

6 ALCOHOL USE DISORDERS IDENTIFICATION TEST

KEY RESULTS

- A fifth of the population (20.0%) drank hazardously in the past 12 months, as assessed by scores on the Alcohol Use Disorders Identification Test (AUDIT).
- Hazardous drinking was more common among males, younger people and people with medium levels of education.
- People with lower equivalised household incomes and people living in more deprived areas were less likely to drink but more likely to drink hazardously if they did drink.
- Māori and the Other composite ethnic group were equally likely to have drunk in the past 12 months (about 80%) but just over half of Pacific people drank in the past 12 months. Even after adjustment for sociodemographic correlates the prevalence of hazardous drinking was higher for Māori drinkers (35.6%) and Pacific drinkers (32.6%) than for Other drinkers (23.4%).
- The AUDIT discriminated very effectively between cases and non-cases for alcohol disorder and for alcohol dependence (area under the curve ≥ 0.96), but, as intended, also detected other people with hazardous or harmful drinking who did not meet criteria for a DSM-IV alcohol disorder.
- If a cut-point on the AUDIT was to be used to indicate alcohol disorder or dependence then a cut-point higher than the standard cut-point of a score of 8 or more should be used.

6.1 INTRODUCTION

When considering the health state of individuals and populations, it is often useful to have continuous measures of ill-health or symptoms, as well as categories of disorder. This is for several related reasons. First, some types of health state are best thought of as points on a continuum, for instance, high blood pressure or high cholesterol. Second, for some disorders it is not possible to demonstrate a clear boundary between states of good health or ill-health (Kendell & Jablensky, 2003; Kendell, 1989). Third, dichotomising into case or non-cases, on the basis of a pre-determined cut-point, leads to a loss of statistical information. Fourth, in population-based public health interventions, it is important to have information on the total distribution of symptoms, as effective interventions may target the whole population, including individuals with mild and moderate levels of symptom, as well as individuals with severe symptom levels

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(Rose, 2001). People with mild or moderate symptom levels may be 'sub-threshold' and not meet criteria for disorder when standard classification systems of disorder are used.

One aim of Te Rau Hinengaro: The New Zealand Mental Health and Wellbeing Survey was to trial short instruments that could be used in repeated generic health surveys to monitor changes in the mental health status of the population. Given the complexity of the Composite International Diagnostic Interview (CIDI) 3.0 (see 1.6.3 and 2006, section 13.4) and the average time taken to complete the questionnaire, it would not be a suitable instrument for such a task. For use as a health surveillance tool, an instrument needs to:

- be quick and simple to administer
- have well-defined psychometric properties
- predict, with acceptable accuracy, the probability that a participant in a health survey has a mental disorder.

The Kessler 10-item scale (K10) is an instrument developed for this task to measure psychological distress. It takes a few minutes to complete, its psychometric properties are now well described (Andrews & Slade, 2001; Furukawa, Kessler, Slade, & Andrews, 2003; Kessler et al., 2002) and it is a very good predictor of the respondent meeting DSM-IV criteria for anxiety and mood disorders (see 1.6.1 about the *Diagnostic and statistical manual of mental disorders* (DSM)). However, it is less effective as a predictor of a substance use disorder. For this reason, the Alcohol Use Disorders Identification Test (AUDIT) was also used in the New Zealand survey. Furthermore the AUDIT had been used in both the 1996/97 and 2002/03 New Zealand Health Surveys (Minister of Health, 1999; Ministry of Health, 2004b) and is being used in the 2006/07 New Zealand Health Survey. Therefore, the Ministry of Health wanted to know the relationship between the AUDIT and diagnoses of alcohol disorders.

This chapter presents the results for the AUDIT. Two sets of relationships are reported.:

- sociodemographic correlates and the AUDIT
- the AUDIT and CIDI-diagnosed disorders.

These results show how the AUDIT varies across groups within New Zealand and how the AUDIT relates to disorder.

6.2 ALCOHOL USE DISORDERS IDENTIFICATION TEST

The AUDIT was developed to make early intervention possible by identifying hazardous and harmful drinking. Primary care is the most likely setting for such early intervention so the test development was carried out in a World Health Organization study in primary care settings in six countries (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). Most of the subsequent research using the AUDIT has also been carried out in clinical settings (Allen, Litten, Fertig, & Babor, 1997; Reinert & Allen, 2002). Nonetheless the AUDIT has also been used in epidemiological studies to estimate rates of hazardous and harmful drinking in various populations (Reinert & Allen, 2002) and its test-retest reliability is acceptable in a general population sample (Selin, 2003).

The AUDIT is a 10-item scale (see Appendix A) that assesses three domains: alcohol intake (items 1–3), dependence (items 4–6) and adverse consequences (7–10 items). The questions focus on consumption and problems in the past 12 months. The range of scores per question is

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0–4 with totals of 0–40. A longitudinal study of subsequent outcomes indicated that scores of 8 or more indicated a potential alcohol problem (ie, hazardous drinking) and this cut-point has been accepted generally (Reinert & Allen, 2002). Note that a score of 8 can be obtained from the alcohol consumption items alone. Someone who drank six or more drinks twice a week would have a score of 8 made up from the following question scores: Q1 = 3; Q2 = 2; Q3 = 3.

In the two previous New Zealand surveys (Minister of Health, 1999; Ministry of Health, 2004b) and in this survey participants were asked the AUDIT questions only if they had drunk alcohol in the past 12 months. Participants who had not drunk alcohol in the past 12 months were assigned an AUDIT score of zero. To reach the AUDIT questions in this survey, a participant had to have ever drunk 12 or more drinks in a year, been randomised to the AUDIT instead of the CIDI 3.0 consumption questions, and to have drunk alcohol in the past 12 months (see 1.5.1).

Participants who had never drunk 12 drinks or more in a year were not asked about the previous 12 months and were categorised as abstainers.

One-fifth of the population (20.0%) aged 16 and over scored positive for hazardous drinking on the AUDIT. In the short screener section of the interview only 15.1% reported ever experiencing problems with alcohol or drugs and the prevalence of DSM-IV CIDI 3.0 alcohol disorder in the past 12 months was 2.6% for alcohol abuse and 1.3% for alcohol dependence. The AUDIT detects hazardous drinking in addition to problems arising from drinking, not just problems serious enough to result in a DSM-IV diagnosis. This is what it was designed to do.

6.3 CORRELATES OF ALCOHOL USE DISORDERS IDENTIFICATION TEST SCORES

6.3.1 Hazardous drinking and sociodemographic correlates

Table 6.1 shows the overall percentage with AUDIT scores for hazardous drinking (ie, a score of 8 or more) by sex, age, educational qualification and equivalised household income. The overall percentage is calculated over drinkers and abstainers combined. It depends on the percentage who were drinkers and the percentage of drinkers with hazardous drinking.

For the overall percentage with hazardous drinking, there were significant differences on all socioeconomic correlates ($p < .0001$) except for income ($p = .6$). Males had more than double the percentage above the cut-point relative to females (28.0% compared with 12.5%). There was a clear and steep gradient with age, from 38.3% of the age group 16–24 above the cut-point to only 4.4% of the age group 65 and over. Those with a middle level of educational qualification had the highest percentage above the cut-point.

The gender difference arose in part because a greater percentage of males had drunk in the past year than females (84.8% compared with 73.7%). However, the major contributor was that males who did drink were nearly twice as likely to be hazardous drinkers than females (33.2% compared with 16.8%). Age groups differed little in the percentage drinking, except for the oldest age group, so the overall percentages with hazardous drinking were dominated by the scores for the drinkers. For education, those without qualifications were less likely to drink, but if they did drink they were as likely to be hazardous drinkers as those with mid-level qualifications. The percentage drinking increased steadily as equivalised household income rose (67.9% to 89.3%), whereas the percentage of hazardous drinkers declined from 32.4% to 22.7%. The pattern of drinking in some groups may account for some of these differences. Surveys of

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drinking behaviour (Casswell, Pledger, & Hooper, 2003; Minister of Health, 1999) have shown that lower socioeconomic groups drink less often than other groups, but tend to drink more heavily when they do drink.

Although the prevalence of hazardous drinking in the population in the past 12 months (20.0%) is much higher than that for alcohol disorder (2.9%), the pattern of results for individual sociodemographic characteristics is similar for both of these outcomes: prevalences are higher for males, younger people and people with less education. However, the prevalence of hazardous drinking does not differ across equivalised income groups whereas the prevalence of alcohol disorder is higher in those with less income.

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Table 6.1: *Percentage with Alcohol Use Disorders Identification Test (AUDIT) scores for hazardous drinking, by sociodemographic correlates*

Correlate	Percentage with hazardous drinking ^{1,2} % (95% CI)	Percentage who drank alcohol in past 12 months ³ (drinkers) % (95% CI)	Percentage with hazardous drinking ^{1,2} among drinkers ³ % (95% CI)
Individual characteristics			
Sex			
Male	28.0 (26.0, 30.2)	84.8 (83.5, 86.0)	33.2 (30.7, 35.7)
Female	12.5 (11.2, 13.9)	73.7 (72.3, 75.1)	16.8 (15.1, 18.7)
Age group (years)			
16–24	38.3 (34.1, 42.8)	78.7 (75.8, 81.3)	48.6 (43.4, 53.9)
25–44	23.3 (21.3, 25.4)	82.3 (80.8, 83.7)	28.2 (25.8, 30.7)
45–64	13.2 (11.5, 15.1)	80.8 (79.2, 82.4)	16.2 (14.2, 18.5)
65 and over	4.4 (3.4, 5.9)	67.4 (65.0, 69.6)	6.7 (5.1, 8.8)
Educational qualifications ⁴			
None	20.1 (17.7, 22.7)	71.2 (69.1, 73.3)	28.8 (25.4, 32.5)
School or post-school only	23.5 (21.3, 25.9)	79.8 (78.2, 81.3)	29.4 (26.7, 32.3)
Both school and post-school	17.0 (15.2, 18.9)	81.7 (80.2, 83.1)	20.7 (18.5, 23.0)
Equivalentised household income ⁴			
Under half of median	21.6 (18.7, 24.8)	67.9 (65.5, 70.1)	32.4 (28.3, 36.7)
Half median to median	19.5 (17.2, 22.0)	74.1 (72.2, 75.9)	26.1 (23.2, 29.2)
Median to one and a half times median	18.8 (16.4, 21.6)	82.8 (80.9, 84.5)	22.8 (19.8, 26.1)
One and a half times median and over	20.4 (18.1, 22.9)	89.3 (87.9, 90.5)	22.7 (20.2, 25.4)
Total	20.0 (18.7, 21.4)	79.0 (78.0, 80.0)	25.3 (23.6, 27.0)

1 An AUDIT score of 8 or more.

2 Assessed in a random sample of participants, see 1.5.1.

3 Those who had never drunk 12 or more drinks in a year were counted as abstainers for the past 12 months, see 1.5.1.

4 Sociodemographic correlates are defined in 1.6.9.

6.3.2 Hazardous drinking and ethnicity

Unadjusted and adjusted prevalences are presented by ethnicity in Table 6.2. Adjustment reduced, but did not eliminate, differences across ethnic groups. With or without adjustment the pattern was for Pacific people to have a much lower prevalence of drinking in the past 12 months than Māori or the Other composite ethnic group (with full adjustment, 55.6% compared with 81.6% and 80.1% respectively; $p < .0001$). However, those Pacific people who did drink had a percentage with hazardous drinking (32.6%) that was close to that for Māori (35.6%) ($p = .3$) and much higher than for Others (23.4%) ($p = .0002$). The net result was that overall percentages for hazardous drinking for Pacific people were close to those for Others and below those for Māori, but this similarity in the overall percentage for Pacific people and Others conceals very different component patterns.

For all three outcomes in Table 6.2 the same pattern of results was seen for all the ethnic groups for educational qualification and equivalised household income. Males were more likely to drink and to drink hazarously than females in all ethnic groups. Nonetheless the pattern seen for the percentage drinking in the past 12 months was as reported in other New Zealand surveys (Huakau et al., 2005; Huakau et al., 2004; Ministry of Health, 2004b) with a larger difference between Pacific males and females than for Māori or Other males and females, although this was not significant when all three groups were compared together ($p = .1$). Among Pacific people, 63.4% of males drank but only 42.0% of females, whereas the percentages were 84.6% and 76.5% for Māori and 85.5% and 75.5% for Others. With increasing age, there was a much steeper decrease in the percentage who had drunk alcohol in the past 12 months for Māori and Pacific people than for Others ($p < .0001$), but this relationship was not seen for the overall prevalence of hazardous drinking ($p = .2$) or the prevalence among drinkers ($p = .2$).

Table 6.2: Percentage with Alcohol Use Disorders Identification Test (AUDIT) scores for hazardous drinking, by prioritised ethnicity

	Percentage with hazardous drinking ^{1,2} % (95% CI)	Percentage who drank alcohol in past 12 months ³ (drinkers) % (95% CI)	Percentage with hazardous drinking ^{1,2} among drinkers ³ % (95% CI)
Unadjusted			
Māori	35.4 (31.9, 38.9)	80.2 (77.8, 82.7)	44.1 (40.1, 48.1)
Pacific	21.4 (17.6, 25.1)	51.6 (47.2, 56.1)	41.4 (35.7, 47.1)
Other	17.9 (16.4, 19.3)	80.4 (79.1, 81.6)	22.2 (20.5, 24.0)
Adjusted for age and sex			
Māori	31.2 (28.1, 34.3)	79.0 (76.4, 81.5)	38.6 (35.0, 42.2)
Pacific	19.0 (15.8, 22.3)	50.4 (46.1, 54.8)	34.7 (29.9, 39.5)
Other	18.4 (16.9, 19.8)	80.6 (79.3, 81.9)	22.9 (21.1, 24.7)
Adjusted for age, sex, educational qualification⁴ and equivalised household income⁴			
Māori	29.6 (26.4, 32.8)	81.6 (79.2, 84.0)	35.6 (32.0, 39.3)
Pacific	18.1 (14.8, 21.3)	55.6 (51.3, 59.9)	32.6 (27.9, 37.3)
Other	18.6 (17.1, 20.1)	80.1 (78.7, 81.4)	23.4 (21.5, 25.2)

1 An AUDIT score of 8 or more.

2 Assessed in a random sample of participants, see 1.5.1.

3 Those who had never drunk 12 or more drinks in a year were counted as abstainers for the past 12 months, see 1.5.1.

4 Sociodemographic correlates are defined in 1.6.9.

6.3.3 Hazardous drinking and area characteristics

AUDIT results are presented by area characteristics in Table 6.3. The percentage drinking in the past 12 months varied significantly by region, urbanicity and deprivation (all $p < .0001$). The North had the lowest percentage of drinkers, reflecting the presence of Pacific people in the Auckland area. Other regions did not differ from each other. Drinking was more common in minor towns and rural areas than in main and secondary urban centres. As with equivalised

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household income, there was a clear gradient across levels of deprivation, with those living in more deprived areas being less likely to drink (71.6% for those in deciles 9 and 10 compared with 83.0% for those in deciles 1 and 2).

The percentage of drinkers with hazardous drinking did not differ by region ($p = .95$) or urbanicity ($p = .09$) and the overall percentage with hazardous drinking also did not differ by region ($p = .3$) or urbanicity ($p = .3$). Drinkers living in more deprived areas were much more likely to drink hazardously ($p < .0001$): 35.2% down to 16.3%. In spite of a lower percentage drinking in more deprived areas the opposite gradient for high AUDIT scores in those who did drink resulted in a gradient for the overall percentage whereby more deprived areas had higher percentages drinking hazardously (25.3%–13.7%).

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Table 6.3: *Percentage with Alcohol Use Disorders Identification Test (AUDIT) scores for hazardous drinking, by area characteristics*

Correlate	Overall percentage with hazardous drinking ^{1,2} % (95% CI)	Percentage who drank alcohol in the past 12 months ³ (drinkers) % (95% CI)	Percentage with hazardous drinking ^{1,2} among drinkers ³ % (95% CI)
Area characteristics			
NZDep2001 deciles ⁴			
9 and 10 (most deprived)	25.3 (22.2, 28.6)	71.6 (69.1, 73.9)	35.2 (31.0, 39.8)
7 and 8	22.8 (19.7, 26.4)	76.1 (73.7, 78.3)	29.9 (25.8, 34.4)
5 and 6	19.8 (17.4, 22.4)	81.4 (79.2, 83.4)	24.5 (21.7, 27.6)
3 and 4	19.4 (16.4, 22.9)	81.8 (79.5, 83.9)	23.7 (20.1, 27.7)
1 and 2 (least deprived)	13.7 (11.3, 16.5)	83.0 (80.9, 85.0)	16.3 (13.5, 19.6)
Urbanicity ⁴			
Major	20.4 (18.8, 22.1)	78.1 (76.8, 79.3)	26.2 (24.2, 28.3)
Secondary	17.8 (13.7, 22.9)	76.4 (72.7, 79.7)	22.7 (17.3, 29.1)
Minor	21.7 (16.8, 27.5)	81.8 (79.0, 84.4)	26.0 (20.2, 32.8)
Other (rural)	17.6 (14.6, 21.0)	84.2 (81.8, 86.4)	20.9 (17.4, 24.9)
Region ⁴			
North	18.2 (16.0, 20.7)	73.6 (71.7, 75.5)	24.6 (21.7, 27.9)
Midland	20.6 (18.0, 23.6)	80.5 (78.3, 82.4)	25.8 (22.4, 29.4)
Central	20.3 (17.7, 23.3)	82.2 (80.3, 84.0)	25.1 (21.8, 28.6)
South	21.7 (19.0, 24.8)	83.1 (81.3, 84.8)	25.8 (22.5, 29.3)
Total	20.0 (18.7, 21.4)	79.0 (78.0, 80.0)	25.3 (23.6, 27.0)

1 An AUDIT score of 8 or more.

2 Assessed in a random sample of participants, see 1.5.1.

3 Those who had never drunk 12 or more drinks in a year were counted as abstainers for the past 12 months, see 1.5.1.

4 Sociodemographic correlates are defined in 1.6.9.

6.4 ALCOHOL USE DISORDERS IDENTIFICATION TEST SCORES AND 12-MONTH MENTAL DISORDERS

Participants who did not drink alcohol in the past 12 months could not have had problems resulting from their drinking in that period. In Table 6.4 only those who drank in the past 12 months are included. The relationship with alcohol abuse (with or without dependence) and alcohol dependence is of primary interest. Drug disorder and any disorder are included in Table 6.4 to see to what extent comorbidity with alcohol consumption and problems produces a relationship between AUDIT scores and these disorders. Anyone who drank in the past 12 months had to score at least 1 on the AUDIT; a score of 1 indicates someone who drank monthly or less and did not score on any other questions.

The distribution of AUDIT scores in drinkers was quite skewed. Only 11.8% scored the minimum of 1. From a score of 6 and above, the percentage of drinkers declined with only 2.2% scoring 20 or more.

Table 6.4: Correspondence between Alcohol Use Disorders Identification Test (AUDIT) scores in drinkers and the prevalence of 12-month mental disorder

AUDIT score ²	Distribution of AUDIT scores among those who drank in the past 12 months % (95% CI)	Twelve-month mental disorder ¹ % (95% CI)				
		Alcohol abuse	Alcohol dependence	Alcohol disorder	Drug disorder	Any disorder ³
1	11.8 (10.8, 13.0)	< 0.1 (0.0, 0.5)	< 0.1 (0.0, 0.5)	< 0.1 (0.0, 0.5)	0.1 (0.0, 0.9)	14.4 (11.0, 18.7)
2–3	22.6 (21.2, 24.1)	< 0.1 (0.0, 0.3)	< 0.1 (0.0, 0.3)	< 0.1 (0.0, 0.3)	0.3 (0.0, 1.1)	13.8 (11.3, 16.7)
4–5	25.5 (24.0, 27.1)	0.3 (0.0, 0.9)	< 0.1 (0.0, 0.4)	0.3 (0.0, 0.9)	0.4 (0.1, 1.0)	15.3 (12.4, 18.7)
6–7	14.7 (13.6, 16.0)	0.7 (0.1, 1.9)	< 0.1 (0.0, 0.5)	0.7 (0.1, 1.9)	0.5 (0.1, 1.4)	17.7 (14.0, 22.2)
8–9	10.0 (9.0, 11.1)	3.7 (2.0, 6.3)	< 0.1 (0.0, 0.6)	3.7 (2.0, 6.3)	2.9 (0.9, 6.7)	21.7 (16.1, 28.4)
10–14	9.4 (8.4, 10.5)	10.6 (7.7, 14.3)	4.5 (2.5, 7.3)	10.8 (7.9, 14.5)	4.8 (2.6, 7.8)	31.8 (25.5, 38.8)
15–19	3.6 (3.0, 4.4)	29.0 (20.4, 39.5)	10.2 (6.0, 16.0)	32.4 (23.5, 42.8)	7.7 (3.5, 14.3)	60.1 (46.6, 72.3)
20–40	2.2 (1.7, 2.8)	51.5 (39.9, 63.0)	42.0 (31.0, 53.7)	58.3 (46.5, 69.2)	20.8 (11.3, 33.5)	76.9 (59.4, 88.4)

1 DSM-IV CIDI 3.0 disorders see 1.6.1–1.6.4.

2 All who were randomly routed to the AUDIT (see 1.5.1) and who drank alcohol in the past 12 months.

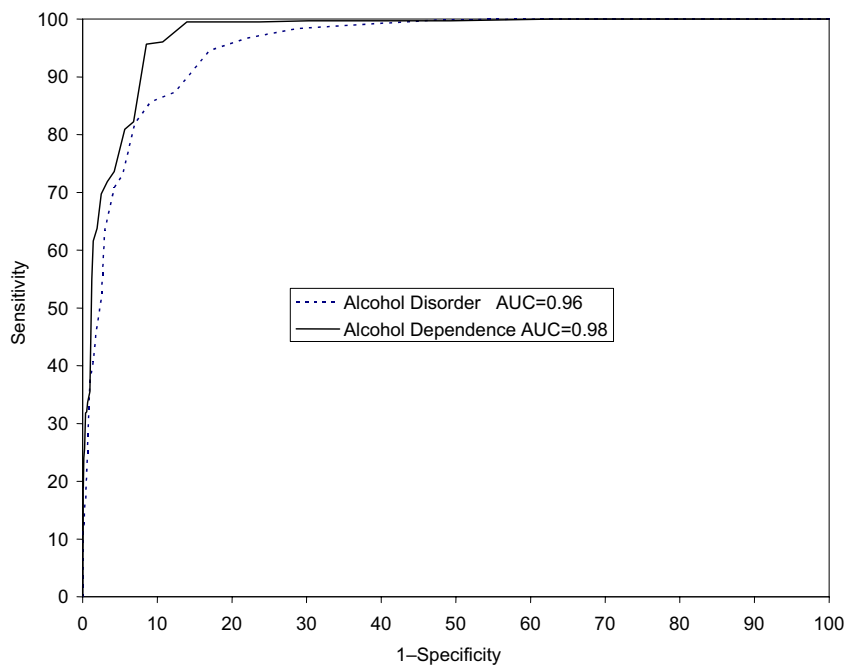
3 Assessed in the subsample who did the long form interview, see 1.5.1.

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For alcohol abuse or alcohol dependence, the higher the AUDIT score the more likely the participant had ever met criteria and had symptoms in the past 12 months. Nonetheless, in even the highest score band (20–40) only 58.3% had a DSM-IV alcohol disorder in the past 12 months. An AUDIT score of less than 8, the standard cut-point, almost certainly ruled out alcohol disorder (0.7% in those scoring 6 or 7). Because of comorbidity AUDIT scores also indicate drug disorder, although this is present in only 20.8% of those in the highest band of AUDIT scores. Because any disorder includes an alcohol disorder it would also be expected to rise with AUDIT scores, as it does; the percentage with any disorder is 15%–25% higher than the percentage with an alcohol disorder across all score bands.

Figure 6.1 shows the receiver operator characteristic (ROC) curve for 12-month DSM-IV alcohol disorder and for alcohol dependence as predicted by AUDIT scores. A ROC curve is a graphical presentation of the ability of a test to discriminate between people with a disorder and people without that disorder. It is plotted for each possible test score. If the test does not discriminate at all the curve is a diagonal from the bottom left to the top right of the graph, because for each value of the test both cases and non-cases are equally likely to score above the cut-point (sensitivity equals 1–specificity). The area under the curve (AUC) can be interpreted as the probability that a randomly chosen participant with a disorder and a randomly chosen participant without a disorder can be distinguished correctly based on their test scores (this probability is often reported as c). A test that does not discriminate at all has an AUC of 0.5.

Figure 6.1: ROC curves¹ for Alcohol Use Disorders Identification Test and 12-month alcohol disorder or alcohol dependence²



- 1 ROC curves = receiver operating characteristic curves; AUC = area under the curve.
- 2 DSM-IV CIDI 3.0 alcohol disorder or dependence, see 1.6.2.

For this survey weighted sensitivities and non-specificities were calculated (see 1.5.6). These sensitivities and non-specificities are provided in Table 6.5 to show the effect of different cut-points on the AUDIT. As the cut-point is increased non-specificity declines but so does sensitivity. With the usual cut-point of 8 or more on the AUDIT 99.5% of those with alcohol

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dependence were detected (sensitivity) but 23.7% of those without dependence also scored in this range (non-specificity). If the cut-point was raised to 14 or more, then sensitivity dropped to 80.9% and non-specificity was reduced to 5.7%. The optimal cut-point depends on the purpose of the test and the costs of failure to detect cases and false detection of non-cases. The ROC curves showing these sensitivities and non-specificities are in Figure 6.1.

Table 6.5: Sensitivity and non-specificity for alcohol disorder and alcohol dependence for different cut-points on the Alcohol Use Disorders Identification Test (AUDIT)

AUDIT score cut-point	Alcohol disorder ¹		Alcohol dependence ¹	
	Sensitivity ²	1-specificity ³	Sensitivity ²	1-specificity ³
1+	100.0	100.0	100.0	100.0
2+	100.0	87.1	100.0	87.4
3+	100.0	75.2	100.0	75.8
4+	100.0	62.2	100.0	63.1
5+	99.9	48.0	99.7	49.3
6+	99.0	36.3	99.7	37.8
7+	98.4	28.7	99.7	30.3
8+ (standard)	96.7	22.0	99.5	23.7
9+	94.6	17.0	99.5	18.8
10+	87.4	12.4	99.5	14.0
11+	85.7	9.1	96.0	10.7
12+	82.0	7.0	95.7	8.5
13+	73.1	5.4	82.2	6.8
14+	70.9	4.2	80.9	5.7
15+	63.4	3.0	73.6	4.2
16+	51.5	2.5	71.9	3.3
17+	46.1	1.8	69.7	2.5
18+	40.6	1.4	63.8	1.9
19+	37.3	1.0	61.6	1.4
20+	32.8	0.8	54.9	1.2
21+	24.1	0.6	35.5	1.0
22+	19.2	0.5	33.7	0.7
23+	16.9	0.4	32.0	0.5
24+	16.1	0.3	31.8	0.4
25+	12.6	0.2	25.7	0.3
26+	11.2	0.1	24.0	0.1
27+	8.5	0.1	18.9	0.1
28+	8.3	0.1	18.8	0.1
29+	5.3	0.1	11.7	0.1
30+	3.3	0.0	7.0	0.0
31+	3.1	0.0	6.4	0.0
32+	1.3	0.0	2.2	0.0
33+	1.3	0.0	2.2	0.0
34+	0.8	0.0	1.8	0.0
35+	0.8	0.0	1.8	0.0
36+	0.8	0.0	1.8	0.0
37+	0.1	0.0	0.2	0.0
38+	0.1	0.0	0.2	0.0
39+	0.0	0.0	0.0	0.0

1 DSM-IV CIDI 3.0 disorders, see 1.6.1–6.4.

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- 2 Sensitivity = probability that a case will be detected (ie, will score at or above the cut-point).
- 3 1-specificity = probability that a non-case will score at or above the cut-point.

The AUDIT is extremely good at discriminating between cases and non-cases of alcohol disorder and similarly for alcohol dependence. For alcohol disorder the AUC is 0.96 (0.92, 0.99) and for alcohol dependence it is 0.98 (0.94, 1.0); with no discrimination the AUC would be 0.5. Therefore, the distribution of scores on the AUDIT could be used to estimate the prevalence of alcohol disorder in the absence of a diagnostic interview.

Nonetheless the AUDIT is intended to detect hazardous and harmful drinking, not just disorder, so should be interpreted in relation to its intended purpose. It is not merely a proxy for a diagnostic interview. The distribution on each item and the distribution of the total score may be of public health relevance as well as the percentage classified with hazardous drinking. However, a 10-item scale cannot capture all the sorts of harm resulting from alcohol consumption. The AUDIT was derived from an initial battery of 150 items, but even that did not exhaust the full range of possible negative outcomes from drinking (Babor et al., 2001; Saunders et al., 1993).

6.5 CONCLUSIONS

Both the 1996/97 New Zealand Health Survey (Minister of Health, 1999) and 2002/03 New Zealand Health Survey (Ministry of Health, 2004b; Public Health Intelligence, 2005) used the AUDIT. These health surveys found slightly lower percentages with hazardous drinking than the present survey. For the 1996/97 survey the overall unadjusted percentage with hazardous drinking was 17.3% (16.1, 18.5) and for the 2002/03 survey it was 17.2% (16.1, 18.3) whereas for this survey the comparable prevalence was 20.0% (18.7, 21.4). The size of this difference is small, being less than 3%, and is detectable only because of the large size of these three surveys. Nonetheless if future health survey AUDIT results are used to estimate alcohol disorder prevalences there should be appropriate calibration for this small difference.

It is unlikely that between 2002/03 and 2003/04, when this survey was carried out, there were population changes or changes in drinking behaviour sufficient to produce this small though significant difference ($p = .002$). In this survey the lowest age was 16 years whereas it was 15 years in the health surveys. Comparison of the youngest age groups (16–24 compared with 15–24) shows, as expected, a higher prevalence of hazardous drinking in this survey (38.3%: 34.1, 42.8) than in the 2002/03 health survey (33.2%: 29.1, 37.3) although this difference was not significant ($p = .1$). However, the prevalence of hazardous drinking was also higher in the 25–44 age group (this survey: 23.3%; 21.3, 25.4; 2002/03 survey: 19.2%; 17.5, 20.9; $p = .04$) and non-significantly higher in the 45–64 age group (this survey: 13.2%; 11.5, 15.1; 2002/03 survey: 11.7%; 10.4, 12.9; $p = .2$). The prevalence was very similar in those aged 65 and over (this survey: 4.4%; 3.4, 5.9; 2002/03 survey: 4.2%; 3.1, 5.3; $p = .8$).

The slightly higher prevalence of hazardous drinking in this survey cannot be attributed entirely to the omission of 15-year-olds. One possible explanation for the difference might be a general context effect; people may report alcohol-related problems a little more readily in the context of a mental health survey than in a general health survey. Another possibility is that the difference is due to the use in this survey of a showcard of the number of standard drinks in various common beverage drinks. The health survey did not have a definition of a drink. If this is the explanation then the difference between the surveys should be only for the consumption questions and not for the dependence symptoms or consequences questions. Thus further analysis could establish to what extent each explanation holds. Most aspects of the sample

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design were similar, apart from some aspects of the oversampling, and the consequences of these would be taken account of in the estimates of standard errors. The response rates were also similar (73.3% compared with 72%).

The relationship between sociodemographic correlates and the AUDIT was very similar in all three surveys. As shown above the prevalence of hazardous drinking was markedly higher in younger people, and was also more than twice as high in males as in females. The prevalences for males were 25.7% in 1996/97, 25.4% in 2002/03,¹ and 28.1% in this survey. For females the prevalences were 9.3%, 9.7% and 12.5%. Contrary gradients across deprivation levels were seen in all three surveys for the percentage drinking and the percentage drinking hazardously: the more deprived the area in which someone lives, the less they are likely to drink, but the more likely they are to drink hazardously.

Ethnic patterns were also the same across all three surveys. Around 80% of Māori and Others had drunk alcohol in the past 12 months whereas only about half of Pacific people had done so. However, Pacific drinkers were nearly as likely as Māori drinkers to drink hazardously. The overall prevalence of hazardous drinking was highest for Māori and similar for Pacific people and Others.

The relationship between the AUDIT and alcohol disorders indicates that the AUDIT could be used to derive estimates of alcohol disorder, although this is not its primary purpose.

1 The 2002/03 results in Tables 11 and 12 (Ministry of Health, 2004b) are labelled 'Hazardous drinking patterns in drinkers' when they are actually 'Hazardous drinking patterns' (personal communication, Maria Turley, Public Health Intelligence, Ministry of Health).

APPENDIX A: ALCOHOL USE DISORDERS IDENTIFICATION TEST QUESTIONS

Each question with a valid answer is scored from 0 to 4. For questions 2 to 10 this requires subtracting 1 from response category shown below. For question 1 the lowest response category of NEVER has been removed and scoring is as shown for responses.

NZAUD1. Looking at showcard 15, how often do you have a drink containing alcohol?

- MONTHLY OR LESS1
 - UP TO 4 TIMES A MONTH2
 - UP TO 3 TIMES A WEEK3
 - 4 OR MORE TIMES A WEEK.....4
 - REFUSED9
-

NZAUD2. Looking at showcard 16, how many drinks containing alcohol do you have on a typical day when you are drinking?

- ONE OR TWO1
 - THREE OR FOUR2
 - FIVE OR SIX3
 - SEVEN TO NINE4
 - TEN OR MORE.....5
 - REFUSED9
-

*NZAUD3. Looking at showcard 17 as a guide to answering the next questions, how often do you have six or more drinks on one occasion?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
 - REFUSED9
-

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*NZAUD4. How often during the last year have you found that you were not able to stop drinking once you had started?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
 - REFUSED9
-

*NZAUD5. How often during the last year have you failed to do what was normally expected from you because of drinking?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
 - REFUSED9
-

*NZAUD6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
-

*NZAUD7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
 - REFUSED9
-

Alcohol Use Disorders Identification Test Questions

*NZAUD8. How often during the last year have you been unable to remember what happened the night before because you have been drinking?

- NEVER1
 - LESS THAN MONTHLY2
 - MONTHLY3
 - WEEKLY4
 - DAILY OR ALMOST DAILY5
 - REFUSED9
-

*NZAUD9. Looking at showcard 18 as a guide to answering this question and the next question, have you or someone else been injured as a result of your drinking?

- NO1
 - YES, BUT NOT IN THE LAST YEAR2
 - YES, DURING THE LAST YEAR.....3
 - REFUSED9
-

*NZAUD10. Has a relative or friend, or a doctor or other health worker, been concerned about your drinking or suggested you cut down?

- NO1
 - YES, BUT NOT IN THE LAST YEAR2
 - YES, DURING THE LAST YEAR.....3
 - REFUSED9
-