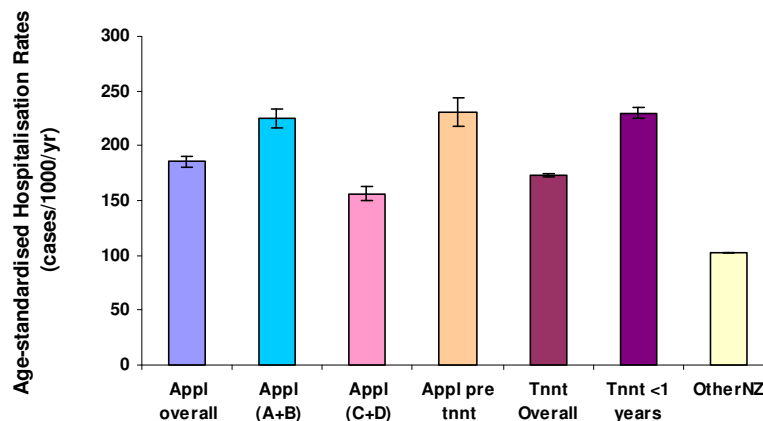
Figure 9.61: Age-standardised hospitalisation rates in *housing tenants* according to duration of tenancy, compared with *housing applicants* and *other NZ* population, for selected mental health conditions, May 2003 to June 2005



9.2.8 Comparison of hospitalisation rates by prioritisation

The following analysis (Figure 9.62, Table 12.28) compares age-standardised hospitalisation rates in sub-groups of *housing applicants*, notably a comparison of higher priority (A+B) with lower priority (C+D) applicants. This analysis shows that the population prioritised for social housing has a 44% higher hospitalisation rate (266 per 1000 per year) compared with those assigned a lower priority (185 per 1000 per year). However, even the lower priority applicants (C+D) have a markedly higher hospitalisation rate than the *other NZ* population (about 127 per 1,000 per year).

Figure 9.62: Age-standardised hospitalisation rates in sub-groups of *housing applicants* (A+B, C+D) compared with *housing tenants* and *other NZ* population, May 2003 to June 2005



9.2.9 Sensitivity analysis based on restricting to overnight admissions

Restricting the analysis to overnight hospitalisations has some advantages. These events are likely to represent a more consistent (and higher) threshold for measuring health outcomes across New Zealand and across diverse populations. Such events also correspond more closely to what many would consider to be the meaning of being *hospitalised*. From a resource perspective, such events also represent a markedly higher quantum of resources that would be expended on a day case.

This analysis has been carried out according to major disease categories (Table 12.29, Table 12.30) and specific diseases (Table 12.31, Table 12.32). Rates were age-standardised to the population structure of the 2001 Census, and again used the standard filter (based on principal diagnosis with exclusion of 'non-hospitalisations', waiting-list admissions, irrelevant conditions, and one-month readmissions). In this instance, the additional filter of overnight admission was added which reduced the total events by about 25%.

Results of this analysis showed the following:

- Overall, the study findings were not particularly sensitive to the use of this more restricted definition of a hospitalised event. Given that this restriction reduced the recorded events, there was a corresponding increase in the width of the confidence interval, which was particularly noticeable for the relatively small population of *housing applicants*.
- When comparing this narrower definition of hospitalisation, the rate in the *cohort* population dropped from 212 to 162 per 1,000 per year, which was similar to the fall in rates for the *other NZ* population (from 127 to 95 per 1,000 per year). Consequently, the rate ratio for hospitalisations in the *cohort* population compared with *other NZ* population remained virtually unchanged (it increased slightly from 1.67 to 1.70).
- When comparing the *cohort* population with the *other NZ* population according to major disease categories there was little effect, with hospitalisation rates remaining significantly elevated for all categories, except *congenital diseases*.
- When comparing the *cohort* population with the *other NZ* population according to specific diseases, there were few important changes in effect sizes, though the confidence intervals were broader. The rate ratio for hospitalisation for *acute laryngitis and tracheitis* for example increased and was significantly higher in *cohort* population compared *other NZ* population. Rate ratios for some groups of injuries, such as *injuries to neck* and *injuries to abdomen, back and pelvis* decreased and become non-significantly higher in the *cohort* population.
- For *housing applicants* compared with *housing tenants*, there was also only a small impact from using this more restricted definition of hospitalisation, with hospitalisation rates dropping in *housing applicants* from 218 to 165 per 1000 per year compared with a drop from 210 to 161 per 1,000 per year in *housing tenants*. The rate ratio dropped from 1.06 to 1.03, but remained significantly higher, but only marginally so.
- When comparing the *housing applicants* with the *housing tenants* according to major disease categories, there tended to be a decrease in the rate ratios for *housing applicants*. *Housing applicants* continued to have significantly higher hospitalisation rates for *mental and behavioural conditions* and *congenital diseases*. Rates also remained higher for *blood and immune system*, *ear and mastoid*, and *injury and poisonings*, but the wider confidence interval meant that these differences were no longer significant. *Housing applicants* continued to have significantly lower rates for diseases of the *skin and subcutaneous tissues* than *housing tenants*.

- When comparing the *housing applicant* population with the *housing tenant* population according to specific diseases there were few important changes in effect sizes, though the confidence intervals were broader which affected the significance of some findings. Using this more restricted definition of hospitalisation for *asthma*, for example, decreased the rate ratio from 1.18 (95%CI 1.03, 1.36) to 1.09 (95%CI 0.92, 1.30) so hospitalisation rates were no longer significantly higher in the *housing applicant* population. This result would also suggest that *housing applicants* were receiving disproportionately more of their asthma treatment as day cases compared with *housing tenants*. The opposite pattern was seen for *bronchitis* where the rate ratio increased with the more restricted definition of hospitalisation. Some categories of injury where rates were lower in *housing applicants* became more marked with the more restricted definition, notably *fractures of shoulder and upper arm, falls* and *contact with sharp glass*, all of which became significantly lower in the *housing applicants* compared with the *housing tenants* after restricting hospitalisations to overnight cases.

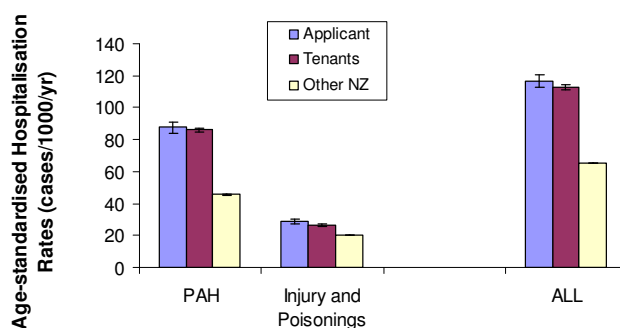
9.2.10 Potentially avoidable hospitalisations

The following analysis of potentially avoidable hospitalisations (PAH) is intended to provide an indication of the total burden of hospitalisations that could be avoided through unrestricted access to completely effective prevention and treatments services. As a result, the hospitalisation data are only filtered to remove overseas visitors and non-hospitalisations (unlike the previous analyses which were based on ‘standard hospitalisations’). PAH include two components:

- Avoidable hospitalisations – Based on selected ICD.10 codes from A00-R99 as used in previous analyses.
- Injuries and poisonings – Based on ICD.10 codes S00-T98. These events are regarded as entirely preventable, by definition

Results are shown in Figure 9.63 and Table 12.33. As this analysis shows, rates of PAH are very much higher in *housing applicants* and *housing tenants* compared with the *other NZ* population.

Figure 9.63: Potentially avoidable hospitalisations, age-standardised hospitalisation rates in *housing applicants*, *housing tenants* and *Other NZ* population



9.2.11 Hospitalisation rates by crowding level

This report includes a preliminary analysis of hospitalisation rates by level of household crowding. This follows a similar format to other results presented in this section with an overall analysis of rates, followed by analysis according to major diagnostic categories then specific diseases of interest. In this case, the comparison is between households reported as crowded using CNOS and uncrowded. Crowded households are also divided into those with one bedroom deficit, and 2+ bedroom deficit. This analysis focused on the *cohort* (combined applicant and tenant households) but also examined *housing applicants* and *housing tenants* separately to see if the health impact of household crowding is different in these two groups. To simplify the analysis, each cohort participant was assigned the crowding level recorded in his or her most recent NA or IRR. Because levels of household crowding are already known to be highly associated with ethnicity, this analysis used age-ethnicity standardised rates.

These results are presented in graphical and tabular form.

- Hospitalisation rates in crowded and uncrowded *housing applicant*, *housing tenant* and *cohort* (applicant and tenant) households are shown in Table 12.34.
- Hospitalisation rates according to crowding level (uncrowded, 1 bedroom deficit and 2+ bedroom deficit based on CNOS) for *housing applicant*, *housing tenant* and *cohort* (applicant and tenant) households are shown in Figure 9.64 and Table 12.35.
- For broad ICD.10 categories, a comparison of crowded and uncrowded households is shown for *housing applicants* (Table 12.36), *housing tenants* (Table 12.37) and the *cohort* population (applicants and tenants combined, Table 12.38). Age-ethnicity standardised rates for the *cohort* population are shown in Figure 9.65 and rate ratios for *cohort* in Figure 9.66
- For specific diseases, a comparison of age-ethnicity standardised rates in crowded and uncrowded households in the *cohort* population (applicants and tenants combined) is shown in Table 12.39.

This analysis showed the following:

- For *housing applicants*, hospitalisation rates were similar for those classified as crowded as for those who were uncrowded.
- For *housing tenants*, hospitalisation rates were significantly higher for those classified as crowded, and considerably elevated for those with a 2 or more bedroom deficit (RR 1.19, 95%CI 1.14, 1.26). Results were similar for combined *housing applicants* and *housing tenants*.
- For combined *housing applicants* and *housing tenants*, hospitalisation rates were significantly elevated for those classified as crowded for several major disease categories, particularly *neoplasms*, *musculoskeletal and connective tissue diseases* and *skin and subcutaneous diseases*. Conversely, hospitalisation rates for crowded households were significantly less than for uncrowded households for *mental and behavioural disorders*.
- For specific diseases, hospitalisation rates were ignorantly elevated in those households classified as crowded for some infectious diseases, including *bacterial infection of unspecified site*, *shingles (zoster)*, *acute bronchiolitis* and most forms of skin infection (*cutaneous abscess*, *furuncle and carbuncle*, *other local infection of skin and subcutaneous tissue*, and *osteomyelitis*). Of note were the significantly higher rates for *acute myocardial infarction* and *heart failure*. *Injuries to wrist and hand* and *injuries to hip and thigh* were all significantly more common causes of hospitalisation in crowded households. External causes that were also significantly more common were *falls* and *exposure to inanimate*

mechanical forces. Interestingly, hospitalisations for *mental disorders due to psychoactive substance use* and *manic episode or bipolar disorder* were significantly less common in crowded households, whereas the opposite pattern was seen for admissions diagnoses as *adult personality disorders*.

Figure 9.64: Comparison of age-ethnicity-standardised hospitalisation rates in *housing applicants, housing tenants and cohort* (applicant and tenants), according to different crowding levels (uncrowded, 1-bedroom deficit, 2+ bedroom deficit), May 2003 to June 2005

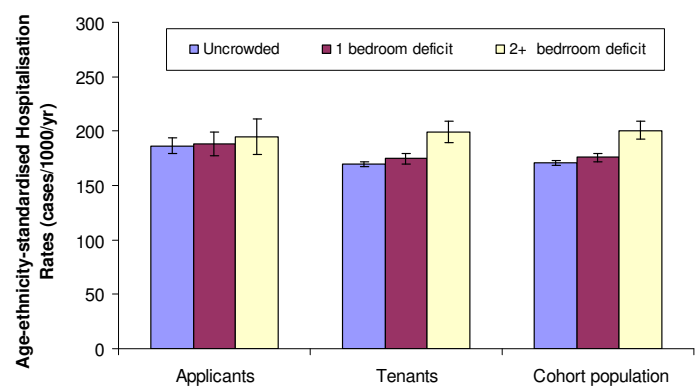


Figure 9.65: Comparison of age-ethnicity-standardised hospitalisation rates in crowded and uncrowded cohort (applicant and tenant) households, according to major disease categories, May 2003 to June 2005

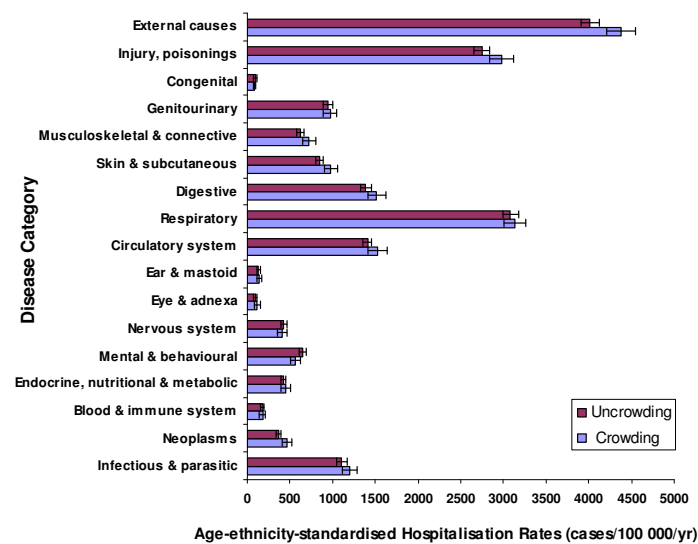
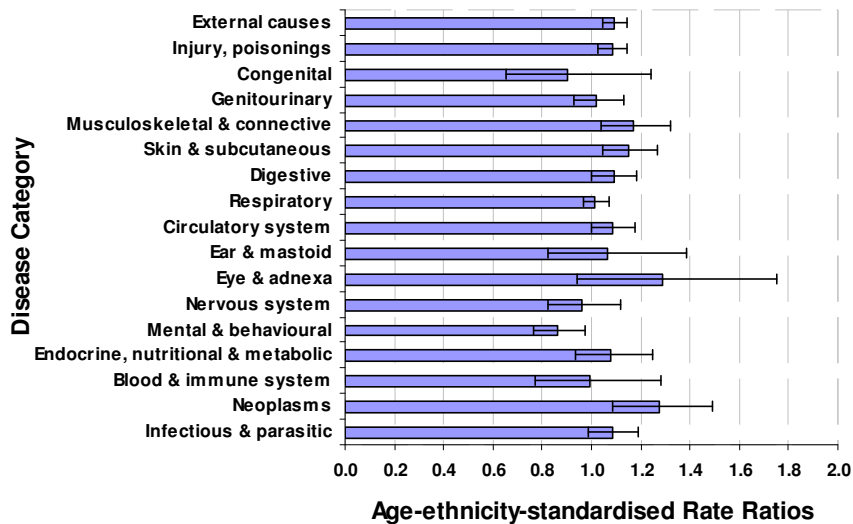


Figure 9.66: Hospitalisation age-ethnicity-standardised rate ratios in crowded and uncrowded cohort (applicant and tenant) households, according to major disease categories, May 2003 to June 2005



9.2.12 Hospitalisation rates for active smoking adults

This report includes a preliminary analysis of hospitalisation rates in those tenants who reported that they were active smokers (one or more cigarettes a day) compared with those who reported they were non-smokers. This analysis is based on tenants over 19 years (52.6 % of total tenants) and those who completed the question (69.1 % of tenants >19 years). This gave a total sample size of 60261 tenants.

These results are presented in graphical and tabular form.

- Overall crude, age-standardised, and age-ethnicity-standardised hospitalisation rates in active smoking and non-smoking *housing tenants* is shown in Table 12.40.
- For broad ICD.10 categories, a comparison of smoking and non smoking *housing tenants* is shown in Figure 9.67, Figure 9.68 and Table 12.42 for age-standardised rates and rate ratios, and Figure 9.69, Figure 9.70 and Table 12.43 for age-ethnicity standardised rates and rate ratios.
- For specific diseases, a comparison of age-standardised rates and age-ethnicity standardised rates in smoking and non-smoking *housing tenants* is shown in Table 12.44 and Table 12.45.

This analysis showed the following:

- In *housing tenants*, age-standardised hospitalisation rates were significantly elevated among smokers compared with non-smokers (RR 1.15, 95%CI 1.11, 1.18). The increase was only marginal when the comparison was based on age-ethnicity standardised rates (RR 1.04, 95%CI 1.00, 1.07).
- Age-standardised hospitalisation rates were significantly elevated for smokers for several major disease categories, including *neoplasms*, *respiratory diseases*, *skin and subcutaneous diseases*, and *external causes*. The association between smoking and hospitalisation rates

was particularly marked for *mental and behavioural disorders*. Using age-ethnicity standardised rates, the association with smoking was less marked, and only persisted for *neoplasms*, *mental and behavioural disorders* and *injuries and poisonings*. Conversely, age standardises and age-ethnicity standardised hospitalisation rates for smokers were significantly less than for non-smokers for *infectious and parasitic diseases*, *diseases of the eye and adnexa*, and *diseases of the circulatory system*.

- For specific diseases, age-standardised and age-ethnicity standardised hospitalisations rates were significantly elevated for *acute tonsillitis*, *chronic obstructive pulmonary disease*, *cutaneous abscess*, *furuncle and carbuncle*, most groups of *mental and behavioural disorders*, *poisonings and toxic effects*, *fracture to wrist and hand*, *intentional self harm* and *assault*.

Figure 9.67: Comparison of age-standardised hospitalisation rates in active smoking and non-smoking tenants (over 19 years old) , according to major disease categories, May 2003 to June 2005

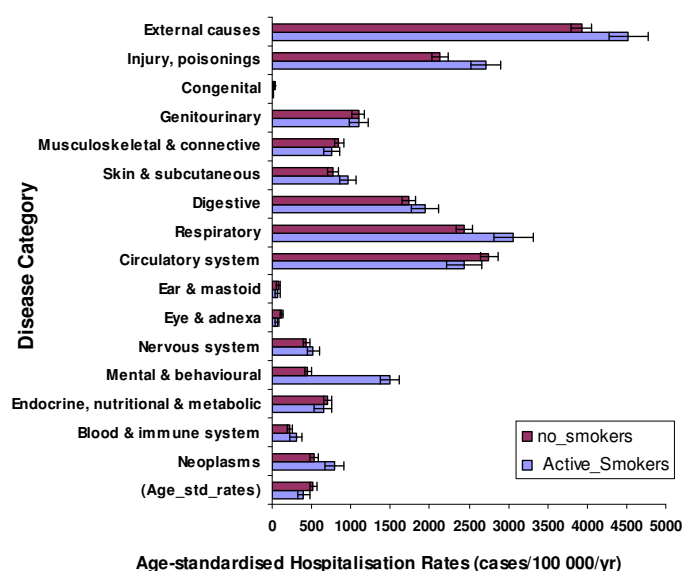


Figure 9.68: Hospitalisation age-standardised rate ratios in active smoking and non smoking tenants (over 19 years old), according to major disease categories, May 2003 to June 2005

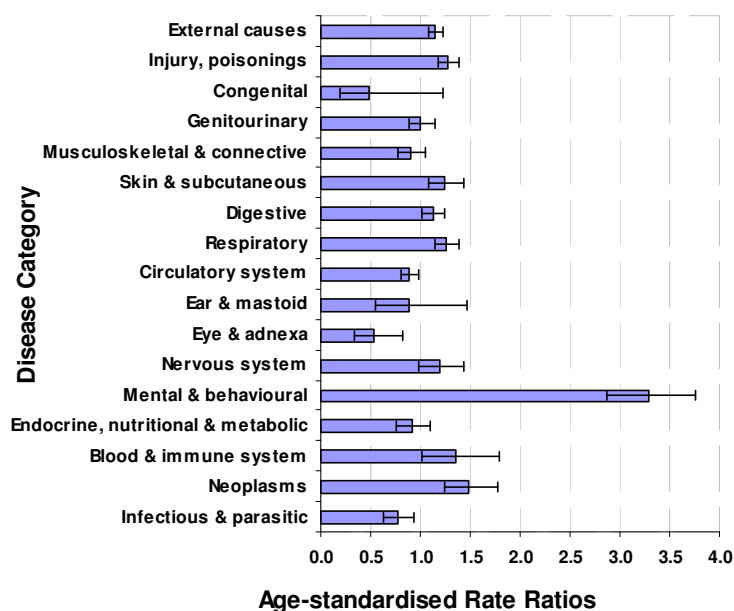


Figure 9.69: Comparison of age-ethnicity-standardised hospitalisation rates in active smoking and non-smoking tenants (over 19 years old) , according to major disease categories, May 2003 to June 2005

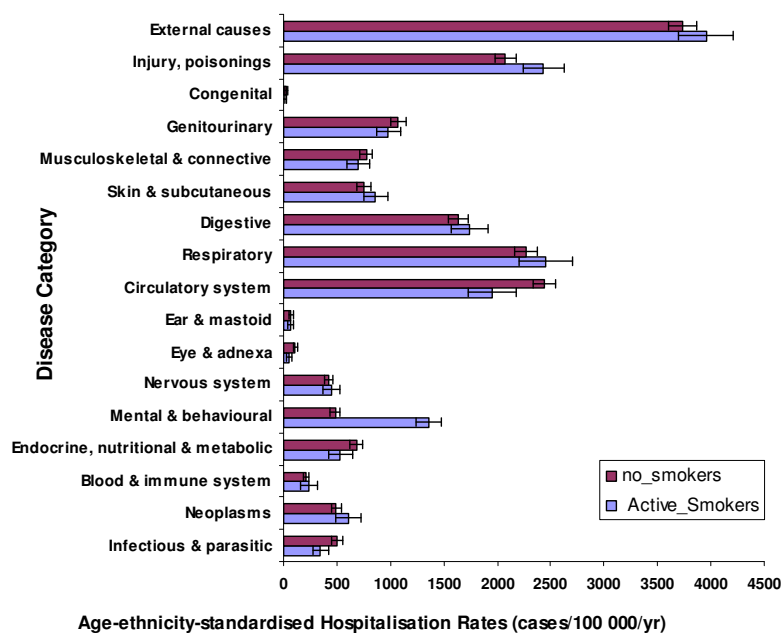
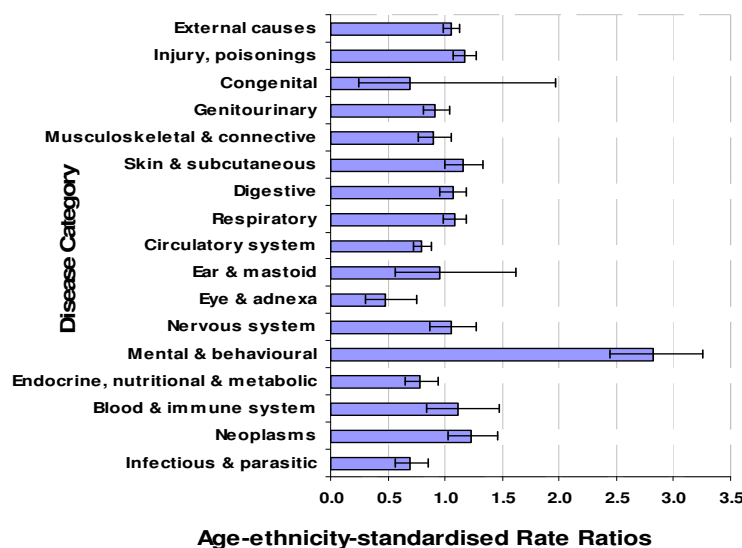


Figure 9.70: Hospitalisation age-standardised rate ratios in active smoking and non smoking tenants (over 19 years old), according to major disease categories, May 2003 to June 2005



9.2.13 Hospitalisation rates for passive smoking children

This report includes a preliminary analysis of hospitalisation rates for children under 15 years old that compares those in non-smoking household (all adults in household responded to the smoking question as ‘No’) with those in smoking households (at least one adult over 18 years in household responded to the smoking question as ‘Yes’). This analysis is based on tenants under 15 years (38.4 % of total tenants) and those whose household members completed the smoking questions (42.1 % of tenants <15 years). This gave a total sample size of 48908 tenants.

These results are presented in graphical and tabular form.

- Overall crude, age-standardised, and age-ethnicity-standardised hospitalisation rates in smoking household and non-smoking households are shown in Table 12.40.
- For broad ICD.10 categories, a comparison of smoking and non-smoking households is shown in Figure 9.71 and Figure 9.72 and Table 12.46 for age-standardised rates and rate ratios, and Figure 9.73 and Figure 9.74 and Table 12.47 for age-ethnicity standardised rates and rate ratios.
- For specific diseases, a comparison of age-standardised rates and age-ethnicity standardised rates in smoking and non-smoking households is shown in Table 12.48 and Table 12.49.

This analysis showed the following:

- In *housing tenants*, age-standardised and age-ethnicity standardised hospitalisation rates were not significantly elevated for children in smoking compared with non-smoking households.

- Age-standardised and age-ethnicity standardised hospitalisation rates were significantly elevated for children in smoking households compared with non-smoking households for *diseases of the blood and immune system*, and *musculoskeletal and connective disorders*. Age standardises and age-ethnicity standardised hospitalisation rates for children in smoking households compared with non-smoking households were marginally lower for *respiratory diseases*.
- For specific diseases, age-standardised and age-ethnicity standardised hospitalisations rates were significantly elevated for children in smoking households compared with non-smoking households for *cellulitis*.
And some specific injuries (*injuries to hip and thigh* and *fracture of femur*).

Figure 9.71: Comparison of age-standardised hospitalisation rates in passive smoking and non-smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005

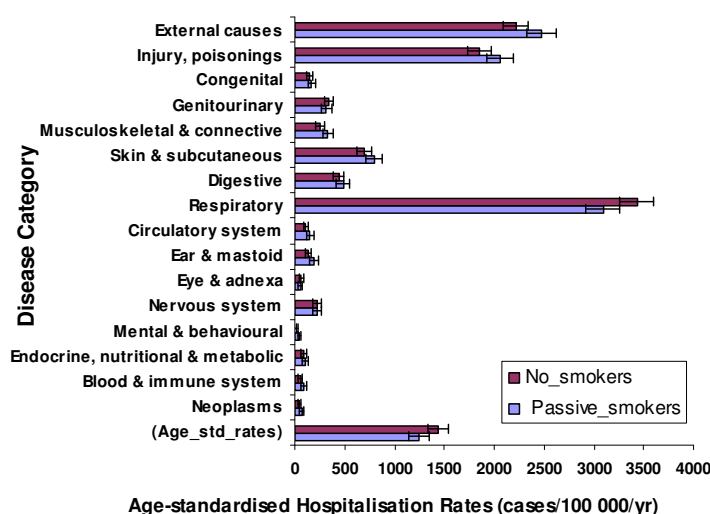


Figure 9.72: Hospitalisation age-standardised rate ratios in passive smoking and non-smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005

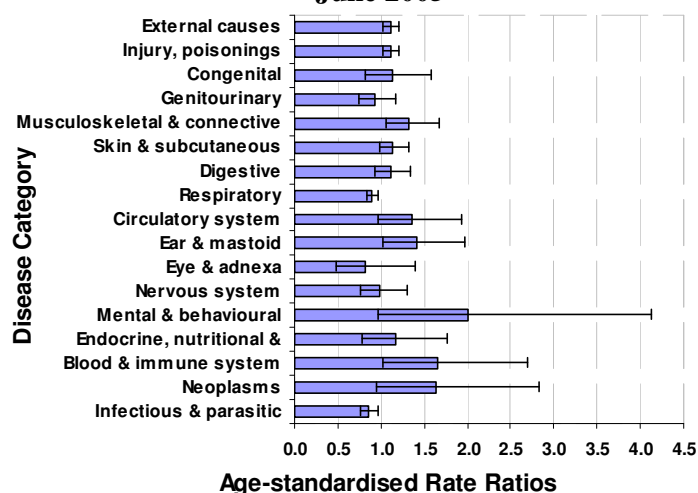


Figure 9.73: Comparison of age-ethnicity-standardised hospitalisation rates in passive smoking and non-smoking tenants (under 15 years old) , according to major disease categories, May 2003 to June 2005

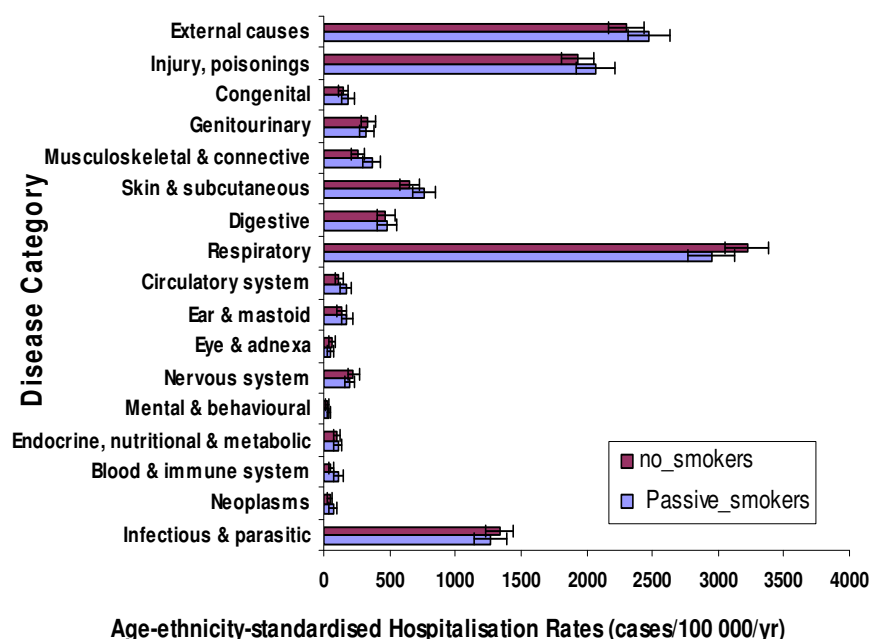
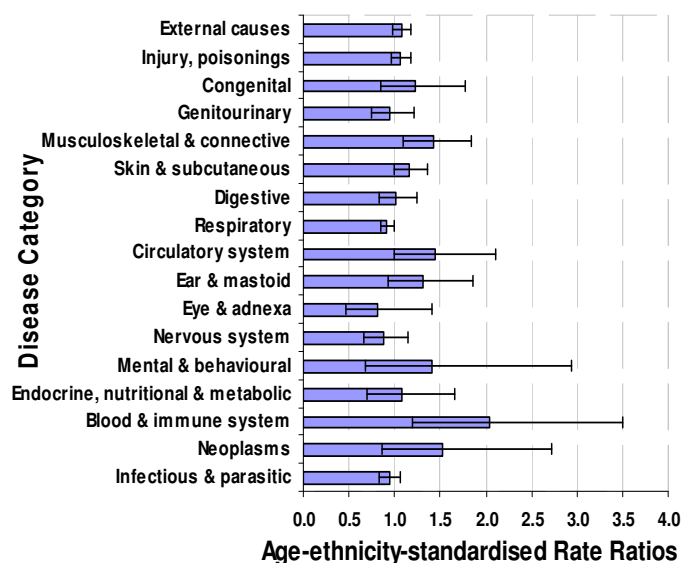


Figure 9.74: Hospitalisation age-ethnicity-standardised rate ratios in passive smoking and non-smoking tenants (under 15 years old), according to major disease categories, May 2003 to June 2005



10 Discussion

10.1.1 Main findings

The first 29 months operation of the *Housing Crowding and Health Study* has demonstrated that the study is technically feasible and likely to be able to investigate all of its planned objectives. In particular:

- HNZC administrative data can be successfully transferred via NZHIS in a form that enables analysis of the characteristics of individuals and households.
- Most (92%) *housing applicants* and *housing tenants* can be matched to their national health index (NHI) number, which is the key to linking to hospitalisation records.
- Most (93%) of applicants and tenants can be followed in a way which allows their 'person time' to be accurately assigned to applicant and tenant categories.
- New and modified questions on the NA and IRR forms are being successfully completed in the majority of cases (though the voluntary smoking question is still only completed by 63%).
- *Housing applicants* are exposed to significantly higher levels of household crowding than *housing tenants*, who are in turn living in more crowded conditions than the *other NZ* population. Crowding levels are particularly high for *housing applicants* sharing houses with non-applicants households.
- The majority (61.6%) of *housing applicants* who become *housing tenants* decrease their level of household crowding in the process, and this decrease is marked.

The analysis of hospitalisation data identified a number of important characteristics of the *cohort* populations:

- Social *housing applicants* and *tenants* have very high rates of recorded contact with the hospital system. These events are equivalent to 399/1000/year for *housing applicants* and 348/1000 for *housing tenants*, compared with 218/1000 for the *other NZ* population.
- The *standard filter* (excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions) removes 50% of recorded hospital contacts. After this filter is applied, hospitalisations remain markedly higher for the *housing applicants* (223/1000) and *housing tenants* (210/1000) compared with *other NZ* population (127/1000).
- The *cohort* population has significantly higher hospitalisations rates than the *other NZ* population for all age groups, and for males and females. They also have higher rates for European, Maori, and Pacific people.
- Surprisingly, hospitalisation rates were significantly higher for the highest income quintile of *housing applicants*, whereas there was a slight negative gradient for *housing tenants* with higher income associated with a lower hospitalisation rate. Similarly, there was a modest increase in hospitalisation rates for *housing tenants* living in the most deprived neighbourhoods where these properties are concentrated (42% are in NZDep 2001 category 10).
- There are significant differences in hospitalisation rates between HNZC regions. HNZC properties are disproportionately located in urban areas compared with rural areas. Hospitalisations rates are lower for those in satellite urban areas, and non-significantly higher in rural areas. Hospitalisations follow a familiar seasonal pattern with higher rates in winter, particularly for *housing applicants*.

- Age-standardised rates for the *cohort* population in total (*housing applicants* and *tenants*), compared with the *other NZ* population, were significantly elevated for every disease grouping except for *congenital diseases*. Such differences were largest for *endocrine, nutritional and metabolic diseases, mental and behavioural conditions, respiratory diseases, and skin and subcutaneous diseases*.
- Age-standardised rates for the *cohort* population were also elevated for virtually every specific disease included in the analysis. Specific examples where rates were elevated two fold or more included: *Infectious diseases (tuberculosis, meningococcal disease, septicaemia, all forms of viral hepatitis)*; *Respiratory diseases (pneumonia, bronchitis, chronic obstructive pulmonary disease, other lower respiratory infections, asthma)*; *Skin and bone infections (impetigo, cutaneous abscess, cellulitis, lymphadenitis, osteomyelitis)*; *Other diseases with an infectious origin (acute rheumatic fever, acute and unspecified nephritis syndrome)*; *Cardiovascular diseases (hypertensive diseases, heart failure)*; *Injuries (from contact with heat, assault, pedestrian injuries, dog bites, sharp glass)*; *Mental and behavioural disorders (most categories, plus intentional self-harm)*.
- By contrast, *housing applicants* and *housing tenants* generally had similar rates of hospitalisation for most groups of diseases and specific diseases. However, *housing applicants* had significant higher rates of hospitalisation for some diseases: *Respiratory diseases (notably acute pharyngitis, acute bronchitis, acute bronchiolitis and asthma)*; *Mental and behavioural disorders (particularly mood disorders, neurotic and stress related disorders, mental disorders due to psychoactive substance use, plus intentional self harm)*; and certain *injuries (notably poisonings and toxic effects)*.
- By contrast, *housing applicants* had lower hospitalisation rates for some conditions, notably some skin infections (*abscess, furuncle and carbuncle*)
- Carrying out the analysis using age-ethnicity standardised rates removed some of the effects that were related to the different ethnic composition of the *housing applicant* and *housing tenant* populations compared with the *other NZ* population. The use of age-ethnicity-standardised results reduced the rate ratio different between the *cohort* population and the *other NZ* population by about 30% suggesting that some of this difference could be explained by the relatively high proportion of Maori and Pacific people in the cohort population. Even with this additional adjustment, *housing applicants* and *housing tenants* continued to experience significantly higher hospitalisation rates than the *other NZ* population for all major disease categories except *congenital diseases*. For some specific diseases, this form of standardisation reduced the difference to non-significance, notably *meningococcal disease, acute bronchitis, and malignant neoplasms of the stomach*. For a minority of diseases, this standardisation resulted in an increase in rate, notably for *intestinal infectious diseases, demyelinating diseases of the CNS, some mental and behavioural disorders* and some injuries. Age-ethnicity-standardisation also increased the hospitalisation rate in the *housing applicants* compared with the *housing tenant* populations (from RR 1.06 to 1.10) which is understandable, given the higher proportion of Pacific people who are *housing tenants* compared with the *housing applicant* population. This standardisation resulted in rates becoming significantly higher for *housing applicants* in some disease categories, particularly *infectious and parasitic diseases and respiratory diseases*. Applicants now no longer had significantly lower rates for diseases of the *ear and mastoid* and *skin and subcutaneous diseases*. They also no longer had significantly higher rates of *congenital disease*. *Housing applicants* continued to have significantly lower rates of *neoplasms*, which was the only disease grouping where this difference was seen. When comparing the *housing applicants* with the *housing tenants* for specific diseases, this standardisation resulted in rates becoming significantly higher for several specific diseases, including *viral infection of unspecified site, other chronic obstructive pulmonary disease,*

and *burns and corrosions*. Some other rate ratios increased to the point that previously lower rates in *housing applicants* no longer applied, notably *other septicæmia*, and *cutaneous abscess, furuncle and carbuncle*. Rate ratios dropped for *fracture of shoulder and upper arm, superficial injury of lower leg* and for *falls* to the point where rates for these conditions were significantly lower in *housing applicants* (though only marginally so).

- Restricting the definition of hospitalisation to overnight hospitalisation removed about 25% of events that involved attending as a day case. This restriction had little effect on the key findings.
- A better indication of the health effects of social housing can be obtained by comparing hospitalisation rates in the sub-group of applicants who subsequently became tenants, and tenants during their first year of hospitalisation. These populations had exactly the same overall hospitalisation rates (rate ratio 1.00, 95%CI 0.93, 1.07). This finding suggests no immediate health effects are associated with the move from waiting list to tenant. However, this finding will be investigated more fully in the future using longitudinal analysis. These populations had very similar rates of hospitalisation for major disease categories and specific diseases. The only differences were that hospitalisations for *nervous system conditions* were significantly more common among *housing applicants* (which was not the case when comparing the total *housing applicant* and total *housing tenant* populations) and *neoplasms* were significantly more common among *housing tenants* (this pattern was more marked than when comparing the total applicant and total tenant populations). *Acute bronchiolitis* had markedly higher rates among *housing applicants*. Some conditions had marginally elevated rates in *housing applicants*, including *injuries to abdomen, back and pelvis*, and *poisonings and toxic effects*. Hospitalisations were significantly lower for *cutaneous abscess, furuncle and carbuncle* among the *housing applicants*.
- Extending this analysis, it is also useful to look at hospitalisation rates according to duration of tenancy. This analysis shows that hospitalisation rates are highest among *housing tenants* during their first year as tenants (277 per 1,000 per year). Hospitalisation rates decline over the subsequent 1-3 years as tenants, and then reach a plateau for those who are tenants for 4 or more years (about 182 per 1,000 per years). This hospitalisation rate remains significantly higher than that seen for the *other NZ* population (about 127 per 1,000 per year). The pattern seen for major disease categories is broadly similar, with a decline from highest rates as *housing tenants* during the first year of the tenancy to lower rates with longer periods spent as HNZA tenants. The only exceptions are *neoplasms* and *congenital conditions* where rates remain relatively constant with duration of tenancy. The pattern seen for selected diseases is more mixed. Some diseases have a very pronounced decline in hospitalisation rates with duration of tenancy. This is particularly the case with *mental health conditions, intentional self-harm, assault*, and *poisonings and toxic effects* (some of which will be self-inflicted). Several of the infectious diseases also show a decline in hospitalisation rates with duration of tenancy. This decline is most marked for the *intestinal infectious diseases, acute bronchiolitis, chronic obstructive pulmonary disease, and asthma*.
- This analysis also reviewed the health outcomes associated with the HNZA prioritisation system, which distinguished higher priority *housing applicants* (A+B) from lower priority *housing applicants* (C+D). This analysis shows that the population prioritised for social housing has a 44% higher hospitalisation rate (266 per 1000 per year) compared with those assigned a lower priority (185 per 1000 per year). However, even the lower priority applicants have a markedly higher hospitalisation rate than the *other NZ* population (about 127 per 1,000 per year).
- Potentially avoidable hospitalisations were almost twice as high in the *cohort population* as compared with the *other NZ* population, with injuries and poisonings about 35% higher.

- This report includes a preliminary analysis of hospitalisation rates in relation to household crowding level of *housing applicants* and *housing tenants*. To simplify the analysis, each cohort participant was assigned the crowding level recorded in his or her most recent NA or IRR. Because levels of household crowding are already known to be highly associated with ethnicity, this analysis used age-ethnicity standardised rates. This analysis showed the following: For combined *housing applicants* and *housing tenants*, hospitalisation rates were significantly elevated for those classified as crowded for total hospitalisations and for several major disease categories, particularly *neoplasms*, *musculoskeletal and connective tissue diseases* and *skin and subcutaneous diseases*. Conversely, hospitalisation rates for crowded households were significantly less than for uncrowded households for *mental and behavioural disorders*. For specific diseases, hospitalisation rates were significantly elevated in those households classified as crowded for some infectious diseases, including *bacterial infection of unspecified site*, *shingles* (zoster), *acute bronchiolitis* and most forms of skin infection (*cutaneous abscess*, *furuncle and carbuncle*, *other local infection of skin and subcutaneous tissue*, and *osteomyelitis*). Of note were the significantly higher rates for *acute myocardial infarction* and *heart failure*. *Injuries to wrist and hand* and *injuries to hip and thigh* were all significantly more common causes of hospitalisation in crowded households. External causes that were also significantly more common were *falls* and *exposure to inanimate mechanical forces*. Interestingly, hospitalisations for *mental disorders due to psychoactive substance use* and *manic episode or bipolar disorder* were significantly less common in crowded households, whereas the opposite pattern was seen for admissions diagnoses as *adult personality disorders*.
- This report includes a preliminary analysis of hospitalisation rates in relation to active and passive smoking. Smoking data was reported by 69.1% of tenants >19 years. This group had significantly higher hospitalisation rates than non-smokers. Age-standardised hospitalisation rates were significantly elevated for *neoplasms*, *respiratory diseases*, *skin and subcutaneous diseases*, *mental and behavioural disorders* and *external causes*. Using age-ethnicity standardised rates, the association with smoking was less marked, and only persisted for *neoplasms*, *mental and behavioural disorders* and *injuries and poisonings*. Conversely, age standardised and age-ethnicity standardised hospitalisation rates for smokers were significantly less than for non-smokers for *infectious and parasitic diseases*, *diseases of the eye and adnexa*, and *diseases of the circulatory system*. For specific diseases, age-standardised and age-ethnicity standardised hospitalisations rates were significantly elevated for *acute tonsillitis*, *chronic obstructive pulmonary disease*, *cutaneous abscess*, *furuncle and carbuncle*, most groups of *mental and behavioural disorders*, *poisonings and toxic effects*, *fracture to wrist and hand*, *intentional self harm* and *assault*.
- The smoking status of household was reported for 42.1% of tenant children <15 years. Overall age-standardised and age-ethnicity standardised hospitalisation rates were not significantly elevated for children in smoking compared with non-smoking households. Age-standardised and age-ethnicity standardised hospitalisation rates were significantly elevated for children in smoking households compared with non-smoking households for *diseases of the blood and immune system*, and *musculoskeletal and connective disorders*. For specific diseases, hospitalisations rates were significantly elevated for *cellulitis* and some specific injuries.

10.1.2 Implications

The findings contained in this report have met the two aims of this document.

Firstly, this report shows that it has been possible to construct the cohort, successfully link applicants and tenants to their hospital records and calculate their person time in the cohort. These data can in turn be used to calculate rates of hospitalisation generally and for specific diseases. These findings have important implications for the next phase of the data analysis. In particular, they show the importance of duration of tenancy as a factor in determining hospitalisation rates. This relationship requires further investigation, ideally using longitudinal data analysis.

Secondly, this report provides a more comprehensive description of the characteristics of social *housing applicants* and *tenants* and additional information on their health status. These observations confirm that this population is highly vulnerable, at least in terms of health events resulting in hospitalisation.

- *Housing applicants* and *housing tenants* have relatively high rates of recorded contacts with the hospital system overall and for virtually every major disease grouping compared with other New Zealanders (the *other NZ* population). These findings have implications for the effective delivery of health services to this population.
- This population also has high rates of hospitalisation for many groups of diseases that are at least partly preventable (e.g. most forms of infectious disease and injuries). This observation suggests that there could be health gain for this population, and possibly also efficiency gains for the health system, by use of a range of prevention measures that targeted social housing populations.
- Some of the diseases with particularly high rates in *housing applicant* and *housing tenant* populations have well defined environmental causes (e.g. asthma, injuries) which suggests the potential for specific prevention programmes.
- It is not possible to say from these findings whether social housing has a protective effect on those who have been housed. *Housing applicants* who are subsequently housed have similar rates of disease to *housing tenants* during their first year, suggesting no short-term health effects from social housing. However, those who have a longer duration of time as *housing tenants* have marked lower hospitalisation rates suggesting some protective effect from medium-term (4+ years) social housing tenancy. This could be a true protective effect. There is also a range of alternative explanations, including a selection effect where those with better health or more stable lifestyles tend to remain as tenants for longer, or a cohort effect reflecting social allocation practices that applied several years ago. This question will be investigated further with a more sophisticated longitudinal analysis.
- These findings provide some validation for the HNZZ social allocation system, which aims to allocate housing on the basis of need, and assigns higher priority to applicants rated A and B ahead of C and D.
- The initial analysis of the role of household crowding supports continuing efforts by HNZZ to reduce levels of household crowding in its properties.

10.1.3 Limitations

The findings reported here have a number of limitations:

These findings need to be interpreted with considerable caution for a number of reasons:

- Limitations with the numerator – Hospitalisations will only capture a proportion of all diseases cases. For severe diseases, such as meningococcal disease, this proportion will be high, but for less severe diseases, such as mumps, this proportion will be low and possibly biased.
- Limitations with the denominator – Accurately assigning participants (and their person-time) to the study is prone to a number of sources of error. Some of these errors reflect the limitations of using administrative data which is collected for applicant and tenant management purposes.
- Confounding – The analysis of hospitalisation data uses age-standardised rates to manage confounding by age. However, there are other confounders that have not yet been considered in the analysis (e.g. tobacco smoke exposure). There are also other unmeasured confounders that cannot be included in the analysis (e.g. there are probably unmeasured differences between tenants living in HNZC houses for <1 year compared with those who stay longer).
- Study size – Some of the diseases reported here are still relatively uncommon so findings need to be interpreted with caution. This limitation will diminish with time as the cohort size increases.
- Causal inference – This analysis treats the cohort as three cross-sections (*housing applicants*, *housing tenants*, and *other NZ*). The finding that some diseases have higher rates in one or other of these populations does not necessarily imply a causal association. For some conditions ‘reverse’ causality is operating in that those with some chronic diseases seek and are prioritised to receive social housing (e.g. multiple sclerosis). Future analyses will exploit the longitudinal nature of this cohort study to try to answer questions about whether a change in housing status is associated with a change in health status. Such analyses have much greater potential to answer such causal questions and will be the key analyses of this study.

10.1.4 Further work

The next stages of the analysis will include the following:

- Use of multivariable methods to adjust for measured confounders to investigate the role of household crowding more rigorously.
- Longitudinal analysis to assess the effects of a change in household crowding level which, by following the same individuals over time, provided un-confounded results.
- Further review of the impact of data quality on study findings. This review will ultimately include a sensitivity analysis to establish whether or not a validation study is needed (notably to validate key recorded variables such as the number of people living in applicant and tenant households).

11 References

1. Baker M, McNicholas A, Garrett N, et al. Household crowding a major risk factor for epidemic meningococcal disease in Auckland children. *Pediatric Infectious Disease Journal*. 2000, 19: 983-990.
2. Baker M, Milosevic J, Blakely T, et al. Housing, crowding and health. In: *Housing and Health*, Philippa Howden-Chapman and Penelope Carroll, Editor. Department of Public Health, Wellington School of Medicine and Health Sciences: Wellington, 2004.
3. Gray A. Definitions of Crowding and the Effects of Crowding on Health: A Literature Review. Ministry of Social Policy: Wellington, 2001.
4. Thomson H, Petticrew M, Morrison D. Housing improvement and health gain: a summary and systematic review. MRC Social and Public Health Sciences Unit: Glasgow: University of Glasgow, 2002.
5. Jensen J. Income equivalences and the estimation of family expenditure on children. Department of Social Welfare (unpublished): Wellington, 1988.
6. Canadian Ministry of Housing Corporation. Core housing need in Canada. Canadian Government Print: Ottawa, 1991.
7. Statistics New Zealand. What is the extent of crowding in New Zealand? Statistics New Zealand: Wellington, 2003.
8. New Zealand Health Information Service. National minimum dataset (hospital events): Data dictionary, Version 6.5. Ministry of Health: Wellington, 2005.
9. Ministry of Health. Hospital throughput 2002/03: For DHBs and their hospitals. Ministry of Health: Wellington, 2005.
10. New Zealand Health Information Service. New Zealand Health Information Service Glossary. 2003 May 2003 [cited; Available from: <http://www.nzhis.govt.nz/documentation/glossary1.1.pdf>].
11. Jackson G, Tobias M. Potentially avoidable hospitalisations in New Zealand, 1989-98. *Aust N Z J Public Health* 2001, 25: 212-21.
12. Rothman K, Greenland S. *Modern epidemiology*. 2nd ed. Philadelphia: Lippincott-Raven; 1998.

12 Appendices

Table 12.1: Population used for age-ethnicity standardisation, based on age-ethnicity structure of HNZC population at June 2005, compared with NZ Census population 2001

HNZC June 2005

Age	Maori		Pacific		European		Asian and Other		Not stated	
Age	Number	%	Number	%	Number	%	Number	%	Number	%
0-9	23536	29.6	20095	27.9	6401	15.0	3112	17.6	3319	21.6
10-19	22518	28.3	19000	26.4	6927	16.3	3592	20.3	5791	37.6
20-29	8429	10.6	7628	10.6	3526	8.3	1955	11.0	1857	12.1
30-39	9223	11.6	8522	11.8	5306	12.5	2277	12.8	938	6.1
40-49	7581	9.5	7642	10.6	5817	13.7	2185	12.3	1043	6.8
50-59	4376	5.5	4427	6.2	5031	11.8	1519	8.6	824	5.4
60-69	2416	3.0	2680	3.7	4153	9.8	1754	9.9	586	3.8
70+	1357	1.7	1945	2.7	5419	12.7	1335	7.5	1027	6.7
Total	79436	100.0	71939	100.0	42580	100.0	17729	100.0	15385	100.0

Census 2001

Age	Maori		Pacific		European		Asian and Other		Not stated	
Age	Number	%	Number	%	Number	%	Number	%	Number	%
0-9	133668	25.4	47940	23.9	320313	12.3	36132	14.6	24669	15.8
10-19	112443	21.4	39795	19.9	337908	12.9	48165	19.5	17808	11.4
20-29	82245	15.6	33813	16.9	305568	11.7	43473	17.6	21639	13.8
30-39	77619	14.7	31722	15.8	397131	15.2	45717	18.5	24624	15.7
40-49	57978	11.0	21807	10.9	397710	15.2	37788	15.3	22170	14.2
50-59	33228	6.3	13329	6.7	334593	12.8	19539	7.9	17637	11.3
60-69	19518	3.7	7476	3.7	232059	8.9	11034	4.5	12450	8.0
70+	9684	1.8	4419	2.2	287388	11.0	5610	2.3	15438	9.9
Total	526383	100.0	200301	100.0	2612670	100.0	247458	100.0	156435	100.0

Table 12.2: Distribution of admission types within DHBs for cohort study population (applicants and tenants), May 2003 to June 2005

DHB	ED Acute admissions		Other Acute admissions		Arranged admissions		Waiting List		Other admissions	
	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers	Percent
Northland DHB	600	5.6	3626	33.6	5640	52.2	938	8.7	0	0.0
Waitemata DHB	1486	13.1	5826	51.4	2038	18.0	1994	17.6	0	0.0
Auckland DHB	3160	12.7	13513	54.5	4337	17.5	3797	15.3	2	0.0
Counties Manukau DHB	2933	9.8	15136	50.6	7606	25.4	4243	14.2	2	0.0
Waikato DHB	1348	9.3	5696	39.4	5651	39.1	1765	12.2	0	0.0
Lakes DHB	259	8.6	1430	47.5	955	31.7	368	12.2	0	0.0
Bay of Plenty DHB	77	1.2	3226	49.9	2311	35.7	852	13.2	0	0.0
Tairāwhiti DHB	13	0.4	1899	59.5	791	24.8	488	15.3	0	0.0
Taranaki DHB	50	1.8	1474	51.6	750	26.3	580	20.3	0	0.0
Hawkes Bay DHB	12	0.1	3476	41.0	3793	44.7	1206	14.2	1	0.0
Midcentral DHB	151	4.2	1828	50.5	914	25.2	727	20.1	1	0.0
Whanganui DHB	144	6.5	1122	50.4	482	21.7	476	21.4	0	0.0
Capital and Coast DHB	27	0.4	3352	47.4	2142	30.3	1545	21.9	0	0.0
Hutt DHB	16	0.2	4333	60.0	1360	18.8	1513	20.9	0	0.0
Wairarapa DHB	1	0.6	110	67.1	31	18.9	22	13.4	0	0.0
Nelson Marlborough DHB	5	0.2	1430	51.4	684	24.6	645	23.2	16	0.6
West Coast DHB	9	1.0	537	57.2	126	13.4	248	26.4	18	1.9
Canterbury DHB	350	3.1	6355	55.8	2561	22.5	2130	18.7	0	0.0
Sth Canterbury DHB	0	0.0	690	59.8	233	20.2	230	19.9	0	0.0
Otago DHB	357	9.0	2009	50.5	779	19.6	827	20.8	3	0.1
Southland DHB	2	0.2	729	56.5	276	21.4	284	22.0	0	0.0
Overseas	14	15.9	46	52.3	21	23.9	7	8.0	0	0.0
Unknown	0	0.0	3	50.0	3	50.0	0	0.0	0	0.0
Total	11014	7.0	77846	49.5	43484	27.6	24885	15.8	43	0.0

Table 12.3: Distribution of admission types within DHBs for *other NZ* population, May 2003 to June 2005

DHB	ED Acute admissions		Other Acute admissions		Arranged admissions		Waiting List		Other admissions	
	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers	Percent
Northland DHB	4070	5.4	29488	39.1	28236	37.4	13683	18.1	0	0.0
Waitemata DHB	14926	10.0	74464	49.8	28620	19.2	31424	21.0	4	0.0
Auckland DHB	12054	10.8	58172	52.0	25832	23.1	15828	14.1	7	0.0
Counties Manukau DHB	10713	7.8	67324	48.8	32082	23.2	27911	20.2	15	0.0
Waikato DHB	12219	8.9	57649	42.2	40414	29.6	26351	19.3	2	0.0
Lakes DHB	3594	7.9	20867	46.0	11688	25.8	9165	20.2	1	0.0
Bay of Plenty DHB	1131	1.3	41885	49.2	20667	24.3	21421	25.2	0	0.0
Tairāwhiti DHB	55	0.3	10483	53.9	4710	24.2	4207	21.6	0	0.0
Taranaki DHB	943	2.4	18554	46.4	9318	23.3	11136	27.9	12	0.0
Hawkes Bay DHB	150	0.3	25880	47.6	14741	27.1	13643	25.1	2	0.0
Midcentral DHB	1694	3.5	24002	50.2	10234	21.4	11861	24.8	3	0.0
Whanganui DHB	1546	5.6	13125	47.7	4329	15.7	8517	31.0	0	0.0
Capital and Coast DHB	179	0.3	29948	45.9	20024	30.7	15103	23.1	1	0.0
Hutt DHB	88	0.2	23756	52.3	9186	20.2	12357	27.2	21	0.0
Wairarapa DHB	21	0.1	9492	54.9	3925	22.7	3826	22.1	25	0.1
Nelson Marlborough DHB	58	0.1	20904	46.2	10417	23.0	13438	29.7	450	1.0
West Coast DHB	134	1.0	6553	47.4	2012	14.5	5131	37.1	9	0.1
Canterbury DHB	3680	2.5	78518	53.4	32864	22.4	31905	21.7	16	0.0
Sth Canterbury DHB	43	0.2	11815	49.6	5414	22.7	6563	27.5	0	0.0
Otago DHB	4401	6.7	32063	49.1	12928	19.8	15907	24.3	30	0.0
Southland DHB	139	0.4	18608	54.5	7000	20.5	8374	24.5	15	0.0
Overseas	377	13.4	1822	64.9	385	13.7	225	8.0	0	0.0
Unknown	13	11.4	71	62.3	22	19.3	8	7.0	0	0.0
Total	72228	5.2	675443	48.5	335048	24.1	307984	22.1	613	0.0

Table 12.4: Hospitalisation numbers and age-standardised rates in *cohort* population (applicants and tenants) compared with *other NZ* population, according to successive levels of filtering and major admission categories, May 2003 to June 2005

Disease category	Cohort population			Other NZ population			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
Total hospital contacts	115864	355.5	353.4 357.6	1689897	218.2	217.9 218.6	1.63	1.62 1.64
Total hospital contacts excluding overseas	113572	348.0	345.9 350.1	1648687	212.9	212.6 213.3	1.63	1.62 1.64
Total hospital contacts excluding non-hospitalisations ³	105939	325.8	323.7 327.8	1443368	186.1	185.8 186.4	1.75	1.74 1.76
All Acute and arranged (ex waiting list)	87715	270.6	268.7 272.4	1127708	145.4	145.2 145.7	1.86	1.85 1.87
All Acute	58925	176.9	175.4 178.4	776314	100.1	99.9 100.3	1.77	1.75 1.78
All Acute minus ED	51593	156.7	155.3 158.2	701936	90.5	90.3 90.7	1.73	1.72 1.75
All Acute minus day cases	44527	137.7	136.3 139.0	603304	77.7	77.5 77.9	1.77	1.75 1.79
Standard (acute & arranged excluding irrelevant conditions ⁴)								
• Total	61266	183.4	181.9 185.0	833981	107.6	107.3 107.8	1.71	1.69 1.72
• With 1 month exclusion	56546	168.9	167.5 170.4	771185	99.5	99.3 99.7	1.70	1.68 1.71

¹ Number for total time period (26 months)

² Rate, as cases / 1000 / year, standardised to age distribution of NZ at 2001 census

³ Non hospitalisations are defined in text

⁴ Irrelevant conditions are defined in text

Table 12.5: Hospitalisation numbers and age-standardised rates in *housing applicants* compared with *housing tenants*, according to successive levels of filtering and major admission categories, May 2003 to June 2005

Disease category	<i>Housing applicants</i>			<i>Housing tenants</i>			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
Total hospital contacts	16386	399.4	392.3 406.6	99478	347.5	345.3 349.8	1.15	1.13 1.17
Total hospital contacts excluding overseas	15842	383.9	376.9 390.9	97730	341.0	338.8 343.3	1.13	1.10 1.15
Total hospital contacts excluding non-hospitalisations ³	14444	355.3	348.6 362.1	91495	320.0	317.8 322.2	1.11	1.09 1.13
All Acute and arranged (ex waiting list)	12312	300.0	293.9 306.2	75403	264.9	263.0 266.9	1.13	1.11 1.16
All Acute	8086	197.6	192.5 202.8	50839	173.5	171.9 175.1	1.14	1.11 1.17
All Acute minus ED	6887	171.3	166.5 176.2	44706	154.2	152.7 155.7	1.11	1.08 1.14
All Acute minus day cases	5765	148.0	143.4 152.5	38762	135.7	134.3 137.1	1.09	1.06 1.13
Standard (acute & arranged excluding irrelevant conditions ⁴)								
• Total	7964	197.4	192.2 202.7	53302	181.1	179.5 182.7	1.09	1.06 1.12
• With 1 month exclusion	7228	177.7	172.7 182.7	49318	167.2	165.7 168.8	1.06	1.03 1.09

¹ Number for total time period (26 months)

² Rate, as cases / 1000 / year, standardised to age distribution of NZ at 2001 census

³ Non hospitalisations are defined in text

⁴ Irrelevant conditions are defined in text

Table 12.6: Total hospitalisation numbers and crude rates in housing applicants, housing tenants and other NZ population, according to key demographic characteristic, May 2003 to June 2005

Characteristic	Housing applicants			Housing tenants			Other NZ population		
	Hosp. No.	Person time ¹	Rate ²	Hosp. No.	Person time ¹	Rate ²	Hosp. No.	Person time ¹	Rate ²
Age group									
<1 years	1608	1498.1	1073.4	4218	4195.7	1005.3	181094	112774.4	1605.8
1-4 years	1614	6569.3	245.7	7421	31665.7	234.4	74004	430415.3	171.9
5-9 years	782	6473.2	120.8	5582	45480.3	122.7	49868	568395.2	87.7
10-19 years	1585	9199.6	172.3	9570	79121.3	121.0	109187	1117299.1	97.7
20-29 years	3058	6006.1	509.2	10468	31536.7	331.9	187293	1017575.5	184.1
30-39 years	2593	6780.3	382.4	12062	41780.5	288.7	214795	1201867.0	178.7
40-49 years	1932	4614.3	418.7	11426	38727.7	295.0	151160	1121698.0	134.8
50-59 years	1345	2690.6	499.9	12872	25981.4	495.4	157319	878091.1	179.2
60-69 years	1153	2248.4	512.8	11986	18476.1	648.7	174260	591747.6	294.5
70+ years	716	1115.9	641.6	13873	19332.0	717.6	390917	678816.7	575.9
Gender									
Male	5937	20234.2	293.4	40935	150485.3	272.0	749849	3781707.4	198.3
Female	10449	26728.2	390.9	58541	185268.1	316.0	940014	3938296.2	238.7
Ethnicity³									
NZ European	5502	11678.3	471.1	36035	84692.7	425.5	1222202	6128923.0	199.4
Maori ⁴	6074	15457.5	392.9	37323	112022.7	333.2	257201	1013254.7	253.8
Pacific ⁵	3856	12246.8	314.9	25707	111026.5	231.5	100247	379056.8	264.5
Asian	753	3784.0	199.0	1759	8677.4	202.7	85461	514024.0	166.3
Other	1298	5114.2	253.8	2553	13136.5	194.3	54223	44826.6	1209.6
Not Stated	128	1284.9	99.6	800	34625.8	23.1	26248	289777.6	90.6
Tenant type									
Tenant	N/A	N/A	N/A	63713	137654.7	462.8	N/A	N/A	N/A
Partner ⁶	N/A	N/A	N/A	836	2296.7	364.0	N/A	N/A	N/A
Dependent child	N/A	N/A	N/A	24384	147397.8	165.4	N/A	N/A	N/A
Other People	N/A	N/A	N/A	12436	50081.2	248.3	N/A	N/A	N/A
Total	16386	46962.3	348.9	99478	335753.4	296.3	1689897	7720003.6	218.9

¹ Person time measured in years

² Crude rate measured in case per 1000 population per year

³ The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

⁴ This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

⁵ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁶ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form

Table 12.7: Hospitalisation numbers and crude rates in *housing applicants*, *housing tenants* and *other NZ* population, using standard filter (excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions), according to key demographic characteristic, May 2003 to June 2005

Characteristic	Housing applicants			Housing tenants			Other NZ population		
	Hosp. No.	Person time ¹	Rate ²	Hosp. No.	Person time ¹	Rate ²	Hosp. No.	Person time ¹	Rate ²
Age group									
<1 years	768	1498.1	512.6	2093	4195.7	498.8	37451	112774.4	332.1
1-4 years	1149	6569.3	174.9	5298	31665.7	167.3	49134	430415.3	114.2
5-9 years	453	6473.2	70.0	3365	45480.3	74.0	29128	568395.2	51.2
10-19 years	692	9199.6	75.2	5561	79121.3	70.3	65458	1117299.1	58.6
20-29 years	749	6006.1	124.7	3393	31536.7	107.6	67604	1017575.5	66.4
30-39 years	1063	6780.3	156.8	5033	41780.5	120.5	73111	1201867.0	60.8
40-49 years	1016	4614.3	220.2	6188	38727.7	159.8	79195	1121698.0	70.6
50-59 years	689	2690.6	256.1	6116	25981.4	235.4	83986	878091.1	95.6
60-69 years	532	2248.4	236.6	5592	18476.1	302.7	89574	591747.6	151.4
70+ years	432	1115.9	387.1	8295	19332.0	429.1	219027	678816.7	322.7
Gender									
Male	3368	20234.2	166.5	22952	150485.3	152.5	404044	3781707.4	106.8
Female	4175	26728.2	156.2	27982	185268.1	151.0	389597	3938296.2	98.9
Ethnicity³									
NZ European	2700	11678.3	231.2	19276	84692.7	227.6	584369	5568109.3	104.4
Maori ⁴	2584	15457.5	167.2	17327	112022.7	154.7	119023	1013760.7	117.4
Pacific ⁵	1899	12246.8	155.1	14167	111026.5	127.6	46631	338319.9	137.8
Asian	349	3784.0	92.2	860	8677.4	99.1	30095	490928.0	61.3
Other	546	5114.2	106.8	1282	13136.5	97.6	25542	36636.4	697.2
Not Stated	45	1284.9	35.0	398	34625.8	11.5	11909	290771.5	41.0
Tenant type									
Tenant	N/A	N/A	N/A	30047	137596.2	218.4	N/A	N/A	N/A
Partner ⁶	N/A	N/A	N/A	361	2283.3	158.1	N/A	N/A	N/A
Dependent child	N/A	N/A	N/A	15218	147613.6	103.1	N/A	N/A	N/A
Other People	N/A	N/A	N/A	6448	49923.4	129.2	N/A	N/A	N/A
Total	7543	46962.3	160.6	50934.0	335753.4	151.7	793668	7720003.6	102.3

¹ Person time measured in years

² Crude rate measured in case per 1000 population per year

³ The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

⁴ This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

⁵ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁶ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form

Table 12.8: Hospitalisation numbers and age-specific or age-standardised rates in *cohort* population (applicants and tenants) compared with the *other NZ* population, based on principal diagnosis and standard filter¹, according to key demographic characteristic May 2003 to June 2005

Disease category	Cohort population			Other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Age group								
<1 years	2861	502.5	482.3	519.3	37451	332.1	328.6	335.3
1-4 years	6447	168.6	163.8	172.0	49134	114.2	114.8	116.8
5-9 years	3818	73.5	70.7	75.4	29128	51.2	51.3	52.5
10-19 years	6253	70.8	68.7	72.2	65458	58.6	57.8	58.7
20-29 years	4142	110.3	106.7	113.4	67604	66.4	65.7	66.7
30-39 years	6096	125.5	122.0	128.3	73111	60.8	60.1	61.0
40-49 years	7204	166.2	161.8	169.4	79195	70.6	69.8	70.8
50-59 years	6805	237.3	230.6	241.9	83986	95.6	94.5	95.8
60-69 years	6124	295.5	287.1	301.9	89574	151.4	149.5	151.5
70+ years	8727	426.8	416.3	434.3	219027	322.7	319.4	322.4
Gender								
Male	26320	182.8	180.3	185.2	404044	105.9	105.6	106.2
Female	32157	168.6	166.7	170.5	389597	98.0	97.7	98.3
Ethnicity³								
NZ European	21976	221.5	218.5	224.5	584369	94.9	94.7	95.2
Maori ⁴	19911	211.0	207.3	214.7	119023	119.0	118.4	119.7
Pacific ⁵	16066	157.6	154.5	160.6	46631	123.2	122.0	124.3
Asian	1209	97.1	91.3	102.9	30095	60.2	59.5	60.9
Other	1828	99.9	95.2	104.5	25542	1234.1	1199.0	1269.2
Not Stated	443	18.9	17.0	20.9	11909	44.3	43.5	45.1
Tenant type								
Tenant	-	-	-	-	-	-	-	-
Partner ⁶	-	-	-	-	-	-	-	-
Dependent child	-	-	-	-	-	-	-	-
Other People	-	-	-	-	-	-	-	-
Total	58477	174.9	173.4	176.4	793668	102.4	102.2	102.6
							1.71	1.69
								1.72

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year, age standardised rates for sex and ethnic groups

³ The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

⁴ This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

⁵ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁶ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form

Table 12.9: Hospitalisation numbers and age-standardised rates in *housing applicants* compared with *housing tenants*, based on principal diagnosis and standard filter¹, according to key demographic characteristic May 2003 to June 2005

Disease category	<i>Housing applicants</i>			<i>Housing tenants</i>			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Age group								
<1 years	768	512.6	474.5 547.5	2093	498.8	476.1 519.0	1.03	0.94 1.11
1-4 years	1149	174.9	164.1 184.4	5298	167.3	162.1 171.1	1.04	0.98 1.11
5-9 years	453	70.0	63.2 76.2	3365	74.0	71.1 76.1	0.95	0.86 1.04
10-19 years	692	75.2	69.8 81.2	5561	70.3	68.1 71.8	1.08	1.00 1.17
20-29 years	749	124.7	115.6 133.6	3393	107.6	103.7 110.9	1.16	1.07 1.26
30-39 years	1063	156.8	147.1 166.0	5033	120.5	116.8 123.4	1.30	1.22 1.39
40-49 years	1016	220.2	205.4 232.6	6188	159.8	155.3 163.3	1.37	1.28 1.47
50-59 years	689	256.1	235.9 274.4	6116	235.4	228.5 240.3	1.09	1.00 1.18
60-69 years	532	236.6	215.7 256.2	5592	302.7	293.8 309.7	0.78	0.71 0.85
70+ years	432	387.1	350.6 424.5	8295	429.1	418.3 436.8	0.90	0.82 1.00
Gender								
Male	3368	190.0	182.1 197.8	22952	181.0	178.4 183.5	1.05	1.00 1.10
Female	4175	182.6	175.8 189.3	27982	166.7	164.7 168.7	1.10	1.05 1.14
Ethnicity³								
NZ European	2700	263.5	252.5 274.4	19276	214.9	211.7 218.0	1.23	1.17 1.28
Maori ⁴	2584	261.2	244.7 277.7	17327	206.7	202.9 210.5	1.26	1.18 1.35
Pacific ⁵	1899	178.7	166.6 190.8	14167	155.4	152.3 158.6	1.15	1.07 1.23
Asian	349	90.3	80.3 100.2	860	100.2	93.2 107.3	0.90	0.79 1.03
Other	546	110.5	100.5 120.4	1282	97.2	91.7 102.7	1.14	1.02 1.26
Not Stated	45	49.8	31.1 68.6	398	17.9	15.9 19.8	2.79	1.88 4.12
Tenant type								
Tenant	-	-	-	30047	218.4	-	-	-
Partner ⁶	-	-	-	361	158.1	-	-	-
Dependent child	-	-	-	15218	103.1	-	-	-
Other People	-	-	-	6448	129.2	-	-	-
Total	7543	185.8	180.8 190.9	50934	172.9	171.3 174.5	1.07	1.04 1.11

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year, age standardised rates for sex and ethnic groups

³ The response rates by ethnicity groups were calculated inclusively. This means that a person who ticked both NZ European and Maori, for example, would get counted in both groups.

⁴ This does not include those of Maori ethnicity who wrote their ethnicity in the "others" category.

⁵ This does not include those of Pacific ethnicity who wrote their ethnicity in the "others" category.

⁶ This is calculated using the partner code in the field for the relationship to the signatory. This is different to the couples code in the IRR form

Table 12.10: Hospitalisation numbers and age-standardised rates in *applicants* compared with *tenants*, based on principal diagnosis and standard filter¹, according to Equivalised Income, May 2003 to May 2005

	<i>Housing applicants</i>			<i>Housing tenants</i>			<i>Comparison</i>	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Equivalised Income (exclude >\$5000)								
Lowest Quintile (\$0-\$159.05)	667	132.5	108.7	156.4	177.0	182.1	0.75	0.62 0.90
Lower Quintile (\$159.06-\$194.31)	1177	166.7	143.1	190.3	169.9	175.2	0.98	0.85 1.13
Middle Quintile (\$194.32-\$242.72)	1667	158.5	142.4	174.6	172.7	168.4	0.92	0.83 1.02
Higher Quintile (\$242.73-\$315.66)	2197	178.0	169.5	186.5	161.7	165.7	1.10	1.04 1.16
Highest Quintile (\$315.67-\$1926.6)	1835	213.3	203.1	223.5	166.5	169.3	1.28	1.22 1.35
Total	7543	185.8	180.8	190.9	172.9	171.3	1.07	1.04 1.11

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year.

Table 12.11: Hospitalisation numbers and age-standardised rates in *tenants*, based on principal diagnosis and standard filter¹, according to SAU average NZDep2001, May 2003 to May 2005

SAU average NZDep2001	Tenants No	Percent	Hosp. No. ¹	Rate ²	95 CI
1	966	0.51	246	164.9	145.3
2	1357	0.72	444	187.4	171.1
3	3441	1.83	1052	166.5	157.6
4	4922	2.61	1369	165.2	157.6
5	6687	3.55	1862	161.9	155.7
6	12478	6.62	3431	166.3	161.9
7	17607	9.35	4703	168.7	164.9
8	28252	15.00	7725	171.5	168.6
9	33799	17.94	9356	177.8	175.2
10	78844	41.86	20205	176.4	174.8
Total	198848	100.00	50394	172.9	171.3

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year.

Table 12.12: Hospitalisation numbers and age-standardised rates in *applicants* compared with *tenants*, based on principal diagnosis and standard filter¹, according to HNZC region, May 2003 to June 2005

HNZC Region	Housing applicants			Housing tenants			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
Auckland (comp_ref=03)	4067	172.5	166.2 179	24804	176.1	173.78 178.44	0.98	0.94 1.02
Northern (comp_ref=04)	1657	263.4	247.6 279.3	10418	205.7	201.5 209.9	1.28	1.20 1.36
Central (comp_ref=05)	806	159.8	146.0 173.7	9079	148.7	145.5 151.8	1.08	0.98 1.18
South (comp_ref=06)	1015	188.0	173.3 202.7	6633	160.7	156.7 164.6	1.17	1.08 1.27
Total	7543	185.8	180.8 190.9	50934	172.9	171.3 174.5	1.07	1.04 1.11

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year,

Table 12.13: Distribution in *housing tenants*, compared with Total New Zealand residents¹, according to Urban and Rural

Urban/Rural profile categories	Housing tenants		Total NZ residents	
	Number	Percent	Number	Percent
Urban	185811	99.0	3203574	85.7
Main urban areas	168823	90.0	2,654,850	71.0
Satellite urban communities	3290	1.8	111,036	3.0
Independent urban communities	13698	7.3	437,688	11.7
Rural	1792	1.0	531945	14.2
Rural areas with high urban influence	49	0.0	95,799	2.6
Rural areas with moderate urban influence	257	0.1	135,306	3.6
Rural areas with low urban influence	1246	0.7	224,391	6.0
Highly rural/remote areas	240	0.1	76,449	2.0
Not included	0.0	0.0	1,758	0.0
Total	187603	100.0	3,737,277	100.0

¹ Based on NZ 2001 census and New Zealand: An Urban/Rural Profile (<http://www.stats.govt.nz/urban-rural-profiles/default.htm>)

Table 12.14: Hospitalisation numbers and age-standardised rates in *applicants*, compared with the *tenants*, based on principal diagnosis and standard filter¹, according to Seasons, May 2003 to May 2005

Seasons	<i>Housing applicants</i>			<i>Housing tenants</i>			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
May-03	160	182.5	145.0	220.1	160.7	152.6	1.14	0.92
June-Aug03	795	207.6	188.4	226.7	178.0	173.2	1.17	1.06
Sep-Nov03	820	180.2	164.5	195.8	165.2	160.6	1.09	1.00
Dec03-Feb04	747	162.7	148.5	176.9	159.0	154.4	1.02	0.93
Mar-May04	872	172.2	158.1	186.2	165.9	161.3	1.04	0.95
June-Aug04	1011	192.3	177.7	206.9	174.2	169.5	1.10	1.02
Sep-Nov04	920	184.3	170.0	198.5	173.5	168.9	1.06	0.98
Dec04-Feb05	734	165.7	151.8	179.6	163.1	158.6	1.02	0.93
Mar-May05	841	171.7	158.2	185.2	168.7	164.3	1.02	0.94

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 1000 population per year

Table 12.15: Hospitalisation numbers and age-standardised rates in *cohort* population (applicants and tenants) compared with the *other* NZ population, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Cohort population		Other NZ population		Comparison	
	Hosp. No. ¹	Rate ²	Rate ²	Hosp. No.	RR	95 CI
A00-B99 Infectious & parasitic	3292	741.1	713.6	36327	476.1	471.2
C00-D48 Neoplasms	1465	511.1	484.3	34963	447.3	442.6
D50-D89 Blood & immune system	654	203.1	186.7	11062	142.3	139.7
E00-E90 Endocrine, nutritional & metabolic	1529	532.6	505.2	16503	154.0	151.6
F00-F99 Mental & behavioural	2370	778.5	746.7	24036	309.1	305.2
G00-G99 Nervous system	1438	441.9	418.0	20683	266.1	262.5
H00-H59 Eye & adnexa	322	97.7	86.4	4532	58.3	56.6
H60-H95 Ear & mastoid	415	104.5	93.6	4691	61.1	59.3
I00-I99 Circulatory system	5384	2030.6	1975.8	99475	1268.5	1260.6
J00-J99 Respiratory	10698	2866.5	2807.8	96187	1249.9	1242.0
K00-K93 Digestive	4700	1515.5	1470.5	75525	971.8	964.9
L00-L99 Skin & subcutaneous	3027	823.7	792.4	28604	370.1	365.9
M00-M99 Musculoskeletal & connective	2219	709.6	678.8	31227	401.4	396.9
N00-N99 Genitourinary	2961	910.8	876.7	38385	494.4	489.5
Q00-Q99 Congenital	283	53.3	46.7	6254	83.2	81.1
R00-R99 Symptoms & signs	7035	2228.0	2173.8	103056	1326.8	1318.7
S00-T98 Injury, poisonings	9279	2533.2	2478.2	142111	1838.8	1829.3
V01-Y98 External causes	13877	4074.2	4002.5	207414	2675.7	2664.2
Z00-Z13 Factors influencing health status	272	63.7	55.5	4218	55.3	53.6
Total	71220	21219.4	21054.8	985253	12708.6	12683.5
					1.67	1.66

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as case per 100 000 population per year.

Table 12.16: Hospitalisation numbers and age-standardised rates in *housing applicants* compared with *housing tenants*, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	515	761.2	680.5	841.9	731.0	701.8	1.04	0.93
C00-D48 Neoplasms	116	387.2	309.2	465.2	522.1	493.7	0.74	0.60
D50-D89 Blood & immune system	90	255.8	193.1	318.4	197.9	180.9	1.29	1.00
E00-E90 Endocrine, nutritional & metabolic	154	521.1	429.0	613.1	532.5	503.8	0.98	0.81
F00-F99 Mental & behavioural	482	1507.3	1367.3	1647.3	704.9	672.7	2.14	1.93
G00-G99 Nervous system	170	484.3	401.5	567.1	438.0	412.9	1.11	0.92
H00-H59 Eye & adnexa	34	78.4	45.7	111.1	98.9	86.9	0.79	0.51
H60-H95 Ear & mastoid	70	150.3	104.9	195.6	99.2	88.0	1.51	1.10
I00-I99 Circulatory system	468	1950.0	1754.8	2145.3	2033.0	1975.7	0.96	0.86
J00-J99 Respiratory	1543	2931.2	2735.9	3126.5	2841.5	2779.6	1.03	0.96
K00-K93 Digestive	539	1610.0	1453.8	1766.2	1506.7	1459.3	1.07	0.96
L00-L99 Skin & subcutaneous	341	698.0	607.1	788.9	840.9	807.3	0.83	0.72
M00-M99 Musculoskeletal & connective	226	669.4	569.9	769.0	711.6	679.2	0.94	0.81
N00-N99 Genitourinary	373	962.1	849.9	1074.3	903.6	867.5	1.06	0.94
Q00-Q99 Congenital	50	130.7	92.9	168.6	53.0	45.8	2.47	1.79
R00-R99 Symptoms & signs	960	2628.0	2430.7	2825.2	2176.3	2119.7	1.21	1.12
S00-T98 Injury, poisonings	1194	2688.8	2512.5	2865.2	2502.3	2444.4	1.07	1.00
V01-Y98 External causes	1693	4146.1	3916.7	4375.6	4038.9	3963.5	1.03	0.97
Z00-Z13 Factors influencing health status	45	80.5	50.4	110.6	61.4	52.8	1.31	0.88
Total	9063	22334.4	21782.7	22886.0	20993.8	20820.8	1.06	1.04
						21166.9		1.09

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as case per 100 000 population per year.

Table 12.17: Hospitalisation numbers and age-standardised rates¹ in *cohort* population (applicants and tenants) compared with the *other NZ* population, according to selected diseases of interest, based on principal diagnosis and standard filter², May 2003 to June 2005

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	971	194.1	180.9 207.2	11308	149.0	146.3 151.8	1.30	1.21 1.40
A15-19 Tuberculosis	77	23.8	18.2 29.4	517	6.6	6.1 7.2	3.59	2.79 4.60
A37 Pertussis	25	4.1	2.5 5.7	320	4.3	3.8 4.7	0.96	0.64 1.44
A39 Meningococcal	111	19.2	15.5 22.9	696	9.2	8.5 9.9	2.09	1.70 2.57
A40 Streptococcal septicaemia	46	15.4	10.8 20.0	464	6.0	5.4 6.5	2.58	1.89 3.52
A41 Other septicaemia	252	90.1	78.8 101.5	3251	41.6	40.1 43.0	2.17	1.90 2.47
A49 Bacterial infection of unspecified site	58	12.6	9.1 16.1	499	6.6	6.0 7.1	1.92	1.43 2.57
A87 Viral meningitis	91	19.0	14.8 23.2	855	11.2	10.4 11.9	1.70	1.35 2.14
B01 Varicella (chickenpox)	61	10.6	7.8 13.4	525	7.0	6.4 7.5	1.52	1.16 2.01
B02 Zoster (herpes zoster)	41	15.2	10.5 19.9	562	7.2	6.6 7.8	2.11	1.53 2.91
B03-B09 Other viral infection of skin & membranes	33	5.9	3.8 8.0	399	5.3	4.8 5.8	1.11	0.77 1.61
B15 Acute hepatitis A	4	0.9	0.3 2.7	20	0.3	0.1 0.4	3.50	1.07 11.40
B16 Acute hepatitis B	8	2.7	0.8 4.6	68	0.9	0.7 1.1	3.11	1.49 6.49
B17-B19 Other viral hepatitis	90	30.7	24.3 37.1	1070	13.7	12.9 14.5	2.24	1.81 2.78
B26 Mumps	2	0.5	0.1 2.2	16	0.2	0.1 0.3	2.44	0.52 11.49
B34 Viral infection of unspecified site	1178	235.7	221.3 250.1	12930	170.5	167.6 173.4	1.38	1.30 1.47
Respiratory infections and asthma								
J02 Acute pharyngitis	105	23.3	18.4 28.1	1166	15.3	14.5 16.2	1.52	1.22 1.88
J03 Acute tonsillitis	213	47.4	40.6 54.2	2693	35.4	34.1 36.7	1.34	1.16 1.55
J04 Acute laryngitis and tracheitis	11	3.1	1.2 5.0	147	1.9	1.6 2.2	1.61	0.85 3.06
J05 Acute laryngitis [croup] and epiglottitis	184	30.2	25.8 34.6	2188	29.2	28.0 30.4	1.04	0.89 1.20
J06 Acute laryngopharyngitis	870	168.0	156.1 179.9	8015	106.2	103.8 108.5	1.58	1.47 1.70
J10-J11 Influenza	91	21.5	16.7 26.3	990	12.9	12.1 13.7	1.66	1.32 2.09
J12 and J14-J18 Pneumonia	2163	577.2	550.9 603.6	20522	265.2	261.6 268.9	2.18	2.07 2.28
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	78	25.3	19.4 31.2	721	9.3	8.6 9.9	2.73	2.14 3.49
J20 Acute bronchitis	80	23.2	17.8 28.6	1047	13.5	12.7 14.4	1.71	1.35 2.18
J21 Acute bronchiolitis	1088	180.0	169.3 190.8	7787	103.9	101.6 106.2	1.73	1.63 1.85
J22 Unspecified acute lower respiratory infection	788	233.1	215.8 250.4	7173	92.5	90.4 94.7	2.52	2.33 2.72
J40-J42 Bronchitis unspecified and chronic	122	43.3	35.5 51.1	1062	13.6	12.8 14.4	3.18	2.63 3.85
J44 Other chronic obstructive pulmonary disease	1862	726.6	693.5 759.7	17407	221.7	218.4 225.0	3.28	3.12 3.44
J45-J46 Asthma	2147	489.6	467.3 511.8	15153	199.0	195.9 202.2	2.46	2.34 2.58

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	63	10.9	8.1 13.7	220	2.9	2.5 3.3	3.75	2.80 5.01
L02 Cutaneous abscess, furuncle and carbuncle	956	245.3	228.8 261.9	6536	85.0	82.9 87.0	2.89	2.69 3.10
L03 Cellulitis	1235	365.7	344.1 387.2	13393	172.5	169.6 175.4	2.12	1.99 2.25
L04 Acute lymphadenitis	57	10.5	7.6 13.3	369	4.9	4.4 5.4	2.15	1.60 2.87
L08 Other local infection of skin & subcutaneous tissue	38	9.0	5.9 12.1	401	5.2	4.7 5.7	1.72	1.20 2.46
M00-M03 Infectious arthropathies	66	17.4	12.9 21.9	986	12.7	11.9 13.5	1.37	1.05 1.79
M86 Osteomyelitis	102	22.5	17.7 27.2	851	11.1	10.4 11.9	2.02	1.62 2.52
Other acute and chronic diseases with partly infectious origins								
H60 Otitis externa	48	11.0	7.7 14.4	430	5.6	5.1 6.1	1.97	1.43 2.70
H65-H66 Otitis media	189	33.6	28.6 38.6	1750	23.3	22.2 24.4	1.44	1.23 1.69
K25-K28 Gastric, peptic, jejunal ulcer	195	72.8	62.5 83.1	2475	31.6	30.3 32.8	2.31	1.99 2.67
C16 Malignant neoplasm of stomach	34	12.3	8.2 16.5	601	7.7	7.0 8.3	1.61	1.14 2.28
I00-I02 Acute rheumatic fever	84	14.4	11.2 17.6	230	3.1	2.7 3.4	4.72	3.65 6.09
N00 and N05 Acute & unspecified nephritis syndrome	69	12.8	9.6 16.0	345	4.5	4.0 5.0	2.83	2.15 3.72
G00-G09 Inflammatory diseases of CNS	47	10.5	7.3 13.8	714	9.3	8.6 10.0	1.13	0.82 1.55
G35-G37 Demyelinating diseases of CNS	74	22.9	17.6 28.2	1238	15.9	15.0 16.8	1.45	1.14 1.83
G60-G64 Polynuropathies	39	14.4	9.8 18.9	1048	13.4	12.6 14.2	1.07	0.78 1.48
Cardiovascular diseases								
I10-I15 Hypertensive diseases	106	38.4	31.0 45.7	1466	18.7	17.8 19.7	2.05	1.68 2.50
I20 Angina pectoris	917	355.9	332.8 379.0	15725	200.4	197.2 203.5	1.78	1.66 1.90
I21 Acute myocardial infarction	798	313.3	291.5 335.1	18886	240.6	237.2 244.0	1.30	1.21 1.40
I22 – I25 Other forms of ischaemic heart disease	81	31.2	24.4 38.0	1749	22.3	21.2 23.3	1.40	1.12 1.75
I48 Atrial fibrillation	452	174.7	158.5 190.9	11120	141.7	139.1 144.4	1.23	1.12 1.35
I50 Heart failure	957	370.0	346.4 393.6	12495	159.1	156.3 161.9	2.33	2.18 2.48
I60-I69 Cerebrovascular disease (incl. Stroke)	643	247.9	228.6 267.2	13242	168.7	165.8 171.6	1.47	1.36 1.59
Mental and behavioural disorders								
F00-F09 Organic mental disorders	95	34.4	27.3 41.4	1787	22.8	21.8 23.9	1.50	1.22 1.86
F10-F19 Mental disorders due to psychoactive substance use	371	118.3	106.0 130.6	4116	53.1	51.5 54.7	2.23	2.00 2.48
F20 Schizophrenia	511	166.9	152.2 181.5	3928	50.4	48.8 52.0	3.31	3.02 3.63
F21-F29 Other delusional disorders	295	96.2	85.1 107.3	2407	30.9	29.7 32.2	3.11	2.75 3.51
F30-F31 Manic episode or bipolar disorder	362	123.9	111.1 136.7	2859	36.6	35.3 38.0	3.38	3.03 3.77
F32-F33 Depressive episode or disorder	223	73.3	63.6 83.1	3341	42.9	41.5 44.4	1.71	1.49 1.96
F34-39 Other mood disorder	28	9.0	5.6 12.4	315	4.1	3.6 4.5	2.21	1.49 3.27
F40-F48 Neurotic, stress related disorders	291	96.3	85.0 107.5	3319	42.7	41.2 44.1	2.26	2.00 2.55
F50-F59 Behavioural syndromes	12	3.9	1.7 6.2	532	7.0	6.4 7.6	0.56	0.32 1.00
F60-F69 Adult personality disorders	136	44.7	37.1 52.2	823	10.6	9.9 11.3	4.22	3.52 5.06
F70-F79 Mental retardation	7	1.9	0.4 3.3	95	1.2	1.0 1.5	1.51	0.67 3.39

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
F80-F89 Disorders of psychological development	10	2.2	0.8 3.7	147	2.0	1.6	1.15	0.58 2.26
F90-F98 Disorders of childhood or adolescence	15	2.9	1.3 4.5	144	1.9	1.6	1.52	0.87 2.68
F99 Unspecified mental disorders	7	2.4	0.6 4.1	119	1.5	1.3	1.54	0.72 3.32
Injuries and poisonings								
S00-S09 Injuries to the head	1541	383.2	362.7 403.7	22335	290.6	286.8	1.32	1.25 1.39
S10-S19 Injuries to neck	180	50.9	43.1 58.7	2878	37.3	35.9	1.37	1.17 1.60
S20-S29 Injuries to thorax	289	95.2	83.9 106.5	4641	59.6	57.8	1.60	1.41 1.81
S30-S39 Injuries to abdomen, back, pelvis	357	102.4	91.1 113.7	6745	87.0	84.9	1.18	1.05 1.32
S40-S49 Injuries to shoulder & upper arm	458	111.3	100.2 122.4	6993	90.8	88.7	1.23	1.11 1.36
S50-S59 Injuries to elbow & forearm	891	191.3	177.6 205.0	13566	177.7	174.7	1.08	1.00 1.16
S60-S69 Injuries to wrist & hand	1243	309.2	290.9 327.5	17890	231.7	228.4	1.33	1.26 1.42
S70-S79 Injuries to hip & thigh	423	143.0	128.7 157.3	12059	154.2	151.4	0.93	0.84 1.03
S80-S89 Injuries to knee and lower leg	821	226.2	209.7 242.7	14344	185.1	182.1	1.22	1.13 1.32
S90-S99 Injuries to ankle and foot	330	81.2	71.8 90.7	4458	57.9	56.2	1.40	1.25 1.58
T08-T14 Injuries to unspecified body region	30	8.3	5.1 11.4	564	7.3	6.7	1.14	0.77 1.68
T15-T19 Effects of foreign body	110	27.8	22.2 33.4	1978	25.8	24.6	1.08	0.88 1.33
T20-T32 Burns & corrosions	195	44.6	37.8 51.3	2064	26.9	25.8	1.65	1.41 1.94
T36-T65 Poisonings & toxic effects	909	270.1	252.0 288.3	11240	145.7	143.0	1.85	1.73 1.99
T66-T78 Other and unspecified effects of external causes	139	36.7	30.2 43.3	2003	26.0	24.9	1.41	1.18 1.70
T79 Early complications of trauma	27	7.0	4.2 9.8	431	5.6	5.0	1.25	0.83 1.89
T80-T88 Complications of care	1305	436.3	412.0 460.7	17249	221.3	218.0	1.97	1.86 2.09
H Specific common injuries (top 50%)								
S01 Open wound of head	463	115.7	104.3 127.0	5628	73.2	71.2	1.58	1.43 1.75
S06 Intracranial injury	374	91.1	81.2 101.1	6218	80.9	78.9	1.13	1.01 1.26
S42 Fracture of shoulder and upper arm	314	68.7	60.3 77.0	4861	63.4	61.6	1.08	0.96 1.23
S52 Fracture of forearm	650	130.5	119.6 141.4	10929	143.5	140.8	0.91	0.83 0.99
S61 Open wound of wrist and hand	356	82.8	73.6 92.1	4350	56.5	54.8	1.47	1.31 1.65
S62 Fracture of wrist and hand level	365	91.7	81.7 101.6	5827	75.5	73.6	1.21	1.08 1.36
S72 Fracture of femur	277	95.3	83.5 107.0	8646	110.5	108.1	0.86	0.76 0.98
S82 Superficial injury of lower leg	490	132.5	119.9 145.1	8648	111.8	109.4	1.19	1.08 1.31
T81 Complications of procedures, NEC	554	182.8	167.1 198.5	8933	114.7	112.3	1.59	1.46 1.74
External causes								
W00-W19 Falls	3080	852.9	820.4 885.5	54179	699.8	693.9	1.22	1.17 1.27
W20-W49 Exposure to inanimate mechanical forces	1746	426.9	405.5 448.4	25005	324.1	320.1	1.32	1.25 1.39
W50-W64 Exposure to animate mechanism forces	508	115.5	104.7 126.3	6790	88.4	86.3	1.31	1.19 1.44
W65-74 Drowning & submersion	13	2.2	1.0 3.3	169	2.2	1.9	0.97	0.55 1.70
W75-84 Other accidental threats to breathing	44	12.7	8.7 16.8	984	12.7	11.9	1.01	0.73 1.39
W85-99 Exposure to electricity & extreme temperature	8	2.2	0.5 3.9	225	2.9	2.5	0.76	0.35 1.63

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
X00-09 Exposure to smoke, fire, & flames	35	9.2	6.0 12.5	579	7.5	6.9 8.1	1.23	0.86 1.77
X10-19 Contact with heat & hot substances	149	33.8	27.9 39.7	1260	16.5	15.6 17.4	2.05	1.71 2.46
X20-X29 Contact with venomous animals and plants	22	4.4	2.4 6.4	598	7.7	7.1 8.4	0.57	0.36 0.90
X30-X39 Exposure to forces of nature	27	9.0	5.5 12.6	336	4.3	3.9 4.8	2.09	1.39 3.15
X40-49 Accidental poisoning	338	91.7	81.3 102.1	4064	52.9	51.3 54.6	1.73	1.54 1.95
X50-57 Overexertion, travel and privation	303	93.5	82.5 104.4	5878	75.5	73.6 77.5	1.24	1.10 1.40
X58-59 Accidental exposure to other and unspecified factors	350	97.3	86.4 108.1	4887	63.2	61.4 65.0	1.54	1.37 1.73
X60-X84 Intentional self-harm	821	256.9	239.0 274.9	9184	118.6	116.2 121.0	2.17	2.01 2.33
X85-Y09 Assault	823	235.7	218.9 252.4	7148	92.5	90.3 94.6	2.55	2.37 2.75
Y10-Y34 Event of undetermined intent	65	19.9	14.9 24.9	635	8.2	7.6 8.9	2.41	1.86 3.14
Specific external causes								
W22 Striking against other objects	254	66.2	57.5 74.9	3489	45.2	43.7 46.7	1.47	1.28 1.68
W23 Caught, crushed, jammed or pinched	346	69.1	61.3 76.9	2961	38.8	37.4 40.2	1.78	1.58 2.01
W25 Contact with sharp glass	359	83.5	74.2 92.7	2772	36.1	34.8 37.5	2.31	2.06 2.60
W50 Hit by another person	110	25.1	20.1 30.2	1813	23.7	22.6 24.8	1.06	0.86 1.30
W54 Bitten or struck by dog	95	22.0	17.3 26.8	821	10.7	10.0 11.4	2.06	1.64 2.59
W85-W87 Exposure to electric current	6	1.4	0.2 2.5	159	2.1	1.7 2.4	0.66	0.27 1.60
X31 Exposure to excessive natural cold	17	5.8	2.9 8.7	246	3.2	2.8 3.6	1.85	1.11 3.09
X50 Overexertion and strenuous or repetitive movements	299	92.2	81.3 103.1	5782	74.3	72.4 76.2	1.24	1.10 1.40
Y04 Assault by bodily force	421	121.1	109.1 133.1	4015	51.9	50.3 53.5	2.33	2.10 2.59
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	235	54.3	46.7 61.9	1653	21.5	20.5 22.5	2.53	2.18 2.93
V10-V99 Other transport injuries	922	240.3	223.7 256.8	20164	261.6	258.0 265.2	0.92	0.86 0.99
V03 Pedestrian injured collision with car, truck or van	194	44.7	37.9 51.6	1225	16.0	15.1 16.8	2.80	2.38 3.30
V43 Car occupant injured in collision with car, pick-up truck or van	245	70.1	60.9 79.4	3855	49.8	48.2 51.3	1.41	1.23 1.61
Y40 Systemic antibiotics	222	69.3	59.7 78.9	3024	38.9	37.5 40.3	1.78	1.54 2.06
Y45 Analgesic agent	237	86.3	75.2 97.5	3727	47.6	46.1 49.1	1.81	1.59 2.07
Y52 Cardiovascular agent	235	92.8	80.8 104.7	3635	46.3	44.8 47.8	2.00	1.76 2.29
Y83 Surgical operation	1471	493.5	467.6 519.5	22728	291.3	287.6 295.1	1.69	1.60 1.79
Y84 Other medical procedure	868	302.6	282.1 323.1	10147	129.9	127.4 132.4	2.33	2.17 2.50
Total	50423	14186.1	14054. 14318. 1 2	669446	8653.6	8632.9 8674.3	1.64	1.62 1.66

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

Table 12.18: Hospitalisation numbers and age-standardised rates¹ in housing applicants compared with housing tenants, according to selected diseases of interest, based on principal diagnosis and standard filter², May 2003 to June 2005

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	179	217.0	177.4 256.5	792	188.7	174.7 202.7	1.15	0.94 1.40
A15-19 Tuberculosis	5	12.3	1.3 23.2	72	24.8	18.8 30.8	0.49	0.20 1.25
A37 Pertussis	4	4.3	1.6 12.0	21	4.1	2.4 5.9	1.05	0.35 3.17
A39 Meningococcal	9	10.3	2.4 18.2	102	20.6	16.4 24.7	0.50	0.23 1.11
A40 Streptococcal septicaemia	4	14.3	4.3 47.3	42	15.7	10.9 20.6	0.91	0.26 3.12
A41 Other septicaemia	14	51.2	21.2 81.2	238	94.0	81.9 106.2	0.54	0.30 0.99
A49 Bacterial infection of unspecified site	10	15.0	4.1 25.8	48	12.4	8.6 16.1	1.21	0.55 2.65
A87 Viral meningitis	8	10.7	2.7 18.7	83	20.0	15.4 24.7	0.54	0.25 1.17
B01 Varicella (chickenpox)	11	16.4	5.0 27.9	50	10.0	7.2 12.8	1.64	0.77 3.49
B02 Zoster (herpes zoster)	2	7.5	1.9 30.3	39	15.8	10.8 20.8	0.48	0.11 1.99
B03-B09 Other viral infection of skin & membranes	8	7.5	2.3 12.7	25	5.5	3.2 7.7	1.36	0.61 3.06
B15 Acute hepatitis A	1	0.9	0.1 6.4	3	0.8	0.2 2.8	1.12	0.11 11.45
B16 Acute hepatitis B	2	7.3	1.8 29.5	6	2.3	0.5 4.1	3.19	0.64 16.02
B17-B19 Other viral hepatitis	14	43.1	19.7 66.5	76	29.4	22.8 36.0	1.47	0.81 2.64
B26 Mumps	0	0.0	0.0 0.0	2	0.6	0.1 2.7		
B34 Viral infection of unspecified site	198	263.8	221.1 306.5	980	229.5	214.2 244.9	1.15	0.96 1.37
Respiratory infections and asthma								
J02 Acute pharyngitis	25	39.2	22.5 55.9	80	20.5	15.6 25.3	1.92	1.18 3.12
J03 Acute tonsillitis	26	41.0	23.7 58.3	187	48.6	41.1 56.0	0.84	0.54 1.32
J04 Acute laryngitis and tracheitis	2	2.5	0.6 10.6	9	3.1	1.0 5.2	0.80	0.16 3.95
J05 Acute laryngitis [croup] and epiglottitis	38	35.1	23.9 46.4	146	29.0	24.3 33.7	1.21	0.85 1.74
J06 Acute laryngopharyngitis	151	170.1	137.1 203.1	719	166.4	153.6 179.3	1.02	0.83 1.26
J10-J11 Influenza	11	18.8	6.5 31.1	80	21.9	16.7 27.0	0.86	0.43 1.73
J12 and J14-J18 Pneumonia	279	499.6	418.8 580.4	1884	581.9	553.9 609.9	0.86	0.73 1.02
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	8	21.3	5.5 37.2	70	25.4	19.3 31.6	0.84	0.38 1.83
J20 Acute bronchitis	15	43.7	16.2 71.3	65	21.3	15.9 26.8	2.05	1.04 4.04
J21 Acute bronchiolitis	261	234.4	206.0 262.9	827	167.6	156.2 179.1	1.40	1.22 1.61
J22 Unspecified acute lower respiratory infection	87	216.8	158.0 275.6	701	236.7	218.3 255.1	0.92	0.69 1.21
J40-J42 Bronchitis unspecified and chronic	13	55.9	22.4 89.5	109	42.7	34.5 50.8	1.31	0.70 2.46
J44 Other chronic obstructive pulmonary disease	166	709.7	590.2 829.2	1696	723.5	689.0 758.0	0.98	0.82 1.17
J45-J46 Asthma	347	567.8	495.3 640.2	1800	479.9	456.3 503.6	1.18	1.03 1.36

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	9	9.7	3.2 16.1	54	11.1	8.0 14.2	0.87	0.42 1.79
L02 Cutaneous abscess, furuncle and carbuncle	98	166.5	128.2 204.8	858	256.7	238.5 274.8	0.65	0.51 0.83
L03 Cellulitis	146	347.2	279.3 415.1	1089	366.7	343.9 389.5	0.95	0.77 1.16
L04 Acute lymphadenitis	5	7.0	2.5 19.6	52	11.1	8.0 14.3	0.63	0.22 1.83
L08 Other local infection of skin & subcutaneous tissue	8	9.7	1.9 17.5	30	8.5	5.3 11.8	1.14	0.46 2.78
M00-M03 Infectious arthropathies	7	15.6	2.3 28.9	59	17.4	12.6 22.1	0.90	0.37 2.20
M86 Osteomyelitis	10	15.5	4.4 26.7	92	23.3	18.2 28.5	0.67	0.31 1.41
Other acute and chronic diseases with partly infectious origins								
H60 Otitis externa	7	19.0	1.0 37.0	41	10.5	7.0 14.0	1.81	0.66 4.93
H65-H66 Otitis media	34	37.8	23.4 52.2	155	32.8	27.4 38.1	1.15	0.76 1.75
K25-K28 Gastric, peptic, jejunal ulcer	20	77.4	39.1 115.7	175	72.1	61.3 82.8	1.07	0.64 1.80
C16 Malignant neoplasm of stomach	5	15.3	1.5 29.2	29	11.7	7.4 16.0	1.31	0.50 3.47
I00-I02 Acute rheumatic fever	11	16.7	6.6 26.8	73	14.1	10.8 17.5	1.18	0.62 2.26
N00 and N05 Acute & unspecified nephritis syndrome	5	8.6	3.2 23.5	64	13.3	9.9 16.8	0.65	0.23 1.83
G00-G09 Inflammatory diseases of CNS	8	13.8	3.3 24.2	39	9.9	6.6 13.3	1.38	0.60 3.17
G35-G37 Demyelinating diseases of CNS	7	16.7	4.2 29.1	67	23.7	18.0 29.5	0.70	0.32 1.54
G60-G64 Polynuropathies	2	15.5	3.9 61.8	37	15.0	10.1 19.9	1.03	0.25 4.29
Cardiovascular diseases								
I10-I15 Hypertensive diseases	10	39.5	12.2 66.9	96	38.5	30.8 46.3	1.03	0.50 2.11
I20 Angina pectoris	87	403.4	311.3 495.5	830	352.0	328.0 376.0	1.15	0.90 1.45
I21 Acute myocardial infarction	56	271.4	194.3 348.4	742	316.7	293.9 339.5	0.86	0.64 1.15
I22 – I25 Other forms of ischaemic heart disease	9	45.8	13.8 77.7	72	30.2	23.2 37.2	1.51	0.73 3.16
I48 Atrial fibrillation	49	215.1	150.1 280.1	403	170.7	154.0 187.4	1.26	0.92 1.73
I50 Heart failure	82	341.2	260.6 421.8	875	369.4	344.8 394.0	0.92	0.72 1.18
I60-I69 Cerebrovascular disease (incl. Stroke)	40	187.6	123.5 251.6	603	254.1	233.7 274.4	0.74	0.52 1.05
Mental and behavioural disorders								
F00-F09 Organic mental disorders	4	9.2	3.4 25.1	91	36.5	28.8 44.1	0.25	0.09 0.70
F10-F19 Mental disorders due to psychoactive substance use	70	181.0	137.6 224.4	301	108.3	95.7 120.8	1.67	1.28 2.18
F20 Schizophrenia	115	286.8	233.2 340.3	396	147.5	132.8 162.2	1.94	1.57 2.40
F21-F29 Other delusional disorders	64	169.6	126.5 212.8	231	86.3	75.0 97.5	1.97	1.48 2.62
F30-F31 Manic episode or bipolar disorder	80	228.3	176.9 279.6	282	109.7	96.8 122.5	2.08	1.61 2.68
F32-F33 Depressive episode or disorder	40	114.1	77.2 151.0	183	68.6	58.6 78.6	1.66	1.17 2.37
F34-39 Other mood disorder	4	10.7	0.1 21.3	24	8.8	5.2 12.4	1.22	0.42 3.56
F40-F48 Neurotic, stress related disorders	60	175.7	127.1 224.3	231	86.5	75.1 97.8	2.03	1.50 2.76
F50-F59 Behavioural syndromes	3	6.8	2.2 21.2	9	3.5	1.2 5.7	1.97	0.53 7.30
F60-F69 Adult personality disorders	35	84.5	56.1 113.0	101	38.4	30.9 45.9	2.20	1.49 3.25
F70-F79 Mental retardation	2	4.3	1.1 17.3	5	1.3	0.1 2.6	3.26	0.61 17.43

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
F80-F89 Disorders of psychological development	2	6.2	1.6 24.9	8	1.8	0.5	3.42	0.71 16.44
F90-F98 Disorders of childhood or adolescence	2	3.2	0.8 12.9	13	2.9	1.2	1.12	0.25 5.05
F99 Unspecified mental disorders	0	0.0	0.0 0.0	7	2.7	0.7		
Injuries and poisonings								
S00-S09 Injuries to the head	200	380.2	319.2 441.1	1341	381.9	360.1	1.00	0.84 1.18
S10-S19 Injuries to neck	25	53.7	32.0 75.3	155	49.6	41.4	1.08	0.70 1.67
S20-S29 Injuries to thorax	37	105.9	67.7 144.1	252	93.3	81.4	1.14	0.77 1.66
S30-S39 Injuries to abdomen, back, pelvis	49	122.3	81.6 163.0	308	99.8	88.0	1.23	0.86 1.74
S40-S49 Injuries to shoulder & upper arm	41	74.7	47.3 102.2	417	115.5	103.5	0.65	0.44 0.95
S50-S59 Injuries to elbow & forearm	108	183.8	143.2 224.4	783	191.1	176.6	0.96	0.76 1.21
S60-S69 Injuries to wrist & hand	146	289.8	238.8 340.8	1097	312.3	292.6	0.93	0.77 1.12
S70-S79 Injuries to hip & thigh	33	103.9	60.0 147.8	390	144.9	129.9	0.72	0.46 1.11
S80-S89 Injuries to knee and lower leg	81	191.4	142.5 240.3	740	229.6	212.0	0.83	0.64 1.09
S90-S99 Injuries to ankle and foot	45	89.7	57.5 122.0	285	80.5	70.5	1.11	0.76 1.63
T08-T14 Injuries to unspecified body region	6	15.7	1.7 29.7	24	7.4	4.3	2.11	0.79 5.68
T15-T19 Effects of foreign body	16	22.6	9.7 35.4	94	27.8	21.8	0.81	0.44 1.49
T20-T32 Burns & corrosions	36	57.1	36.1 78.1	159	42.2	35.2	1.35	0.90 2.02
T36-T65 Poisonings & toxic effects	191	467.0	396.3 537.7	718	243.5	225.1	1.92	1.62 2.27
T66-T78 Other and unspecified effects of external causes	23	42.6	23.3 61.8	116	35.2	28.3	1.21	0.74 1.98
T79 Early complications of trauma	3	6.9	2.1 22.3	24	7.0	4.0	0.99	0.29 3.45
T80-T88 Complications of cure	150	473.8	389.4 558.2	1155	432.1	406.6	1.10	0.91 1.32
Specific common injuries (top 50%)								
S01 Open wound of head	60	115.4	80.9 149.8	403	115.5	103.5	1.00	0.73 1.37
S06 Intracranial injury	36	67.0	41.1 92.8	338	94.5	83.7	0.71	0.47 1.06
S42 Fracture of shoulder and upper arm	26	42.9	21.3 64.5	288	71.9	62.9	0.60	0.35 1.00
S52 Fracture of forearm	85	136.9	102.0 171.8	565	128.8	117.3	1.06	0.81 1.39
S61 Open wound of wrist and hand	44	80.8	54.6 107.1	312	83.7	73.7	0.97	0.68 1.37
S62 Fracture of wrist and hand level	38	78.6	52.5 104.7	327	93.5	82.7	0.84	0.59 1.19
S72 Fracture of femur	19	72.8	32.4 113.2	258	96.7	84.4	0.75	0.43 1.33
S82 Superficial injury of lower leg	41	95.7	60.9 130.4	449	136.7	123.2	0.70	0.48 1.02
T81 Complications of procedures, NEC	71	228.5	168.6 288.3	483	178.2	161.9	1.28	0.97 1.69
External causes								
W00-W19 Falls	323	760.5	657.2 863.8	2757	856.9	822.6	0.89	0.77 1.02
W20-W49 Exposure to inanimate mechanical forces	199	353.3	298.8 407.9	1547	435.7	412.4	0.81	0.69 0.95
W50-W64 Exposure to animate mechanism forces	56	89.0	63.5 114.5	452	118.5	106.8	0.75	0.55 1.02
W65-74 Drowning & submersion	3	4.4	1.4 13.8	10	1.9	0.7	2.28	0.62 8.37
W75-84 Other accidental threats to breathing	6	13.2	0.5 25.8	38	12.4	8.3	1.06	0.38 2.93
W85-99 Exposure to electricity & extreme temperature	1	1.2	0.2 8.4	7	2.2	0.5	0.53	0.06 4.38

Disease	Housing applicants		Housing tenants		Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI
X00-09 Exposure to smoke, fire, & flames	6	12.7	2.1	29	8.7	5.3
X10-19 Contact with heat & hot substances	26	36.9	20.7	123	32.7	26.5
X20-X29 Contact with venomous animals and plants	6	7.2	1.4	16	3.9	1.9
X30-X39 Exposure to forces of nature	0	0.0	0.0	27	9.9	6.0
X40-49 Accidental poisoning	51	100.3	69.4	287	89.6	78.6
X50-57 Overexertion, travel and privation	36	91.2	60.0	267	92.5	80.9
X58-59 Accidental exposure to other and unspecified factors	48	119.3	78.5	302	95.2	83.8
X60-X84 Intentional self-harm	187	484.3	411.7	634	226.3	208.3
X85-Y09 Assault	124	269.3	220.3	699	228.2	210.6
Y10-Y34 Event of undetermined intent	12	29.8	12.6	53	18.2	13.1
Specific external causes						
W22 Striking against other objects	37	63.3	40.4	217	65.6	56.3
W23 Caught, crushed, jammed or pinched	48	66.3	45.2	298	69.6	61.2
W25 Contact with sharp glass	32	59.3	37.4	327	87.2	77.1
W50 Hit by another person	13	22.1	9.4	97	25.5	20.1
W54 Bitten or struck by dog	10	17.2	5.5	85	22.3	17.2
W85-W87 Exposure to electric current	1	1.2	0.2	5	1.3	0.1
X31 Exposure to excessive natural cold	0	0.0	0.0	17	6.3	3.2
X50 Overexertion and strenuous or repetitive movements	34	84.9	55.0	265	91.9	80.3
Y04 Assault by bodily force	63	140.9	105.2	358	116.9	104.2
Other specific external causes (including top 50%)						
V01-V09 Pedestrian injuries	35	65.3	37.1	200	53.2	45.3
V10-V99 Other transport injuries	107	243.3	190.5	815	241.0	223.4
V03 Pedestrian injured collision with car, truck or van	28	52.9	26.6	166	44.3	37.0
V43 Car occupant injured in collision with car, pick-up truck or van	30	68.3	40.4	215	71.0	61.1
Y40 Systemic antibiotics	28	76.3	41.3	194	68.2	58.2
Y45 Analgesic agent	18	55.7	27.6	219	88.4	76.6
Y52 Cardiovascular agent	19	87.0	44.3	216	92.7	80.3
Y83 Surgical operation	179	560.2	467.1	1292	485.8	458.6
Y84 Other medical procedure	76	237.2	180.5	792	307.8	286.0
Total	6546	14787.7	14353.3	43877	14040.7	13901.6
			15222.			14179.7
			0			1.05
						1.02
						1.09

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

Table 12.19: Comparison of rates and rate ratios for *housing applicants* and *housing tenants* with the *other NZ* population, using different measures of rate, based on principal diagnosis and standard filter,¹ May 2003 to June 2005

Disease category	Cohort			Other NZ			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Crude rate	71220	185.6	184.7	187.4	127.6	127.4	1.46	1.45
Age-standardised rate	71220	212.2	210.5	213.8	127.1	126.8	1.67	1.66
Age-ethnicity-standardised rate	71220	213.2	211.3	215.1	145.5	144.9	1.47	1.44

Disease category	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Crude rate	9063	192.0	189.0	197.0	184.8	183.7	1.04	1.02
Age-standardised rate	9063	223.3	217.8	228.9	209.9	208.2	1.06	1.04
Age-ethnicity-standardised rate	9063	232.5	227.2	237.8	211.2	209.0	1.10	1.07

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 1000 population per year,

Table 12.20: Hospitalisation numbers and age-ethnicity-standardised rates in *cohort* population (applicants & tenants) compared with Other New Zealand population, according to major disease categories, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease category	Cohort population			Other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	3292	1133.1	1082.6	36327	772.0	757.3	1.47	1.40 1.54
C00-D48 Neoplasms	1465	429.2	402.8	34963	366.4	358.5	1.17	1.10 1.25
D50-D89 Blood & immune system	654	204.0	184.1	11062	139.8	134.4	1.46	1.31 1.62
E00-E90 Endocrine, nutritional & metabolic	1529	425.7	401.7	16503	227.0	220.3	1.88	1.76 2.00
F00-F99 Mental & behavioural	2370	657.7	626.3	24036	295.0	288.2	2.23	2.11 2.35
G00-G99 Nervous system	1438	418.0	391.8	20683	244.3	237.5	1.71	1.60 1.83
H00-H59 Eye & adnexa	322	102.0	88.3	4532	66.0	62.3	1.54	1.34 1.79
H60-H95 Ear & mastoid	415	136.0	119.8	4691	93.9	89.2	1.45	1.27 1.65
I00-I99 Circulatory system	5384	1459.5	1415.3	99475	1084.2	1070.3	1.35	1.30 1.39
J00-J99 Respiratory	10698	3149.8	3079.2	96187	2212.9	2187.9	1.42	1.39 1.46
K00-K93 Digestive	4700	1431.9	1380.4	75525	951.0	937.4	1.51	1.45 1.57
L00-L99 Skin & subcutaneous	3027	893.3	855.3	28604	573.9	561.7	1.56	1.48 1.63
M00-M99 Musculoskeletal & connective	2219	661.2	627.6	31227	432.1	422.4	1.53	1.45 1.62
N00-N99 Genitourinary	2961	920.7	879.2	38385	579.0	567.8	1.59	1.51 1.67
Q00-Q99 Congenital	283	96.9	81.9	6254	157.4	150.5	0.62	0.52 0.72
R00-R99 Symptoms & signs	7035	2175.6	2110.9	103056	1369.0	1352.1	1.59	1.54 1.64
S00-T98 Injury, poisonings	9279	2818.4	2747.6	142111	2059.0	2037.9	1.37	1.33 1.41
V01-Y98 External causes	13877	4110.3	4026.9	207414	2890.3	2865.5	1.42	1.39 1.45
Z00-Z13 Factors influencing health status	272	80.9	69.4	4218	85.0	80.3	0.95	0.82 1.11
Total	71220	21218.2	21027.0	985253	14552.6	14495.5	1.46	1.44 1.47

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year

Table 12.21: Hospitalisation numbers and age-ethnicity-standardised rates in housing applicants compared with housing tenants, according to major disease categories, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease category	Housing applicants			Housing tenants			Comparison		
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI	
A00-B99 Infectious & parasitic	515	1259.4	1137.7	1381.2	2777	1089.9	1.16	1.04	1.29
C00-D48 Neoplasms	116	327.3	261.8	392.7	1349	453.8	0.72	0.58	0.89
D50-D89 Blood & immune system	90	269.2	209.7	328.7	564	205.5	1.31	1.02	1.69
E00-E90 Endocrine, nutritional & metabolic	154	451.7	374.9	528.5	1375	434.5	1.04	0.87	1.25
F00-F99 Mental & behavioural	482	1012.6	915.8	1109.4	1888	604.2	1.68	1.50	1.87
G00-G99 Nervous system	170	435.7	363.5	507.8	1268	422.1	1.03	0.86	1.24
H00-H59 Eye & adnexa	34	89.3	55.8	122.8	288	109.0	0.82	0.55	1.23
H60-H95 Ear & mastoid	70	169.2	124.8	213.6	345	132.0	1.28	0.95	1.73
I00-I99 Circulatory system	468	1561.4	1407.9	1714.9	4916	1467.6	1.06	0.96	1.18
J00-J99 Respiratory	1543	3691.8	3490.7	3892.9	9155	3088.8	1.20	1.13	1.27
K00-K93 Digestive	539	1527.6	1385.0	1670.2	4161	1423.0	1.07	0.97	1.19
L00-L99 Skin & subcutaneous	341	823.1	727.2	919.1	2686	905.2	0.91	0.80	1.03
M00-M99 Musculoskeletal & connective	226	653.4	560.0	746.9	1993	662.2	0.99	0.85	1.15
N00-N99 Genitourinary	373	1011.8	899.2	1124.4	2588	907.5	1.11	0.99	1.26
Q00-Q99 Congenital	50	98.7	68.6	128.8	233	95.5	1.03	0.72	1.48
R00-R99 Symptoms & signs	960	2589.6	2406.4	2772.9	6075	2123.8	1.22	1.13	1.32
S00-T98 Injury, poisonings	1194	2941.7	2758.1	3125.3	8085	2803.2	1.05	0.98	1.12
V01-Y98 External causes	1693	4246.5	4024.2	4468.8	12184	4107.0	1.03	0.98	1.09
Z00-Z13 Factors influencing health status	45	90.2	62.8	117.7	227	81.7	1.10	0.78	1.57
Total	9063	23250.3	22721.6	23779.1	62157	21116.4	1.10	1.07	1.13

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year

Table 12.22: Hospitalisation numbers and age-ethnicity-standardised rates¹ in *cohort* population (applicants and tenants) compared with the *other* NZ population, according to selected diseases of interest, based on principal diagnosis and standard filter², May 2003 to June 2005

Disease	Cohort population			Other NZ population			Comparison				
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI			
Infectious diseases											
A00-A09 Intestinal infectious diseases	971	369.8	338.3	401.4	11308	235.0	226.8	243.1	1.57	1.44	1.73
A15-19 Tuberculosis	77	30.8	21.6	40.0	517	13.8	12.0	15.5	2.24	1.62	3.10
A37 Pertussis	25	7.7	4.0	11.3	320	11.3	9.5	13.2	0.68	0.41	1.12
A39 Meningococcal	111	30.7	25.0	36.4	696	25.7	22.7	28.7	1.19	0.96	1.49
A40 Streptococcal septicaemia	46	12.0	8.5	15.5	464	8.1	6.7	9.4	1.49	1.07	2.08
A41 Other septicaemia	252	71.7	61.8	81.7	3251	47.3	44.0	50.5	1.52	1.30	1.77
A49 Bacterial infection of unspecified site	58	20.8	13.8	27.8	499	13.5	11.4	15.6	1.54	1.07	2.24
A87 Viral meningitis	91	30.2	22.2	38.2	855	21.5	18.9	24.2	1.41	1.05	1.88
B01 Varicella (chickenpox)	61	24.2	16.1	32.3	525	15.7	13.6	17.9	1.54	1.07	2.21
B02 Zoster (herpes zoster)	41	10.0	6.9	13.1	562	6.4	5.3	7.5	1.57	1.11	2.24
B03-B09 Other viral infection of skin & membranes	33	9.9	5.9	13.9	399	7.8	6.4	9.2	1.27	0.82	1.98
B15 Acute hepatitis A	4	2.1	0.6	7.9	20	0.5	0.1	0.9	4.13	0.90	18.98
B16 Acute hepatitis B	8	2.8	0.4	5.1	68	1.8	1.1	2.4	1.57	0.62	3.98
B17-B19 Other viral hepatitis	90	26.1	19.7	32.5	1070	14.2	12.7	15.8	1.84	1.41	2.40
B26 Mumps	2	0.6	0.1	2.4	16	0.2	0.0	0.3	3.34	0.68	16.38
B34 Viral infection of unspecified site	1178	409.2	378.7	439.7	12930	301.1	291.6	310.5	1.36	1.25	1.47
Respiratory infections and asthma											
J02 Acute pharyngitis	105	44.1	32.5	55.6	1166	22.2	19.8	24.6	1.99	1.50	2.63
J03 Acute tonsillitis	213	69.6	58.0	81.3	2693	46.7	43.3	50.1	1.49	1.24	1.79
J04 Acute laryngitis and tracheitis	11	3.0	1.2	4.7	147	1.8	1.2	2.4	1.64	0.83	3.24
J05 Acute laryngitis [croup] and epiglottitis	184	59.4	48.5	70.4	2188	49.8	46.1	53.5	1.19	0.98	1.46
J06 Acute laryngopharyngitis	870	282.0	258.8	305.3	8015	222.0	213.9	230.1	1.27	1.16	1.39
J10-J11 Influenza	91	30.6	22.9	38.4	990	19.2	17.0	21.5	1.59	1.21	2.10
J12 and J14-J18 Pneumonia	2163	638.4	607.0	669.8	20522	465.0	453.2	476.8	1.37	1.30	1.45
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	78	21.0	16.1	25.9	721	12.7	10.9	14.5	1.66	1.26	2.18
J20 Acute bronchitis	80	21.9	16.8	26.9	1047	20.1	18.0	22.3	1.08	0.84	1.40
J21 Acute bronchiolitis	1088	317.6	296.4	338.8	7787	367.3	356.3	378.4	0.86	0.80	0.93
J22 Unspecified acute lower respiratory infection	788	241.5	220.5	262.4	7173	138.8	132.8	144.8	1.74	1.58	1.92
J40-J42 Bronchitis unspecified and chronic	122	32.4	26.5	38.4	1062	21.5	19.2	23.8	1.51	1.22	1.87
J44 Other chronic obstructive pulmonary disease	1862	475.8	452.9	498.7	17407	220.8	214.1	227.4	2.16	2.04	2.28
J45-J46 Asthma	2147	645.4	613.2	677.6	15153	440.2	428.9	451.4	1.47	1.39	1.55

Disease	Cohort population			other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	63	21.4	14.2	28.6	220	7.9	2.73	1.85
L02 Cutaneous abscess, furuncle and carbuncle	956	282.8	261.9	303.7	6536	177.6	1.59	1.46
L03 Cellulitis	1235	344.4	322.5	366.3	13393	226.6	1.52	1.42
L04 Acute lymphadenitis	57	17.0	12.1	21.8	369	12.1	1.41	1.01
L08 Other local infection of skin & subcutaneous tissue	38	12.1	6.9	17.4	401	8.7	1.39	0.87
M00-M03 Infectious arthropathies	66	21.4	14.2	28.6	986	16.9	1.27	0.89
M86 Osteomyelitis	102	35.8	27.0	44.6	851	20.5	1.74	1.33
Other acute & chronic diseases with partly infectious origins								
H60 Otitis externa	48	16.2	10.0	22.3	430	10.6	1.53	1.01
H65-H66 Otitis media	189	59.1	49.0	69.3	1750	48.0	1.23	1.02
K25-K28 Gastric, peptic, jejunal ulcer	195	58.4	48.5	68.2	2475	45.3	1.29	1.07
C16 Malignant neoplasm of stomach	34	10.1	6.2	14.1	601	9.8	1.03	0.68
I00-I02 Acute rheumatic fever	84	27.3	20.1	34.4	230	15.2	1.79	1.32
N00 and N05 Acute & unspecified nephritis syndrome	69	19.2	14.7	23.8	345	11.4	1.68	1.26
G00-G09 Inflammatory diseases of CNS	47	14.0	9.5	18.5	714	16.0	0.87	0.62
G35-G37 Demyelinating diseases of CNS	74	18.2	13.8	22.7	1238	5.1	3.57	2.72
G60-G64 Polyneuropathies	39	10.9	6.8	15.0	1048	7.9	1.39	0.93
Cardiovascular diseases								
I10-I15 Hypertensive diseases	106	32.3	24.9	39.7	1466	21.4	1.51	1.18
I20 Angina pectoris	917	245.1	227.3	262.8	15725	147.7	1.66	1.53
I21 Acute myocardial infarction	798	219.4	201.8	236.9	18886	188.6	1.16	1.07
I22 – I25 Other forms of ischaemic heart disease	81	23.0	17.1	28.8	1749	17.8	1.29	0.98
I48 Atrial fibrillation	452	120.6	108.3	132.8	11120	107.6	1.12	1.00
I50 Heart failure	957	248.0	231.3	264.6	12495	163.7	1.52	1.41
I60-I69 Cerebrovascular disease (incl. Stroke)	643	172.4	157.5	187.3	13242	155.0	1.11	1.01
Mental and behavioural disorders								
F00-F09 Organic mental disorders	95	25.1	19.5	30.6	1787	17.8	1.41	1.11
F10-F19 Mental disorders due to psychoactive substance use	371	113.8	99.0	128.6	4116	45.0	2.53	2.19
F20 Schizophrenia	511	147.6	132.0	163.2	3928	70.9	2.08	1.86
F21-F29 Other delusional disorders	295	77.3	67.9	86.7	2407	36.7	2.11	1.83
F30-F31 Manic episode or bipolar disorder	362	90.8	81.1	100.6	2859	39.4	2.31	2.04
F32-F33 Depressive episode or disorder	223	57.8	49.5	66.1	3341	29.6	1.95	1.67
F34-39 Other mood disorder	28	6.9	4.3	9.5	315	2.9	2.40	1.56
F40-F48 Neurotic, stress related disorders	291	88.0	75.3	100.7	3319	35.6	2.47	2.11
F50-F59 Behavioural syndromes	12	2.9	1.3	4.6	532	3.5	0.82	0.45
F60-F69 Adult personality disorders	136	33.8	27.4	40.1	823	6.3	5.34	4.24
F70-F79 Mental retardation	7	1.9	0.5	3.3	95	1.3	1.43	0.61
								3.33

Disease	Cohort population			other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
F80-F89 Disorders of psychological development	10	4.4	1.6	11.9	1.8	1.2	2.36	0.81
F90-F98 Disorders of childhood or adolescence	15	4.1	2.0	6.2	1.9	1.3	2.18	1.21
F99 Unspecified mental disorders	7	1.8	0.5	3.1	1.3	0.9	1.42	0.64
								3.16
Injuries and poisonings								
S00-S09 Injuries to the head	1541	497.5	465.9	529.2	22335	389.6	1.28	1.19
S10-S19 Injuries to neck	180	55.6	45.3	65.9	2878	45.0	1.23	1.01
S20-S29 Injuries to thorax	289	85.9	74.1	97.8	4641	56.6	1.52	1.31
S30-S39 Injuries to abdomen, back, pelvis	357	116.1	100.0	132.1	6745	85.2	1.36	1.18
S40-S49 Injuries to shoulder & upper arm	458	138.5	123.1	154.0	6993	102.8	1.35	1.19
S50-S59 Injuries to elbow & forearm	891	279.1	256.1	302.1	13566	219.0	1.27	1.17
S60-S69 Injuries to wrist & hand	1243	399.7	371.7	427.7	17890	321.9	1.24	1.15
S70-S79 Injuries to hip & thigh	423	118.0	103.8	132.1	12059	105.6	1.12	0.99
S80-S89 Injuries to knee and lower leg	821	251.1	230.1	272.1	14344	199.5	1.26	1.15
S90-S99 Injuries to ankle and foot	330	103.2	90.2	116.3	4458	68.7	1.50	1.31
T08-T14 Injuries to unspecified body region	30	7.9	5.1	10.7	564	8.8	0.90	0.61
T15-T19 Effects of foreign body	110	30.9	24.5	37.2	1978	27.3	1.13	0.90
T20-T32 Burns & corrosions	195	56.7	47.5	65.8	2064	43.4	1.31	1.09
T36-T65 Poisonings & toxic effects	909	255.8	235.7	275.9	11240	131.2	1.95	1.79
T66-T78 Other and unspecified effects of external causes	139	38.6	31.7	45.6	2003	32.5	1.19	0.97
T79 Early complications of trauma	27	9.1	4.1	14.0	431	6.5	1.38	0.78
T80-T88 Complications of care	1305	364.8	342.1	387.4	17249	206.2	1.77	1.65
								1.89
H Specific common injuries (top 50%)								
S01 Open wound of head	463	152.5	134.7	170.2	5628	100.3	1.52	1.34
S06 Intracranial injury	374	117.8	102.9	132.6	6218	103.2	1.14	1.00
S42 Fracture of shoulder and upper arm	314	95.4	82.4	108.4	4861	70.3	1.36	1.17
S52 Fracture of forearm	650	203.3	183.7	222.8	10929	171.2	1.19	1.07
S61 Open wound of wrist and hand	356	112.7	97.7	127.7	4350	86.4	1.31	1.13
S62 Fracture of wrist and hand level	365	116.0	101.3	130.6	5827	104.6	1.11	0.97
S72 Fracture of femur	277	79.3	66.9	91.6	8646	71.4	1.11	0.94
S82 Superficial injury of lower leg	490	150.5	134.3	166.7	8648	118.8	1.27	1.13
T81 Complications of procedures, NEC	554	162.7	146.4	179.1	8933	94.9	1.72	1.54
								1.91
External causes								
W00-W19 Falls	3080	928.2	887.1	969.3	54179	694.0	1.34	1.28
W20-W49 Exposure to inanimate mechanical forces	1746	558.6	525.7	591.6	25005	430.3	1.30	1.22
W50-W64 Exposure to animate mechanism forces	508	157.6	140.5	174.7	6790	133.3	1.18	1.05
W65-74 Drowning & submersion	13	3.8	1.7	5.8	169	3.3	1.15	0.62
W75-84 Other accidental threats to breathing	44	12.3	8.1	16.5	984	12.1	1.02	0.70
								1.47

Disease	Cohort population			other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
W85-99 Exposure to electricity & extreme temperature	8	2.1	0.6	3.5	225	2.2	0.69	0.33 1.45
X00-09 Exposure to smoke, fire, & flames	35	9.8	6.5	13.1	579	7.1	1.19	0.82 1.71
X10-19 Contact with heat & hot substances	149	42.6	34.9	50.3	1260	28.6	1.35	1.10 1.65
X20-X29 Contact with venomous animals and plants	22	6.0	3.5	8.5	598	5.5	0.93	0.60 1.45
X30-X39 Exposure to forces of nature	27	8.5	3.7	13.3	336	2.4	2.67	1.45 4.93
X40-49 Accidental poisoning	338	101.9	88.8	114.9	4064	60.4	1.59	1.38 1.83
X50-57 Overexertion, travel and privation	303	90.8	78.4	103.2	5878	72.4	1.19	1.03 1.38
X58-59 Accidental exposure to other and unspecified factors	350	96.8	85.6	107.9	4887	72.5	1.26	1.11 1.43
X60-X84 Intentional self-harm	821	227.5	208.3	246.6	9184	92.2	2.36	2.15 2.60
X85-Y09 Assault	823	257.8	235.6	280.0	7148	147.5	1.68	1.53 1.85
Y10-Y34 Event of undetermined intent	65	16.5	12.5	20.5	635	7.0	2.01	1.51 2.68
Specific external causes								
W22 Striking against other objects	254	80.0	67.2	92.8	3489	57.1	1.31	1.10 1.56
W23 Caught, crushed, jammed or pinched	346	112.3	97.5	127.2	2961	62.6	1.68	1.45 1.94
W25 Contact with sharp glass	359	125.8	108.2	143.4	2772	62.3	1.89	1.62 2.21
W50 Hit by another person	110	36.1	27.8	44.5	1813	34.5	0.96	0.75 1.23
W54 Bitten or struck by dog	95	27.6	21.5	33.8	821	13.1	1.86	1.45 2.39
W85-W87 Exposure to electric current	6	1.6	0.3	2.9	159	1.5	0.75	0.32 1.76
X31 Exposure to excessive natural cold	17	6.0	1.5	10.6	246	2.2	2.81	1.27 6.24
X50 Overexertion and strenuous or repetitive movements	299	88.9	76.7	101.1	5782	71.8	1.18	1.02 1.36
Y04 Assault by bodily force	421	134.4	117.7	151.1	4015	73.2	1.74	1.52 1.99
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	235	76.1	63.9	88.4	1653	31.6	2.20	1.83 2.64
V10-V99 Other transport injuries	922	303.4	278.5	328.4	20164	272.4	1.08	0.99 1.18
V03 Pedestrian injured collision with car, truck or van	194	64.9	53.2	76.6	1225	25.4	2.30	1.87 2.82
V43 Car occupant injured in collision with car, pick-up truck or van	245	86.6	71.6	101.6	3855	59.4	1.37	1.14 1.65
Y40 Systemic antibiotics	222	66.9	55.8	78.1	3024	34.9	1.77	1.48 2.13
Y45 Analgesic agent	237	65.3	55.6	74.9	3727	42.2	1.45	1.23 1.70
Y52 Cardiovascular agent	235	62.2	53.4	71.1	3635	37.8	1.53	1.31 1.79
Y83 Surgical operation	1471	405.4	382.0	428.7	22728	248.4	1.59	1.49 1.69
Y84 Other medical procedure	868	240.7	222.5	258.8	10147	135.7	1.71	1.57 1.86
Total	50423	15130.2	14968.7	15291.7	669446	10609.6	1.43	1.41 1.44

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year. Rates and rate ratios shaded where number of events <10 as these rates are likely to be unstable. Rates and rate ratios based on numbers <40 should be interpreted with caution

Table 12.23: Hospitalisation numbers and age-ethnicity-standardised rates¹ in housing applicants compared with housing tenants, according to selected diseases of interest, based on principal diagnosis and standard filter², May 2003 to June 2005

Disease	Housing applicants			Housing tenants			Comparison			
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI		
Infectious diseases										
A00-A09 Intestinal infectious diseases	179	419.6	349.4	489.8	792	320.3	392.8	1.18	0.97	1.43
A15-19 Tuberculosis	5	20.5	1.0	39.9	72	29.6	39.4	0.69	0.25	1.89
A37 Pertussis	4	7.0	2.6	19.1	21	8.1	12.9	0.86	0.27	2.74
A39 Meningococcal	9	17.6	6.1	29.1	102	32.5	38.8	0.54	0.27	1.07
A40 Streptococcal septicaemia	4	12.6	4.4	35.8	42	12.0	8.4	1.05	0.35	3.11
A41 Other septicaemia	14	48.2	20.7	75.7	238	78.0	90.2	0.62	0.34	1.12
A49 Bacterial infection of unspecified site	10	23.3	8.0	38.7	48	21.4	30.1	1.09	0.50	2.37
A87 Viral meningitis	8	18.5	5.0	32.0	83	32.3	42.1	0.57	0.26	1.26
B01 Varicella (chickenpox)	11	29.6	9.9	49.4	50	22.5	31.3	1.32	0.61	2.86
B02 Zoster (herpes zoster)	2	5.7	1.4	22.9	39	10.3	7.1	0.55	0.13	2.30
B03-B09 Other viral infection of skin & membranes	8	15.7	3.7	27.6	25	8.0	11.1	1.97	0.83	4.64
B15 Acute hepatitis A	1	4.2	0.6	30.0	3	0.9	2.8	4.81	0.50	46.61
B16 Acute hepatitis B	2	7.4	1.9	29.7	6	2.9	8.7	2.57	0.44	15.09
B17-B19 Other viral hepatitis	14	31.6	14.4	48.7	76	24.4	31.3	1.29	0.70	2.38
B26 Mumps	0	0.0	0.0	0.0	2	0.7	2.8			
B34 Viral infection of unspecified site	198	495.1	418.4	571.8	980	381.9	414.6	1.30	1.09	1.55
Respiratory infections and asthma										
J02 Acute pharyngitis	25	65.3	37.5	93.1	80	38.0	50.8	1.72	1.00	2.96
J03 Acute tonsillitis	26	63.3	37.3	89.3	187	68.4	81.3	0.93	0.59	1.45
J04 Acute laryngitis and tracheitis	2	4.9	1.2	20.1	9	2.7	4.4	1.86	0.39	8.76
J05 Acute laryngitis [croup] and epiglottitis	38	73.5	47.9	99.0	146	55.6	67.9	1.32	0.87	2.00
J06 Acute laryngopharyngitis	151	328.1	271.5	384.6	719	269.3	295.1	1.22	1.00	1.48
J10-J11 Influenza	11	17.9	6.9	28.8	80	34.3	44.3	0.52	0.26	1.03
J12 and J14-J18 Pneumonia	279	660.2	575.4	745.0	1884	644.9	681.9	1.02	0.89	1.18
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	8	21.3	5.8	36.7	70	20.0	24.8	1.06	0.49	2.28
J20 Acute bronchitis	15	42.3	18.4	66.2	65	19.4	24.3	2.18	1.18	4.04
J21 Acute bronchiolitis	261	515.0	450.2	579.9	827	277.6	298.9	1.86	1.60	2.15
J22 Unspecified acute lower respiratory infection	87	226.0	173.5	278.5	701	249.8	275.1	0.90	0.70	1.17
J40-J42 Bronchitis unspecified and chronic	13	38.6	16.4	60.7	109	31.1	37.0	1.24	0.68	2.27
J44 Other chronic obstructive pulmonary disease	166	563.4	472.6	654.2	1696	472.6	497.8	1.19	1.01	1.41
J45-J46 Asthma	347	762.4	676.9	847.8	1800	643.7	681.8	1.18	1.04	1.34

Disease	Housing applicants			Housing tenants			Comparison				
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI			
Skin and bone infections	9	20.7	4.5	37.0	54	20.8	13.3	28.2	1.00	0.42	2.37
	98	242.5	189.7	295.4	858	287.6	264.7	310.4	0.84	0.67	1.06
	146	351.2	289.0	413.4	1089	340.5	316.4	364.6	1.03	0.85	1.25
	5	9.9	0.9	18.9	52	18.3	12.4	24.2	0.54	0.21	1.42
	8	16.0	4.8	27.2	30	12.0	5.1	18.9	1.34	0.54	3.31
	7	18.3	4.1	32.4	59	23.4	13.7	33.1	0.78	0.32	1.88
	10	28.4	9.3	47.4	92	34.6	25.3	43.9	0.82	0.40	1.69
	7	18.4	2.4	34.4	41	17.6	9.4	25.8	1.05	0.39	2.82
	34	64.0	41.0	87.0	155	59.9	47.4	72.3	1.07	0.71	1.62
	20	65.8	33.9	97.7	175	52.6	43.7	61.5	1.25	0.75	2.09
Other acute and chronic diseases with partly infectious origins	5	11.0	1.0	21.0	29	10.1	5.3	14.8	1.10	0.39	3.05
	11	32.5	11.6	53.4	73	25.5	18.8	32.2	1.27	0.63	2.55
	5	11.4	1.2	21.6	64	20.4	15.4	25.5	0.56	0.22	1.41
	8	18.2	4.6	31.8	39	12.1	8.3	15.9	1.50	0.67	3.38
	7	10.6	2.7	18.6	67	19.7	14.4	25.0	0.54	0.24	1.20
	2	11.5	2.8	46.6	37	12.1	7.0	17.1	0.95	0.22	4.10
	10	31.8	10.1	53.5	96	31.9	24.2	39.7	1.00	0.48	2.05
	87	306.6	235.8	377.4	830	244.5	224.6	264.3	1.25	0.98	1.60
	56	210.1	150.0	270.1	742	223.9	203.8	244.1	0.94	0.70	1.27
	9	28.9	9.2	48.6	72	22.6	15.9	29.3	1.28	0.61	2.69
Cardiovascular diseases	49	173.5	121.7	225.4	403	118.7	104.9	132.4	1.46	1.06	2.01
	82	265.1	204.1	326.1	875	246.1	228.0	264.1	1.08	0.85	1.37
	40	140.6	93.4	187.7	603	179.1	161.8	196.3	0.78	0.55	1.11
	4	7.0	0.0	14.0	91	27.3	20.6	34.1	0.26	0.09	0.72
	70	154.5	114.8	194.2	301	104.2	88.0	120.4	1.48	1.10	2.00
	115	225.8	182.9	268.7	396	137.2	118.8	155.5	1.65	1.31	2.08
	64	143.5	106.4	180.6	231	69.8	59.7	80.0	2.05	1.53	2.76
	80	176.5	135.7	217.3	282	78.9	69.4	88.5	2.24	1.72	2.90
	40	91.0	61.5	120.5	183	52.4	44.3	60.4	1.74	1.21	2.49
	Mental and behavioural disorders	4	5.7	1.9	17.2	24	7.0	4.2	9.8	0.82	0.26
60		136.9	98.2	175.6	231	80.0	66.0	94.0	1.71	1.23	2.39
3		5.4	1.7	16.9	9	2.6	0.9	4.3	2.09	0.56	7.81
35		54.2	35.6	72.7	101	30.1	23.0	37.2	1.80	1.19	2.72
2		3.0	0.7	12.2	5	1.6	0.2	3.0	1.90	0.36	9.98
F00-F09 Organic mental disorders											
F10-F19 Mental disorders due to psychoactive substance use											
F20 Schizophrenia											
	F21-F29 Other delusional disorders										
	F30-F31 Manic episode or bipolar disorder										
	F32-F33 Depressive episode or disorder										
	F34-39 Other mood disorder										
	F40-F48 Neurotic, stress related disorders										
	F50-F59 Behavioural syndromes										
	F60-F69 Adult personality disorders										
	F70-F79 Mental retardation										

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
F80-F89 Disorders of psychological development	2	4.2	1.0	16.7	8	5.2	0.80	0.13
F90-F98 Disorders of childhood or adolescence	2	3.5	0.9	13.9	13	4.2	0.84	0.19
F99 Unspecified mental disorders	0	0.0	0.0	0.0	7	2.1		3.71
Injuries and poisonings								
S00-S09 Injuries to the head	200	483.2	408.5	558.0	1341	497.6	0.97	0.82
S10-S19 Injuries to neck	25	61.5	33.5	89.5	155	52.2	1.18	0.72
S20-S29 Injuries to thorax	37	94.2	61.8	126.5	252	83.2	1.13	0.78
S30-S39 Injuries to abdomen, back, pelvis	49	125.9	86.9	164.9	308	114.0	1.10	0.78
S40-S49 Injuries to shoulder & upper arm	41	95.2	62.8	127.6	417	147.6	0.65	0.45
S50-S59 Injuries to elbow & forearm	108	252.3	201.1	303.4	783	279.9	0.90	0.72
S60-S69 Injuries to wrist & hand	146	382.3	314.5	450.1	1097	402.2	0.95	0.78
S70-S79 Injuries to hip & thigh	33	93.8	57.3	130.3	390	123.9	0.76	0.50
S80-S89 Injuries to knee and lower leg	81	222.3	169.2	275.4	740	261.2	0.85	0.66
S90-S99 Injuries to ankle and foot	45	114.1	77.6	150.5	285	103.7	1.10	0.77
T08-T14 Injuries to unspecified body region	6	15.8	2.6	29.1	24	7.2	2.21	0.87
T15-T19 Effects of foreign body	16	34.7	16.3	53.2	94	29.7	1.17	0.66
T20-T32 Burns & corrosions	36	78.6	50.4	106.8	159	52.2	1.51	1.01
T36-T65 Poisonings & toxic effects	191	383.4	325.2	441.6	718	239.5	1.60	1.34
T66-T78 Other and unspecified effects of external causes	23	49.4	28.3	70.5	116	36.2	1.37	0.85
T79 Early complications of trauma	3	6.7	2.1	21.4	24	10.1	0.67	0.18
T80-T88 Complications of care	150	436.6	361.7	511.6	1155	354.7	1.23	1.02
Specific common injuries (top 50%)								
S01 Open wound of head	60	142.4	102.8	182.1	403	153.0	0.93	0.68
S06 Intracranial injury	36	86.1	54.6	117.6	338	124.9	0.69	0.47
S42 Fracture of shoulder and upper arm	26	59.8	33.5	86.1	288	102.4	0.58	0.37
S52 Fracture of forearm	85	190.6	146.9	234.3	565	203.0	0.94	0.73
S61 Open wound of wrist and hand	44	122.0	82.1	161.9	312	107.2	1.14	0.80
S62 Fracture of wrist and hand level	38	96.3	63.1	129.6	327	122.8	0.78	0.54
S72 Fracture of femur	19	62.1	29.8	94.4	258	84.0	0.74	0.42
S82 Superficial injury of lower leg	41	109.0	72.5	145.5	449	160.9	0.68	0.47
T81 Complications of procedures, NEC	71	206.1	153.6	258.6	483	153.0	1.35	1.02
External causes								
W00-W19 Falls	323	835.2	733.9	936.4	2757	955.2	0.87	0.77
W20-W49 Exposure to inanimate mechanical forces	199	508.2	430.7	585.6	1547	558.3	0.91	0.77
W50-W64 Exposure to animate mechanism forces	56	116.8	84.6	149.0	452	168.2	0.69	0.51
W65-74 Drowning & submersion	3	6.4	2.0	20.6	10	3.3	1.94	0.52
W75-84 Other accidental threats to breathing	6	15.1	2.0	28.2	38	10.9	1.39	0.55

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
W85-99 Exposure to electricity & extreme temperature	1	1.2	0.2	8.3	7	2.0	0.5	3.5
X00-09 Exposure to smoke, fire, & flames	6	14.4	2.1	26.6	29	9.5	5.9	13.1
X10-19 Contact with heat & hot substances	26	58.9	34.0	83.7	123	38.7	31.4	45.9
X20-X29 Contact with venomous animals and plants	6	10.2	2.0	18.4	16	5.0	2.5	7.5
X30-X39 Exposure to forces of nature	0	0.0	0.0	0.0	27	10.1	3.5	16.8
X40-49 Accidental poisoning	51	108.8	77.1	140.4	287	100.9	85.9	115.9
X50-57 Overexertion, travel and privation	36	94.4	61.1	127.7	267	88.7	75.5	101.9
X58-59 Accidental exposure to other and unspecified factors	48	132.5	91.1	174.0	302	93.2	81.5	105.0
X60-X84 Intentional self-harm	187	368.1	311.8	424.5	634	211.4	188.9	233.9
X85-Y09 Assault	124	282.5	228.4	336.5	699	252.2	226.8	277.7
Y10-Y34 Event of undetermined intent	12	21.6	9.0	34.1	53	15.4	11.2	19.6
Specific external causes								
W22 Striking against other objects	37	90.7	57.1	124.4	217	71.8	59.9	83.8
W23 Caught, crushed, jammed or pinched	48	115.1	79.2	151.0	298	108.5	92.6	124.5
W25 Contact with sharp glass	32	89.9	55.6	124.1	327	131.8	110.7	152.9
W50 Hit by another person	13	26.4	11.8	41.0	97	38.7	28.1	49.4
W54 Bitten or struck by dog	10	19.5	6.7	32.2	85	28.3	21.5	35.1
W85-W87 Exposure to electric current	1	1.2	0.2	8.3	5	1.5	0.2	2.9
X31 Exposure to excessive natural cold	0	0.0	0.0	0.0	17	7.4	1.0	13.8
X50 Overexertion and strenuous or repetitive movements	34	88.2	56.2	120.3	265	88.0	74.9	101.2
Y04 Assault by bodily force	63	151.7	110.1	193.3	358	129.0	110.4	147.6
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	35	98.0	61.0	134.9	200	74.5	60.9	88.1
V10-V99 Other transport injuries	107	281.3	222.2	340.4	815	305.8	277.5	334.2
V03 Pedestrian injured collision with car, truck or van	28	85.5	50.1	120.9	166	64.1	51.0	77.3
V43 Car occupant injured in collision with car, pick-up truck or van	30	78.5	46.3	110.7	215	87.8	70.2	105.3
Y40 Systemic antibiotics	28	77.9	45.7	110.1	194	67.4	54.0	80.8
Y45 Analgesic agent	18	49.4	24.4	74.4	219	64.9	55.0	74.9
Y52 Cardiovascular agent	19	72.6	38.5	106.8	216	62.8	53.0	72.6
Y83 Surgical operation	179	493.7	415.4	571.9	1292	393.8	368.9	418.7
Y84 Other medical procedure	76	218.7	166.9	270.6	792	243.8	223.3	264.3
Total	6546	16253.9	15819.3	16688.4	43877	14985.6	14801.7	15169.6

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year. Rates and rate ratios shaded where number of events <10 as these rates are likely to be unstable. Rates and rate ratios based on numbers <40 should be interpreted with caution

Table 12.24: Hospitalisation numbers and age-standardised rates in *housing applicants* (who subsequently became tenants) compared with *housing tenants* (during their first 12 months of tenancy time), according to major disease categories, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease category	Housing applicants (who became tenants)			Housing tenants (first 12 months)			Comparison		
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI	
A00-B99 Infectious & parasitic	127	847.3	670.3	1024.3	921.0	754.2	0.92	0.70	1.21
C00-D48 Neoplasms	24	412.1	228.6	595.5	78	709.3	0.58	0.35	0.97
D50-D89 Blood & immune system	10	145.9	26.4	265.3	24	156.8	0.93	0.36	2.43
E00-E90 Endocrine, nutritional & metabolic	56	1015.7	729.2	1302.1	93	948.3	1.07	0.74	1.55
F00-F99 Mental & behavioural	114	1655.7	1337.8	1973.7	204	1382.2	1.20	0.94	1.52
G00-G99 Nervous system	55	806.9	558.6	1055.1	72	453.9	1.78	1.17	2.69
H00-H59 Eye & adnexa	8	75.0	14.6	135.3	17	135.7	0.55	0.21	1.49
H60-H95 Ear & mastoid	17	179.4	77.3	281.5	25	114.1	1.57	0.66	3.72
I00-I99 Circulatory system	105	2584.5	2038.2	3130.9	204	2604.3	0.99	0.76	1.29
J00-J99 Respiratory	362	3611.8	3077.1	4146.5	674	3552.7	1.02	0.85	1.22
K00-K93 Digestive	101	1691.0	1302.2	2079.9	276	1915.8	0.88	0.67	1.16
L00-L99 Skin & subcutaneous	69	764.5	539.6	989.4	204	1022.3	0.75	0.53	1.05
M00-M99 Musculoskeletal & connective	53	784.3	538.6	1029.9	104	872.5	0.90	0.61	1.33
N00-N99 Genitourinary	79	1137.9	840.3	1435.5	182	1072.8	1.06	0.78	1.45
Q00-Q99 Congenital	15	66.0	32.6	99.4	21	61.5	1.07	0.52	2.21
R00-R99 Symptoms & signs	220	3417.0	2873.0	3960.9	423	3149.0	1.09	0.89	1.32
S00-T98 Injury, poisonings	260	3245.9	2773.9	3717.9	603	3258.0	1.00	0.84	1.19
V01-Y98 External causes	382	5174.1	4559.8	5788.5	864	5360.4	0.97	0.83	1.12
Z00-Z13 Factors influencing health status	12	98.1	27.8	168.5	26	88.5	1.11	0.48	2.57
Total	2069	27713.1	26238.1	29188.0	4318	27779.1	1.00	0.93	1.07

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year

Table 12.25: Hospitalisation numbers and age-standardised rates in *housing applicants* (who subsequently became tenants) compared with *housing tenants* (during their first 12 months of tenancy time), according to major disease categories, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease	Housing applicants (who became tenants)				Housing tenants (during first 12 months as tenants)				Comparison		
	Hosp. No. ¹	Rate ²	95 CI		Hosp. No. ¹	Rate ²	95 CI		RR	95 CI	
Infectious diseases											
A00-A09 Intestinal infectious diseases	44	259.6	167.2	352.0	79	226.9	164.2	289.6	1.14	0.73	1.80
A15-19 Tuberculosis	2	26.7	6.7	106.7	2	14.2	2.6	78.1	1.88	0.21	16.85
A37 Pertussis	2	12.5	2.9	53.0	2	4.1	1.0	16.2	3.07	0.41	22.76
A39 Meningococcal	2	8.8	2.2	35.2	5	12.5	1.3	23.7	0.70	0.13	3.65
A40 Streptococcal septicaemia	2	24.0	5.0	115.7	3	43.6	12.7	150.3	0.55	0.07	4.07
A41 Other septicaemia	4	65.2	22.3	190.5	14	139.2	52.1	226.4	0.47	0.14	1.62
A49 Bacterial infection of unspecified site	1	8.1	1.1	57.4	5	15.0	0.6	29.3	0.54	0.06	4.79
A87 Viral meningitis	2	8.8	2.2	35.2	6	14.3	2.6	25.9	0.62	0.12	3.09
B01 Varicella (chickenpox)	1	5.5	0.8	39.3	4	8.1	0.2	16.1	0.68	0.08	6.10
B02 Zoster (herpes zoster)	1	21.2	3.0	150.5	3	47.2	14.3	156.2	0.45	0.05	4.47
B03-B09 Other viral infection of skin & membranes	1	4.4	0.6	31.2	2	4.1	1.0	16.2	1.08	0.10	11.94
B15 Acute hepatitis A	0	0.0	0.0	0.0	0	0.0	0.0	0.0	.	.	.
B16 Acute hepatitis B	0	0.0	0.0	0.0	2	13.8	3.3	56.7	.	.	.
B17-B19 Other viral hepatitis	1	18.4	2.6	130.9	7	61.1	13.2	109.1	0.30	0.04	2.49
B26 Mumps	0	0.0	0.0	0.0	0	0.0	0.0	0.0	.	.	.
B34 Viral infection of unspecified site	52	297.1	208.2	386.0	78	256.2	185.4	326.9	1.16	0.77	1.74
Respiratory infections and asthma											
J02 Acute pharyngitis	2	17.7	3.8	83.7	5	15.2	0.5	29.9	1.17	0.19	7.26
J03 Acute tonsillitis	5	47.3	3.2	91.4	13	51.4	20.5	82.3	0.92	0.30	2.79
J04 Acute laryngitis and tracheitis	1	8.1	1.1	57.4	1	12.2	1.7	86.6	0.66	0.04	10.61
J05 Acute laryngitis [croup] and epiglottitis	5	23.1	2.8	43.5	16	34.6	17.4	51.7	0.67	0.24	1.84
J06 Acute laryngopharyngitis	39	219.8	132.0	307.7	83	229.0	166.8	291.2	0.96	0.59	1.56
J10-J11 Influenza	3	13.2	4.3	40.9	6	27.7	10.0	76.6	0.48	0.10	2.18
J12 and J14-J18 Pneumonia	70	523.0	346.3	699.8	117	680.0	504.3	855.7	0.77	0.50	1.18
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	1	12.5	1.8	88.4	6	59.9	2.1	117.7	0.21	0.02	1.85
J20 Acute bronchitis	4	82.0	24.2	277.6	6	35.0	9.1	134.1	2.35	0.38	14.41
J21 Acute bronchiolitis	81	356.4	278.8	434.0	74	150.4	116.1	184.6	2.37	1.73	3.25
J22 Unspecified acute lower respiratory infection	15	166.5	46.9	286.1	62	301.0	197.4	404.6	0.55	0.25	1.23
J40-J42 Bronchitis unspecified and chronic	3	55.7	17.4	178.0	6	78.4	5.7	151.0	0.71	0.16	3.14
J44 Other chronic obstructive pulmonary disease	37	1073.9	701.4	1446.5	67	912.9	673.3	1152.5	1.18	0.76	1.82
J45-J46 Asthma	73	686.9	479.9	893.8	160	598.6	467.3	729.9	1.15	0.79	1.67

Disease	Housing applicants (who became tenants)				Housing tenants (during first 12 months as tenants)				Comparison			
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI				
Skin and bone infections	L01 Impetigo	1	4.4	0.6	31.2	4	8.5	0.2	16.8	0.52	0.06	4.66
	L02 Cutaneous abscess, furuncle and carbuncle	19	173.7	86.1	261.3	76	366.9	273.4	460.4	0.47	0.27	0.83
	L03 Cellulitis	29	383.8	216.9	550.8	73	407.4	296.5	518.3	0.94	0.56	1.57
	L04 Acute lymphadenitis	1	4.4	0.6	31.2	2	4.1	1.0	16.2	1.08	0.10	11.94
	L08 Other local infection of skin & subcutaneous tissue	1	4.4	0.6	31.2	0	0.0	0.0	0.0			
	M00-M03 Infectious arthropathies	1	4.4	0.6	31.2	3	30.1	9.2	98.2	0.15	0.01	1.45
	M86 Osteomyelitis	3	15.5	5.0	48.3	6	13.8	2.7	24.9	1.12	0.28	4.51
	Other acute and chronic diseases with partly infectious origins											
H60 Otitis externa	2	24.0	5.0	115.7	4	10.2	3.7	27.7	2.35	0.36	15.20	
H65-H66 Otitis media	7	35.6	8.4	62.9	16	34.6	17.4	51.7	1.03	0.41	2.56	
K25-K28 Gastric, peptic, jejunal ulcer	2	29.3	6.4	133.7	3	28.6	9.0	90.1	1.03	0.15	6.89	
C16 Malignant neoplasm of stomach	1	23.9	3.4	169.9	3	36.0	11.6	111.7	0.66	0.07	6.39	
I00-I02 Acute rheumatic fever	2	13.6	3.3	55.8	2	4.7	1.2	18.8	2.89	0.40	20.90	
N00 and N05 Acute & unspecified nephritis syndrome	1	12.5	1.8	88.4	7	18.0	4.4	31.7	0.69	0.08	5.65	
G00-G09 Inflammatory diseases of CNS	2	9.9	2.5	40.1	3	6.1	2.0	18.9	1.63	0.27	9.83	
G35-G37 Demyelinating diseases of CNS	6	75.6	15.1	136.1	1	5.7	0.8	40.2	13.35	1.61	110.89	
G60-G64 Polyneuropathies	2	91.1	22.8	364.4	4	27.5	10.1	74.9	3.31	0.60	18.32	
Cardiovascular diseases												
I10-I15 Hypertensive diseases	4	74.1	0.0	148.3	5	50.9	17.8	145.5	1.46	0.34	6.21	
I20 Angina pectoris	32	941.7	585.7	1297.7	41	590.9	394.9	786.9	1.59	0.96	2.63	
I21 Acute myocardial infarction	10	282.3	93.5	471.2	25	362.4	209.7	515.1	0.78	0.35	1.72	
I22 – I25 Other forms of ischaemic heart disease	2	69.5	16.3	296.7	2	23.8	6.0	95.2	2.92	0.39	21.72	
I48 Atrial fibrillation	7	199.8	41.4	358.3	14	181.6	80.5	282.7	1.10	0.42	2.90	
I50 Heart failure	17	430.6	211.8	649.5	33	483.2	305.0	661.4	0.89	0.48	1.67	
I60-I69 Cerebrovascular disease (incl. Stroke)	6	145.5	19.0	272.0	17	243.4	117.5	369.2	0.60	0.22	1.64	
Mental and behavioural disorders												
F00-F09 Organic mental disorders	0	0.0	0.0	0.0	4	28.5	9.9	82.2				
F10-F19 Mental disorders due to psychoactive substance use	16	205.3	103.6	307.0	25	161.4	94.8	227.9	1.27	0.67	2.42	
F20 Schizophrenia	25	366.7	219.9	513.5	44	300.7	206.2	395.1	1.22	0.73	2.03	
F21-F29 Other delusional disorders	10	152.1	53.1	251.1	30	180.3	114.1	246.5	0.84	0.40	1.78	
F30-F31 Manic episode or bipolar disorder	15	224.0	107.6	340.5	25	159.7	94.0	225.4	1.40	0.72	2.72	
F32-F33 Depressive episode or disorder	11	157.5	59.6	255.4	28	201.7	124.0	279.3	0.78	0.38	1.62	
F34-39 Other mood disorder	2	36.9	9.2	147.5	1	5.4	0.8	38.5	6.79	0.62	74.94	
F40-F48 Neurotic, stress related disorders	16	253.9	113.1	394.8	15	121.5	49.9	193.0	2.09	0.93	4.69	
F50-F59 Behavioural syndromes	1	12.5	1.8	88.4	0	0.0	0.0	0.0				

Disease	Housing applicants (who became tenants)				Housing tenants (during first 12 months as tenants)				Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI		
F60-F69 Adult personality disorders	18	246.8	131.9	361.7	217.4	139.5	295.4	1.13	0.63	2.04
F70-F79 Mental retardation	0	0.0	0.0	0.0	0.0	0.0	0.0	.	.	.
F80-F89 Disorders of psychological development	0	0.0	0.0	0.0	0.0	0.0	0.0	.	.	.
F90-F98 Disorders of childhood or adolescence	0	0.0	0.0	0.0	0.0	0.0	0.0	.	.	.
F99 Unspecified mental disorders	0	0.0	0.0	0.0	5.7	0.8	40.2	.	.	.
Injuries and poisonings										
S00-S09 Injuries to the head	44	449.3	299.8	598.9	465.0	355.9	574.1	0.97	0.64	1.45
S10-S19 Injuries to neck	3	39.1	12.6	121.4	91.8	31.5	152.1	0.43	0.12	1.58
S20-S29 Injuries to thorax	6	68.7	9.5	127.9	136.8	67.9	205.8	0.50	0.18	1.36
S30-S39 Injuries to abdomen, back, pelvis	17	240.3	98.9	381.7	108.8	60.3	157.4	2.21	1.06	4.62
S40-S49 Injuries to shoulder & upper arm	13	132.2	27.9	236.5	144.3	87.1	201.6	0.92	0.38	2.21
S50-S59 Injuries to elbow & forearm	17	141.7	63.1	220.3	221.4	134.6	308.2	0.64	0.32	1.26
S60-S69 Injuries to wrist & hand	25	268.3	150.4	386.1	335.7	251.4	420.1	0.80	0.48	1.33
S70-S79 Injuries to hip & thigh	7	171.8	12.9	330.6	186.0	82.4	289.6	0.92	0.31	2.72
S80-S89 Injuries to knee and lower leg	19	292.0	137.1	447.0	229.5	141.1	318.0	1.27	0.66	2.45
S90-S99 Injuries to ankle and foot	10	125.4	17.8	233.0	66.2	28.3	104.1	1.89	0.68	5.31
T08-T14 Injuries to unspecified body region	3	37.3	10.9	127.7	12.9	4.5	37.6	2.88	0.57	14.70
T15-T19 Effects of foreign body	5	29.1	3.0	55.2	20.4	7.3	57.2	1.43	0.36	5.59
T20-T32 Burns & corrosions	9	60.1	10.1	110.1	66.5	29.3	103.6	0.90	0.33	2.46
T36-T65 Poisonings & toxic effects	49	658.5	457.9	859.1	448.7	343.4	554.0	1.47	1.00	2.16
T66-T78 Other and unspecified effects of external causes	3	35.3	10.0	124.4	27.9	0.7	55.0	1.27	0.26	6.23
T79 Early complications of trauma	0	0.0	0.0	0.0	3.4	0.5	24.5	.	.	.
T80-T88 Complications of care	30	496.8	307.9	685.8	687.1	524.2	850.1	0.72	0.46	1.13
Specific common injuries (top 50%)										
S01 Open wound of head	10	82.7	24.2	141.1	135.3	69.0	201.7	0.61	0.26	1.44
S06 Intracranial injury	9	65.8	13.7	117.9	132.8	80.5	185.0	0.50	0.20	1.20
S42 Fracture of shoulder and upper arm	8	90.4	31.1	262.5	80.7	40.5	120.9	1.12	0.35	3.63
S52 Fracture of forearm	10	72.9	23.9	122.0	155.6	79.5	231.7	0.47	0.20	1.08
S61 Open wound of wrist and hand	5	48.7	17.8	132.9	83.5	44.7	122.2	0.58	0.19	1.76
S62 Fracture of wrist and hand level	9	104.1	31.4	176.7	80.9	41.0	120.8	1.29	0.55	3.02
S72 Fracture of femur	6	158.4	1.7	315.1	100.5	16.3	184.7	1.58	0.43	5.76
S82 Superficial injury of lower leg	9	154.6	32.2	277.0	83.6	39.5	127.7	1.85	0.71	4.79
T81 Complications of procedures, NEC	12	204.1	81.4	326.9	258.9	154.9	362.9	0.79	0.38	1.62
External causes										
W00-W19 Falls	70	981.8	684.8	1278.8	951.6	755.4	1147.8	1.03	0.72	1.49
W20-W49 Exposure to inanimate mechanical forces	41	357.9	229.3	486.6	492.9	378.2	607.5	0.73	0.47	1.11

Disease	Housing applicants (who became tenants)				Housing tenants (during first 12 months as tenants)				Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI		
W50-W64 Exposure to animate mechanism forces	13	98.8	39.3	158.3	79.0	37.9	120.1	1.25	0.56	2.77
W65-74 Drowning & submersion	0	0.0	0.0	0.0	2.0	0.3	14.4	.	.	.
W75-84 Other accidental threats to breathing	4	26.5	8.5	82.5	12.4	3.1	49.9	2.14	0.36	12.92
W85-99 Exposure to electricity & extreme temperature	0	0.0	0.0	0.0	0.0	0.0	0.0	.	.	.
X00-09 Exposure to smoke, fire, & flames	0	0.0	0.0	0.0	16.3	3.7	71.6	.	.	.
X10-19 Contact with heat & hot substances	7	34.5	8.1	60.9	43.8	17.0	70.6	0.79	0.30	2.10
X20-X29 Contact with venomous animals and plants	3	19.2	6.1	60.6	7.8	1.8	34.5	2.46	0.37	16.19
X30-X39 Exposure to forces of nature	0	0.0	0.0	0.0	3.4	0.5	24.5	.	.	.
X40-49 Accidental poisoning	16	192.9	80.6	305.3	109.9	59.9	159.8	1.76	0.84	3.68
X50-57 Overexertion, travel and privation	10	136.9	45.5	228.3	148.1	73.3	222.9	0.92	0.40	2.14
X58-59 Accidental exposure to other and unspecified factors	7	94.5	16.1	173.0	86.3	32.8	139.9	1.09	0.39	3.09
X60-X84 Intentional self-harm	45	660.4	461.1	859.6	475.0	367.4	582.6	1.39	0.95	2.03
X85-Y09 Assault	29	383.4	235.7	531.0	331.0	240.1	421.9	1.16	0.72	1.86
Y10-Y34 Event of undetermined intent	1	13.3	1.9	94.7	29.4	10.0	86.0	0.45	0.05	4.24
Specific external causes										
W22 Striking against other objects	6	54.7	2.2	107.1	82.5	26.0	139.0	0.66	0.20	2.15
W23 Caught, crushed, jammed or pinched	6	32.4	5.7	59.0	60.8	37.0	84.7	0.53	0.21	1.32
W25 Contact with sharp glass	10	87.2	23.2	151.2	66.9	33.3	100.5	1.30	0.54	3.17
W50 Hit by another person	4	30.2	10.2	89.8	10.1	3.0	34.7	2.98	0.58	15.43
W54 Bitten or struck by dog	1	12.5	1.8	88.4	26.3	3.8	48.8	0.47	0.06	4.02
W85-W87 Exposure to electric current	0	0.0	0.0	0.0	0.0	0.0	0.0	.	.	.
X31 Exposure to excessive natural cold	0	0.0	0.0	0.0	3.4	0.5	24.5	.	.	.
X50 Overexertion and strenuous or repetitive movements	9	118.5	34.5	202.4	148.1	73.3	222.9	0.80	0.34	1.91
Y04 Assault by bodily force	14	186.0	82.6	289.4	159.4	99.7	219.1	1.17	0.60	2.28
Other specific external causes (including top 50%)										
V01-V09 Pedestrian injuries	6	56.7	3.0	110.4	42.7	9.6	75.8	1.33	0.39	4.51
V10-V99 Other transport injuries	24	330.2	163.1	497.3	255.7	182.1	329.2	1.29	0.72	2.31
V03 Pedestrian injured collision with car, truck or van	3	16.6	5.4	51.5	35.2	4.2	66.3	0.47	0.11	1.98
V43 Car occupant injured in collision with car, pick-up truck or van	8	87.5	22.2	152.8	90.0	42.7	137.3	0.97	0.39	2.42
Y40 Systemic antibiotics	11	174.9	47.5	302.3	35.9	9.1	62.6	4.87	1.72	13.82
Y45 Analgesic agent	2	26.5	6.0	117.4	117.4	42.5	192.4	0.23	0.04	1.14
Y52 Cardiovascular agent	3	90.7	27.2	302.0	127.3	33.2	221.4	0.71	0.17	2.93
Y83 Surgical operation	30	519.6	313.9	725.4	905.6	702.2	1109.0	0.57	0.36	0.90
Y84 Other medical procedure	22	377.4	211.2	543.7	415.8	277.2	554.5	0.91	0.52	1.58
Total	1469	1818.5	17005.2	19357.7	18103.7	17280.4	18927.0	1.00	0.93	1.09

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as case per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

Table 12.26: Hospitalisation numbers and age-standardised rates in *housing tenants* according to duration as tenants, for major disease categories, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease category	<1 year			1-3 years			4-6 years			7-9 years			10+ years		
	Hosp No ¹	Rate ²	95 CI	Hosp No ¹	Rate ²	95 CI	Hosp No ¹	Rate ²	95 CI	Hosp No ¹	Rate ²	95 CI	Hosp No ¹	Rate ²	95 CI
A00-B99 Infectious & parasitic	729	1007.7	909.5	1105.8	1018	759.2	703.6	814.9	656.3	199	630.0	534.6	404	620.0	552.1
C00-D48 Neoplasms	226	764.8	656.4	873.3	392	554.5	495.3	613.6	449.3	115	470.1	381.7	433	506.5	456.1
D50-D89 Blood & immune system	80	204.3	152.5	256.1	179	218.5	182.4	254.5	228.2	42	153.7	103.6	150	194.0	158.8
E00-E90 Endocrine, nutritional & metabolic	289	964.1	842.5	1085.6	435	610.8	549.9	671.8	543.1	106	403.1	322.5	324	382.6	338.2
F00-F99 Mental & behavioural	503	1307.7	1186.2	1429.2	686	772.7	712.5	833.0	599.7	129	525.8	430.7	291	438.5	383.5
G00-G99 Nervous system	211	512.7	433.1	592.3	444	476.8	427.6	525.9	471.7	127	443.4	360.9	262	352.9	305.8
H00-H59 Eye & adnexa	44	117.7	77.1	158.3	92	102.1	78.0	126.2	123.4	28	86.1	51.3	71	86.4	64.4
H60-H95 Ear & mastoid	87	118.7	84.7	152.6	122	101.3	79.0	123.5	122.4	15	55.1	26.0	61	90.4	65.2
I00-I99 Circulatory system	601	2379.2	2180.7	2577.6	1339	2158.1	2036.9	2279.4	1893.1	471	2062.3	1870.0	1785	1888.2	1795.0
J00-J99 Respiratory	2249	3866.1	3650.0	4082.3	3071	2967.4	2841.8	3093.0	2644.3	683	2619.5	2412.0	1818	2411.8	2286.0
K00-K93 Digestive	752	1923.6	1765.6	2081.7	1301	1525.1	1433.5	1616.8	1562.7	349	1300.3	1156.0	1041	1325.6	1237.0
L00-L99 Skin & subcutaneous	579	1068.2	961.6	1174.9	978	904.8	840.3	969.3	773.6	194	647.5	550.0	504	732.2	661.4
M00-M99 Musculoskeletal & connective	313	885.0	773.6	996.3	636	738.3	674.7	801.9	778.9	166	543.1	454.1	528	622.1	565.5
N00-N99 Genitourinary	480	1082.6	971.8	1193.4	953	1054.5	981.1	1127.9	890.2	210	765.1	654.9	527	756.4	685.0
Q00-Q99 Congenital	59	57.0	37.7	76.3	77	46.0	34.4	57.7	32.0	10	34.7	12.4	29	56.5	33.8
R00-R99 Symptoms & signs	1158	2925.1	2729.2	3121.1	1970	2314.5	2201.3	2427.7	1994.7	567	2139.4	1954.0	1459	1830.6	1727.0
S00-T98 Injury, poisonings	1570	3212.2	3023.6	3400.7	2821	2676.3	2563.6	2789.0	2293.8	664	2029.0	1857.0	1666	2226.4	2108.0
V01-Y98 External causes	2275	5216.9	4963.8	5470.0	4095	4341.7	4190.9	4492.4	3636.5	990	3320.8	3094.0	2830	3603.2	3457.0
Z00-Z13 Factors influencing health status	56	80.5	54.2	106.7	87	63.7	48.2	79.1	65.6	13	51.3	21.9	31	50.9	31.0
Total	12261	27693.9	27103.0	28284.7	20696	22386.0	22040.0	22732.0	18679.0	5078	18280.0	1774.0	14214	18175.0	17845.0

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions
² Rate measured as case per 100 000 population per year

Table 12.27: Hospitalisation numbers and age-standardised rates in *housing tenants* according to duration as tenants, for selected diseases, based on principal diagnosis and standard filter¹, May 2003 to June 2005

Disease category	<1 year			1-3 years			4-6 years			7-9 years			10+ years		
	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI
Infectious diseases															
A00-A09 Intestinal infectious diseases	259	255.0	213.1 297.0	304	200.3	172.8 227.8	123	157.1	127.1 187.1	48	163.6	114.1 213.0	65	98.7	71.2 126.3
A15-19 Tuberculosis	14	35.3	13.4 57.2	22	22.4	11.7 33.2	7	10.9	2.5 19.3	1	3.6	0.5 25.8	16	18.0	8.7 27.3
A37 Pertussis	10	6.8	2.6 10.9	3	1.4	0.4 4.3	4	3.8	1.4 10.3	3	10.0	3.0 32.7	1	1.7	0.2 12.1
A39 Meningococcal	26	21.6	13.1 30.1	38	19.1	12.6 25.6	16	16.1	7.9 24.3	8	27.4	6.8 47.9	15	24.1	10.6 37.6
A40 Streptococcal septicaemia	11	43.2	16.3 70.1	16	19.4	8.9 29.9	6	12.3	1.9 22.7	2	7.7	1.9 30.6	7	9.6	1.6 17.5
A41 Other septicaemia	37	128.7	83.9 173.6	69	106.3	79.8 132.8	39	79.9	53.1 106.7	19	82.1	43.8 120.5	76	88.6	67.3 109.9
A49 Bacterial infection of unspecified site	14	20.2	7.4 33.0	18	10.1	4.9 15.4	7	9.3	2.0 16.5	2	8.1	2.0 32.6	7	11.4	1.8 20.9
A87 Viral meningitis	16	17.8	8.4 27.1	32	21.3	13.2 29.4	10	11.1	3.8 18.3	9	19.4	5.5 33.3	16	32.0	15.2 48.9
B01 Varicella (chickenpox)	15	11.3	5.5 17.1	25	12.4	7.1 17.7	6	6.7	1.2 12.2	2	5.6	1.2 25.7	2	5.0	1.2 20.5
B02 Zoster (herpes zoster)	8	34.2	10.1 58.3	12	15.1	5.9 24.3	5	12.0	1.2 22.8	4	16.7	6.1 45.6	12	11.5	4.9 18.1
B03-B09 Other viral infection of skin & membranes	11	7.7	3.1 12.3	7	3.8	0.7 6.9	6	8.0	1.0 15.1	0	0.0	0.0 0.0	1	1.7	0.2 12.1
B15 Acute hepatitis A	0	0.0	0.0 0.0	1	0.4	0.1 2.9	0	0.0	0.0 0.0	0	0.0	0.0 0.0	2	1.7	0.4 7.0
B16 Acute hepatitis B	2	5.2	1.3 21.5	1	0.9	0.1 6.7	2	3.2	0.8 12.6	0	0.0	0.0 0.0	1	1.3	0.2 9.1
B17-B19 Other viral hepatitis	19	56.5	29.7 83.2	20	24.4	13.4 35.4	21	35.9	20.5 51.4	6	20.5	4.0 37.0	12	20.3	7.8 32.7
B26 Mumps	0	0.0	0.0 0.0	2	1.6	0.4 7.1	0	0.0	0.0 0.0	0	0.0	0.0 0.0	0	0.0	0.0 0.0
B34 Viral infection of unspecified site	239	269.1	225.9 312.3	362	218.8	193.6 244.0	152	180.3	149.1 211.5	81	216.4	164.3 268.6	146	247.0	202.4 291.6
Respiratory infections and asthma															
J02 Acute pharyngitis	25	37.8	18.3 57.4	24	16.9	8.9 24.9	13	18.5	7.5 29.6	7	18.2	3.5 32.8	11	14.0	5.2 22.8
J03 Acute tonsillitis	41	57.0	36.8 77.2	75	52.7	39.7 65.7	33	38.5	24.4 52.6	19	52.1	24.8 79.4	19	29.4	14.7 44.2
J04 Acute laryngitis and tracheitis	1	4.6	0.6 32.4	4	3.7	1.3 10.3	2	3.8	0.9 15.3	0	0.0	0.0 0.0	2	2.1	0.5 8.3
J05 Acute laryngitis [croup] and epiglottitis	53	37.2	27.1 47.4	56	26.7	19.3 34.1	19	19.9	10.6 29.2	10	36.3	13.1 59.4	9	23.3	7.5 39.1
J06 Acute laryngopharyngitis	253	242.6	203.0 282.3	273	166.6	143.5 189.8	95	124.5	97.9 151.2	45	155.1	106.9 203.3	50	97.3	67.8 126.9
J10-J11 Influenza	22	33.4	16.0 50.8	38	34.0	21.0 47.0	12	20.1	7.2 33.1	2	6.9	1.7 28.0	8	16.9	4.4 29.3
J12 and J14-J18 Pneumonia	411	701.0	610.4 791.6	608	580.2	524.4 636.0	331	589.5	518.7 660.3	149	560.9	465.5 656.3	395	507.3	450.7 563.8
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	13	40.9	15.2 66.5	17	19.3	9.1 29.5	15	31.3	14.2 48.3	4	13.3	4.8 37.1	21	24.1	12.6 35.6
J20 Acute bronchitis	12	16.4	3.8 29.0	23	21.9	11.8 32.1	14	27.7	12.2 43.3	4	15.6	0.3 31.0	12	13.4	5.6 21.2
J21 Acute bronchiolitis	436	299.0	269.6 328.5	242	111.9	97.8 126.0	71	91.5	70.2 112.8	29	118.2	75.2 161.2	40	113.9	78.2 149.6
J22 Unspecified acute lower	160	311.5	250.0 373.0	245	268.3	229.9 306.7	104	210.7	166.7 254.7	46	177.5	123.3 231.8	151	200.0	164.5 235.5

respiratory infection	17	54.5	25.8	83.1	40	57.5	38.4	76.7	12	22.1	9.3	34.9	12	50.5	20.6	80.4	30	36.2	21.8	50.6
J40-J42 Bronchitis unspecified and chronic	1103.	1	1242.																	
J44 Other chronic obstructive pulmonary disease	251	963.7	5	434	807.4	729.9	884.9	252	576.7	746.0	181	620	801.3	681.5	921.1	620	624.1	574.1	674.2	
J45-J46 Asthma	415	575.9	505.5	646.2	725	506.3	463.7	548.9	298	410.6	360.7	460.4	128	435.1	353.8	516.4	249	449.9	388.4	511.5
Skin and bone infections																				
L01 Impetigo	17	17.8	5.7	29.8	25	12.9	7.4	18.4	8	9.1	2.5	15.6	0	0.0	0.0	0.0	4	8.1	2.9	22.3
L02 Cutaneous abscess, furuncle and carbuncle	190	323.4	269.0	377.9	326	271.9	239.2	304.5	145	213.6	176.1	251.1	70	214.5	159.9	269.0	134	228.3	186.0	270.7
L03 Cellulitis	198	408.5	340.5	476.5	383	406.6	360.5	452.8	183	312.8	262.9	362.7	87	300.4	233.4	367.4	247	336.2	289.9	382.6
L04 Acute lymphadenitis	15	13.6	6.1	21.1	21	10.8	6.0	15.6	8	10.6	2.8	18.4	3	7.2	2.0	25.4	5	7.7	0.2	15.3
L08 Other local infection of skin & subcutaneous tissue	5	7.7	2.6	23.2	9	8.4	2.1	14.8	9	11.3	3.3	19.4	1	3.9	0.5	27.4	6	6.1	1.1	11.0
M00-M03 Infectious arthropathies	9	21.2	4.9	37.5	20	18.0	8.9	27.1	13	18.3	7.5	29.1	6	13.9	1.9	25.9	11	10.7	4.2	17.2
M86 Osteomyelitis	18	29.1	11.1	47.1	28	21.5	12.2	30.7	19	22.9	11.5	34.3	10	24.1	8.0	40.2	18	23.0	11.5	34.5
Other acute and chronic diseases with partly infectious origins																				
H60 Otitis externa	12	17.8	5.5	30.1	14	9.8	4.2	15.3	7	7.3	1.7	13.0	0	0.0	0.0	0.0	8	17.9	4.9	30.9
H65-H66 Otitis media	56	46.6	32.4	60.7	62	28.2	21.1	35.2	25	32.3	19.0	45.6	4	10.1	3.6	28.5	10	20.6	6.9	34.3
K25-K28 Gastric, peptic, jejunal ulcer	22	80.2	45.9	114.5	50	80.8	57.4	104.2	27	55.1	33.3	77.0	13	53.3	23.0	83.5	69	75.5	56.5	94.6
C16 Malignant neoplasm of stomach	3	12.2	3.9	38.1	4	5.5	0.1	11.0	5	8.7	1.0	16.3	9	38.3	12.8	63.8	9	10.1	3.3	16.9
I00-I02 Acute rheumatic fever	8	14.2	2.5	25.9	30	15.4	9.7	21.1	12	9.8	4.2	15.4	12	19.5	8.4	30.6	11	11.4	4.3	18.4
N00 and N05 Acute & unspecified nephritis syndrome	10	11.4	3.9	18.9	33	17.1	10.7	23.4	14	15.3	6.5	24.1	5	8.9	1.1	16.7	4	6.6	2.2	19.6
G00-G09 Inflammatory diseases of CNS	7	6.8	1.1	12.4	14	9.1	3.7	14.6	6	7.9	0.0	15.8	7	21.1	3.7	38.5	7	10.6	2.0	19.1
G35-G37 Demyelinating diseases of CNS	25	52.8	32.1	73.4	34	31.6	20.6	42.6	4	8.3	0.1	16.5	2	6.7	1.7	27.0	2	2.4	0.6	9.8
G60-G64 Polyneuropathies	4	10.5	0.0	21.0	22	33.9	19.3	48.6	9	19.0	6.6	31.4	2	7.7	1.9	30.6	2	2.4	0.6	10.3
Cardiovascular diseases																				
I10-I15 Hypertensive diseases	16	49.0	23.9	74.0	21	31.1	17.1	45.2	20	39.2	21.2	57.1	6	20.5	4.0	37.0	33	39.3	25.0	53.7
I20 Angina pectoris	87	369.9	290.6	449.2	237	416.0	361.5	470.4	120	301.7	245.7	357.7	101	462.8	370.5	555.1	291	311.6	274.5	348.6
I21 Acute myocardial infarction	77	336.8	260.4	413.3	188	333.1	284.3	381.9	104	268.9	214.9	322.8	63	282.8	211.1	354.5	318	321.4	285.2	357.6
I22 – I25 Other forms of ischaemic heart disease	5	21.3	2.5	40.1	24	40.7	24.0	57.4	11	23.4	9.2	37.5	9	36.2	11.9	60.5	25	26.2	15.6	36.7

I48 Atrial fibrillation	44	189.8	132.6	247.1	114	185.0	150.0	220.0	65	152.8	114.3	191.4	35	151.2	99.8	202.7	147	151.4	125.5	177.2
I50 Heart failure	106	438.1	351.8	524.5	213	348.2	299.5	397.0	117	313.0	254.1	371.8	84	389.7	304.3	475.0	359	363.1	323.9	402.3
I60-I69 Cerebrovascular disease (incl. Stroke)	74	309.3	237.5	381.0	151	254.0	212.0	296.0	98	244.5	194.0	295.0	61	282.0	209.6	354.4	223	233.9	202.0	265.9
Mental and behavioural disorders																				
F00-F09 Organic mental disorders	13	43.3	17.7	68.8	29	40.9	24.6	57.1	11	26.3	9.7	43.0	8	39.4	11.4	67.4	30	29.6	18.7	40.5
F10-F19 Mental disorders due to psychoactive substance use	76	199.0	150.8	247.2	112	127.7	102.6	152.7	45	79.1	54.8	103.4	29	106.2	64.7	147.8	41	55.4	36.9	73.9
F20 Schizophrenia	111	262.4	210.3	314.4	146	162.0	135.2	188.8	48	86.7	61.3	112.1	23	104.7	60.5	148.9	71	129.6	97.2	162.1
F21-F29 Other delusional disorders	59	147.1	107.7	186.4	90	98.4	77.6	119.1	40	75.4	51.4	99.3	17	70.2	34.9	105.6	26	43.5	25.7	61.3
F30-F31 Manic episode or bipolar disorder	68	196.4	147.3	245.5	95	111.9	88.8	135.1	52	100.5	72.7	128.3	17	61.8	32.3	91.2	50	81.7	57.4	106.0
F32-F33 Depressive episode or disorder	59	157.0	114.9	199.1	58	66.2	48.5	84.0	34	58.9	38.8	78.9	13	48.0	20.8	75.2	24	35.8	20.0	51.6
F34-39 Other mood disorder	3	8.1	2.5	26.3	10	10.8	3.9	17.8	6	9.5	1.7	17.3	3	15.4	4.8	48.7	2	2.5	0.6	10.4
F40-F48 Neurotic, stress related disorders	63	163.8	120.3	207.3	82	95.9	74.3	117.5	33	59.9	38.8	80.9	17	76.5	39.2	113.8	41	53.2	35.7	70.7
F50-F59 Behavioural syndromes	4	9.1	3.3	24.9	2	2.3	0.6	9.3	3	4.7	1.5	14.7	0	0.0	0.0	0.0	0	0.0	0.0	0.0
F60-F69 Adult personality disorders	43	114.6	79.5	149.7	43	43.3	30.2	56.3	13	24.3	10.8	37.7	0	0.0	0.0	0.0	4	5.5	2.0	15.3
F70-F79 Mental retardation	1	1.9	0.3	13.8	2	1.6	0.3	7.5	1	0.9	0.1	6.3	0	0.0	0.0	0.0	1	0.9	0.1	6.3
F80-F89 Disorders of psychological development	1	1.0	0.1	6.8	4	2.9	1.0	8.1	0	0.0	0.0	0.0	2	3.7	0.9	14.6	1	0.9	0.1	6.3
F90-F98 Disorders of childhood or adolescence	0	0.0	0.0	0.0	10	5.7	2.1	9.4	3	5.2	1.3	20.9	0	0.0	0.0	0.0	0	0.0	0.0	0.0
F99 Unspecified mental disorders	2	4.1	1.0	16.2	3	3.1	1.0	9.6	2	4.5	1.1	18.2	0	0.0	0.0	0.0	0	0.0	0.0	0.0
Injuries and poisonings																				
S00-S09 Injuries to the head	283	498.2	428.2	568.3	490	409.1	367.9	450.3	250	349.9	301.6	398.1	101	277.5	216.1	339.0	229	338.8	290.1	387.4
S10-S19 Injuries to neck	29	58.8	35.1	82.4	51	53.6	37.4	69.8	33	47.0	29.4	64.7	14	38.9	16.5	61.2	30	48.0	29.1	67.0
S20-S29 Injuries to thorax	48	146.7	102.6	190.9	77	101.5	76.9	126.1	44	81.9	55.1	108.6	19	80.7	42.7	118.7	68	85.0	62.6	107.3
S30-S39 Injuries to abdomen, back, pelvis	67	119.5	86.7	152.3	97	100.7	77.3	124.1	56	98.6	70.3	127.0	21	74.1	40.5	107.6	69	95.0	69.7	120.3
S40-S49 Injuries to shoulder & upper arm	83	132.7	97.0	168.4	155	125.4	101.3	149.5	74	90.5	67.3	113.7	32	101.5	62.7	140.4	77	100.6	75.8	125.5
S50-S59 Injuries to elbow & forearm	141	219.7	174.7	264.7	268	175.1	151.0	199.1	158	170.0	140.0	200.1	84	201.9	152.9	250.9	141	179.2	147.1	211.3
S60-S69 Injuries to wrist &	220	353.5	299.8	407.1	386	305.6	271.8	339.4	219	314.5	269.0	360.0	97	271.0	211.2	330.7	195	301.1	254.7	347.6

hand	49	153.9	103.6	204.1	96	122.7	93.9	151.4	56	120.4	85.3	155.5	32	139.3	87.9	190.6	157	151.2	126.4	175.9
S70-S79 Injuries to hip & thigh																				
S80-S89 Injuries to knee and lower leg	97	227.1	174.9	279.4	233	223.6	190.9	256.3	142	200.8	164.1	237.5	81	244.5	184.0	305.0	188	231.0	194.5	267.6
S90-S99 Injuries to ankle and food	50	84.4	55.6	113.3	90	77.2	58.8	95.6	52	71.6	50.8	92.4	30	77.8	46.7	108.9	66	98.6	72.6	124.7
T08-T14 Injuries to unspecified body region	7	17.0	2.0	32.0	11	9.7	3.1	16.2	3	4.3	1.3	14.2	0	0.0	0.0	0.0	3	5.7	1.8	17.8
T15-T19 Effects of foreign body	14	19.3	7.0	31.7	33	31.0	18.4	43.6	21	28.5	14.7	42.3	10	34.0	11.1	57.0	18	23.3	11.7	35.0
T20-T32 Burns & corrosions	42	50.9	31.8	70.1	59	40.8	28.9	52.6	23	32.9	18.4	47.3	12	28.4	11.3	45.6	25	37.6	21.0	54.2
T36-T65 Poisonings & toxic effects	189	398.6	335.9	461.3	310	320.2	282.2	358.3	110	183.2	147.2	219.1	37	127.1	83.6	170.6	89	141.6	109.5	173.7
T66-T78 Other and unspecified effects of external causes	21	44.5	20.2	68.8	42	38.0	24.6	51.3	22	31.5	17.4	45.6	9	32.0	10.0	54.0	22	33.0	17.9	48.1
T79 Early complications of trauma	3	4.5	1.4	14.2	9	7.1	2.1	12.1	3	4.7	1.4	15.5	1	1.6	0.2	11.0	8	10.1	2.7	17.6
T80-T88 Complications of care	226	680.7	583.4	778.1	411	531.4	476.1	586.6	177	339.2	286.1	392.4	84	298.8	231.6	366.0	280	344.9	301.9	387.8
Specific common injuries (top 50%)																				
S01 Open wound of head	79	143.5	103.6	183.5	169	137.0	113.2	160.8	73	103.8	77.5	130.0	28	76.5	44.4	108.6	59	89.2	64.2	114.2
S06 Intracranial injury	74	130.0	95.1	164.9	108	91.2	71.6	110.7	71	93.9	69.7	118.1	23	58.2	31.0	85.4	66	94.1	68.8	119.3
S42 Fracture of shoulder and upper arm	58	77.8	51.5	104.1	108	75.5	57.6	93.5	50	49.2	34.5	63.9	25	78.4	44.2	112.5	51	69.3	48.4	90.3
S52 Fracture of forearm	100	131.5	99.9	163.1	202	122.7	103.4	142.0	119	118.0	94.2	141.8	62	151.9	108.9	194.9	91	110.9	86.3	135.5
S61 Open wound of wrist and hand	67	96.6	68.8	124.3	121	86.5	69.1	103.9	63	88.1	64.3	111.9	27	85.4	50.2	120.6	42	65.9	44.1	87.7
S62 Fracture of wrist and hand level	57	99.5	70.7	128.4	107	85.8	68.1	103.6	63	93.2	67.9	118.5	36	91.3	57.4	125.3	67	98.2	72.6	123.8
S72 Fracture of femur	29	91.1	51.7	130.6	63	82.4	58.4	106.5	36	81.0	51.7	110.3	19	81.4	42.3	120.4	111	101.8	82.3	121.2
S82 Superficial injury of lower leg	54	110.6	76.1	145.1	140	132.4	107.4	157.5	88	129.6	99.3	160.0	53	163.8	113.6	214.0	115	144.9	115.4	174.5
T81 Complications of procedures, NEC	82	224.0	169.4	278.7	170	221.0	185.0	257.0	78	140.2	107.1	173.4	36	128.1	84.0	172.3	119	153.8	124.1	183.5
External causes																				
W00- W19 Falls	465	966.3	856.0	1076.	869	865.2	796.1	934.2	488	744.6	667.8	821.4	243	797.2	685.5	909.0	711	812.0	746.8	877.2
W20- W49 Exposure to inanimate mechanical forces	296	474.7	409.6	539.8	544	440.4	398.5	482.3	295	405.7	355.0	456.4	134	366.4	297.1	435.7	296	435.1	380.8	489.3
W50- W64 Exposure to animate mechanism forces	77	115.2	83.3	147.1	157	108.3	89.5	127.2	99	125.3	98.2	152.4	45	109.2	73.9	144.5	79	116.0	87.8	144.2
W65-74 Drowning &	2	1.4	0.3	5.4	5	2.7	0.3	5.1	2	2.2	0.5	8.9	1	1.6	0.2	11.0	0	0.0	0.0	0.0

Table 12.28: Age-standardised hospitalisation rates in Sub-groups of housing applicants (A+B, C+D) compared with Tenants and other NZ population, May 2003 to June 2005

Disease category	A+B Housing applicants			C+D Housing applicants			Housing applicants total			Housing tenants			Other NZ		
	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI	No ¹	Rate ²	95 CI
A00-B99 Infectious & parasitic	301	928.6	791.7	1065.6	209	608.6	515	761.2	680.5	2777	731.0	701.8	36327	476.1	471.2
C00-D48 Neoplasms	62	498.1	357.6	638.6	54	306.2	116	387.2	309.2	1349	522.1	493.7	34963	447.3	442.6
D50-D89 Blood & immune system	55	319.0	209.5	428.5	35	207.4	90	255.8	193.1	564	197.9	180.9	11062	142.3	139.7
E00-E90 Endocrine, nutritional & metabolic	98	800.1	619.8	980.3	56	322.7	154	521.1	429.0	1375	532.5	503.8	16503	154.0	151.6
F00-F99 Mental & behavioural	288	1727.3	1515.6	1939.1	193	934.6	482	1507.3	1367.3	1888	704.9	672.7	24036	309.1	305.2
G00-G99 Nervous system	96	673.9	511.0	836.8	73	358.7	170	484.3	401.5	1268	438.0	412.9	20683	266.1	262.5
H00-H59 Eye & adnexa	20	116.8	52.9	180.7	14	53.3	34	78.4	45.7	288	98.9	86.9	4532	58.3	56.6
H60-H95 Ear & mastoid	32	135.5	71.6	199.5	38	161.3	70	150.3	104.9	345	99.2	88.0	4691	61.1	59.3
I00-I99 Circulatory system	205	2033.4	1719.9	2347.0	262	1906.4	468	1950.0	1754.8	4916	2033.0	1975.7	99475	1268.5	1260.
J00-J99 Respiratory	915	3642.4	3297.1	3987.6	617	2329.8	1543	2931.2	2735.9	9155	2841.5	2779.6	96187	1249.9	1242.
K00-K93 Digestive	286	1865.0	1608.3	2121.7	252	1416.0	539	1610.0	1453.8	4161	1506.7	1459.3	75525	971.8	964.9
L00-L99 Skin & subcutaneous	181	806.6	650.0	963.1	160	619.9	341	698.0	607.1	2686	840.9	807.3	28604	370.1	365.9
M00-M99 Musculoskeletal & connective	118	732.6	571.0	894.1	107	611.4	226	669.4	569.9	1993	711.6	679.2	31227	401.4	396.9
N00-N99 Genitourinary	211	1149.8	969.8	1329.7	161	815.5	373	962.1	849.9	2588	903.6	867.5	38385	494.4	489.5
Q00-Q99 Congenital	31	55.8	35.8	75.9	19	41.3	50	130.7	92.9	233	53.0	45.8	6254	83.2	81.1
R00-R99 Symptoms & signs	491	3091.7	2751.7	3431.7	474	2354.0	960	2628.0	2430.7	6075	2176.3	2119.7	10305	1326.8	1318.
S00-T98 Injury, poisonings	664	3441.6	3120.3	3762.8	529	2161.8	1194	2688.8	2512.5	8085	2502.3	2444.4	14211	1838.8	1829.
V01-Y98 External causes	969	5494.1	5071.8	5916.3	724	3193.1	1693	4146.1	3916.7	12184	4038.9	3963.5	20741	2675.7	2664.
Z00-Z13 Factors influencing health status	28	95.9	43.0	148.8	17	65.1	45	80.5	50.4	227	61.4	52.8	4218	55.3	53.6
Total	5051	27608.	26644.	28572.0	3994	18467.2	9063	22334.	21782.	62157	20993.8	20820.	98525	12708.	12683
		1	1	0	4	4	7	4	7	0	20993.8	8	3	6	.7

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

Table 12.29: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in *cohort* population (applicants & tenants) compared with Other New Zealand population, according to major disease categories, based on principal diagnosis and standard filter¹ and excluding all day cases, May 2003 to June 2005

Disease category	Cohort population			Other NZ Population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	2073	492.3	469.3	515.3	24940	326.0	1.51	1.44
C00-D48 Neoplasms	1191	422.5	398.0	447.0	26163	334.4	1.26	1.19
D50-D89 Blood & immune system	421	138.2	124.4	151.9	6738	86.5	1.60	1.44
E00-E90 Endocrine, nutritional & metabolic	1299	454.6	429.4	479.9	13219	138.2	3.29	3.10
F00-F99 Mental & behavioural	2037	674.1	644.5	703.8	19850	255.1	2.64	2.52
G00-G99 Nervous system	973	301.4	281.6	321.2	13799	177.4	1.70	1.59
H00-H59 Eye & adnexa	161	45.7	38.1	53.2	2343	30.2	1.51	1.28
H60-H95 Ear & mastoid	248	67.7	58.7	76.8	2914	37.7	1.79	1.56
I00-I99 Circulatory system	4831	1829.6	1777.5	1881.8	88194	1124.4	1.63	1.58
J00-J99 Respiratory	8354	2356.5	2302.3	2410.8	78013	1010.9	2.33	2.28
K00-K93 Digestive	3609	1210.0	1169.3	1250.7	60954	782.7	1.55	1.49
L00-L99 Skin & subcutaneous	2666	728.5	699.0	757.9	24609	318.3	2.29	2.19
M00-M99 Musculoskeletal & connective	1488	470.6	445.6	495.6	19981	256.8	1.83	1.73
N00-N99 Genitourinary	2209	684.7	655.0	714.3	27745	357.1	1.92	1.83
Q00-Q99 Congenital	174	33.3	28.1	38.6	4388	58.4	0.57	0.49
R00-R99 Symptoms & signs	4636	1522.6	1477.2	1568.0	70628	908.0	1.68	1.63
S00-T98 Injury, poisonings	6098	1687.2	1642.0	1732.4	98670	1275.1	1.32	1.29
V01-Y98 External causes	10143	3060.3	2997.5	3123.2	156312	2013.2	1.52	1.49
Z00-Z13 Factors influencing health status	89	23.4	18.2	28.6	1605	21.1	1.11	0.89
Total	52700	16203.4	16057.9	16348.9	741065	9543.2	1.70	1.68
						9521.4		1.71

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year

Table 12.30: Sensitivity analysis, Hospitalisation numbers and age-standardised rates in *housing applicants* compared with *housing tenants*, according to major disease categories, based on principal diagnosis and standard filter¹ and excluding all day cases, May 2003 to June 2005

Disease category	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	298	465.7	398.6	532.8	1775	467.3	0.95	0.81
C00-D48 Neoplasms	92	352.5	273.5	431.4	1099	405.1	0.82	0.65
D50-D89 Blood & immune system	33	160.0	96.4	223.5	388	126.1	1.14	0.75
E00-E90 Endocrine, nutritional & metabolic	131	445.9	360.5	531.2	1168	428.0	0.98	0.80
F00-F99 Mental & behavioural	426	1325.6	1195.4	1455.8	1611	576.4	2.19	1.96
G00-G99 Nervous system	100	295.5	227.8	363.2	873	282.4	0.97	0.77
H00-H59 Eye & adnexa	13	34.5	12.4	56.6	148	39.7	0.72	0.37
H60-H95 Ear & mastoid	37	96.9	58.3	135.5	211	55.4	1.50	0.98
I00-I99 Circulatory system	421	1769.8	1583.3	1956.3	4410	1774.9	0.97	0.87
J00-J99 Respiratory	1116	2281.3	2101.6	2461.0	7238	2295.9	0.97	0.89
K00-K93 Digestive	394	1267.6	1125.4	1409.9	3215	1161.8	1.05	0.94
L00-L99 Skin & subcutaneous	297	609.3	524.7	693.9	2369	712.6	0.82	0.71
M00-M99 Musculoskeletal & connective	143	422.2	341.6	502.7	1345	448.9	0.89	0.73
N00-N99 Genitourinary	273	718.6	620.2	817.0	1936	648.1	1.06	0.92
Q00-Q99 Congenital	32	84.0	53.7	114.4	142	27.3	2.55	1.71
R00-R99 Symptoms & signs	596	1734.6	1570.9	1898.2	4040	1446.7	1.16	1.05
S00-T98 Injury, poisonings	746	1740.7	1593.9	1887.5	5352	1626.6	1.04	0.95
V01-Y98 External causes	1162	3003.7	2801.6	3205.8	8981	2982.5	0.99	0.92
Z00-Z13 Factors influencing health status	26	74.1	38.0	110.2	63	14.1	3.88	2.23
Total	6336	16542.3	16053.5	17031.1	46364	15942.6	1.03	1.00
						16248.5		1.06

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year

Table 12.31: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in *cohort* population (applicants & tenants) compared with Other New Zealand population, a according to selected diseases of interest, based on principal diagnosis and standard filter¹ and excluding all day cases, May 2003 to June 2005

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	614	131.2	119.9 142.4	7870	103.4	101.1 105.7	1.27	1.16 1.39
A15-19 Tuberculosis	42	12.4	8.4 16.3	342	4.4	3.9 4.9	2.82	2.01 3.95
A37 Pertussis	16	2.6	1.3 3.9	264	3.5	3.1 3.9	0.75	0.45 1.25
A39 Meningococcal	91	16.0	12.6 19.5	628	8.3	7.6 8.9	1.93	1.54 2.43
A40 Streptococcal septicaemia	41	13.7	9.4 18.1	446	5.7	5.2 6.3	2.39	1.72 3.32
A41 Other septicaemia	243	87.0	75.8 98.1	3090	39.5	38.1 40.9	2.20	1.93 2.51
A49 Bacterial infection of unspecified site	37	9.2	6.0 12.4	390	5.1	4.6 5.6	1.80	1.25 2.58
A87 Viral meningitis	81	17.1	13.1 21.0	786	10.3	9.6 11.0	1.66	1.30 2.12
B01 Varicella (chickenpox)	45	7.9	5.5 10.3	392	5.2	4.7 5.7	1.52	1.10 2.09
B02 Zoster (herpes zoster)	32	11.8	7.6 15.9	460	5.9	5.3 6.4	2.00	1.39 2.88
B03-B09 Other viral infection of skin & membranes	17	3.1	1.6 4.7	203	2.7	2.3 3.1	1.16	0.69 1.95
B15 Acute hepatitis A	3	0.8	0.2 2.6	18	0.2	0.1 0.3	3.26	0.86 12.40
B16 Acute hepatitis B	4	1.4	0.0 2.7	49	0.6	0.5 0.8	2.16	0.78 6.00
B17-B19 Other viral hepatitis	13	4.3	1.9 6.7	145	1.9	1.6 2.2	2.31	1.30 4.10
B26 Mumps	0	0.0	0.0 0.0	9	0.1	0.0 0.2	.	.
B34 Viral infection of unspecified site	622	131.1	120.0 142.2	7605	100.0	97.8 102.3	1.31	1.20 1.43
Respiratory infections and asthma								
J02 Acute pharyngitis	59	14.0	10.1 17.9	714	9.4	8.7 10.1	1.49	1.12 1.99
J03 Acute tonsillitis	134	31.6	25.9 37.3	1914	25.1	24.0 26.3	1.26	1.04 1.51
J04 Acute laryngitis and tracheitis	10	2.7	0.9 4.5	105	1.4	1.1 1.6	2.00	1.01 3.96
J05 Acute laryngitis [croup] and epiglottitis	85	14.1	11.1 17.2	1130	15.1	14.2 15.9	0.94	0.75 1.17
J06 Acute laryngopharyngitis	445	89.9	80.9 98.9	4504	59.5	57.8 61.3	1.51	1.36 1.68
J10-J11 Influenza	65	14.8	10.9 18.7	711	9.3	8.6 10.0	1.60	1.22 2.10
J12 and J14-J18 Pneumonia	1877	517.4	492.1 542.7	18713	241.5	238.0 245.0	2.14	2.04 2.25
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	74	24.4	18.6 30.1	700	9.0	8.3 9.6	2.72	2.12 3.48
J20 Acute bronchitis	60	18.4	13.5 23.3	827	10.7	9.9 11.4	1.73	1.31 2.27
J21 Acute bronchiolitis	872	144.4	134.8 154.0	6317	84.3	82.2 86.3	1.71	1.60 1.84
J22 Unspecified acute lower respiratory infection	613	188.3	172.6 204.1	5897	75.9	74.0 77.8	2.48	2.27 2.71
J40-J42 Bronchitis unspecified and chronic	102	36.6	29.3 43.8	846	10.8	10.1 11.5	3.38	2.74 4.16
J44 Other chronic obstructive pulmonary disease	1739	679.9	647.8 712.0	16357	208.3	205.1 211.5	3.26	3.11 3.43
J45-J46 Asthma	1450	339.8	321.0 358.6	10806	141.8	139.1 144.5	2.40	2.26 2.54

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	51	8.8	6.3 11.3	190	2.5	2.2 2.9	3.50	2.54 4.82
L02 Cutaneous abscess, furuncle and carbuncle	868	223.8	208.0 239.6	5941	77.2	75.2 79.2	2.90	2.69 3.13
L03 Cellulitis	1150	342.4	321.5 363.3	12438	160.2	157.3 163.0	2.14	2.01 2.28
L04 Acute lymphadenitis	53	9.6	6.9 12.4	307	4.1	3.6 4.5	2.38	1.75 3.22
L08 Other local infection of skin & subcutaneous tissue	30	6.9	4.2 9.5	316	4.1	3.7 4.6	1.67	1.11 2.49
M00-M03 Infectious arthropathies	62	16.1	11.8 20.5	935	12.0	11.3 12.8	1.34	1.02 1.76
M86 Osteomyelitis	99	21.6	16.9 26.2	801	10.5	9.8 11.2	2.06	1.64 2.58
Other acute and chronic diseases with partly infectious origins								
H60 Otitis externa	40	8.9	5.9 11.9	341	4.4	4.0 4.9	2.01	1.42 2.85
H65-H66 Otitis media	90	16.9	13.2 20.6	801	10.6	9.9 11.4	1.59	1.26 2.00
K25-K28 Gastric, peptic, jejunal ulcer	189	70.8	60.6 80.9	2367	30.2	29.0 31.4	2.34	2.02 2.72
C16 Malignant neoplasm of stomach	33	12.0	7.9 16.1	595	7.6	7.0 8.2	1.58	1.11 2.25
I00-I02 Acute rheumatic fever	78	13.5	10.4 16.6	219	2.9	2.5 3.3	4.64	3.56 6.04
N00 and N05 Acute & unspecified nephritis syndrome	62	10.8	7.9 13.6	255	3.4	2.9 3.8	3.20	2.40 4.28
G00-G09 Inflammatory diseases of CNS	42	9.3	6.2 12.3	605	7.9	7.3 8.5	1.18	0.84 1.65
G35-G37 Demyelinating diseases of CNS	18	6.1	3.2 8.9	392	5.0	4.5 5.5	1.21	0.75 1.95
G60-G64 Polynuropathies	16	5.4	2.7 8.1	283	3.6	3.2 4.1	1.49	0.89 2.49
Cardiovascular diseases								
I10-I15 Hypertensive diseases	89	32.4	25.7 39.2	1198	15.3	14.4 16.2	2.12	1.71 2.63
I20 Angina pectoris	820	318.9	297.0 340.8	14233	181.3	178.4 184.3	1.76	1.64 1.89
I21 Acute myocardial infarction	777	305.3	283.7 326.8	18327	233.5	230.1 236.8	1.31	1.22 1.41
I22 – I25 Other forms of ischaemic heart disease	61	23.2	17.4 29.1	1287	16.4	15.5 17.3	1.42	1.10 1.83
I48 Atrial fibrillation	405	156.8	141.5 172.1	9154	116.7	114.3 119.0	1.34	1.22 1.49
I50 Heart failure	899	348.3	325.4 371.3	11939	152.0	149.3 154.7	2.29	2.14 2.45
I60-I69 Cerebrovascular disease (incl. Stroke)	605	233.9	215.2 252.7	12286	156.5	153.7 159.3	1.49	1.38 1.62
Mental and behavioural disorders								
F00-F09 Organic mental disorders	75	28.6	22.0 35.1	1532	19.6	18.6 20.5	1.46	1.16 1.85
F10-F19 Mental disorders due to psychoactive substance use	267	87.6	76.9 98.3	2895	37.2	35.9 38.6	2.35	2.07 2.67
F20 Schizophrenia	484	157.9	143.7 172.2	3463	44.5	43.0 45.9	3.55	3.23 3.91
F21-F29 Other delusional disorders	285	93.2	82.2 104.1	2265	29.1	27.9 30.3	3.20	2.83 3.63
F30-F31 Manic episode or bipolar disorder	335	114.3	102.0 126.7	2586	33.2	31.9 34.4	3.45	3.08 3.87
F32-F33 Depressive episode or disorder	187	61.4	52.5 70.4	2809	36.1	34.8 37.5	1.70	1.46 1.98
F34-39 Other mood disorder	24	7.6	4.5 10.7	293	3.8	3.4 4.2	2.01	1.32 3.07
F40-F48 Neurotic, stress related disorders	229	75.5	65.6 85.5	2566	33.0	31.7 34.3	2.29	2.00 2.63
F50-F59 Behavioural syndromes	11	3.6	1.5 5.7	370	4.8	4.3 5.3	0.75	0.41 1.37
F60-F69 Adult personality disorders	111	36.8	29.9 43.6	727	9.4	8.7 10.0	3.93	3.22 4.80
F70-F79 Mental retardation	4	1.4	0.0 2.7	76	1.0	0.8 1.2	1.40	0.51 3.83

Disease	Cohort population			Other NZ population			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
F80-F89 Disorders of psychological development	5	1.5	0.2	2.8	54	0.5	2.06	0.81
F90-F98 Disorders of childhood or adolescence	14	2.7	1.2	4.3	118	1.3	1.75	0.97
F99 Unspecified mental disorders	6	2.0	0.4	3.7	96	1.0	1.65	0.72
Injuries and poisonings								
S00-S09 Injuries to the head	798	200.3	185.4	215.2	11562	147.5	1.33	1.23
S10-S19 Injuries to neck	83	23.5	18.1	28.8	1534	18.8	1.18	0.94
S20-S29 Injuries to thorax	177	60.0	50.9	69.0	3325	41.2	1.41	1.20
S30-S39 Injuries to abdomen, back, pelvis	237	68.0	58.8	77.2	5018	62.9	1.05	0.92
S40-S49 Injuries to shoulder & upper arm	313	72.9	64.0	81.8	4888	61.8	1.15	1.01
S50-S59 Injuries to elbow & forearm	613	129.3	118.2	140.5	9830	126.2	1.00	0.92
S60-S69 Injuries to wrist & hand	770	188.7	174.5	203.0	11543	146.7	1.26	1.17
S70-S79 Injuries to hip & thigh	363	124.6	111.2	138.0	10699	134.1	0.91	0.82
S80-S89 Injuries to knee and lower leg	603	168.8	154.5	183.2	11700	148.2	1.12	1.03
S90-S99 Injuries to ankle and foot	196	46.6	39.6	53.7	3059	38.3	1.18	1.01
T08-T14 Injuries to unspecified body region	19	5.6	2.9	8.2	331	3.8	1.31	0.81
T15-T19 Effects of foreign body	42	12.1	8.2	16.1	991	12.8	0.95	0.68
T20-T32 Burns & corrosions	161	37.5	31.2	43.7	1579	19.6	1.82	1.53
T36-T65 Poisonings & toxic effects	552	163.3	149.2	177.4	6691	84.5	1.89	1.72
T66-T78 Other and unspecified effects of external causes	76	20.7	15.7	25.7	1122	13.7	1.42	1.11
T79 Early complications of trauma	25	6.4	3.7	9.0	383	4.4	1.29	0.84
T80-T88 Complications of care	1065	357.1	335.1	379.2	14304	183.4	1.95	1.83
Specific common injuries (top 50%)								
S01 Open wound of head	213	52.2	44.7	59.8	2675	33.4	1.50	1.29
S06 Intracranial injury	196	50.4	42.8	58.0	3331	41.8	1.16	1.00
S42 Fracture of shoulder and upper arm	248	53.6	46.2	60.9	3792	47.9	1.08	0.94
S52 Fracture of forearm	470	93.5	84.3	102.7	8154	104.8	0.87	0.79
S61 Open wound of wrist and hand	215	48.6	41.6	55.6	2603	32.5	1.44	1.24
S62 Fracture of wrist and hand level	199	50.2	42.8	57.6	3489	43.7	1.11	0.95
S72 Fracture of femur	263	90.8	79.3	102.3	8234	102.9	0.86	0.76
S82 Superficial injury of lower leg	397	109.8	98.3	121.3	7621	96.3	1.12	1.00
T81 Complications of procedures, NEC	479	158.8	144.2	173.5	7718	96.9	1.60	1.46
External causes								
W00-W19 Falls	2198	624.1	595.9	652.3	41073	524.5	1.18	1.13
W20-W49 Exposure to inanimate mechanical forces	1143	281.3	263.8	298.8	17386	221.7	1.25	1.17
W50-W64 Exposure to animate mechanism forces	380	87.9	78.4	97.4	4937	62.4	1.37	1.22
W65-74 Drowning & submersion	11	1.8	0.7	2.9	122	1.3	1.13	0.61
W75-84 Other accidental threats to breathing	40	11.8	7.9	15.7	876	10.5	1.05	0.75
W85-99 Exposure to electricity & extreme temperature	6	1.6	0.2	3.1	140	1.5	0.91	0.37

Disease	Cohort population			Other NZ population			Comparison			
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI		
X00-09 Exposure to smoke, fire, & flames X10-19 Contact with heat & hot substances X20-X29 Contact with venomous animals and plants X30-X39 Exposure to forces of nature X40-49 Accidental poisoning X50-57 Overexertion, travel and privation X58-59 Accidental exposure to other and unspecified factors X60-X84 Intentional self-harm X85-Y09 Assault Y10-Y34 Event of undetermined intent	25	6.5	3.7	9.2	416	5.4	1.20	0.78	1.85	
	124	28.6	23.2	34.0	1015	13.3	2.15	1.76	2.63	
	16	3.2	1.5	4.9	381	4.9	0.65	0.38	1.11	
	25	8.5	5.0	12.0	248	3.2	2.68	1.75	4.12	
	210	57.8	49.5	66.1	2324	30.2	1.92	1.65	2.22	
	171	53.7	45.4	62.1	3755	48.2	1.11	0.95	1.31	
	223	64.4	55.5	73.3	3071	39.6	1.63	1.41	1.88	
	516	161.0	146.8	175.2	5998	77.4	2.08	1.90	2.28	
	423	122.5	110.4	134.6	3524	45.6	2.69	2.42	2.98	
	52	15.5	11.1	19.9	397	5.1	3.02	2.24	4.08	
	Specific external causes W22 Striking against other objects W23 Caught, crushed, jammed or pinched W25 Contact with sharp glass W50 Hit by another person W54 Bitten or struck by dog W85-W87 Exposure to electric current X31 Exposure to excessive natural cold X50 Overexertion and strenuous or repetitive movements Y04 Assault by bodily force	153	39.9	33.1	46.7	2396	31.0	1.29	1.08	1.53
		212	40.9	35.0	46.7	1980	25.9	1.58	1.36	1.83
256		58.1	50.5	65.7	1967	25.6	2.27	1.97	2.60	
67		15.2	11.3	19.2	1134	14.8	1.03	0.79	1.34	
80		19.5	14.9	24.1	679	8.8	2.21	1.73	2.83	
4		0.8	0.3	2.3	90	1.2	0.68	0.23	1.99	
16		5.7	2.8	8.6	189	2.4	2.35	1.38	3.98	
169		53.0	44.7	61.3	3688	47.3	1.12	0.95	1.31	
205		59.3	50.9	67.8	1848	23.9	2.48	2.14	2.88	
Other specific external causes (including top 50%) V01-V09 Pedestrian injuries V10-V99 Other transport injuries V03 Pedestrian injured collision with car, truck or van V43 Car occupant injured in collision with car, pick-up truck or van Y40 Systemic antibiotics Y45 Analgesic agent Y52 Cardiovascular agent Y83 Surgical operation Y84 Other medical procedure		156	36.7	30.4	43.0	1159	15.1	2.43	2.03	2.92
		562	147.6	134.6	160.6	13890	180.1	0.82	0.75	0.90
		130	30.5	24.8	36.2	839	10.9	2.79	2.29	3.41
	137	41.7	34.4	48.9	2377	30.7	1.36	1.14	1.62	
	196	62.1	53.0	71.3	2603	33.4	1.86	1.60	2.16	
	217	79.4	68.7	90.1	3345	42.7	1.86	1.62	2.14	
	216	85.4	73.9	96.8	3420	43.5	1.96	1.71	2.25	
	1280	430.7	406.4	454.9	20037	256.8	1.68	1.58	1.78	
	765	266.8	247.6	286.1	8972	114.8	2.32	2.16	2.50	
	Total	37218	10838.9	10721.9	10955.9	509785	6577.6	1.65	1.63	1.67

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured as cases per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

Table 12.32: Sensitivity analysis: Hospitalisation numbers and age-standardised rates in housing applicants compared with housing tenants, according to selected diseases of interest, based on principal diagnosis and standard filter¹ and excluding all day cases, May 2003 to June 2005

Disease	Housing applicants			Housing tenants			Comparison				
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI			
Infectious diseases											
A00-A09 Intestinal infectious diseases	111	141.1	106.6	175.5	125.6	113.9	137.4	1.12	0.86	1.46	
A15-19 Tuberculosis	1	2.1	0.3	15.1	41	13.2	17.5	0.16	0.02	1.18	
A37 Pertussis	3	2.7	0.9	8.3	13	2.6	3.9	1.04	0.30	3.66	
A39 Meningococcal	9	10.2	2.4	18.0	82	16.4	20.1	0.62	0.28	1.38	
A40 Streptococcal septicaemia	4	14.2	4.3	47.0	37	13.7	18.2	1.04	0.30	3.60	
A41 Other septicaemia	14	50.8	21.0	80.6	229	89.3	77.5	101.0	0.57	0.31	1.04
A49 Bacterial infection of unspecified site	8	12.3	2.2	22.4	29	8.5	5.2	11.8	1.44	0.58	3.58
A87 Viral meningitis	7	9.4	1.9	17.0	74	17.5	13.2	21.8	0.54	0.23	1.24
B01 Varicella (chickenpox)	8	12.6	2.1	23.1	37	7.2	4.8	9.5	1.76	0.72	4.31
B02 Zoster (herpes zoster)	2	7.5	1.9	30.1	30	11.9	7.6	16.3	0.63	0.15	2.64
B03-B09 Other viral infection of skin & membranes	2	1.8	0.4	7.1	15	3.3	1.5	5.0	0.54	0.12	2.39
B15 Acute hepatitis A	1	0.9	0.1	6.3	2	0.6	0.1	2.8	1.42	0.12	16.83
B16 Acute hepatitis B	0	0.0	0.0	0.0	4	1.5	0.0	3.0			
B17-B19 Other viral hepatitis	4	11.3	4.0	31.9	9	3.4	1.2	5.6	3.33	0.98	11.34
B26 Mumps	0	0.0	0.0	0.0	0	0.0	0.0	0.0			
B34 Viral infection of unspecified site	95	134.1	101.5	166.6	527	127.2	115.6	138.9	1.05	0.81	1.37
Respiratory infections and asthma											
J02 Acute pharyngitis	12	19.0	7.3	30.6	47	12.7	8.8	16.6	1.50	0.75	2.98
J03 Acute tonsillitis	17	28.1	13.3	42.9	117	31.4	25.3	37.5	0.89	0.51	1.57
J04 Acute laryngitis and tracheitis	2	2.5	0.6	10.5	8	2.7	0.7	4.6	0.93	0.19	4.65
J05 Acute laryngitis [croup] and epiglottitis	15	14.0	6.8	21.2	70	13.8	10.5	17.0	1.02	0.58	1.79
J06 Acute laryngopharyngitis	69	74.3	54.2	94.5	376	89.2	79.6	98.8	0.83	0.62	1.12
J10-J11 Influenza	9	16.5	4.7	28.4	56	14.3	10.2	14.3	1.16	0.54	2.51
J12 and J14-J18 Pneumonia	240	445.3	367.3	523.3	1637	512.4	486.0	538.8	0.87	0.72	1.04
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	8	21.1	5.4	36.8	66	24.0	18.0	30.0	0.88	0.40	1.93
J20 Acute bronchitis	13	40.6	13.5	67.7	47	16.0	11.2	20.8	2.53	1.22	5.26
J21 Acute bronchiolitis	208	184.5	159.4	209.6	664	131.6	121.6	141.6	1.40	1.20	1.64
J22 Unspecified acute lower respiratory infection	60	158.5	106.3	210.7	553	190.0	173.4	206.5	0.83	0.59	1.17
J40-J42 Bronchitis unspecified and chronic	6	32.4	4.1	60.8	96	37.3	29.7	44.9	0.87	0.35	2.13
J44 Other chronic obstructive pulmonary disease	149	650.8	535.7	766.0	1590	670.6	637.6	703.7	0.97	0.81	1.17
J45-J46 Asthma	222	360.8	301.9	419.7	1228	331.1	311.3	350.9	1.09	0.92	1.30

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	6	5.9	1.1	45	9.0	6.2	0.66	0.28
L02 Cutaneous abscess, furuncle and carbuncle	84	141.3	106.1	784	230.7	213.6	0.61	0.47
L03 Cellulitis	134	310.7	247.2	1016	338.6	316.8	0.92	0.74
L04 Acute lymphadenitis	5	6.9	2.5	48	9.9	7.0	0.70	0.24
L08 Other focal infection of skin & subcutaneous tissue	7	8.7	1.1	23	6.2	3.4	1.41	0.53
M00-M03 Infectious arthropathies	5	11.2	4.1	57	16.2	11.7	0.69	0.24
M86 Osteomyelitis	10	15.4	4.3	89	21.9	16.9	0.70	0.33
Other acute and chronic diseases with partly infectious origins								
H60 Otitis externa	4	6.4	2.3	36	8.9	5.8	0.72	0.24
H65-H66 Otitis media	13	17.0	5.8	77	16.6	12.8	1.02	0.51
K25-K28 Gastric, peptic, jejunal ulcer	19	74.6	36.8	170	69.2	58.7	1.08	0.64
C16 Malignant neoplasm of stomach	5	15.2	1.5	28	11.2	7.0	1.36	0.51
I00-I02 Acute rheumatic fever	8	12.6	3.7	70	13.2	10.0	0.95	0.45
N00 and N05 Acute & unspecified nephritis syndrome	4	6.3	1.9	58	11.1	8.1	0.57	0.17
G00-G09 Inflammatory diseases of CNS	8	13.6	3.3	34	8.3	5.3	1.63	0.70
G35-G37 Demyelinating diseases of CNS	2	5.2	1.3	16	6.0	3.0	0.87	0.20
G60-G64 Polyneuropathies	2	15.4	3.9	14	5.0	2.3	3.08	0.70
Cardiovascular diseases								
I10-I15 Hypertensive diseases	9	31.5	8.9	80	31.9	24.9	0.99	0.47
I20 Angina pectoris	76	351.1	265.3	744	312.1	289.6	1.13	0.87
I21 Acute myocardial infarction	54	262.5	186.5	723	304.9	282.7	0.86	0.64
I22 – I25 Other forms of ischaemic heart disease	7	34.5	7.3	54	22.2	16.3	1.55	0.68
I48 Atrial fibrillation	43	189.9	128.7	362	151.5	135.9	1.25	0.89
I50 Heart failure	78	328.0	248.6	821	342.9	319.3	0.96	0.74
I60-I69 Cerebrovascular disease (incl. Stroke)	38	173.8	112.6	567	236.6	217.1	0.73	0.51
Mental and behavioural disorders								
F00-F09 Organic mental disorders	2	5.3	1.3	73	30.0	23.1	0.18	0.04
F10-F19 Mental disorders due to psychoactive substance use	53	136.2	98.6	214	78.1	67.4	1.74	1.28
F20 Schizophrenia	108	265.3	214.1	376	137.2	123.1	1.93	1.55
F21-F29 Other delusional disorders	61	160.8	118.9	224	82.2	71.3	1.96	1.46
F30-F31 Manic episode or bipolar disorder	76	214.5	164.9	259	98.8	86.7	2.17	1.67
F32-F33 Depressive episode or disorder	37	105.0	69.8	150	55.2	46.3	1.90	1.31
F34-39 Other mood disorder	3	7.5	2.4	21	7.4	4.2	1.01	0.30
F40-F48 Neurotic, stress related disorders	48	130.1	90.8	181	66.5	56.6	1.96	1.40
F50-F59 Behavioural syndromes	2	4.5	1.1	9	3.4	1.2	1.33	0.29
F60-F69 Adult personality disorders	31	74.4	47.8	80	30.0	23.4	2.48	1.63

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No.	Rate ²	95 CI	Hosp. No.	Rate ²	95 CI	RR	95 CI
F70-F79 Mental retardation	2	4.3	1.1	17.1	2	0.8	5.56	0.78
F80-F89 Disorders of psychological development	2	6.2	1.5	24.7	3	0.9	6.80	1.10
F90-F98 Disorders of childhood or adolescence	1	1.6	0.2	11.3	13	2.8	0.57	0.07
F99 Unspecified mental disorders	0	0.0	0.0	0.0	6	2.3		4.40
Injuries and poisonings								
S00-S09 Injuries to the head	98	186.6	142.6	230.6	700	197.5	0.94	0.74
S10-S19 Injuries to neck	10	20.7	7.8	33.7	73	22.7	0.91	0.47
S20-S29 Injuries to thorax	21	67.8	35.0	100.5	156	58.2	1.17	0.70
S30-S39 Injuries to abdomen, back, pelvis	32	82.5	47.1	117.9	205	65.1	1.27	0.81
S40-S49 Injuries to shoulder & upper arm	29	48.0	28.6	67.4	284	73.9	0.65	0.43
S50-S59 Injuries to elbow & forearm	68	108.1	79.1	137.0	545	127.8	0.85	0.64
S60-S69 Injuries to wrist & hand	82	158.5	121.2	195.8	688	188.2	0.84	0.66
S70-S79 Injuries to hip & thigh	30	96.3	53.5	139.2	333	123.6	0.78	0.49
S80-S89 Injuries to knee and lower leg	55	135.2	92.0	178.4	548	169.7	0.80	0.57
S90-S99 Injuries to ankle and food	26	55.7	28.3	83.1	170	45.4	1.23	0.73
T08-T14 Injuries to unspecified body region	5	14.6	0.8	28.4	14	4.4	3.30	1.11
T15-T19 Effects of foreign body	6	7.0	1.2	12.8	36	12.3	0.57	0.23
T20-T32 Burns & corrosions	29	48.8	28.9	68.7	132	34.6	1.41	0.90
T36-T65 Poisonings & toxic effects	122	289.3	234.0	344.5	430	142.1	2.04	1.64
T66-T78 Other and unspecified effects of external causes	12	20.1	7.4	32.8	64	19.8	1.02	0.51
T79 Early complications of trauma	3	6.8	2.1	22.0	22	6.2	1.10	0.31
T80-T88 Complications of care	118	376.7	300.5	452.9	947	349.6	1.08	0.87
Specific common injuries (top 50%)								
S01 Open wound of head	27	47.9	26.9	68.8	186	51.1	0.94	0.59
S06 Intracranial injury	18	35.5	14.7	56.2	178	51.7	0.69	0.37
S42 Fracture of shoulder and upper arm	22	31.4	16.7	46.1	226	54.8	0.57	0.35
S52 Fracture of forearm	58	85.4	60.7	110.0	412	91.3	0.93	0.69
S61 Open wound of wrist and hand	20	34.6	17.9	51.2	195	49.5	0.70	0.42
S62 Fracture of wrist and hand level	20	42.0	22.9	61.2	179	50.3	0.84	0.52
S72 Fracture of femur	19	72.3	32.1	112.5	244	90.6	0.80	0.45
S82 Superficial injury of lower leg	33	78.6	46.3	110.9	364	111.3	0.71	0.46
T81 Complications of procedures, NEC	58	190.5	134.9	246.1	421	153.3	1.24	0.91
External causes								
W00-W19 Falls	208	516.4	428.5	604.4	1990	620.1	0.83	0.70
W20-W49 Exposure to inanimate mechanical forces	109	193.7	153.1	234.2	1034	286.5	0.68	0.54
W50-W64 Exposure to animate mechanism forces	39	60.8	39.8	81.9	341	89.0	0.68	0.47
W65-74 Drowning & submersion	2	2.8	0.7	11.2	9	1.7	1.63	0.35
W75-84 Other accidental threats to breathing	6	13.1	0.5	25.6	34	11.2	1.16	0.42

Disease	Housing applicants			Housing tenants			Comparison	
	Hosp. No. ¹	Rate ²	95 CI	Hosp. No. ¹	Rate ²	95 CI	RR	95 CI
W85-99 Exposure to electricity & extreme temperature	1	1.2	0.2	8.3	5	1.6	0.73	0.08
X00-09 Exposure to smoke, fire, & flames	3	6.0	1.9	18.8	22	6.2	0.97	0.28
X10-19 Contact with heat & hot substances	22	33.0	17.3	48.6	102	26.9	1.23	0.73
X20-X29 Contact with venomous animals and plants	3	3.2	1.0	10.1	13	3.1	1.05	0.29
X30-X39 Exposure to forces of nature	0	0.0	0.0	0.0	25	9.2		3.78
X40-49 Accidental poisoning	35	66.6	41.5	91.7	175	54.7	1.22	0.81
X50-57 Overexertion, travel and privation	22	57.5	32.3	82.8	149	51.5	1.12	0.70
X58-59 Accidental exposure to other and unspecified factors	33	84.3	49.7	118.8	190	60.9	1.38	0.89
X60-X84 Intentional self-harm	126	317.8	259.6	376.0	390	135.5	2.35	1.90
X85-Y09 Assault	61	129.4	95.7	163.2	362	117.5	1.10	0.83
Y10-Y34 Event of undetermined intent	8	18.1	5.4	30.8	44	14.5	1.24	0.58
Specific external causes								2.68
W22 Striking against other objects	18	30.0	14.3	45.7	135	39.8	0.75	0.43
W23 Caught, crushed, jammed or pinched	28	37.4	21.5	53.3	184	40.6	0.92	0.59
W25 Contact with sharp glass	17	31.7	16.0	47.5	239	60.6	0.52	0.31
W50 Hit by another person	7	11.8	2.3	21.2	60	15.3	0.77	0.33
W54 Bitten or struck by dog	10	17.0	5.5	28.5	70	19.0	0.89	0.43
W85-W87 Exposure to electric current	1	1.2	0.2	8.3	3	0.7	1.64	0.16
X31 Exposure to excessive natural cold	0	0.0	0.0	0.0	16	6.1		16.39
X50 Overexertion and strenuous or repetitive movements	21	54.4	29.9	79.0	148	51.0	1.07	0.66
Y04 Assault by bodily force	28	60.9	37.7	84.2	177	57.1	1.07	0.71
Other specific external causes (including top 50%)								1.61
V01-V09 Pedestrian injuries	24	47.5	21.7	73.3	132	34.9	1.36	0.77
V10-V99 Other transport injuries	66	159.9	114.8	205.1	496	144.5	1.11	0.82
V03 Pedestrian injured collision with car, truck or van	20	41.1	16.2	65.9	110	29.2	1.41	0.74
V43 Car occupant injured in collision with car, pick-up truck or van	15	41.8	17.8	65.8	122	41.4	1.01	0.55
Y40 Systemic antibiotics	24	67.7	33.8	101.6	172	60.3	1.12	0.66
Y45 Analgesic agent	14	45.5	19.5	71.5	203	69.7	0.56	0.31
Y52 Cardiovascular agent	18	83.2	41.2	125.1	198	84.0	0.99	0.59
Y83 Surgical operation	154	482.2	395.3	569.1	1126	418.0	1.15	0.95
Y84 Other medical procedure	63	198.7	146.4	251.0	702	268.7	0.74	0.56
Total	4573	10869.1	10484.5	11253.7	32645	10586.4	1.03	0.99

¹ Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

Table 12.33: Potentially avoidable hospitalisations (PAH), age-standardised rates in *housing applicants* compared with *housing tenants* and the *other NZ* population, based on principal diagnosis and minimal filtering¹, May 2003 to June 2005

Disease category	Cohort			Other NZ			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
PAH	30247	87.9	86.9 89.0	353005	45.6	45.4 45.7	1.93	1.91 1.95
Injury and Poising	9996	27.5	26.9 28.0	154387	20.0	19.9 20.1	1.38	1.35 1.41
Total	40243	115.4	114.2 116.6	507392	65.5	65.3 65.7	1.76	1.74 1.78

Disease category	Housing applicants			Housing tenants			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
PAH	3804	87.6	84.1 91.2	26443	86.2	85.1 87.3	1.02	0.97 1.06
Injury and Poising	1280	28.8	27.0 30.7	8716	26.6	26.0 27.2	1.08	1.01 1.16
Total	5084	116.5	112.5 120.5	35159	112.8	111.6 114.1	1.03	1.00 1.07

¹ Filter only excludes overseas visitors and non-hospitalisations

² Rate measured as cases per 1000 population per year

Table 12.34: Hospitalisation numbers, standardised rates and rate ratios in crowded compared with uncrowded households, based on principal diagnosis and standard filter,¹ May 2003 to June 2005

Housing applicants

Disease category	Crowded ³			Uncrowded ³			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
Crude rate	3568	139.9	--	3672	169.3	--	0.83	--
Age-standardised rate	3568	173.1	164.2	3672	184.0	177.6	0.94	0.88
Age-ethnicity-standardised rate	3568	186.6	178.0	3672	186.5	179.7	1.00	0.94

Housing tenants

Disease category	Crowded ³			Uncrowded ³			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
Crude rate	15966	119.6	--	33742	166.4	--	0.72	--
Age-standardised rate	15966	166.1	162.7	33742	172.5	170.7	0.96	0.94
Age-ethnicity-standardised rate	15966	179.2	175.2	33742	169.8	167.3	1.06	1.03

Cohort (applicant and tenants) households

Disease category	Crowded ³			Uncrowded ³			Comparison	
	No. ¹	Rate ²	95 CI	No. ¹	Rate ²	95 CI	RR	95 CI
Crude rate	19596	123.2	--	37504	167.1	--	0.74	--
Age-standardised rate	19596	168.3	165.2	37504	174.4	172.6	0.97	0.94
Age-ethnicity-standardised rate	19596	181.2	177.7	37504	170.9	168.7	1.06	1.04

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Crowded household are those with a bedroom deficit of one or more according to the CNOS

Table 12.35: Hospitalisation numbers, standardised rates and rate ratios according to crowding level, based on principal diagnosis and standard filter,¹ May 2003 to June 2005

3

Housing applicants

Disease category	Uncrowded ³			1 bedroom room deficit ³			2 or more bedroom deficit ³				
	No. ¹	Rate ²	RR	No. ¹	Rate ²	RR	95CI	No	Rate	RR	95CI
Crude rate											
Age-standardised rate	3672	169.3	Ref 1.0	1695	143.6	0.85	--	1873	142.0	0.84	--
Age-ethnicity-standardised rate	3672	184.0	Ref 1.0	1695	173.6	0.94	0.87	1873	173.2	0.94	0.86
	3672	186.5	Ref 1.0	1695	188.5	1.01	0.94	1873	194.6	1.04	0.95
											1.14

Housing tenants

Disease category	Uncrowded ³			1 bedroom room deficit ³			2 or more bedroom deficit ³				
	No. ¹	Rate ²	RR	No. ¹	Rate ²	RR	95CI	No	Rate	RR	95CI
Crude rate											
Age-standardised rate	33742	166.4	Ref 1.0	9894	125.5	0.75	--	6072	115.5	0.69	--
Age-ethnicity-standardised rate	33742	172.5	Ref 1.0	9894	168.8	0.98	0.95	6072	162.1	0.94	0.91
	33742	169.8	Ref 1.0	9894	174.7	1.03	1.00	6072	199.1	1.17	1.12
											1.23

Cohort (applicant and tenants) households

Disease category	Uncrowded ³			1 bedroom room deficit ³			2 or more bedroom deficit ³				
	No. ¹	Rate ²	RR	No. ¹	Rate ²	RR	95CI	No	Rate	RR	95CI
Crude rate	37504	167.1	Ref 1.0	11610	125.2	0.75	--	7986	120.5	0.72	--
Age-standardised rate	37504	174.4	Ref 1.0	11610	170.3	0.98	0.95	7986	165.5	0.95	0.98
Age-ethnicity-standardised rate	37504	170.9	Ref 1.0	11610	176.0	1.03	1.00	7986	200.5	1.17	1.12
											1.22

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in cases per 100 000 population per year

³Household crowding according to CNOS

Table 12.36: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded *housing applicant* households, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Crowded ³			Uncrowded ³			Comparison		
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI	
A00-B99 Infectious & parasitic	294	1293.6	1110.7	1476.6	1259.9	1071.8	1.03	0.84	1.26
C00-D48 Neoplasms	43	420.9	241.7	600.1	276.5	197.3	1.52	0.91	2.54
D50-D89 Blood & immune system	26	203.6	102.0	305.2	147.8	91.0	1.38	0.73	2.59
E00-E90 Endocrine, nutritional & metabolic	59	459.3	289.1	629.6	364.9	276.6	1.26	0.81	1.96
F00-F99 Mental & behavioural	142	723.6	582.1	865.2	1122.2	977.8	0.64	0.51	0.81
G00-G99 Nervous system	72	432.4	316.5	548.4	382.6	293.0	1.13	0.79	1.61
H00-H59 Eye & adnexa	20	78.1	41.5	114.7	68.0	24.8	1.15	0.52	2.53
H60-H95 Ear & mastoid	36	129.3	79.7	178.8	168.2	105.6	0.77	0.45	1.31
I00-I99 Circulatory system	151	1596.4	1220.0	1972.8	1513.4	1328.2	1.05	0.81	1.38
J00-J99 Respiratory	830	3335.2	3028.6	3641.8	3511.2	3205.2	0.95	0.84	1.08
K00-K93 Digestive	232	1527.6	1246.6	1808.5	1487.7	1295.4	1.03	0.82	1.29
L00-L99 Skin & subcutaneous	207	999.7	770.8	1228.5	703.6	569.2	1.42	1.05	1.91
M00-M99 Musculoskeletal & connective	103	604.1	467.8	740.3	625.0	499.9	0.97	0.71	1.31
N00-N99 Genitourinary	191	967.7	774.0	1161.3	1044.2	873.0	0.93	0.72	1.20
Q00-Q99 Congenital	27	81.7	48.7	114.6	95.2	47.6	0.86	0.45	1.63
R00-R99 Symptoms & signs	404	2406.9	2104.6	2709.1	2621.7	2363.5	0.92	0.78	1.08
S00-T98 Injury, poisonings	619	2873.5	2602.9	3144.1	2778.9	2516.5	1.03	0.90	1.18
V01-Y98 External causes	830	4131.0	3770.3	4491.7	4032.3	3720.5	1.02	0.91	1.15
Z00-Z13 Factors influencing health status	25	90.0	46.7	133.4	88.0	44.6	1.02	0.51	2.04
Total	4311	22354.6	21425.7	23283.5	22291.4	21548.4	1.00	0.95	1.06

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Crowded household are those with a bedroom deficit of one or more according to the CNOS

Table 12.37: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded housing tenant households, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	1138	1141.1	1040.8 1241.4	1623	1069.5	998.6 1140.5	1.07	0.96 1.19
C00-D48 Neoplasms	318	487.5	412.9 562.1	875	381.3	345.9 416.7	1.28	1.07 1.53
D50-D89 Blood & immune system	132	184.2	136.3 232.1	358	186.4	156.2 216.6	0.99	0.73 1.34
E00-E90 Endocrine, nutritional & metabolic	331	471.1	404.1 538.1	983	430.2	397.2 463.1	1.10	0.93 1.29
F00-F99 Mental & behavioural	440	523.6	457.3 590.0	1333	597.9	555.0 640.8	0.88	0.76 1.01
G00-G99 Nervous system	330	403.9	346.3 461.5	859	435.4	395.5 475.3	0.93	0.78 1.10
H00-H59 Eye & adnexa	111	132.7	92.6 172.9	177	100.5	79.8 121.2	1.32	0.92 1.90
H60-H95 Ear & mastoid	137	148.4	109.2 187.6	206	126.7	104.1 149.2	1.17	0.85 1.61
I00-I99 Circulatory system	996	1535.1	1404.2 1666.0	3792	1416.2	1360.3 1472.1	1.08	0.99 1.19
J00-J99 Respiratory	3089	3051.7	2899.6 3203.9	5758	3071.7	2968.1 3175.3	0.99	0.94 1.06
K00-K93 Digestive	1197	1524.3	1398.2 1650.3	2888	1373.5	1305.6 1441.3	1.11	1.01 1.22
L00-L99 Skin & subcutaneous	1012	987.4	896.4 1078.4	1655	860.3	809.6 911.0	1.15	1.03 1.28
M00-M99 Musculoskeletal & connective	622	748.6	661.3 836.0	1335	619.8	576.4 663.2	1.21	1.05 1.38
N00-N99 Genitourinary	885	966.1	872.0 1060.2	1693	936.0	875.4 996.6	1.03	0.92 1.16
Q00-Q99 Congenital	96	86.4	62.7 110.2	122	90.5	66.4 114.6	0.96	0.65 1.40
R00-R99 Symptoms & signs	1779	2144.8	2003.0 2286.7	4258	2131.5	2039.8 2223.3	1.01	0.93 1.09
S00-T98 Injury, poisonings	2951	2991.9	2827.8 3156.0	5078	2740.5	2640.1 2840.9	1.09	1.02 1.17
V01-Y98 External causes	4047	4414.6	4212.0 4617.3	7996	4009.6	3892.3 4127.0	1.10	1.04 1.16
Z00-Z13 Factors influencing health status	77	79.5	53.9 105.1	144	79.6	63.8 95.4	1.00	0.68 1.46
Total	19688	22023.1	21571.9 22474.2	41133	20657.1	20388.1 20926.0	1.07	1.04 1.09

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Crowded household are those with a bedroom deficit of one or more according to the CNOS

Table 12.38: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded cohort (applicant and tenant) households, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	1437	1198.5	1111.3 1285.6	1849	1104.3	1039.3 1169.4	1.09	0.99 1.19
C00-D48 Neoplasms	361	465.2	402.6 527.7	935	365.3	335.1 395.5	1.27	1.09 1.49
D50-D89 Blood & immune system	159	178.1	140.1 216.1	391	179.5	154.5 204.5	0.99	0.77 1.28
E00-E90 Endocrine, nutritional & metabolic	393	456.2	399.5 513.0	1064	422.3	392.7 451.9	1.08	0.94 1.25
F00-F99 Mental & behavioural	583	563.8	506.5 621.2	1628	652.4	613.0 691.8	0.86	0.77 0.97
G00-G99 Nervous system	402	410.4	357.9 462.9	948	426.6	391.7 461.5	0.96	0.83 1.12
H00-H59 Eye & adnexa	131	118.7	89.0 148.4	191	92.3	75.5 109.2	1.29	0.94 1.75
H60-H95 Ear & mastoid	173	140.9	111.5 170.3	239	131.9	111.3 152.5	1.07	0.82 1.39
I00-I99 Circulatory system	1148	1524.7	1410.9 1638.5	4103	1407.4	1357.3 1457.6	1.08	1.00 1.18
J00-J99 Respiratory	3930	3133.6	3001.9 3265.4	6392	3084.2	2991.6 3176.8	1.02	0.96 1.07
K00-K93 Digestive	1433	1516.5	1409.3 1623.7	3187	1391.1	1328.6 1453.6	1.09	1.00 1.19
L00-L99 Skin & subcutaneous	1228	979.0	903.2 1054.8	1792	849.1	802.5 895.7	1.15	1.05 1.27
M00-M99 Musculoskeletal & connective	725	726.6	654.6 798.6	1455	620.1	580.5 659.6	1.17	1.04 1.32
N00-N99 Genitourinary	1087	971.2	893.0 1049.4	1873	949.6	893.7 1005.4	1.02	0.93 1.13
Q00-Q99 Congenital	123	86.2	66.9 105.4	143	95.5	73.7 117.3	0.90	0.66 1.24
R00-R99 Symptoms & signs	2190	2256.2	2128.3 2384.1	4792	2156.1	2074.4 2237.9	1.05	0.98 1.12
S00-T98 Injury, poisonings	3579	2980.8	2845.6 3115.9	5660	2752.6	2662.2 2842.9	1.08	1.02 1.15
V01-Y98 External causes	4892	4383.0	4214.1 4551.8	8853	4012.0	3906.8 4117.3	1.09	1.04 1.14
Z00-Z13 Factors influencing health status	102	79.2	58.9 99.4	164	79.9	65.9 93.9	0.99	0.73 1.35
Total	24076	22168.7	21785.7 22551.8	45659	20772.3	20530.2 21014.4	1.07	1.05 1.09

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Crowded household are those with a bedroom deficit of one or more according to the CNOS

Table 12.39: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in crowded compared with uncrowded cohort (applicant and tenant) households, according to specific diseases, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	412	368.5	318.3	418.7	566	448.6	413.6	0.99
A15-19 Tuberculosis	29	36.3	16.7	55.9	34	21.0	29.7	1.76
A37 Pertussis	11	5.0	2.0	8.0	15	9.3	15.4	0.54
A39 Meningococcal	65	35.9	25.8	45.9	48	27.8	36.0	1.29
A40 Streptococcal septicaemia	18	17.1	7.4	26.8	28	11.9	16.6	1.43
A41 Other septicaemia	86	93.6	67.6	119.6	165	66.3	78.6	1.41
A49 Bacterial infection of unspecified site	29	29.9	15.2	44.6	29	13.4	18.6	2.24
A87 Viral meningitis	44	28.9	18.0	39.9	47	31.3	42.7	0.92
B01 Varicella (chickenpox)	40	32.1	17.1	47.1	19	16.4	23.3	1.96
B02 Zoster (herpes zoster)	14	26.8	10.8	42.8	28	8.4	11.6	3.20
B03-B09 Other viral infection of skin & membranes	8	5.2	1.5	8.8	25	15.0	22.1	0.34
B15 Acute hepatitis A	2	3.5	0.6	19.2	2	0.9	4.3	3.84
B16 Acute hepatitis B	3	2.0	0.6	6.9	5	3.0	8.4	0.67
B17-B19 Other viral hepatitis	24	23.0	11.8	34.2	68	26.2	33.4	0.88
B26 Mumps	1	0.5	0.1	3.9	1	0.7	4.8	0.80
B34 Viral infection of unspecified site	549	417.8	367.8	467.8	634	405.6	444.9	1.03
Respiratory infections and asthma								
J02 Acute pharyngitis	38	35.9	20.8	51.0	66	49.1	65.2	0.73
J03 Acute tonsillitis	92	77.6	55.3	99.8	123	68.6	82.7	1.13
J04 Acute laryngitis and tracheitis	3	1.7	0.5	5.2	8	3.9	6.9	0.42
J05 Acute laryngitis [croup] and epiglottitis	94	66.2	49.7	82.7	90	57.2	72.5	1.16
J06 Acute laryngopharyngitis	395	277.3	241.1	313.5	476	285.5	316.8	0.97
J10-J11 Influenza	36	26.3	14.7	37.9	56	37.3	49.5	0.70
J12 and J14-J18 Pneumonia	842	609.5	554.1	664.8	1316	651.4	693.6	0.94
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	27	22.0	11.3	32.7	50	19.6	25.7	1.12
J20 Acute bronchitis	33	29.8	15.7	43.9	47	20.5	26.9	1.45
J21 Acute bronchiolitis	571	333.7	301.0	366.4	448	268.2	295.4	1.24
J22 Unspecified acute lower respiratory infection	292	268.3	225.2	311.5	494	235.5	262.1	1.14
J40-J42 Bronchitis unspecified and chronic	44	36.3	24.0	48.6	84	34.3	42.2	1.06
J44 Other chronic obstructive pulmonary disease	318	521.6	454.9	588.3	1364	430.1	455.0	1.21
J45-J46 Asthma	889	593.5	543.7	643.3	1176	647.7	691.8	0.92

Disease	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
Skin and bone infections								
L01 Impetigo	35	24.6	12.3	36.9	30	21.0	1.17	0.60
L02 Cutaneous abscess, furuncle and carbuncle	457	319.5	280.6	358.3	502	256.5	1.25	1.07
L03 Cellulitis	432	349.7	307.6	391.7	800	337.9	1.03	0.89
L04 Acute lymphadenitis	31	18.8	10.5	27.0	26	15.7	1.20	0.67
L08 Other local infection of skin & subcutaneous tissue	22	20.1	7.1	33.1	16	8.0	2.51	1.10
M00-M03 Infectious arthropathies	28	22.3	9.9	34.6	38	19.9	1.12	0.55
M86 Osteomyelitis	47	42.6	25.4	59.9	52	26.7	1.60	0.97
Other acute and chronic diseases with partly infectious origins								
H60 Otitis externa	22	16.9	5.4	28.5	26	15.3	1.11	0.48
H65-H66 Otitis media	99	66.4	50.1	82.7	92	56.0	1.19	0.84
K25-K28 Gastric, peptic, jejunal ulcer	52	55.8	35.7	76.0	147	58.2	0.96	0.64
C16 Malignant neoplasm of stomach	9	17.3	1.7	32.9	26	8.9	1.94	0.73
I00-I02 Acute rheumatic fever	45	28.7	16.2	41.3	38	26.2	1.10	0.63
N00 and N05 Acute & unspecified nephritis syndrome	36	19.1	12.8	25.5	33	19.3	0.99	0.61
G00-G09 Inflammatory diseases of CNS	20	13.5	5.9	21.1	29	15.3	0.88	0.45
G35-G37 Demyelinating diseases of CNS	6	7.2	1.1	13.3	29	9.8	0.73	0.28
G60-G64 Polynuropathies	5	8.4	3.1	23.0	22	8.8	0.96	0.30
Cardiovascular diseases								
I10-I15 Hypertensive diseases	29	37.4	18.9	55.9	76	31.7	1.18	0.67
I20 Angina pectoris	145	239.4	191.5	287.3	737	238.2	1.01	0.81
I21 Acute myocardial infarction	168	262.7	211.4	314.0	626	202.8	1.30	1.04
I22 – I25 Other forms of ischaemic heart disease	18	32.7	14.2	51.2	65	21.9	1.50	0.80
I48 Atrial fibrillation	90	97.7	73.2	122.2	355	118.8	0.82	0.62
I50 Heart failure	213	287.7	239.1	336.3	702	229.0	1.26	1.04
I60-I69 Cerebrovascular disease (incl. Stroke)	124	166.3	129.6	203.0	522	181.3	0.92	0.72
Mental and behavioural disorders								
F00-F09 Organic mental disorders	20	24.7	11.2	38.2	75	26.1	0.95	0.52
F10-F19 Mental disorders due to psychoactive substance use	80	79.1	58.0	100.3	275	121.9	0.65	0.47
F20 Schizophrenia	158	138.4	110.2	166.5	326	147.2	0.94	0.74
F21-F29 Other delusional disorders	80	67.4	50.0	84.7	209	84.3	0.80	0.59
F30-F31 Manic episode or bipolar disorder	61	52.3	37.0	67.7	258	91.0	0.57	0.42
F32-F33 Depressive episode or disorder	51	57.1	37.6	76.6	163	55.9	1.02	0.69
F34-39 Other mood disorder	6	3.9	0.7	7.1	22	7.4	0.52	0.21
F40-F48 Neurotic, stress related disorders	84	100.7	72.7	128.6	203	79.2	1.27	0.92
F50-F59 Behavioural syndromes	3	2.7	0.9	8.8	8	2.8	0.97	0.25
F60-F69 Adult personality disorders	27	27.1	16.4	37.7	63	22.7	1.19	0.72

Disease	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
F90-F98 Disorders of childhood or adolescence	4	3.5	0.0	6.9	11	4.8	7.8	2.33
F99 Unspecified mental disorders	3	1.8	0.6	5.7	4	1.4	2.7	6.00
Injuries and poisonings								
S00-S09 Injuries to the head	673	531.4	475.8	587.0	871	492.9	534.8	1.08
S10-S19 Injuries to neck	80	66.1	45.2	87.0	100	47.4	58.2	1.40
S20-S29 Injuries to thorax	102	103.8	75.7	131.8	189	82.5	97.6	1.26
S30-S39 Injuries to abdomen, back, pelvis	128	121.0	89.0	153.0	229	116.7	137.0	1.04
S40-S49 Injuries to shoulder & upper arm	190	153.0	123.1	182.8	268	136.9	157.2	1.12
S50-S59 Injuries to elbow & forearm	388	281.7	243.5	320.0	501	279.3	310.1	1.01
S60-S69 Injuries to wrist & hand	640	501.3	445.0	557.5	620	339.6	371.3	1.48
S70-S79 Injuries to hip & thigh	104	157.8	118.7	196.8	302	112.0	128.7	1.41
S80-S89 Injuries to knee and lower leg	316	232.4	199.5	265.4	498	252.6	281.8	0.92
S90-S99 Injuries to ankle and foot	135	98.3	76.2	120.4	196	104.2	121.1	0.94
T08-T14 Injuries to unspecified body region	14	9.0	4.0	14.0	16	6.3	9.6	1.42
T15-T19 Effects of foreign body	44	34.1	21.2	46.9	66	28.1	35.4	1.21
T20-T32 Burns & corrosions	89	60.8	45.3	76.2	103	52.8	65.2	1.15
T36-T65 Poisonings & toxic effects	266	230.4	195.8	265.0	653	267.3	292.9	0.86
T66-T78 Other and unspecified effects of external causes	51	37.9	24.8	51.0	89	39.3	48.2	0.96
T79 Early complications of trauma	7	4.9	1.2	8.7	20	11.9	19.8	0.41
T80-T88 Complications of care	351	356.0	306.0	405.9	935	381.0	410.2	0.93
Specific common injuries (top 50%)								
S01 Open wound of head	200	167.9	135.5	200.3	269	154.0	177.4	1.09
S06 Intracranial injury	170	129.6	102.5	156.6	206	111.7	131.2	1.16
S42 Fracture of shoulder and upper arm	134	112.3	85.3	139.2	180	92.0	108.3	1.22
S52 Fracture of forearm	285	204.0	171.5	236.6	363	202.2	228.4	1.01
S61 Open wound of wrist and hand	173	142.1	108.7	175.5	187	95.6	110.9	1.49
S62 Fracture of wrist and hand level	204	146.7	119.3	174.0	163	91.9	108.8	1.60
S72 Fracture of femur	64	106.5	73.4	139.6	210	78.5	93.3	1.36
S82 Superficial injury of lower leg	180	134.9	108.9	160.9	302	154.2	176.7	0.87
T81 Complications of procedures, NEC	148	147.8	116.4	179.2	399	166.8	186.6	0.89
External causes								
W00-W19 Falls	1085	1028.3	942.0	1114.7	1984	914.3	967.3	1.12
W20-W49 Exposure to inanimate mechanical forces	848	640.5	580.7	700.3	917	495.7	535.2	1.29
W50-W64 Exposure to animate mechanism forces	251	179.2	147.7	210.6	257	146.0	168.1	1.23
W65-74 Drowning & submersion	3	1.7	0.6	5.4	12	6.4	10.1	0.27
W75-84 Other accidental threats to breathing	19	19.5	8.1	30.8	24	9.2	13.2	2.11
W85-99 Exposure to electricity & extreme temperature	4	4.3	1.4	13.4	4	1.6	4.7	2.68
X00-09 Exposure to smoke, fire, & flames	18	11.0	5.8	16.1	18	7.0	10.4	1.57

Disease	Crowded ³			Uncrowded ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
X10-19 Contact with heat & hot substances	56	38.2	25.4	51.0	45.9	30.5	0.83	0.55
X20-X29 Contact with venomous animals and plants	12	8.3	3.4	13.2	4.9	2.6	1.69	0.70
X30-X39 Exposure to forces of nature	4	3.8	1.4	10.7	11.0	15.3	0.35	0.10
X40-49 Accidental poisoning	119	88.2	68.9	107.6	110.9	89.0	0.80	0.60
X50-57 Overexertion, travel and privation	102	82.5	62.3	102.7	94.7	76.7	111.9	0.87
X58-59 Accidental exposure to other and unspecified factors	139	109.4	85.2	133.6	90.5	47.4	104.0	0.21
X60-X84 Intentional self-harm	229	215.3	180.4	250.1	227.4	142.2	250.7	0.95
X85-Y09 Assault	363	282.6	243.2	322.0	251.6	217.8	280.6	1.12
Y10-Y34 Event of undetermined intent	15	13.7	6.1	21.3	19.5	8.4	25.2	0.70
Specific external causes								
W22 Striking against other objects	120	92.3	69.6	115.0	70.7	64.9	86.5	1.31
W23 Caught, crushed, jammed or pinched	189	131.2	106.0	156.3	100.2	86.8	118.4	1.31
W25 Contact with sharp glass	194	148.7	116.3	181.1	102.6	105.9	122.7	1.45
W50 Hit by another person	54	38.7	25.8	51.7	36.9	36.3	48.7	1.05
W54 Bitten or struck by dog	44	28.8	20.0	37.7	26.9	18.3	35.3	1.07
W85-W87 Exposure to electric current	4	4.3	1.4	13.4	1.1	0.7	4.6	3.79
X31 Exposure to excessive natural cold	3	2.6	0.8	8.6	7.4	13.5	14.5	0.35
X50 Overexertion and strenuous or repetitive movements	100	80.5	60.5	100.5	92.8	74.2	109.6	0.87
Y04 Assault by bodily force	179	145.2	115.7	174.7	128.5	110.7	149.2	1.13
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	101	77.1	54.0	100.2	80.0	67.6	96.1	0.96
V10-V99 Other transport injuries	393	317.7	273.3	362.1	295.2	267.1	327.2	1.08
V03 Pedestrian injured collision with car, truck or van	83	66.5	43.9	89.0	69.4	62.0	84.9	0.96
V43 Car occupant injured in collision with car, pick-up truck or van	107	105.4	74.9	136.0	78.6	81.3	96.3	1.34
Y40 Systemic antibiotics	72	75.5	50.7	100.2	59.8	45.2	73.0	1.26
Y45 Analgesic agent	70	89.8	60.1	119.4	53.0	20.4	61.8	1.69
Y52 Cardiovascular agent	37	57.0	34.7	79.4	64.4	29.9	75.1	0.89
Y83 Surgical operation	389	416.6	362.4	470.8	417.4	210.2	445.8	1.00
Y84 Other medical procedure	239	264.8	221.0	308.7	247.9	153.6	272.2	1.07
Total	18506	15885.8	15570.4	16201.2	14684.7	10893.3	14889.2	1.08
								1.06
								1.11

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios shaded where number of events <10 as these rates are likely to be unstable. Rates and rate ratios based on numbers <40 should be interpreted with caution

³Crowded household are those with a bedroom deficit of one or more according to the CNOS

Table 12.40: Hospitalisation numbers, standardised rates and rate ratios according to active smoking tenants (over 19 years), based on principal diagnosis and standard filter,¹ May 2003 to June 2005

<i>Housing tenants</i>									
Disease category	Active smokers ³			Non smokers ⁴			Comparison		
	No.	Rate ²	95 CI	No	Rate ²	95 CI	RR	95 CI	
Crude rate	6818	177.7	--	15698	193.7	--	0.92	--	--
Age-standardised rate	6818	203.7	198.1 209.3	15698	177.6	174.8 180.4	1.15	1.11	1.18
Age-ethnicity-standardised rate	6818	174.3	169.5 179.2	15698	168.0	165.2 170.8	1.04	1.00	1.07

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 1000 population per year

³Active smokers defined as adults over 20 years old who ticked smoking question as 'YES'

⁴Non smokers defined as adults over 20 years old who ticked smoking question as 'NO'

Table 12.41: Hospitalisation numbers, standardised rates and rate ratios according to passive smoking (under 15 years), based on principal diagnosis and standard filter,¹ May 2003 to June 2005

<i>Housing tenants</i>									
Disease category	Passive smokers ³			Non-smokers ⁴			Comparison		
	No.	Rate ²	95 CI	No	Rate ²	95 CI	RR	95 CI	
Crude rate	4388	98.5	--	5343	96.4	--	1.02	--	--
Age-standardised rate	4388	103.3	100.2 106.4	5343	102.5	99.7 105.3	1.01	0.97	1.05
Age-ethnicity-standardised rate	4388	102.0	98.7 105.3	5343	100.8	97.9 103.7	1.01	0.97	1.06

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 1000 population per year

³Passive smokers defined as children under 15 years old and at least one adult in their ticked smoking question as 'YES'

⁴Non smokers defined as children under 15 years old and all adults in their household ticked smoking question as 'NO'

Table 12.42: Hospitalisation numbers, age-standardised rates and rate ratios in active smoking tenants compared with non smoking tenants, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Active smokers ³			Non smokers ⁴			Comparison	
	Hosp. No	Rate ²	95 CI	Hosp. No	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	147	401.7	328.8	443	522.7	473.1	0.77	0.63
C00-D48 Neoplasms	229	786.4	669.7	489	529.2	481.8	1.49	1.25
D50-D89 Blood & immune system	85	304.9	229.9	205	226.3	194.9	1.35	1.02
E00-E90 Endocrine, nutritional & metabolic	187	648.0	539.7	634	707.2	651.4	0.92	0.76
F00-F99 Mental & behavioural	625	1493.9	1369.6	365	454.1	406.6	3.29	2.88
G00-G99 Nervous system	203	518.3	439.0	373	434.7	389.5	1.19	0.99
H00-H59 Eye & adnexa	24	63.5	37.4	109	121.1	98.0	0.52	0.33
H60-H95 Ear & mastoid	24	69.8	39.0	72	78.2	59.9	0.89	0.54
I00-I99 Circulatory system	623	2442.6	2218.0	2632	2757.5	2651.3	0.89	0.80
J00-J99 Respiratory	811	3063.9	2816.1	2226	2433.7	2330.9	1.26	1.15
K00-K93 Digestive	659	1947.0	1773.6	1509	1730.1	1640.9	1.13	1.02
L00-L99 Skin & subcutaneous	373	963.1	854.0	642	774.3	713.0	1.24	1.08
M00-M99 Musculoskeletal & connective	276	760.6	658.4	758	843.9	782.9	0.90	0.77
N00-N99 Genitourinary	434	1100.1	986.5	903	1092.2	1019.3	1.01	0.89
Q00-Q99 Congenital	6	12.7	2.4	19	26.3	14.2	0.48	0.19
R00-R99 Symptoms & signs	925	2642.9	2448.2	2159	2445.2	2340.4	1.08	0.99
S00-T98 Injury, poisonings	1022	2712.1	2524.3	1806	2129.5	2028.9	1.27	1.17
V01-Y98 External causes	1606	4524.6	4270.6	3447	3927.8	3793.9	1.15	1.08
Z00-Z13 Factors influencing health status	16	37.1	18.5	34	40.3	26.3	0.92	0.50
Total	8275	24493.2	23880.8	18825	21274.4	20964.7	1.15	1.12
			25105.5			21584.2		1.19

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Active smokers defined as adults over 20 years old who ticked smoking question as 'YES'

⁴Non smokers defined as adults over 20 years old who ticked smoking question as 'NO'

Table 12.43: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in active smoking tenants compared with non-smoking tenants, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Active smokers ³			Non smokers ⁴			Comparison		
	Hosp. No	Rate ²	95 CI	Hosp. No	Rate ²	95 CI	RR	95 CI	
A00-B99 Infectious & parasitic	147	346.6	282.7	443	503.3	453.1	0.69	0.56	0.85
C00-D48 Neoplasms	229	603.7	513.2	489	491.1	445.0	1.23	1.03	1.47
D50-D89 Blood & immune system	85	235.8	179.7	205	212.2	181.1	1.11	0.84	1.47
E00-E90 Endocrine, nutritional & metabolic	187	532.4	441.6	634	682.5	626.4	0.78	0.65	0.94
F00-F99 Mental & behavioural	625	1359.8	1231.1	365	481.9	429.8	2.82	2.44	3.26
G00-G99 Nervous system	203	445.5	377.3	373	422.6	376.6	1.05	0.87	1.27
H00-H59 Eye & adnexa	24	52.3	30.5	109	109.8	88.0	0.48	0.30	0.75
H60-H95 Ear & mastoid	24	67.0	36.0	72	69.7	52.5	0.96	0.57	1.62
I00-I99 Circulatory system	623	1957.7	1778.7	2632	2439.5	2341.1	0.80	0.73	0.89
J00-J99 Respiratory	811	2451.3	2256.0	2226	2272.4	2171.5	1.08	0.98	1.18
K00-K93 Digestive	659	1742.7	1585.8	1509	1638.5	1549.7	1.06	0.96	1.18
L00-L99 Skin & subcutaneous	373	864.2	758.2	642	750.3	688.6	1.15	0.99	1.33
M00-M99 Musculoskeletal & connective	276	700.6	603.8	758	776.8	717.9	0.90	0.77	1.06
N00-N99 Genitourinary	434	981.5	877.1	903	1073.3	998.0	0.91	0.81	1.04
Q00-Q99 Congenital	6	19.7	1.2	19	28.6	15.2	0.69	0.24	1.96
R00-R99 Symptoms & signs	925	2246.2	2077.4	2159	2307.0	2203.7	0.97	0.89	1.06
S00-T98 Injury, poisonings	1022	2434.2	2260.0	1806	2078.0	1974.3	1.17	1.07	1.28
V01-Y98 External causes	1606	3955.4	3729.6	3447	3738.0	3603.2	1.06	0.99	1.13
Z00-Z13 Factors influencing health status	16	29.8	14.6	34	38.3	24.1	0.78	0.42	1.46
Total	8275	21026.4	20494.4	18825	20113.9	19805.5	1.05	1.01	1.08

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Active smokers defined as adults over 20 years old who ticked smoking question as 'YES'

⁴Non smokers defined as adults over 20 years old who ticked smoking question as 'NO'

Table 12.44: Hospitalisation numbers, age-standardised rates and rate ratios in active smoking tenants compared with non-smoking tenants, according to specific diseases, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease	Active smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	17	53.0	23.1 82.8	87	98.5	77.5 119.5	0.54	0.29 0.98
A15-19 Tuberculosis	7	19.4	4.6 34.3	16	18.2	9.1 27.3	1.07	0.43 2.66
A37 Pertussis	0	0.0	0.0 0.0	0	0.0	0.0 0.0	--	-- --
A39 Meningococcal	1	3.8	0.5 27.1	4	5.1	1.8 14.1	0.76	0.08 6.90
A40 Streptococcal septicaemia	5	14.3	1.5 27.1	15	15.7	7.7 23.7	0.91	0.32 2.55
A41 Other septicaemia	33	103.6	63.0 144.2	98	105.5	84.5 126.6	0.98	0.63 1.52
A49 Bacterial infection of unspecified site	4	10.8	0.1 21.5	5	5.4	0.6 10.1	2.00	0.53 7.55
A87 Viral meningitis	4	11.7	4.3 31.9	14	21.0	9.7 32.4	0.55	0.18 1.73
B01 Varicella (chickenpox)	0	0.0	0.0 0.0	1	1.0	0.1 7.2	--	-- --
==	5	10.5	1.2 19.7	20	20.0	11.2 28.9	0.52	0.19 1.40
B03-B09 Other viral infection of skin & membranes	0	0.0	0.0 0.0	1	1.2	0.2 8.4	--	-- --
B15 Acute hepatitis A	0	0.0	0.0 0.0	1	1.0	0.1 6.8	--	-- --
B16 Acute hepatitis B	0	0.0	0.0 0.0	3	3.7	1.2 11.6	--	-- --
B17-B19 Other viral hepatitis	24	48.6	29.0 68.1	28	35.4	22.1 48.6	1.37	0.79 2.38
B26 Mumps	0	0.0	0.0 0.0	0	0.0	0.0 0.0	--	-- --
B34 Viral infection of unspecified site	32	81.9	50.7 113.1	100	128.7	102.9 154.6	0.64	0.41 0.98
Respiratory infections and asthma								
J02 Acute pharyngitis	4	9.5	0.0 18.9	12	14.0	5.9 22.1	0.68	0.21 2.15
J03 Acute tonsillitis	23	54.5	31.6 77.3	14	20.5	9.5 31.5	2.66	1.34 5.26
J04 Acute laryngitis and tracheitis	1	2.0	0.3 13.9	4	5.4	2.0 14.7	0.37	0.04 3.32
J05 Acute laryngitis [croup] and epiglottitis	0	0.0	0.0 0.0	1	1.0	0.1 6.8	--	-- --
J06 Acute laryngopharyngitis	11	26.1	10.4 41.9	62	74.4	55.6 93.3	0.35	0.18 0.67
J10-J11 Influenza	3	7.7	2.3 25.6	13	15.5	6.8 24.2	0.50	0.13 1.87
J12 and J14-J18 Pneumonia	150	526.0	426.3 625.8	470	507.9	461.2 554.6	1.04	0.84 1.28
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	6	14.3	2.4 26.2	21	21.8	12.4 31.2	0.65	0.26 1.67
J20 Acute bronchitis	6	15.3	2.6 27.9	21	25.1	14.1 36.0	0.61	0.24 1.55
J21 Acute bronchiolitis	0	0.0	0.0 0.0	1	1.3	0.2 8.9	--	-- --
J22 Unspecified acute lower respiratory infection	81	249.7	188.4 311.1	223	247.2	214.2 280.2	1.01	0.76 1.34
J40-J42 Bronchitis unspecified and chronic	20	65.5	31.0 100.0	45	50.5	35.5 65.6	1.30	0.71 2.37
J44 Other chronic obstructive pulmonary disease	296	1528.5	1333.8 1723.1	797	808.6	752.2 865.0	1.89	1.63 2.19
J45-J46 Asthma	123	287.8	234.6 341.0	292	361.1	318.8 403.4	0.80	0.64 0.99

Disease	Active smokers ³				Non smokers ⁴				Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	RR	95 CI
Skin and bone infections										
L01 Impetigo	2	3.9	1.0	15.6	1	1.2	0.2	8.4	3.29	0.30 36.29
L02 Cutaneous abscess, furuncle and carbuncle	130	302.1	247.8	356.5	160	204.5	172.2	236.8	1.48	1.16 1.88
L03 Cellulitis	155	439.4	358.9	519.8	346	400.3	357.3	443.4	1.10	0.89 1.36
L04 Acute lymphadenitis	2	3.9	1.0	15.7	2	3.1	0.7	12.8	1.27	0.17 9.22
L08 Other local infection of skin & subcutaneous tissue	6	20.4	0.9	39.9	4	4.7	0.1	9.4	4.30	1.09 16.93
M00-M03 Infectious arthropathies	7	23.2	2.8	43.7	10	10.7	4.0	17.4	2.17	0.74 6.37
M86 Osteomyelitis	5	16.0	1.6	30.5	18	20.8	11.0	30.6	0.77	0.28 2.13
Other acute and chronic diseases with partly infectious origins										
H60 Otitis externa	2	4.9	1.2	20.1	4	4.9	0.1	9.6	1.01	0.18 5.63
H65-H66 Otitis media	5	12.1	1.4	22.9	4	4.6	0.1	9.1	2.65	0.70 9.97
K25-K28 Gastric, peptic, jejunal ulcer	34	125.0	74.7	175.3	95	101.1	80.6	121.7	1.24	0.79 1.94
C16 Malignant neoplasm of stomach	4	13.4	4.9	36.8	14	15.4	7.3	23.5	0.87	0.28 2.72
I00-I02 Acute rheumatic fever	0	0.0	0.0	0.0	2	3.1	0.8	12.9	--	--
N00 and N05 Acute & unspecified nephritis syndrome	1	2.6	0.4	18.7	5	5.9	0.7	11.1	0.45	0.05 3.82
G00-G09 Inflammatory diseases of CNS	5	10.8	1.2	20.4	5	6.1	0.8	11.4	1.77	0.51 6.16
G35-G37 Demyelinating diseases of CNS	44	88.7	62.2	115.2	8	11.0	3.2	18.8	8.05	3.73 17.40
G60-G64 Polynuropathies	4	9.2	0.1	18.3	5	5.6	0.7	10.5	1.65	0.44 6.22
Cardiovascular diseases										
I10-I15 Hypertensive diseases	22	61.4	31.0	91.8	36	39.4	26.3	52.4	1.56	0.86 2.83
I20 Angina pectoris	112	447.8	351.2	544.3	501	524.4	478.2	570.6	0.85	0.68 1.08
I21 Acute myocardial infarction	88	380.3	286.6	474.0	419	432.5	390.9	474.2	0.88	0.67 1.15
I22 – I25 Other forms of ischaemic heart disease	8	26.5	5.2	47.9	45	47.9	33.8	62.0	0.55	0.24 1.30
I48 Atrial fibrillation	50	160.4	109.5	211.3	233	242.4	211.0	273.8	0.66	0.47 0.93
I50 Heart failure	93	395.7	302.2	489.2	483	501.5	456.4	546.5	0.79	0.61 1.02
I60-I69 Cerebrovascular disease (incl. Stroke)	79	331.0	246.8	415.3	324	336.3	299.4	373.2	0.98	0.75 1.30
Mental and behavioural disorders										
F00-F09 Organic mental disorders	14	50.3	20.0	80.5	31	31.4	20.3	42.5	1.60	0.80 3.22
F10-F19 Mental disorders due to psychoactive substance use	105	277.5	218.7	336.2	47	58.7	41.5	75.9	4.73	3.29 6.79
F20 Schizophrenia	117	269.6	219.5	319.6	45	60.5	42.5	78.6	4.45	3.13 6.33
F21-F29 Other delusional disorders	74	164.2	125.7	202.7	35	45.0	29.8	60.1	3.65	2.42 5.50
F30-F31 Manic episode or bipolar disorder	124	320.0	261.4	378.5	52	63.6	46.1	81.0	5.03	3.62 7.00
F32-F33 Depressive episode or disorder	60	130.4	94.9	165.9	61	77.2	57.4	97.0	1.69	1.16 2.46
F34-39 Other mood disorder	8	19.6	5.7	33.4	7	8.5	2.2	14.8	2.30	0.83 6.42
F40-F48 Neurotic, stress related disorders	54	116.5	85.0	148.0	69	84.5	64.2	104.8	1.38	0.96 1.98
F50-F59 Behavioural syndromes	4	9.8	0.0	19.6	3	4.4	1.4	14.0	2.21	0.48 10.21
F60-F69 Adult personality disorders	62	130.2	97.4	163.0	12	15.9	6.8	25.1	8.17	4.35 15.32

Disease	Active smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
F90-F98 Disorders of childhood or adolescence	1	2.0	0.3	13.9	0	0.0	--	--
F99 Unspecified mental disorders	2	3.9	1.0	15.7	0	0.0	--	--
Injuries and poisonings								
S00-S09 Injuries to the head	138	361.7	294.0	429.4	193	240.9	1.50	1.18
S10-S19 Injuries to neck	20	51.8	26.1	77.4	38	46.2	1.12	0.62
S20-S29 Injuries to thorax	57	164.9	113.5	216.3	77	86.4	1.91	1.30
S30-S39 Injuries to abdomen, back, pelvis	38	123.8	77.3	170.3	81	94.4	1.31	0.85
S40-S49 Injuries to shoulder & upper arm	34	101.7	62.2	141.3	72	83.6	1.22	0.77
S50-S59 Injuries to elbow & forearm	48	118.6	82.2	154.9	96	112.0	1.06	0.73
S60-S69 Injuries to wrist & hand	129	310.2	253.1	367.3	156	202.0	1.54	1.20
S70-S79 Injuries to hip & thigh	36	164.0	103.4	224.6	163	162.2	1.01	0.68
S80-S89 Injuries to knee and lower leg	72	190.3	141.1	239.4	204	238.3	0.80	0.60
S90-S99 Injuries to ankle and foot	31	68.3	43.9	92.7	59	75.3	0.91	0.58
T08-T14 Injuries to unspecified body region	4	8.8	0.0	17.6	4	5.3	1.65	0.40
T15-T19 Effects of foreign body	12	33.9	11.6	56.2	24	30.1	1.12	0.52
T20-T32 Burns & corrosions	16	41.3	17.9	64.8	21	25.6	1.62	0.79
T36-T65 Poisonings & toxic effects	198	466.2	396.1	536.3	130	166.0	2.81	2.23
T66-T78 Other and unspecified effects of external causes	16	38.5	19.2	57.8	35	40.8	0.94	0.52
T79 Early complications of trauma	3	5.9	1.9	18.1	5	5.6	1.04	0.25
T80-T88 Complications of care	168	457.7	380.9	534.6	447	513.0	0.89	0.74
Specific common injuries (top 50%)								
S01 Open wound of head	36	100.9	63.9	138.0	58	71.3	1.42	0.90
S06 Intracranial injury	33	98.6	59.4	137.9	37	45.0	2.19	1.31
S42 Fracture of shoulder and upper arm	15	55.8	22.3	89.2	35	37.5	1.49	0.75
S52 Fracture of forearm	25	62.6	34.9	90.3	59	67.4	0.93	0.56
S61 Open wound of wrist and hand	25	66.2	37.3	95.1	46	59.3	1.12	0.66
S62 Fracture of wrist and hand level	38	92.0	62.1	122.0	42	56.5	1.63	1.04
S72 Fracture of femur	20	102.3	51.7	152.9	107	104.9	0.98	0.57
S82 Superficial injury of lower leg	51	141.6	97.4	185.9	116	134.5	1.05	0.73
T81 Complications of procedures, NEC	73	187.3	140.4	234.1	199	233.2	0.80	0.60
External causes								
W00-W19 Falls	249	879.8	750.5	1009.1	745	801.6	1.10	0.93
W20-W49 Exposure to inanimate mechanical forces	155	377.3	314.3	440.2	248	310.7	1.21	0.98
W50-W64 Exposure to animate mechanism forces	43	93.4	65.1	121.7	55	65.5	1.43	0.95
W65-74 Drowning & submersion	0	0.0	0.0	0.0	0	0.0	--	--
W75-84 Other accidental threats to breathing	6	30.7	1.8	59.7	8	8.7	3.53	1.09
W85-99 Exposure to electricity & extreme temperature	0	0.0	0.0	0.0	3	3.1	9.8	11.40
X00-09 Exposure to smoke, fire, & flames	5	23.1	8.1	65.8	7	9.1	2.55	0.70
								9.26

Disease	Active smokers ³			Non smokers ³			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
X10-19 Contact with heat & hot substances	10	20.9	7.8	34.0	20.8	11.2	30.5	1.00
X20-X29 Contact with venomous animals and plants	1	2.0	0.3	13.8	2.4	0.6	9.7	0.81
X30-X39 Exposure to forces of nature	4	9.2	0.1	18.2	7.9	2.4	13.5	1.15
X40-49 Accidental poisoning	44	113.9	76.1	151.7	57.2	41.1	73.3	1.99
X50-57 Overexertion, travel and privation	44	118.7	79.3	158.0	117.4	93.1	141.7	1.01
X58-59 Accidental exposure to other and unspecified factors	45	117.1	78.6	155.7	91.4	70.3	112.5	1.28
X60-X84 Intentional self-harm	185	417.1	354.7	479.6	185.4	154.1	216.7	2.25
X85-Y09 Assault	146	334.5	279.1	389.9	144.1	116.1	172.0	2.32
Y10-Y34 Event of undetermined intent	19	43.7	23.6	63.8	12.3	4.5	20.1	3.56
Specific external causes								
W22 Striking against other objects	22	51.9	29.7	74.1	57.0	40.5	73.5	0.91
W23 Caught, crushed, jammed or pinched	11	25.3	9.8	40.8	36.2	23.4	48.9	0.70
W25 Contact with sharp glass	36	83.9	56.0	111.9	43.3	27.6	59.0	1.94
W50 Hit by another person	11	24.2	9.7	38.7	7.8	1.4	14.2	3.10
W54 Bitten or struck by dog	10	20.5	7.7	33.4	14.3	6.1	22.6	1.43
W85-W87 Exposure to electric current	0	0.0	0.0	0.0	1.2	0.2	8.7	1.42
X31 Exposure to excessive natural cold	3	7.2	2.3	22.6	5.1	0.6	9.6	0.34
X50 Overexertion and strenuous or repetitive movements	44	118.7	79.3	158.0	116.4	92.2	140.6	1.02
Y04 Assault by bodily force	74	169.5	130.2	208.9	72.4	52.9	92.0	2.34
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	10	22.8	8.2	37.3	33.4	20.9	45.9	0.68
V10-V99 Other transport injuries	88	234.6	179.7	289.5	195.4	164.1	226.6	1.20
V03 Pedestrian injured collision with car, truck or van	9	20.8	6.8	34.9	30.5	18.4	42.6	0.68
V43 Car occupant injured in collision with car, pick-up truck or van	23	64.3	35.3	93.3	68.2	49.3	87.0	0.94
Y40 Systemic antibiotics	21	76.3	38.7	113.9	83.0	64.2	101.8	0.92
Y45 Analgesic agent	35	137.2	84.5	189.9	115.7	93.2	138.2	1.19
Y52 Cardiovascular agent	18	84.7	40.0	129.4	133.9	111.0	156.8	0.63
Y83 Surgical operation	196	580.1	486.9	673.3	591.4	539.6	643.2	0.98
Y84 Other medical procedure	120	344.8	276.1	413.6	368.6	328.7	408.6	0.94
Total	5363	15782.4	15290.9	16274.0	12745.0	12504.6	12985.3	1.24

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios shaded where number of events <5 as these rates are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

³Active smokers defined as adults over 20 years old who ticked smoking question as 'YES'

⁴Non smokers defined as adults over 20 years old who ticked smoking question as 'NO'

Table 12.45: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in active smoking tenants compared with non-smoking tenants, according to specific diseases, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease	Active smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	17	43.5	17.5	69.5	87	72.3	114.0	0.47
A15-19 Tuberculosis	7	19.6	3.6	35.7	16	8.7	26.3	1.12
A37 Pertussis	0	0.0	0.0	0.0	0	0.0	0.0	--
A40 Streptococcal septicaemia	5	10.6	1.0	20.2	15	6.6	21.6	0.75
A41 Other septicaemia	33	87.2	52.4	121.9	98	77.9	118.5	0.89
A49 Bacterial infection of unspecified site	4	9.9	0.1	19.7	5	5.5	10.7	1.79
A87 Viral meningitis	4	8.8	3.2	24.2	14	24.1	37.7	0.37
B01 Varicella (chickenpox)	0	0.0	0.0	0.0	1	0.9	6.2	--
B02 Zoster (herpes zoster)	5	8.0	0.9	15.0	20	17.2	24.8	0.46
B03-B09 Other viral infection of skin & membranes	0	0.0	0.0	0.0	1	1.8	12.9	--
B15 Acute hepatitis A	0	0.0	0.0	0.0	1	0.6	4.5	--
B16 Acute hepatitis B	0	0.0	0.0	0.0	3	3.2	10.2	--
B17-B19 Other viral hepatitis	24	39.4	23.5	55.3	28	35.8	49.7	1.10
B26 Mumps	0	0.0	0.0	0.0	0	0.0	0.0	--
B34 Viral infection of unspecified site	32	79.4	49.6	109.2	100	129.5	156.7	0.61
Respiratory infections and asthma								
J02 Acute pharyngitis	4	8.8	3.1	24.7	12	13.7	22.0	0.64
J03 Acute tonsillitis	23	49.8	27.7	71.9	14	21.5	33.5	2.32
J04 Acute laryngitis and tracheitis	1	1.4	0.2	10.1	4	6.5	17.8	0.22
J05 Acute laryngitis [croup] and epiglottitis	0	0.0	0.0	0.0	1	0.6	4.5	--
J06 Acute laryngopharyngitis	11	21.2	8.1	34.4	62	66.5	84.0	0.32
J10-J11 Influenza	3	12.0	2.8	51.1	13	14.7	23.4	0.82
J12 and J14-J18 Pneumonia	150	456.2	370.2	542.2	470	461.7	506.0	0.99
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	6	16.0	2.8	29.2	21	19.3	28.0	0.83
J20 Acute bronchitis	6	14.6	2.3	26.8	21	22.9	33.4	0.64
J21 Acute bronchiolitis	0	0.0	0.0	0.0	1	1.0	6.8	--
J22 Unspecified acute lower respiratory infection	81	204.8	153.0	256.6	223	228.7	260.6	0.90
J40-J42 Bronchitis unspecified and chronic	20	50.8	25.3	76.3	45	47.2	61.6	1.08
J44 Other chronic obstructive pulmonary disease	296	1130.6	987.0	1274.2	797	706.1	757.1	1.60
J45-J46 Asthma	123	258.2	208.9	307.5	292	385.8	432.9	0.67

Disease	Active smokers ³				Non smokers ⁴				Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	RR	95 CI
Skin and bone infections										
L01 Impetigo	2	2.8	0.7	11.4	1	1.8	0.3	12.9	1.56	0.14 17.22
L02 Cutaneous abscess, furuncle and carbuncle	130	281.3	221.0	341.6	160	206.9	173.0	240.8	1.36	1.04 1.78
L03 Cellulitis	155	363.0	297.7	428.4	346	378.9	336.5	421.3	0.96	0.78 1.18
L04 Acute lymphadenitis	2	2.8	0.7	11.4	2	2.8	0.6	12.0	1.02	0.14 7.66
L08 Other local infection of skin & subcutaneous tissue	6	14.3	0.8	27.8	4	4.7	1.6	13.3	3.05	0.75 12.45
M00-M03 Infectious arthropathies	7	20.0	3.6	36.3	10	11.4	3.6	19.2	1.75	0.60 5.10
M86 Osteomyelitis	5	25.1	0.7	49.6	18	19.2	9.9	28.6	1.31	0.44 3.88
Other acute and chronic diseases with partly infectious origins										
H60 Otitis externa	2	3.7	0.9	15.2	4	5.6	2.0	15.7	0.66	0.11 3.82
H65-H66 Otitis media	5	13.5	0.0	26.9	4	4.2	0.0	8.4	3.19	0.78 12.99
K25-K28 Gastric, peptic, jejunal ulcer	34	115.4	68.1	162.7	95	89.7	70.8	108.6	1.29	0.81 2.04
C16 Malignant neoplasm of stomach	4	12.1	4.1	35.9	14	17.4	7.7	27.0	0.70	0.21 2.36
I00-I02 Acute rheumatic fever	0	0.0	0.0	0.0	2	3.7	0.9	15.8		
N00 and N05 Acute & unspecified nephritis syndrome	1	1.8	0.2	12.6	5	4.6	0.6	8.6	0.38	0.04 3.29
G00-G09 Inflammatory diseases of CNS	5	10.0	0.5	19.5	5	6.5	0.6	12.3	1.55	0.42 5.72
G35-G37 Demyelinating diseases of CNS	44	76.5	53.8	99.2	8	11.3	3.4	19.2	6.77	3.17 14.46
G60-G64 Polynuropathies	4	7.4	0.1	14.7	5	5.7	0.4	11.0	1.30	0.34 5.05
Cardiovascular diseases										
I10-I15 Hypertensive diseases	22	51.6	26.4	76.7	36	36.8	24.0	49.5	1.40	0.77 2.55
I20 Angina pectoris	112	348.4	275.1	421.7	501	455.1	413.3	496.8	0.77	0.61 0.96
I21 Acute myocardial infarction	88	305.0	230.4	379.7	419	371.2	333.8	408.6	0.82	0.63 1.07
I22 – I25 Other forms of ischaemic heart disease	8	20.8	4.8	36.9	45	41.7	29.1	54.3	0.50	0.22 1.14
I48 Atrial fibrillation	50	131.2	86.0	176.5	233	213.2	184.4	242.0	0.62	0.42 0.89
I50 Heart failure	93	300.4	229.9	370.9	483	449.3	406.7	491.8	0.67	0.52 0.86
I60-I69 Cerebrovascular disease (incl. Stroke)	79	260.8	194.9	326.7	324	294.0	260.3	327.7	0.89	0.67 1.17
Mental and behavioural disorders										
F00-F09 Organic mental disorders	14	42.6	15.9	69.3	31	26.6	16.8	36.5	1.60	0.77 3.31
F10-F19 Mental disorders due to psychoactive substance use	105	255.2	194.4	316.1	47	62.1	43.3	80.8	4.11	2.80 6.04
F20 Schizophrenia	117	309.8	232.4	387.2	45	65.8	45.6	85.9	4.71	3.17 6.99
F21-F29 Other delusional disorders	74	140.4	106.4	174.4	35	50.7	33.4	68.0	2.77	1.82 4.21
F30-F31 Manic episode or bipolar disorder	124	261.4	212.8	310.1	52	69.9	49.9	89.8	3.74	2.66 5.26
F32-F33 Depressive episode or disorder	60	109.2	80.3	138.0	61	80.3	59.4	101.3	1.36	0.94 1.97
F34-39 Other mood disorder	8	19.8	4.5	35.0	7	9.0	2.2	15.8	2.20	0.75 6.51
F40-F48 Neurotic, stress related disorders	54	98.0	71.5	124.4	69	90.6	67.9	113.3	1.08	0.75 1.56
F50-F59 Behavioural syndromes	4	8.0	0.1	15.9	3	4.5	1.4	14.1	1.77	0.39 7.99
F60-F69 Adult personality disorders	62	110.6	82.9	138.3	12	18.0	7.6	28.4	6.14	3.28 11.52

Disease	Active smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
F90-F98 Disorders of childhood or adolescence	1	1.7	0.2	12.1	0.0	0.0	--	--
F99 Unspecified mental disorders	2	3.1	0.8	12.6	0.0	0.0	--	--
Injuries and poisonings								
S00-S09 Injuries to the head	138	346.3	277.9	414.7	254.8	215.7	1.36	1.06
S10-S19 Injuries to neck	20	40.8	21.1	60.6	47.3	31.2	0.86	0.48
S20-S29 Injuries to thorax	57	144.6	100.4	188.8	78.3	59.8	1.85	1.25
S30-S39 Injuries to abdomen, back, pelvis	38	99.8	64.2	135.4	91.5	69.9	1.09	0.71
S40-S49 Injuries to shoulder & upper arm	34	81.6	50.5	112.6	80.2	59.7	1.02	0.64
S50-S59 Injuries to elbow & forearm	48	106.6	72.6	140.6	101.9	79.6	1.05	0.71
S60-S69 Injuries to wrist & hand	129	349.8	276.7	422.8	206.3	171.6	1.70	1.30
S70-S79 Injuries to hip & thigh	36	122.5	76.9	168.0	124.2	104.1	0.99	0.66
S80-S89 Injuries to knee and lower leg	72	180.9	127.4	234.5	227.5	193.6	0.80	0.57
S90-S99 Injuries to ankle and foot	31	70.5	43.1	97.9	80.1	58.3	0.88	0.55
T08-T14 Injuries to unspecified body region	4	7.4	0.1	14.8	5.1	1.7	1.47	0.33
T15-T19 Effects of foreign body	12	32.7	11.8	53.5	27.6	15.4	1.19	0.55
T20-T32 Burns & corrosions	16	35.7	16.2	55.2	29.4	16.1	1.21	0.60
T36-T65 Poisonings & toxic effects	198	385.3	328.1	442.4	177.3	145.6	2.17	1.72
T66-T78 Other and unspecified effects of external causes	16	33.2	16.4	50.0	37.7	24.3	0.88	0.47
T79 Early complications of trauma	3	4.6	1.5	14.4	5.6	0.3	0.82	0.19
T80-T88 Complications of care	168	388.5	322.0	455.1	501.6	452.3	0.77	0.64
Specific common injuries (top 50%)								
S01 Open wound of head	36	110.1	69.5	150.7	73.8	53.0	1.49	0.94
S06 Intracranial injury	33	84.0	47.7	120.2	44.5	28.5	1.89	1.08
S42 Fracture of shoulder and upper arm	15	44.4	18.6	70.3	33.7	21.2	1.32	0.66
S52 Fracture of forearm	25	55.8	30.2	81.4	59.2	42.8	0.94	0.55
S61 Open wound of wrist and hand	25	63.3	33.3	93.2	60.3	41.7	1.05	0.60
S62 Fracture of wrist and hand level	38	115.4	68.2	162.7	57.7	39.0	2.00	1.19
S72 Fracture of femur	20	77.1	38.4	115.7	78.6	63.0	0.98	0.57
S82 Superficial injury of lower leg	51	133.1	85.6	180.5	129.0	103.7	1.03	0.69
T81 Complications of procedures, NEC	73	164.9	121.7	208.1	230.4	196.0	0.72	0.53
External causes								
W00-W19 Falls	249	725.1	617.5	832.7	714.0	657.9	1.02	0.86
W20-W49 Exposure to inanimate mechanical forces	155	387.1	317.6	456.7	311.3	269.8	1.24	0.99
W50-W64 Exposure to animate mechanism forces	43	91.5	60.8	122.2	65.3	46.8	1.40	0.90
W65-74 Drowning & submersion	0	0.0	0.0	0.0	0.0	0.0	--	--
W75-84 Other accidental threats to breathing	6	21.6	1.7	41.4	7.9	2.0	2.72	0.83
W85-99 Exposure to electricity & extreme temperature	0	0.0	0.0	0.0	2.3	0.7	--	--
X00-09 Exposure to smoke, fire, & flames	5	16.2	5.8	45.2	10.6	2.3	1.53	0.42
--								

Disease	Active smokers ³			Non smokers ⁴			Comparison			
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI		
X10-19 Contact with heat & hot substances X20-X29 Contact with venomous animals and plants X30-X39 Exposure to forces of nature X40-49 Accidental poisoning X50-57 Overexertion, travel and privation X58-59 Accidental exposure to other and unspecified factors X60-X84 Intentional self-harm X85-Y09 Assault Y10-Y34 Event of undetermined intent	10	19.7	6.7	32.6	18	22.6	0.87	0.38	1.97	
	1	1.4	0.2	10.1	2	2.9	0.7	0.49	0.04	5.61
	4	7.5	0.1	15.0	8	5.8	1.7	1.31	0.39	4.39
	44	96.1	64.2	128.1	50	53.8	37.9	1.79	1.14	2.79
	44	121.5	74.5	168.5	96	106.7	83.3	1.14	0.73	1.78
	45	100.5	67.9	133.1	76	88.8	67.3	1.13	0.75	1.70
	185	348.6	296.1	401.2	140	202.6	167.9	1.72	1.37	2.16
	146	326.2	268.2	384.2	107	159.2	127.2	2.05	1.57	2.68
	19	40.1	21.3	59.0	10	15.8	5.4	2.55	1.14	5.71
	Specific external causes									
W22 Striking against other objects W23 Caught, crushed, jammed or pinched W25 Contact with sharp glass W50 Hit by another person W54 Bitten or struck by dog W85-W87 Exposure to electric current X31 Exposure to excessive natural cold X50 Overexertion and strenuous or repetitive movements Y04 Assault by bodily force	22	62.0	32.1	91.9	48	56.6	1.10	0.62	1.94	
	11	20.9	8.0	33.8	31	33.1	21.1	0.63	0.31	1.29
	36	81.5	52.0	110.9	31	48.0	30.0	1.70	1.01	2.86
	11	25.6	9.4	41.8	6	8.8	1.6	2.90	1.03	8.16
	10	22.4	5.7	39.0	12	14.4	5.6	1.56	0.59	4.08
	0	0.0	0.0	0.0	1	1.1	0.1	7.5	.	.
	3	5.8	1.9	17.9	5	3.9	0.4	1.50	0.35	6.35
	44	121.5	74.5	168.5	95	105.7	82.4	1.15	0.74	1.79
	74	154.8	116.6	193.1	55	78.9	56.7	1.96	1.35	2.85
	Other specific external causes (including top 50%)									
V01-V09 Pedestrian injuries V10-V99 Other transport injuries V03 Pedestrian injured collision with car, truck or van V43 Car occupant injured in collision with car, pick-up truck or van Y40 Systemic antibiotics Y45 Analgesic agent Y52 Cardiovascular agent Y83 Surgical operation Y84 Other medical procedure	10	17.9	6.5	29.3	29	32.3	0.55	0.26	1.17	
	88	209.2	157.7	260.6	158	194.4	161.7	1.08	0.80	1.45
	9	16.2	5.3	27.1	26	30.4	17.9	0.53	0.24	1.17
	23	50.0	28.0	72.1	53	65.6	46.4	0.76	0.45	1.29
	21	71.7	35.7	107.7	77	70.9	54.1	1.01	0.58	1.76
	35	105.7	66.5	144.9	105	105.0	83.5	1.01	0.66	1.54
	18	67.2	31.5	102.9	133	109.7	90.4	0.61	0.35	1.07
	196	497.6	415.6	579.6	520	562.0	510.3	0.89	0.73	1.07
	120	282.5	225.9	339.0	333	364.2	322.8	0.78	0.62	0.98
	Total	5363	13657.6	13225.4	14089.8	11253	12057.7	1.13	1.09	1.18

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios shaded where number of events <10 as these rates are likely to be unstable. Rates and rate ratios based on numbers <40 should be interpreted with caution

³Active smokers defined as adults over 20 years old who ticked smoking question as 'YES'

⁴Non smokers defined as adults over 20 years old who ticked smoking question as 'NO'

Table 12.46: Hospitalisation numbers, age-standardised rates and rate ratios in passive smoking tenants compared with non-smoking tenants, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No	Rate ²	95 CI	Hosp. No	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	510	1245.5	1136.9 1354.1	727	1441.0	1335.6 1546.4	0.86	0.77 0.97
C00-D48 Neoplasms	28	68.9	43.3 94.5	24	42.2	25.2 59.1	1.63	0.95 2.82
D50-D89 Blood & immune system	37	87.6	59.2 116.0	29	52.9	33.5 72.3	1.66	1.02 2.70
E00-E90 Endocrine, nutritional & metabolic	48	104.4	74.8 134.0	47	88.6	63.1 114.1	1.18	0.79 1.77
F00-F99 Mental & behavioural	19	41.5	22.8 60.1	12	20.7	9.0 32.5	2.00	0.97 4.13
G00-G99 Nervous system	95	219.2	174.9 263.5	119	221.1	181.1 261.2	0.99	0.76 1.30
H00-H59 Eye & adnexa	23	52.1	30.7 73.4	34	63.9	42.3 85.5	0.82	0.48 1.39
H60-H95 Ear & mastoid	81	191.5	149.6 233.4	67	134.7	102.3 167.2	1.42	1.03 1.97
I00-I99 Circulatory system	65	149.1	112.7 185.5	61	109.6	81.9 137.2	1.36	0.96 1.93
J00-J99 Respiratory	1237	3091.0	2918.2 3263.8	1673	3429.9	3264.8 3595.0	0.90	0.84 0.97
K00-K93 Digestive	211	487.1	421.0 553.1	235	438.8	382.3 495.3	1.11	0.92 1.34
L00-L99 Skin & subcutaneous	332	794.3	708.4 880.1	360	697.9	625.3 770.5	1.14	0.98 1.32
M00-M99 Musculoskeletal & connective	149	331.6	278.2 385.1	139	249.5	207.8 291.3	1.33	1.05 1.68
N00-N99 Genitourinary	136	316.4	263.0 369.9	178	339.2	289.0 389.4	0.93	0.75 1.17
Q00-Q99 Congenital	67	167.8	127.5 208.1	72	148.2	113.8 182.6	1.13	0.81 1.58
R00-R99 Symptoms & signs	331	785.2	700.2 870.3	452	878.2	796.7 959.7	0.89	0.78 1.03
S00-T98 Injury, poisonings	895	2055.4	1920.1 2190.7	1001	1849.7	1734.3 1965.0	1.11	1.01 1.22
V01-Y98 External causes	1071	2467.0	2318.6 2615.5	1199	2219.1	2092.7 2345.5	1.11	1.02 1.21
Z00-Z13 Factors influencing health status	56	136.4	100.5 172.3	35	70.2	46.8 93.6	1.94	1.27 2.97
Total	5391	12792.1	12448.9 13135.2	6464	12495.2	12188.5 12802.0	1.02	0.99 1.06

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Passive smokers defined as children under 15 years old and at least one adult in their ticked smoking question as 'YES'

⁴Non smokers defined as children under 15 years old and all adults in their household ticked smoking question as 'NO'

Table 12.47: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in passive smoking tenants compared with non-smoking tenants, according to major disease categories, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease category	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No	Rate ²	95 CI	Hosp. No	Rate ²	95 CI	RR	95 CI
A00-B99 Infectious & parasitic	510	1267.7	1148.0 1387.4	727	1339.5	1235.9 1443.2	0.95	0.84 1.07
C00-D48 Neoplasms	28	69.0	42.5 95.6	24	45.1	25.8 64.4	1.53	0.86 2.72
D50-D89 Blood & immune system	37	110.8	68.2 153.3	29	54.2	33.8 74.6	2.04	1.19 3.50
E00-E90 Endocrine, nutritional & metabolic	48	105.3	72.0 138.6	47	97.5	68.4 126.6	1.08	0.70 1.67
F00-F99 Mental & behavioural	19	36.3	19.9 52.7	12	25.8	10.7 40.8	1.41	0.67 2.95
G00-G99 Nervous system	95	198.0	157.5 238.4	119	226.6	183.9 269.2	0.87	0.66 1.15
H00-H59 Eye & adnexa	23	52.2	30.1 74.4	34	64.6	41.5 87.8	0.81	0.46 1.41
H60-H95 Ear & mastoid	81	177.1	135.1 219.2	67	134.7	100.2 169.2	1.31	0.93 1.86
I00-I99 Circulatory system	65	166.2	122.8 209.7	61	114.8	84.0 145.6	1.45	1.00 2.11
J00-J99 Respiratory	1237	2948.9	2773.0 3124.9	1673	3223.0	3057.5 3388.5	0.91	0.85 0.99
K00-K93 Digestive	211	481.4	406.9 555.8	235	472.9	409.1 536.8	1.02	0.83 1.25
L00-L99 Skin & subcutaneous	332	759.7	674.0 845.5	360	655.6	583.2 728.0	1.16	0.99 1.36
M00-M99 Musculoskeletal & connective	149	364.3	296.7 432.0	139	256.5	211.0 302.0	1.42	1.10 1.84
N00-N99 Genitourinary	136	322.8	265.5 380.1	178	338.4	285.5 391.2	0.95	0.75 1.21
Q00-Q99 Congenital	67	184.0	132.1 236.0	72	150.8	114.0 187.6	1.22	0.84 1.77
R00-R99 Symptoms & signs	331	747.7	663.3 832.2	452	875.1	789.6 960.5	0.85	0.74 0.99
S00-T98 Injury, poisonings	895	2064.4	1917.1 2211.7	1001	1930.9	1803.7 2058.2	1.07	0.97 1.18
V01-Y98 External causes	1071	2478.8	2318.0 2639.6	1199	2304.2	2165.5 2443.0	1.08	0.98 1.18
Z00-Z13 Factors influencing health status	56	124.5	90.9 158.1	35	69.9	45.2 94.6	1.78	1.14 2.78
Total	5391	12659.3	12292.9 13025.6	6464	12380.1	12058.5 12701.6	1.02	0.98 1.06

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

²Rate measured in case per 100 000 population per year

³Passive smokers defined as children under 15 years old and at least one adult in their ticked smoking question as 'YES'

⁴Non smokers defined as children under 15 years old and all adults in their household ticked smoking question as 'NO'

Table 12.48: Hospitalisation numbers, age-standardised rates and rate ratios in passive smoking tenants compared with non-smoking tenants, according to specific diseases, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
Infectious diseases								
A00-A09 Intestinal infectious diseases	180	451.4	385.2	517.5	533.5	468.2	598.9	0.85
A15-19 Tuberculosis	5	12.6	1.5	23.6	11.1	2.2	20.1	1.13
A37 Pertussis	7	16.9	4.3	29.4	22.8	9.3	36.4	0.74
A39 Meningococcal	31	75.3	48.7	102.0	87.7	62.2	113.2	0.86
A40 Streptococcal septicaemia	2	5.2	1.3	20.9	7.7	0.1	15.4	0.68
A41 Other septicaemia	3	6.9	2.2	21.5	12.7	3.2	22.3	0.54
A49 Bacterial infection of unspecified site	9	22.5	7.8	37.3	37.1	19.9	54.4	0.61
A87 Viral meningitis	16	35.2	17.9	52.6	40.7	23.6	57.8	0.87
B01 Varicella (chickenpox)	17	40.7	21.2	60.1	37.1	19.9	54.3	1.10
B02 Zoster (herpes zoster)	0	0.0	0.0	0.0	1.7	0.2	12.0	--
B03-B09 Other viral infection of skin & membranes	6	15.7	3.1	28.2	7.8	0.1	15.4	2.02
B15 Acute hepatitis A	0	0.0	0.0	0.0	1.7	0.2	12.2	--
B16 Acute hepatitis B	0	0.0	0.0	0.0	0.0	0.0	0.0	--
B17-B19 Other viral hepatitis	0	0.0	0.0	0.0	0.0	0.0	0.0	--
B26 Mumps	0	0.0	0.0	0.0	2.2	0.3	15.3	--
B34 Viral infection of unspecified site	210	505.2	436.5	573.8	575.1	509.4	640.7	0.88
Respiratory infections and asthma								
J02 Acute pharyngitis	12	29.0	12.5	45.4	45.1	26.9	63.2	0.64
J03 Acute tonsillitis	24	55.2	33.0	77.3	78.4	54.2	102.6	0.70
J04 Acute laryngitis and tracheitis	1	2.2	0.3	15.3	0.0	0.0	0.0	--
J05 Acute laryngitis [croup] and epiglottitis	60	150.2	112.1	188.4	101.9	73.0	130.8	1.47
J06 Acute laryngopharyngitis	187	472.0	404.2	539.8	495.6	432.5	558.6	0.95
J10-J11 Influenza	13	31.6	14.3	48.8	38.3	21.0	55.7	0.82
J12 and J14-J18 Pneumonia	251	628.7	550.7	706.7	831.0	749.8	912.2	0.76
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	2	5.2	1.3	20.9	15.9	4.8	26.9	0.33
J20 Acute bronchitis	7	17.8	4.6	31.0	11.1	2.2	20.1	1.60
J21 Acute bronchiolitis	237	618.8	540.0	697.5	630.3	558.0	702.6	0.98
J22 Unspecified acute lower respiratory infection	58	144.4	107.1	181.7	191.5	152.6	230.4	0.75
J40-J42 Bronchitis unspecified and chronic	0	0.0	0.0	0.0	3.9	1.0	15.7	--
J44 Other chronic obstructive pulmonary disease	1	2.2	0.3	15.3	0.0	0.0	0.0	--
J45-J46 Asthma	341	832.4	743.7	921.1	870.7	788.3	953.2	0.96
								0.83
								1.10

Disease	Passive smokers ³				Non smokers ⁴				Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	RR	95 CI
Skin and bone infections										
L01 Impetigo	15	35.5	17.5	53.6	19	37.9	20.8	55.1	0.94	0.47 1.85
L02 Cutaneous abscess, furuncle and carbuncle	110	260.8	211.8	309.8	128	243.9	201.4	286.5	1.07	0.83 1.38
L03 Cellulitis	121	288.6	236.9	340.2	102	197.7	159.1	236.4	1.46	1.12 1.90
L04 Acute lymphadenitis	15	35.8	17.6	54.0	18	34.7	18.6	50.9	1.03	0.52 2.06
L08 Other local infection of skin & subcutaneous tissue	4	9.5	0.1	18.9	9	17.1	5.9	28.4	0.55	0.17 1.81
M00-M03 Infectious arthropathies	10	22.3	8.4	36.2	6	10.7	2.1	19.2	2.09	0.76 5.79
M86 Osteomyelitis	24	52.8	31.6	74.0	21	37.9	21.6	54.2	1.39	0.77 2.51
Other acute and chronic diseases with partly infectious origins										
H60 Otitis externa	8	17.6	5.4	29.8	9	16.7	5.7	27.7	1.05	0.40 2.74
H65-H66 Otitis media	63	151.1	113.6	188.5	50	102.6	74.0	131.2	1.47	1.01 2.14
K25-K28 Gastric, peptic, jejunal ulcer	1	2.1	0.3	15.1	0	0.0	0.0	0.0	--	-- --
C16 Malignant neoplasm of stomach	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I00-I02 Acute rheumatic fever	22	47.1	27.4	66.8	28	47.4	29.9	65.0	0.99	0.57 1.74
N00 and N05 Acute & unspecified nephritis syndrome	15	33.7	16.6	50.7	26	47.1	28.9	65.4	0.71	0.38 1.35
G00-G09 Inflammatory diseases of CNS	7	16.9	4.3	29.4	12	22.2	9.5	34.8	0.76	0.30 1.94
G35-G37 Demyelinating diseases of CNS	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
G60-G64 Polyneuropathies	1	2.2	0.3	15.3	1	1.7	0.2	12.2	1.25	0.08 19.99
Cardiovascular diseases										
I10-I15 Hypertensive diseases	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I20 Angina pectoris	1	2.2	0.3	15.3	0	0.0	0.0	0.0	--	-- --
I21 Acute myocardial infarction	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I22 – I25 Other forms of ischaemic heart disease	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I48 Atrial fibrillation	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I50 Heart failure	10	24.7	9.3	40.1	1	2.2	0.3	15.3	11.45	1.46 89.52
I60-I69 Cerebrovascular disease (incl. Stroke)	3	6.4	2.1	19.8	2	3.4	0.8	13.5	1.89	0.32 11.33
Mental and behavioural disorders										
F00-F09 Organic mental disorders	1	2.6	0.4	18.5	1	2.2	0.3	15.3	1.21	0.08 19.32
F10-F19 Mental disorders due to psychoactive substance use	9	19.1	6.6	31.6	2	3.4	0.8	13.5	5.68	1.23 26.29
F20 Schizophrenia	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F21-F29 Other delusional disorders	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F30-F31 Manic episode or bipolar disorder	0	0.0	0.0	0.0	1	1.7	0.2	12.0	--	-- --
F32-F33 Depressive episode or disorder	1	2.6	0.4	18.5	1	1.7	0.2	12.0	1.55	0.10 24.77
F34-39 Other mood disorder	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F40-F48 Neurotic, stress related disorders	4	8.5	0.2	16.8	5	8.4	1.0	15.8	1.01	0.27 3.76
F50-F59 Behavioural syndromes	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F60-F69 Adult personality disorders	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --

Disease	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
F90-F98 Disorders of childhood or adolescence	2	4.3	1.1 17.1	1	1.7	0.2 12.0	2.54	0.23 28.02
F99 Unspecified mental disorders	0	0.0	0.0 0.0	0	0.0	0.0 0.0	--	-- --
Injuries and poisonings								
S00-S09 Injuries to the head	170	399.0	338.7 459.3	213	400.8	346.6 455.0	1.00	0.81 1.22
S10-S19 Injuries to neck	8	17.6	5.4 29.7	13	22.5	10.2 34.7	0.78	0.32 1.89
S20-S29 Injuries to thorax	8	17.6	5.4 29.8	4	6.8	0.1 13.4	2.59	0.78 8.62
S30-S39 Injuries to abdomen, back, pelvis	30	68.5	43.9 93.1	26	47.1	28.9 65.3	1.45	0.86 2.47
S40-S49 Injuries to shoulder & upper arm	65	150.2	113.5 186.9	104	191.8	154.7 228.9	0.78	0.57 1.07
S50-S59 Injuries to elbow & forearm	178	393.5	335.5 451.4	177	312.0	265.9 358.2	1.26	1.02 1.55
S60-S69 Injuries to wrist & hand	137	322.4	268.1 376.6	145	276.0	230.7 321.2	1.17	0.92 1.48
S70-S79 Injuries to hip & thigh	35	78.7	52.5 104.9	24	45.3	27.0 63.6	1.74	1.03 2.93
S80-S89 Injuries to knee and lower leg	73	162.1	124.8 199.5	86	151.6	119.5 183.8	1.07	0.78 1.46
S90-S99 Injuries to ankle and foot	49	110.1	79.1 141.0	46	82.1	58.3 105.9	1.34	0.89 2.01
T08-T14 Injuries to unspecified body region	2	4.7	1.2 19.1	3	6.0	1.9 18.8	0.79	0.13 4.77
T15-T19 Effects of foreign body	13	30.2	13.7 46.6	21	40.0	22.8 57.2	0.75	0.38 1.51
T20-T32 Burns & corrosions	31	74.8	48.4 101.3	29	58.5	37.1 79.9	1.28	0.77 2.13
T36-T65 Poisonings & toxic effects	47	113.7	81.0 146.4	40	79.1	54.4 103.7	1.44	0.94 2.20
T66-T78 Other and unspecified effects of external causes	15	34.0	16.7 51.3	18	35.2	18.8 51.6	0.97	0.48 1.92
T79 Early complications of trauma	4	9.0	0.1 17.8	4	7.3	0.1 14.5	1.23	0.31 4.97
T80-T88 Complications of care	30	69.3	44.4 94.3	48	87.6	62.7 112.6	0.79	0.50 1.25
Specific common injuries (top 50%)								
S01 Open wound of head	58	139.3	103.3 175.3	77	149.6	116.0 183.2	0.93	0.66 1.31
S06 Intracranial injury	35	79.5	53.0 106.0	51	93.7	67.8 119.5	0.85	0.55 1.31
S42 Fracture of shoulder and upper arm	55	127.8	93.9 161.8	91	169.2	134.2 204.2	0.76	0.54 1.06
S52 Fracture of forearm	149	330.0	276.9 383.1	151	264.6	222.3 307.0	1.25	0.99 1.56
S61 Open wound of wrist and hand	50	123.1	88.8 157.3	51	100.2	72.5 127.8	1.23	0.83 1.82
S62 Fracture of wrist and hand level	34	75.1	49.8 100.4	46	81.3	57.7 104.9	0.92	0.59 1.44
S72 Fracture of femur	26	59.0	36.2 81.7	15	28.2	13.8 42.5	2.09	1.10 3.97
S82 Superficial injury of lower leg	50	111.6	80.6 142.7	45	79.2	55.9 102.4	1.41	0.94 2.11
T81 Complications of procedures, NEC	15	34.5	17.0 52.0	25	45.3	27.4 63.1	0.76	0.40 1.45
External causes								
W00-W19 Falls	362	817.6	733.0 902.1	428	779.0	704.7 853.2	1.05	0.91 1.21
W20-W49 Exposure to inanimate mechanical forces	231	545.4	474.7 616.1	248	465.6	407.2 523.9	1.17	0.98 1.40
W50-W64 Exposure to animate mechanism forces	92	212.0	168.4 255.5	80	152.1	118.5 185.6	1.39	1.03 1.88
W65-74 Drowning & submersion	7	16.3	4.2 28.5	1	1.7	0.2 12.0	9.70	1.19 78.94
W75-84 Other accidental threats to breathing	3	7.8	2.5 24.3	7	14.2	3.6 24.8	0.55	0.14 2.14
W85-99 Exposure to electricity & extreme temperature	2	4.3	1.1 17.1	0	0.0	0.0 0.0	--	-- --
X00-09 Exposure to smoke, fire, & flames	4	9.5	0.1 18.8	2	3.4	0.9 13.6	2.78	0.51 15.23

Disease	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
X10-19 Contact with heat & hot substances	26	62.6	38.5	86.8	49.0	29.3	1.28	0.73
X20-X29 Contact with venomous animals and plants	4	8.9	0.1	17.7	3.4	0.9	2.62	0.48
X30-X39 Exposure to forces of nature	2	4.2	1.1	17.0	3.4	0.8	1.26	0.18
X40-49 Accidental poisoning	44	108.2	76.2	140.3	72.6	49.1	1.49	0.96
X50-57 Overexertion, travel and privation	12	25.4	11.0	39.8	36.5	20.8	0.70	0.34
X58-59 Accidental exposure to other and unspecified factors	35	80.5	53.7	107.2	65.0	43.0	1.24	0.77
X60-X84 Intentional self-harm	7	14.8	3.8	25.7	10.0	2.0	1.47	0.49
X85-Y09 Assault	24	51.7	31.0	72.5	44.6	27.1	1.16	0.66
Y10-Y34 Event of undetermined intent	4	8.9	0.1	17.7	4.2	1.1	2.11	0.39
Specific external causes								
W22 Striking against other objects	22	50.7	29.4	71.9	54.0	34.6	0.94	0.54
W23 Caught, crushed, jammed or pinched	78	190.9	148.4	233.4	171.3	135.1	1.11	0.82
W25 Contact with sharp glass	47	103.2	73.6	132.8	74.2	51.9	1.39	0.92
W50 Hit by another person	18	39.0	21.0	57.1	25.2	11.9	1.55	0.77
W54 Bitten or struck by dog	17	37.4	19.6	55.3	22.0	9.5	1.70	0.81
W85-W87 Exposure to electric current	2	4.2	1.1	17.0	0.0	0.0	--	--
X31 Exposure to excessive natural cold	2	4.2	1.1	17.0	1.7	0.2	2.54	0.23
X50 Overexertion and strenuous or repetitive movements	12	25.4	11.0	39.8	36.5	20.8	0.70	0.34
Y04 Assault by bodily force	12	25.4	11.0	39.8	17.2	6.5	1.48	0.64
Other specific external causes (including top 50%)								
V01-V09 Pedestrian injuries	42	96.5	67.2	125.8	73.9	50.9	1.31	0.84
V10-V99 Other transport injuries	83	183.1	143.6	222.6	165.8	132.4	1.10	0.82
V03 Pedestrian injured collision with car, truck or van	35	80.3	53.6	107.1	58.3	38.0	1.38	0.85
V43 Car occupant injured in collision with car, pick-up truck or van	15	35.4	17.4	53.3	23.3	10.6	1.52	0.72
Y40 Systemic antibiotics	15	33.5	16.5	50.6	35.0	19.2	0.96	0.49
Y45 Analgesic agent	1	2.1	0.3	15.2	5.1	1.6	0.42	0.04
Y52 Cardiovascular agent	0	0.0	0.0	0.0	1.7	0.2	--	--
Y83 Surgical operation	41	94.8	65.7	124.0	106.0	78.8	0.89	0.60
Y84 Other medical procedure	6	14.5	2.9	26.1	38.7	22.0	0.37	0.15
Total	4806	11221.0	10902.4	11539.6	10865.3	10582.3	1.03	0.99

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios are likely to be unstable. Rates and rate ratios based on numbers <20 should be interpreted with caution

³Passive smokers defined as children under 15 years old and at least one adult in their ticked smoking question as 'YES'

⁴Non smokers defined as children under 15 years old and all adults in their household ticked smoking question as 'NO'

Table 12.49: Hospitalisation numbers, age-ethnicity-standardised rates and rate ratios in passive smoking tenants compared with non-smoking tenants, according to specific diseases, based on principal diagnosis and standard filter¹ May 2003 to June 2005

Disease	Passive smokers ³			Non smokers ⁴			Comparison			
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI		
Infectious diseases										
A00-A09 Intestinal infectious diseases	180	460.3	385.7	534.9	515.4	448.7	582.1	0.89	0.73	1.10
A15-19 Tuberculosis	5	12.1	1.2	23.0	9.8	1.3	18.4	1.23	0.35	4.31
A37 Pertussis	7	16.4	3.8	28.9	17.9	7.0	28.8	0.91	0.34	2.43
A39 Meningococcal	31	74.0	46.9	101.0	75.8	52.4	99.2	0.98	0.60	1.57
A40 Streptococcal septicaemia	2	3.9	1.0	15.5	8.8	3.1	25.1	0.44	0.08	2.52
A41 Other septicaemia	3	5.7	1.8	17.7	11.9	2.6	21.3	0.48	0.12	1.90
A49 Bacterial infection of unspecified site	9	31.6	7.4	55.7	39.3	20.1	58.5	0.80	0.32	1.99
A87 Viral meningitis	16	40.9	17.6	64.2	36.4	20.1	52.7	1.12	0.54	2.32
B01 Varicella (chickenpox)	17	41.9	21.3	62.6	27.7	14.6	40.7	1.52	0.77	3.00
B02 Zoster (herpes zoster)	0	0.0	0.0	0.0	2.6	0.4	18.7	--	--	--
B03-B09 Other viral infection of skin & membranes	6	12.1	2.4	21.8	6.6	2.4	18.3	1.84	0.50	6.76
B15 Acute hepatitis A	0	0.0	0.0	0.0	1.3	0.2	9.4	--	--	--
B16 Acute hepatitis B	0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
B17-B19 Other viral hepatitis	0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
B26 Mumps	0	0.0	0.0	0.0	1.4	0.2	10.2	--	--	--
B34 Viral infection of unspecified site	210	514.8	440.5	589.2	523.9	460.9	586.9	0.98	0.81	1.19
Respiratory infections and asthma										
J02 Acute pharyngitis	12	23.6	10.2	37.0	46.6	26.8	66.5	0.51	0.25	1.03
J03 Acute tonsillitis	24	60.3	33.1	87.5	78.2	53.0	103.4	0.77	0.44	1.34
J04 Acute laryngitis and tracheitis	1	3.2	0.4	22.7	0.0	0.0	0.0	--	--	--
J05 Acute laryngitis [croup] and epiglottitis	60	139.1	102.8	175.5	95.4	66.7	124.1	1.46	0.98	2.17
J06 Acute laryngopharyngitis	187	424.5	360.4	488.7	491.6	425.0	558.2	0.86	0.70	1.06
J10-J11 Influenza	13	30.2	13.2	47.3	36.7	19.4	53.9	0.82	0.40	1.72
J12 and J14-J18 Pneumonia	251	640.5	555.3	725.7	731.8	655.8	807.9	0.88	0.74	1.04
J13 Pneumonia due to <i>Streptococcal pneumoniae</i>	2	4.1	1.0	16.5	14.1	3.6	24.6	0.29	0.06	1.41
J20 Acute bronchitis	7	16.2	3.9	28.5	13.8	2.2	25.3	1.18	0.38	3.65
J21 Acute bronchiolitis	237	571.5	492.8	650.3	583.7	511.5	656.0	0.98	0.81	1.18
J22 Unspecified acute lower respiratory infection	58	145.5	104.7	186.2	184.4	144.7	224.2	0.79	0.55	1.12
J40-J42 Bronchitis unspecified and chronic	0	0.0	0.0	0.0	6.1	1.5	24.3	--	--	--
J44 Other chronic obstructive pulmonary disease	1	1.8	0.3	12.7	0.0	0.0	0.0	--	--	--
J45-J46 Asthma	341	781.2	693.6	868.7	836.7	752.1	921.2	0.93	0.80	1.09

Disease	Passive smokers ³				Non smokers ⁴				Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	RR	95 CI
Skin and bone infections										
L01 Impetigo	15	31.0	14.9	47.1	19	32.8	17.2	48.3	0.95	0.47 1.91
L02 Cutaneous abscess, furuncle and carbuncle	110	253.0	204.1	301.9	128	233.1	189.8	276.4	1.09	0.83 1.42
L03 Cellulitis	121	278.3	225.1	331.5	102	187.4	148.6	226.2	1.49	1.12 1.97
L04 Acute lymphadenitis	15	38.6	18.4	58.8	18	27.5	14.4	40.6	1.40	0.69 2.85
L08 Other local infection of skin & subcutaneous tissue	4	7.9	0.1	15.6	9	15.5	4.9	26.0	0.51	0.15 1.69
M00-M03 Infectious arthropathies	10	25.9	9.3	42.4	6	12.0	1.8	22.2	2.16	0.74 6.28
M86 Osteomyelitis	24	58.5	30.8	86.3	21	34.7	18.6	50.7	1.69	0.87 3.27
Other acute and chronic diseases with partly infectious origins										
H60 Otitis externa	8	17.6	4.9	30.3	9	16.0	4.8	27.3	1.10	0.40 3.01
H65-H66 Otitis media	63	139.5	101.5	177.5	50	102.1	71.8	132.4	1.37	0.91 2.04
K25-K28 Gastric, peptic, jejunal ulcer	1	2.9	0.4	20.4	0	0.0	0.0	0.0	--	-- --
C16 Malignant neoplasm of stomach	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I00-I02 Acute rheumatic fever	22	56.5	29.7	83.3	28	49.0	29.7	68.2	1.15	0.62 2.14
N00 and N05 Acute & unspecified nephritis syndrome	15	34.5	16.3	52.7	26	42.9	25.6	60.2	0.81	0.41 1.56
G00-G09 Inflammatory diseases of CNS	7	16.9	4.1	29.8	12	18.7	7.6	29.8	0.91	0.35 2.37
G35-G37 Demyelinating diseases of CNS	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
G60-G64 Polynuropathies	1	1.8	0.3	12.7	1	1.3	0.2	9.4	1.35	0.08 21.55
Cardiovascular diseases										
I10-I15 Hypertensive diseases	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I20 Angina pectoris	1	1.8	0.3	12.7	0	0.0	0.0	0.0	--	-- --
I21 Acute myocardial infarction	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I22 – I25 Other forms of ischaemic heart disease	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I48 Atrial fibrillation	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
I50 Heart failure	10	27.6	9.8	45.3	1	3.2	0.5	22.8	8.58	1.09 67.48
I60-I69 Cerebrovascular disease (incl. Stroke)	3	5.4	1.7	16.8	2	2.5	0.6	10.1	2.14	0.36 12.86
Mental and behavioural disorders										
F00-F09 Organic mental disorders	1	1.9	0.3	13.8	1	1.4	0.2	10.2	1.35	0.08 21.65
F10-F19 Mental disorders due to psychoactive substance use	9	16.8	5.8	27.8	2	4.4	1.1	18.1	3.81	0.80 18.04
F20 Schizophrenia	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F21-F29 Other delusional disorders	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F30-F31 Manic episode or bipolar disorder	0	0.0	0.0	0.0	1	2.6	0.4	18.7	--	-- --
F32-F33 Depressive episode or disorder	1	1.9	0.3	13.8	1	2.6	0.4	18.7	0.74	0.05 11.80
F34-39 Other mood disorder	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F40-F48 Neurotic, stress related disorders	4	7.4	0.1	14.7	5	11.2	1.1	21.3	0.66	0.17 2.50
F50-F59 Behavioural syndromes	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --
F60-F69 Adult personality disorders	0	0.0	0.0	0.0	0	0.0	0.0	0.0	--	-- --

Disease	Passive smokers ³			Non smokers ⁴			Comparison	
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI
F90-F98 Disorders of childhood or adolescence	2	4.1	1.0	16.3	1	1.3	3.22	0.29
F99 Unspecified mental disorders	0	0.0	0.0	0.0	0	0.0	--	35.51
Injuries and poisonings								
S00-S09 Injuries to the head	170	397.8	331.1	464.5	213	416.7	357.3	476.1
S10-S19 Injuries to neck	8	18.1	5.2	31.0	13	26.2	11.2	41.1
S20-S29 Injuries to thorax	8	16.7	4.7	28.7	4	8.2	3.0	22.4
S30-S39 Injuries to abdomen, back, pelvis	30	66.6	41.9	91.3	26	56.6	33.5	79.7
S40-S49 Injuries to shoulder & upper arm	65	145.9	109.2	182.6	104	213.0	169.2	256.7
S50-S59 Injuries to elbow & forearm	178	412.4	343.8	481.0	177	338.4	285.5	391.3
S60-S69 Injuries to wrist & hand	137	324.1	265.2	382.9	145	270.8	223.5	318.1
S70-S79 Injuries to hip & thigh	35	72.9	48.1	97.8	24	39.7	22.7	56.6
S80-S89 Injuries to knee and lower leg	73	172.2	129.9	214.4	86	157.4	122.1	192.8
S90-S99 Injuries to ankle and foot	49	120.5	83.8	157.2	46	86.4	60.0	112.8
T08-T14 Injuries to unspecified body region	2	3.7	0.9	14.6	3	7.3	2.2	23.8
T15-T19 Effects of foreign body	13	28.5	12.4	44.6	21	45.9	25.3	66.5
T20-T32 Burns & corrosions	31	71.2	45.3	97.1	29	55.5	33.8	77.3
T36-T65 Poisonings & toxic effects	47	109.5	74.6	144.4	40	80.1	54.3	105.8
T66-T78 Other and unspecified effects of external causes	15	33.0	15.8	50.3	18	29.9	15.4	44.4
T79 Early complications of trauma	4	7.6	0.1	15.1	4	8.9	3.2	24.7
T80-T88 Complications of care	30	63.9	40.4	87.4	48	90.1	62.9	117.3
Specific common injuries (top 50%)								
S01 Open wound of head	58	135.7	97.2	174.2	77	149.6	113.9	185.2
S06 Intracranial injury	35	81.0	51.1	110.9	51	96.3	68.3	124.4
S42 Fracture of shoulder and upper arm	55	124.2	90.1	158.3	91	188.7	147.2	230.1
S52 Fracture of forearm	149	349.8	285.4	414.2	151	292.2	242.8	341.6
S61 Open wound of wrist and hand	50	117.5	83.9	151.2	51	96.6	68.2	125.1
S62 Fracture of wrist and hand level	34	71.9	46.9	96.9	46	82.8	57.3	108.4
S72 Fracture of femur	26	55.2	33.3	77.1	15	24.2	11.3	37.2
S82 Superficial injury of lower leg	50	107.8	77.0	138.6	45	80.0	55.3	104.8
T81 Complications of procedures, NEC	15	33.3	16.0	50.6	25	47.6	27.8	67.4
External causes								
W00-W19 Falls	362	824.5	731.7	917.3	428	818.9	736.1	901.6
W20-W49 Exposure to inanimate mechanical forces	231	567.5	487.9	647.1	248	472.9	410.0	535.8
W50-W64 Exposure to animate mechanism forces	92	222.8	174.0	271.7	80	157.5	120.9	194.1
W65-74 Drowning & submersion	7	15.8	3.7	27.9	1	2.6	0.4	18.7
W75-84 Other accidental threats to breathing	3	8.7	2.7	27.8	7	15.2	3.3	27.1
W85-99 Exposure to electricity & extreme temperature	2	3.5	0.9	14.0	0	0.0	0.0	0.0
X00-09 Exposure to smoke, fire, & flames	4	7.5	0.1	15.0	2	2.6	0.6	10.4

Disease	Passive smokers ³			Non smokers ⁴			Comparison				
	Hosp. No ¹	Rate ²	95 CI	Hosp. No ¹	Rate ²	95 CI	RR	95 CI			
X10-19 Contact with heat & hot substances X20-X29 Contact with venomous animals and plants X30-X39 Exposure to forces of nature X40-49 Accidental poisoning X50-57 Overexertion, travel and privation X58-59 Accidental exposure to other and unspecified factors X60-X84 Intentional self-harm X85-Y09 Assault Y10-Y34 Event of undetermined intent	26	58.3	35.2	81.5	47.1	26.7	67.5	1.24	0.69	2.23	
	4	8.6	3.2	23.4	5.7	1.4	22.8	1.51	0.27	8.36	
	2	3.8	0.9	15.1	4.0	1.0	16.0	0.95	0.13	6.79	
	44	104.4	70.0	138.9	72.9	48.4	97.4	1.43	0.89	2.29	
	12	22.9	9.7	36.0	33.2	18.4	48.1	0.69	0.33	1.42	
	35	73.9	48.8	99.0	68.6	44.0	93.3	1.08	0.66	1.77	
	7	13.1	3.4	22.8	13.0	2.6	23.5	1.01	0.34	3.01	
	24	52.3	30.6	74.0	57.3	34.1	80.6	0.91	0.51	1.63	
	4	8.3	3.0	22.7	3.9	0.9	16.5	2.12	0.37	12.23	
	Specific external causes W22 Striking against other objects W23 Caught, crushed, jammed or pinched W25 Contact with sharp glass W50 Hit by another person W54 Bitten or struck by dog W85-W87 Exposure to electric current X31 Exposure to excessive natural cold X50 Overexertion and strenuous or repetitive movements Y04 Assault by bodily force	22	52.2	29.7	74.8	52.0	32.3	71.7	1.00	0.56	1.78
		78	201.0	151.8	250.2	168.3	130.2	206.4	1.19	0.86	1.67
		47	112.7	79.4	146.0	76.2	51.9	100.5	1.48	0.96	2.28
18		48.1	22.1	74.2	27.5	12.3	42.8	1.75	0.81	3.79	
17		37.5	19.1	55.9	25.6	10.3	40.9	1.47	0.68	3.17	
2		3.5	0.9	14.0	0.0	0.0	0.0	--	--	--	
2		3.8	0.9	15.1	1.8	0.3	12.7	2.12	0.19	23.37	
12		22.9	9.7	36.0	33.2	18.4	48.1	0.69	0.33	1.42	
12		25.0	10.3	39.6	24.0	8.8	39.3	1.04	0.44	2.47	
Other specific external causes (including top 50%) V01-V09 Pedestrian injuries V10-V99 Other transport injuries V03 Pedestrian injured collision with car, truck or van V43 Car occupant injured in collision with car, pick-up truck or van Y40 Systemic antibiotics Y45 Analgesic agent Y52 Cardiovascular agent Y83 Surgical operation Y84 Other medical procedure		42	101.5	67.3	135.7	73.7	49.3	98.1	1.38	0.86	2.21
		83	173.2	133.2	213.2	193.1	152.2	234.0	0.90	0.66	1.23
		35	86.1	54.0	118.2	57.5	36.3	78.7	1.50	0.89	2.53
	15	29.5	14.4	44.6	28.5	12.3	44.7	1.03	0.48	2.22	
	15	39.8	19.2	60.4	31.0	16.3	45.6	1.28	0.64	2.59	
	1	1.8	0.3	12.7	3.9	1.3	12.1	0.46	0.05	4.39	
	0	0.0	0.0	0.0	1.3	0.2	9.4	--	--	--	
	41	88.0	60.2	115.8	115.8	84.5	147.1	0.76	0.50	1.15	
	6	16.1	2.9	29.4	32.3	17.9	46.6	0.50	0.20	1.27	
	Total	4803	11268.9	10924.3	11613.4	10912.7	10611.0	11214.4	1.03	0.99	1.08

¹Standard filter excludes overseas visitors, non-hospitalisations, waiting list admissions, irrelevant conditions and one-month readmissions

² Rate measured in case per 100 000 population per year. Rates and rate ratios shaded where number of events <10 as these rates are likely to be unstable. Rates and rate ratios based on numbers <40 should be interpreted with caution

³Passive smokers defined as children under 15 years old and at least one adult in their ticked smoking question as 'YES'

⁴Non smokers defined as children under 15 years old and all adults in their household ticked smoking question as 'NO'