

Chapter 6: Combined Cardiovascular Risk Factors

Key points

- Cardiovascular diseases such as coronary heart disease and stroke cause 44% of all deaths in New Zealand.
- The 1996/97 Health Survey provides information on four important risk factors for cardiovascular disease: cigarette smoking, high blood pressure, lack of physical activity and diabetes.
- More than half the adults in the 1996/97 Health Survey had none of these four risk factors, around a third had one risk factor, while the remainder had two or more risk factors.
- People over 65 years were more likely to have two or more risk factors for cardiovascular disease than younger people.
- Māori were more likely to have two or more risk factors, and less likely to have no risk factors, for cardiovascular disease than people from other ethnic groups.
- People in lower socioeconomic groups were more likely to have two or more cardiovascular risk factors regardless of whether socioeconomic status was measured in terms of family income, education or NZDep96 scores.

Introduction

Overall, 44% of all deaths in New Zealand can be attributed to cardiovascular disease (Bonita and Beaglehole 1998). The major cardiovascular diseases are coronary heart disease and stroke. There are substantial costs associated with cardiovascular disease in New Zealand: in the early 1990s, it was estimated that coronary heart disease cost between \$307 million and \$467 million per year (Scott et al 1993), and stroke cost between \$100 million and \$150 million (Scott 1994). In the last few decades there have been significant declines in death rates due to cardiovascular disease in New Zealand (Ministry of Health 1998). These declines have been attributed both to changes in the patterns of food, tobacco and alcohol consumption in New Zealand, and to improvements in the medical treatment of cardiovascular disease (Beaglehole 1986; Jackson and Beaglehole 1987).

A large number of risk factors for cardiovascular disease have been identified and many of these risk factors are interrelated (Ministry of Health 1998). Five of the most important risk factors are cigarette smoking, raised blood pressure, lack of physical activity, diabetes and high blood cholesterol (Ministry of Health 1998). The 1996/97 Health Survey provides information on the first four of these. The fifth, high blood cholesterol levels, was examined by the National Nutrition Survey, but this information was not available at the time of writing this report.

This chapter looks briefly at how the four risk factors for which we have information (smoking, physical inactivity, high blood pressure and diabetes) are clustered in the population. This gives a useful, simplified summary of the cardiovascular risk in the New Zealand population. The proportion of the population with none, one and two or more risk factors are given for the whole population and within specific sub-populations. The risk factors are defined in Table 32.

Because the definitions of high blood pressure and diabetes depend on people knowing they have these conditions, the prevalence of these, in particular, will have been under-estimated in the 1996/97 Health Survey. Specific information on each of these risk factors is available in the relevant chapters in this report.

Alcohol use was not included in this analysis because of its relatively complex relationship with cardiovascular disease. While high users of alcohol have an increased risk, moderate users, especially those aged over 45 years, may have a reduced risk (Anderson, 1996). For more detailed discussion on this, see Chapter 5: Alcohol Use.

The results of this chapter need to be interpreted with some care because the relative importance of each of these risk factors is not the same. Also, the analysis does not take account of other cardiovascular risk factors, nor the degree to which each risk factor is raised. This means that people with the same number of risk factors do not necessarily have the same risk for cardiovascular disease. For example, older people have a substantially higher risk for cardiovascular disease than younger people, regardless of their risk profile. It was not possible to analyse the data according to specific groupings of risk factors because of the small numbers involved in some categories.

Unless otherwise stated, age- and sex-standardised rates, and 95% confidence intervals in parentheses, are given in the text. Tables at the end of this section show key standardised and unstandardised estimates. More detailed tables related to this section are available on the Ministry of Health website (www.moh.govt.nz).

Table 32: Definitions and prevalence of cardiovascular risk factors from the 1996/97 Health Survey

Risk factor	Definition of risk factor	Proportion of risk factor in total population % (95% CI)
Smoking	Person was currently a smoker (one or more tobacco cigarettes a day) at time of 1996/97 Health Survey interview	24.9% (23.5–26.3)
Sedentary	Person reported doing no leisure-time physical activity in the week prior to Health Survey interview	15.3% (14.1–16.5)
High blood pressure	Person reported taking medication for high blood pressure at some time (excluding during pregnancy)	11.7% (10.7–12.7)
Diabetes	Person reported having been told by a doctor that they have diabetes (excluding during pregnancy)	3.7% (3.1–4.3)

Results

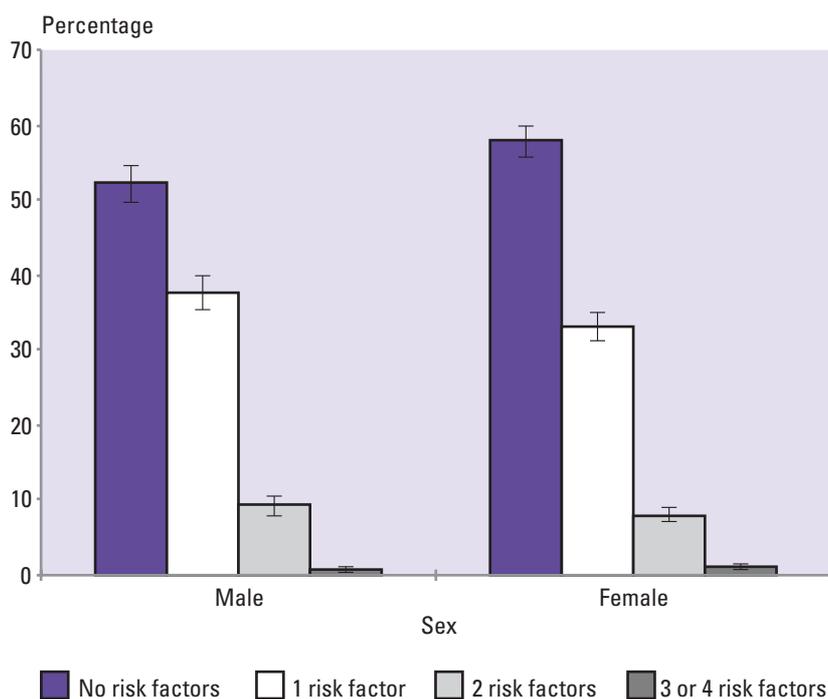
Combined cardiovascular risk factors

Risk factors by age and sex

In the 1996/97 Health Survey, 55.1% (53.5–56.7) of adults had none of these four cardiovascular risk factors, 35.3% (33.9–36.7) had one risk factor, 8.6% (7.8–9.4) had two risk factors and only 1.0% (0.8–1.2) had three or four risk factors. Females were slightly more likely than males to have no risk factors, and males were more likely than females to have one risk factor ($p < 0.01$). Similar proportions of males and females had two or more risk factors (see Figure 30).

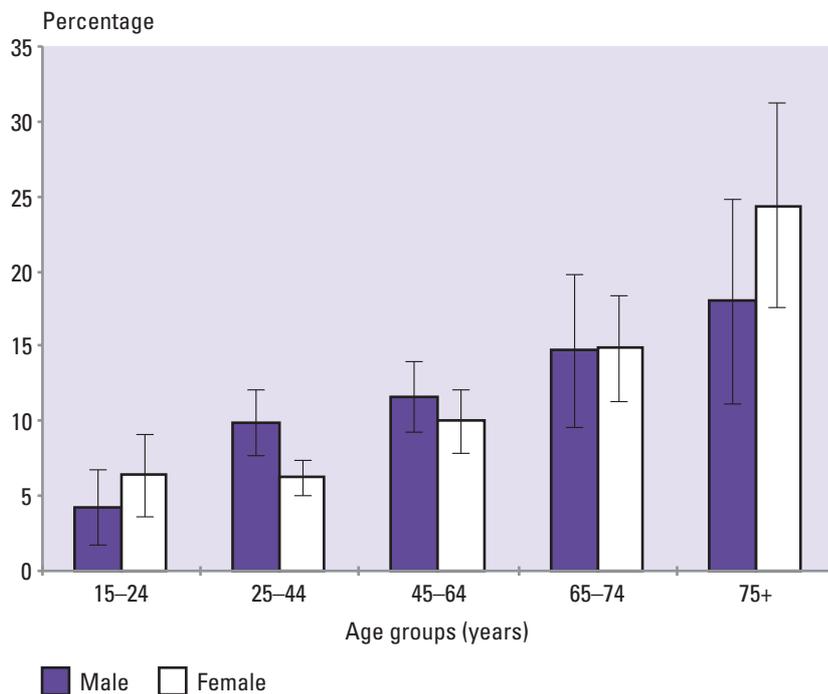
There was a much stronger relationship between the number of risk factors and age. For both sexes, people in the older age group were more likely to have two or more risk factors than those in younger age groups ($p < 0.0001$; see Figure 31). This age-related gradient was steeper for females than males. Because 87% of all deaths related to cardiovascular disease occur in people over the age of 65 years, reduction in risk factors is particularly important for this group (Bonita and Beaglehole 1998).

Figure 30: Number of cardiovascular risk factors, by sex (age-standardised)



Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Figure 31: Proportion of people with two or more cardiovascular risk factors, by age and sex

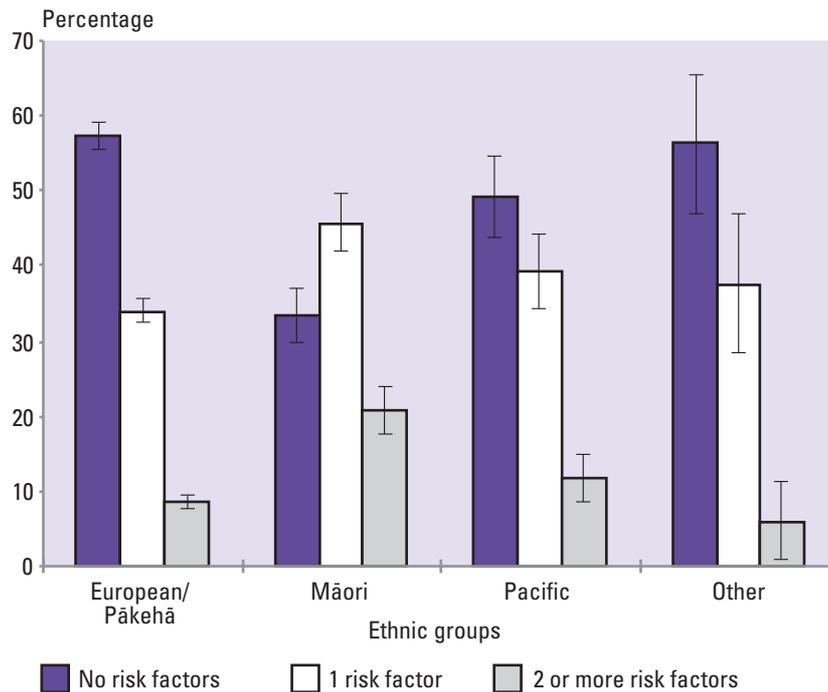


Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Risk factors by ethnicity

The number of cardiovascular risk factors varied significantly across ethnic groups. Māori people were more likely to have two or more risk factors, and less likely to have no risk factors, than European/Pākehā or Pacific people, or people from the Other ethnic group ($p < 0.0001$; see Figure 32). Pacific people were slightly more likely to have multiple risk factors than European/Pākehā people. This is consistent with a large work-force study which found that more Māori and Pacific people had multiple cardiovascular risk factors than European/Pākehā people (Bullen et al 1996).

Figure 32: Number of cardiovascular risk factors, by ethnicity (age- and sex-standardised)



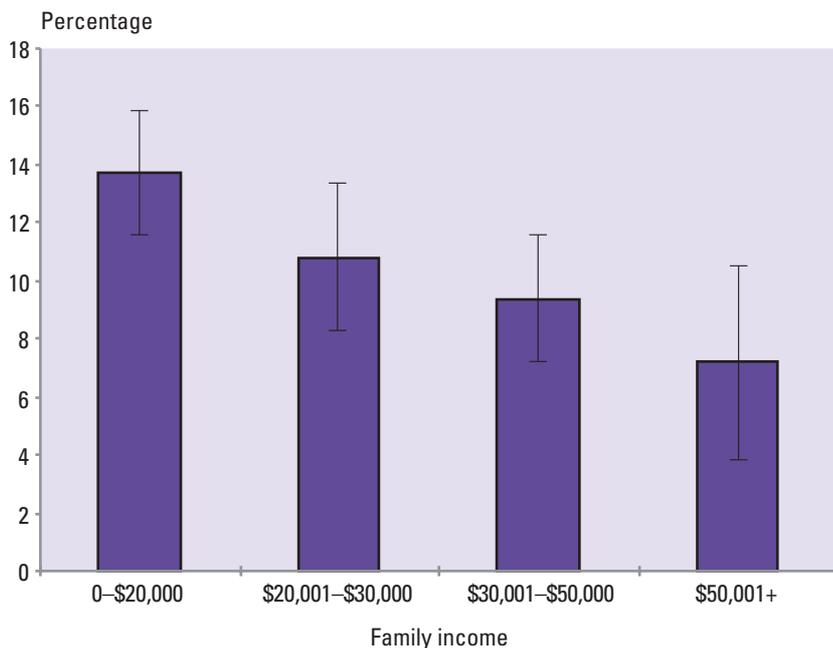
Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Risk factors by family income, education and NZDep96 score*

People in lower socioeconomic groups were more likely to have two or more cardiovascular risk factors, regardless of whether socioeconomic status was measured in terms of family income, educational status or NZDep96 scores (all $p < 0.0001$; see Figures 33, 34 and 35). This is consistent with findings in New Zealand that there is a strong gradient between ischaemic heart disease and socioeconomic status. This gradient increased between the mid-1970s and the mid-1980s (Kawachi et al 1991). Of note is that other studies have suggested that differences in cardiovascular mortality across socioeconomic groups can only be partially explained by the differences in the frequency of known risk factors (Suadicani et al 1994).

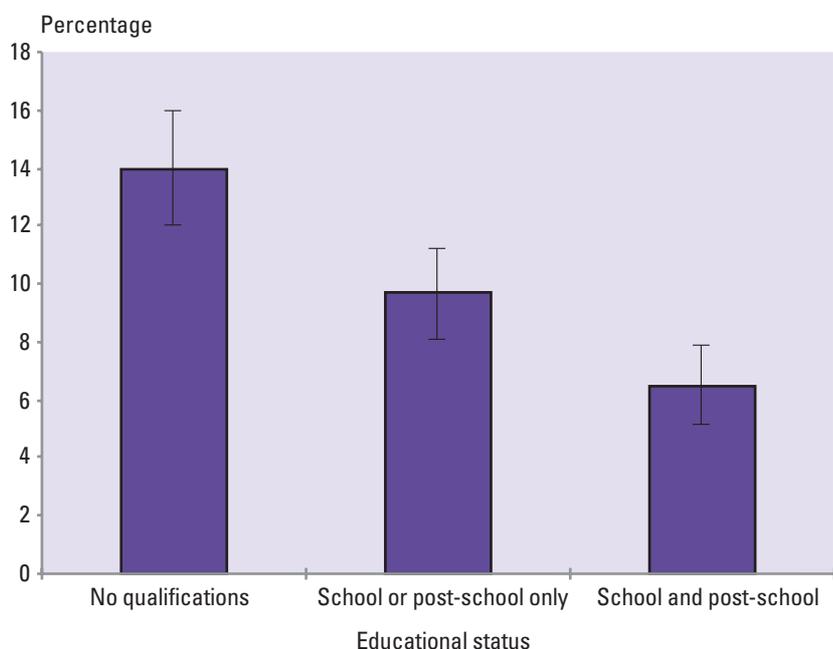
* The NZDep96 score measures the level of deprivation in the area in which a person lives, according to a number of census variables such as the proportion of people in that area who earn low incomes or who receive income support benefits, are unemployed, do not own their own home, have no access to a car, are single-parent families, or have no qualifications. The scores are divided into quartiles from 1 (least deprived) to 4 (most deprived). For more details, see Chapter 1: The Survey.

Figure 33: Proportion of people with two or more cardiovascular risk factors, by family income (age- and sex-standardised)



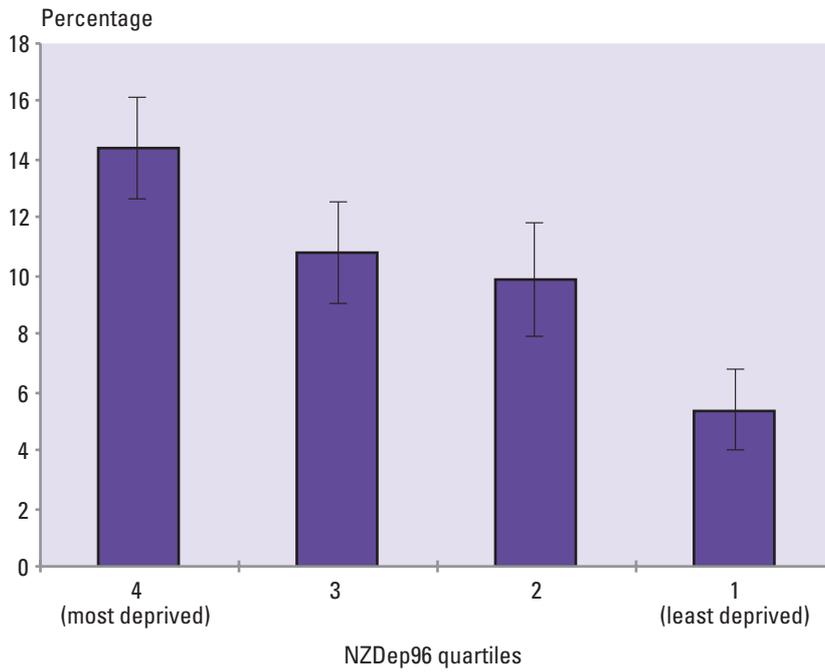
Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Figure 34: Proportion of people with two or more cardiovascular risk factors, by education (age- and sex-standardised)



Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Figure 35: Proportion of people with two or more cardiovascular risk factors, by NZDep96 score (age- and sex-standardised)



Note: Error bars indicate 95% confidence intervals. For further explanation of graphs, see Appendix 2: Notes to Figures and Tables.

Table 33: Number of cardiovascular risk factors, by sociodemographic variables: percent (95% confidence intervals)

	No risk factors			One risk factor			Two or more risk factors		
	%		Pop est	%		Pop est	%		Pop est
	(95% CI)			(95% CI)			(95% CI)		
	Unadj	Adj*		Unadj	Adj*		Unadj	Adj*	
Total	55.1 (53.5–56.7)		1,549,175	35.3 (33.9–36.7)		992,166	9.6 (8.6–10.6)		270,964
Sex									
Male	52.4 (50.0–54.8)	52.2 (49.8–54.6)	716,148	37.5 (35.1–39.9)	37.7 (35.3–40.1)	512,830	10.1 (8.7–11.5)	10.2 (8.8–11.6)	137,515
Female	57.6 (55.6–59.6)	57.8 (55.8–59.8)	833,027	33.2 (31.4–35.0)	33.1 (31.3–34.9)	479,336	9.2 (8.0–10.4)	9.1 (7.9–10.3)	133,449
Age									
15–24 years	64.2 (60.1–68.3)	64.1 (60.0–68.2)	336,214	30.5 (26.8–34.2)	30.5 (26.8–34.2)	159,947	5.3 (3.3–7.3)	5.3 (3.3–7.3)	27,741
25–44 years	58.1 (55.9–60.3)	58.1 (55.9–60.3)	661,000	33.8 (31.6–36.0)	33.8 (31.6–36.0)	384,734	8.0 (6.6–9.4)	8.0 (6.6–9.4)	91,058
45–64 years	52.0 (49.1–54.9)	52.1 (49.2–55.0)	388,819	37.2 (34.3–40.1)	37.1 (34.2–40.0)	278,020	10.8 (9.2–12.4)	10.8 (9.2–12.4)	80,988
65–74 years	43.3 (38.6–48.0)	42.9 (38.2–47.6)	105,555	41.9 (37.6–46.2)	42.3 (38.0–46.6)	102,161	14.8 (11.9–17.7)	14.8 (11.7–17.9)	36,110
75+ years	36.0 (31.1–40.9)	36.0 (31.1–40.9)	57,587	42.1 (36.8–47.4)	42.3 (37.0–47.6)	67,303	21.9 (16.6–27.2)	21.6 (16.5–26.7)	35,066
Ethnicity									
European/ Pākehā	56.6 (54.8–58.4)	57.4 (55.6–59.2)	1,279,020	34.3 (32.7–35.9)	33.9 (32.3–35.5)	775,244	9.0 (8.0–10.0)	8.7 (7.7–9.7)	203,939
Māori	36.4 (32.7–40.1)	33.4 (29.9–36.9)	100,893	45.9 (42.2–49.6)	45.8 (42.1–49.5)	127,483	17.7 (15.0–20.4)	20.8 (17.7–23.9)	49,170
Pacific	55.2 (50.3–60.1)	49.2 (43.7–54.7)	72,431	35.2 (30.7–39.7)	39.3 (34.2–44.4)	46,220	9.5 (7.0–12.0)	11.6 (8.5–14.7)	12,505
Other	66.6 (58.6–74.6)	56.3 (47.1–65.5)	96,830	29.7 (21.5–37.9)	37.7 (28.3–47.1)	43,219	3.7 (1.0–6.4)	6.0 (0.9–11.1)	5350
Family income									
0–\$20,000	41.7 (38.8–44.6)	44.6 (40.9–48.3)	209,459	42.2 (39.3–45.1)	41.6 (38.1–45.1)	211,820	16.2 (14.2–18.2)	13.7 (11.5–15.9)	81,241
\$20,001–\$30,000	48.6 (44.9–52.3)	49.3 (45.2–53.4)	183,789	40.3 (36.8–43.8)	39.9 (36.0–43.8)	152,585	11.1 (8.7–13.5)	10.8 (8.3–13.3)	41,991
\$30,001–\$50,000	56.9 (53.6–60.2)	57.0 (53.5–60.5)	303,526	33.6 (30.7–36.5)	33.6 (30.5–36.7)	179,219	9.6 (7.4–11.8)	9.4 (7.2–11.6)	50,991
\$50,001+	65.5 (62.6–68.4)	63.2 (59.1–67.3)	568,937	29.2 (26.5–31.9)	29.6 (26.1–33.1)	253,468	5.3 (3.9–6.7)	7.2 (3.9–10.5)	46,159
NZDep96 score									
1 (least deprived)	66.2 (62.9–69.5)	66.4 (63.1–69.7)	532,399	28.6 (25.5–31.7)	28.2 (25.1–31.3)	230,395	5.2 (3.8–6.6)	5.4 (4.0–6.8)	41,425
2	54.2 (51.1–57.3)	54.2 (50.9–57.5)	379,678	35.9 (33.2–38.6)	35.8 (32.9–38.7)	251,214	9.9 (7.9–11.9)	9.9 (7.9–11.9)	68,984
3	53.9 (51.0–56.8)	53.9 (51.0–56.8)	340,658	35.3 (32.6–38.0)	35.3 (32.6–38.0)	223,549	10.8 (9.0–12.6)	10.8 (9.0–12.6)	68,261
4 (most deprived)	43.9 (41.5–46.3)	42.7 (40.3–45.1)	296,440	42.5 (40.1–44.9)	42.8 (40.4–45.2)	287,008	13.7 (12.1–15.3)	14.4 (12.6–16.2)	92,295
Education									
No qualification	41.8 (39.3–44.3)	42.0 (39.3–44.7)	335,039	43.6 (41.1–46.1)	44.0 (41.3–46.7)	349,471	14.7 (12.9–16.5)	14.0 (12.0–16.0)	117,839
School or post-school only	55.3 (52.6–58.0)	51.6 (48.9–54.3)	556,160	35.6 (33.1–38.1)	38.7 (36.0–41.4)	358,437	9.1 (7.7–10.5)	9.7 (8.1–11.3)	91,610
School and post-school	65.5 (62.8–68.2)	64.1 (61.2–67.0)	649,645	28.4 (25.9–30.9)	29.4 (26.7–32.1)	281,724	6.1 (4.9–7.3)	6.5 (5.1–7.9)	60,141

* Adjusted rates are adjusted for age and sex, except when they are age-specific, in which case they are adjusted only for sex, or when they are sex-specific, in which case they are adjusted only for age.

Note: For further explanation of Tables, see Appendix 2: Notes to Figures and Tables.

Table 34: Number of cardiovascular risk factors among males, by sociodemographic variables: percent (95% confidence intervals)

Males	No risk factors			One risk factor			Two or more risk factors		
	%		Pop est	%		Pop est	%		Pop est
	(95% CI)			(95% CI)			(95% CI)		
	Unadj	Adj*		Unadj	Adj*		Unadj	Adj*	
Total	52.4 (50.0–54.8)	52.2 (49.8–54.6)	716,148	37.5 (35.1–39.9)	37.7 (35.3–40.1)	512,830	10.1 (8.7–11.5)	10.2 (8.8–11.6)	137,515
Age									
15–24 years	64.9 (59.0–70.8)		170,707	30.9 (25.4–36.4)		81,359	4.2 (1.7–6.7)		11,011
25–44 years	54.3 (50.8–57.8)		299,597	35.8 (32.5–39.1)		197,618	9.9 (7.7–12.1)		54,698
45–64 years	47.9 (43.2–52.6)		178,402	40.4 (35.9–44.9)		150,554	11.6 (9.2–14.0)		43,347
65–74 years	38.2 (31.5–44.9)		44,544	47.1 (40.4–53.8)		54,901	14.7 (9.6–19.8)		17,190
75+ years	36.6 (28.4–44.8)		22,898	45.4 (36.8–54.0)		28,398	18.0 (11.1–24.9)		11,270
Ethnicity									
European/ Pākehā	53.0 (50.3–55.7)	53.4 (50.7–56.1)	581,694	37.3 (34.8–39.8)	37.0 (34.5–39.5)	409,556	9.8 (8.2–11.4)	9.7 (8.1–11.3)	107,263
Māori	40.2 (34.1–46.3)	36.3 (30.6–42.0)	52,804	43.9 (38.0–49.8)	44.2 (38.5–49.9)	57,701	16.0 (11.7–20.3)	19.4 (14.5–24.3)	21,008
Pacific	50.1 (42.8–57.4)	42.0 (34.7–49.3)	32,511	39.1 (32.0–46.2)	45.4 (37.6–53.2)	25,333	10.8 (6.5–15.1)	12.6 (7.5–17.7)	7,006
Other	68.6 (56.4–80.8)	56.2 (41.9–70.5)	49,139	28.3 (16.5–40.1)	38.4 (24.1–52.7)	20,240	3.1 (0.2–6.0)	5.4 (0.0–12.7)	2,237

* Adjusted rates are adjusted for age.

Note: For further explanation of Tables, see Appendix 2: Notes to Figures and Tables.

Table 35: Number of cardiovascular risk factors among females, by sociodemographic variables: percent (95% confidence intervals)

Females	No risk factors			One risk factor			Two or more risk factors		
	%		Pop est	%		Pop est	%		Pop est
	(95% CI)			(95% CI)			(95% CI)		
	Unadj	Adj*		Unadj	Adj*		Unadj	Adj*	
Total	57.6 (55.6–59.6)	57.8 (55.8–59.8)	833,027	33.2 (31.4–35.0)	33.1 (31.3–34.9)	479,336	9.2 (8.0–10.4)	9.1 (7.9–10.3)	133,449
Age									
15–24 years	63.5 (57.8–69.2)		165,507	30.1 (24.8–35.4)		78,589	6.4 (3.7–9.1)		16,730
25–44 years	61.8 (59.1–64.5)		361,403	32.0 (29.3–34.7)		187,116	6.2 (5.0–7.4)		36,361
45–64 years	56.0 (52.1–59.9)		210,416	33.9 (30.2–37.6)		127,466	10.0 (7.8–12.2)		37,641
65–74 years	48.0 (41.9–54.1)		61,012	37.2 (31.7–42.7)		47,260	14.9 (11.4–18.4)		18,920
75+ years	35.6 (29.7–41.5)		34,689	39.9 (33.4–46.4)		38,905	24.4 (17.5–31.3)		23,797
Ethnicity									
European/ Pākehā	60.1 (57.7–62.5)	61.2 (58.8–63.6)	697,326	31.5 (29.3–33.7)	31.1 (28.9–33.3)	365,688	8.3 (7.1–9.5)	7.7 (6.5–8.9)	96,676
Māori	32.9 (28.8–37.0)	30.7 (26.6–34.8)	48,089	47.8 (43.5–52.1)	47.2 (42.5–51.9)	69,782	19.3 (16.0–22.6)	22.2 (18.5–25.9)	28,162
Pacific	60.2 (54.1–66.3)	56.0 (49.1–62.9)	39,921	31.5 (26.2–36.8)	33.5 (27.4–39.6)	20,887	8.3 (5.2–11.4)	10.6 (6.7–14.5)	5,499
Other	64.6 (53.4–75.8)	56.4 (44.1–68.7)	47,691	31.1 (19.9–42.3)	37.0 (24.7–49.3)	22,979	4.2 (0.0–8.7)	6.6 (0.0–14.2)	3,112

* Adjusted rates are adjusted for age.

Note: For further explanation of Tables, see Appendix 2: Notes to Figures and Tables.

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