

ALCOHOL-RELATED HOSPITAL ADMISSIONS

Introduction

Alcohol is New Zealand's most widely used recreational drug. It causes harm through toxicity, intoxication and dependence. The way a person drinks is a key determinant of their risk of suffering harm from their alcohol consumption. Both intermittent heavy drinking (binge drinking) and frequent drinking episodes are hazardous to health and wellbeing [354]. Long term harm from excessive alcohol intake over many years includes conditions entirely attributable to alcohol, such as alcohol dependence syndrome and alcoholic liver disease. There are also more than 200 other diseases and conditions for which alcohol is a component cause in that it increases the risk of a person developing the condition via a dose-response relationship. These conditions include many types of cancer, depression, and dementia [355]. Short term risks associated with acute alcohol intoxication are often relevant to young people. These include injury, risky sexual behaviour leading to sexually transmitted infections and/or pregnancy, being the victim or perpetrator of assault or sexual violence and use of other psychoactive substances [356]. A 2011 systematic review of cohort studies found that there was consistent evidence that higher alcohol consumption in late adolescence (15–19 years) continues into adulthood and that it is associated with alcohol-related problems including dependence. There was not sufficient high quality evidence, however, to warrant making causal inferences on the broader health and social consequences of late adolescent drinking [357].

The latest New Zealand Health Survey (2012/13) found that a quarter of young people aged 15–24 years engaged in hazardous drinking, compared to 35% in the 2006/07 survey [335]. The Youth'12 survey, involving 8,500 secondary school students, also found improvements in drinking behaviour. In 2012, 23% of students reported binge drinking in the past four weeks compared to 34% in 2007 and 40% in 2001 [358]. The percentage binge reporting binge drinking, or ever having drunk alcohol, did not vary with deprivation but the proportion who reported currently drinking alcohol was somewhat higher in students in low deprivation areas [359]. The Youth '07 survey found significant variations by ethnic group in the proportion of students reporting binge drinking in the past four weeks: (Māori, 51.0%; Pacific, 27.0%; Asian, 14.4%; NZ European, 35.6%; Other, 26.2%) [360].

The following section explores alcohol-related hospital admissions in young people aged 15–24 years. This section serves to identify the tip of the iceberg in terms of the contribution alcohol makes to hospital admissions in this age group. Note however, the following analyses potentially are an undercount (due to regional variations in coding and the fact that many alcohol-related issues are dealt with in the ED setting: refer to Methods box).

Data Source and Methods

Indicator

1. *Alcohol-related hospital admissions in young people aged 15–24 years*

Numerator: National Minimum Dataset (NMDS): Hospital admissions with an ICD-10-AM alcohol-related diagnosis in any of their first 15 diagnostic codes (F10 mental and behavioural disorders due to alcohol, T51 toxic effects of alcohol) or first 10 external cause codes (X45 accidental poisoning by/ exposure to alcohol, X65 intentional self-poisoning by/exposure to alcohol, Y15 poisoning by/exposure to alcohol of undetermined intent, Y90–91 evidence of alcohol involvement determined by blood alcohol level or level of intoxication).

Denominator: Statistics NZ estimated resident population

Notes on Interpretation

Note 1: As alcohol is often coded as a secondary cause (e.g. in a traffic crash, alcohol will only be listed after the primary diagnosis (e.g. fractured femur) and external cause (e.g. vehicle occupant in transport accident) have been recorded), the following section includes all admissions where alcohol was listed in any of the first 15 diagnoses or 10 external causes of injury.



Note 2: It is likely that the figures presented reflect a considerable undercount as a result of regional differences in the extent to which:

- 1) clinicians document alcohol as a contributory cause of admission; or
- 2) coders code alcohol-related diagnoses over and above those associated with the primary diagnosis and first external cause of injury code.

In this context, a 2000 study of the role alcohol played in injury attendances at an Auckland emergency department noted 35% of injured patients had consumed alcohol prior to their injury [361]. In contrast, an analysis of New Zealand ED cases for the period 2000–2005 using the NMDS found that only 10.3% of injury cases in young people 15–24 years had any mention of alcohol, while 4.5% of injury cases admitted beyond the ED (the group reviewed in this section) had alcohol as a listed cause. This suggests that the figures in this section are likely to significantly underestimate the contribution alcohol makes to hospital admissions in this age group.

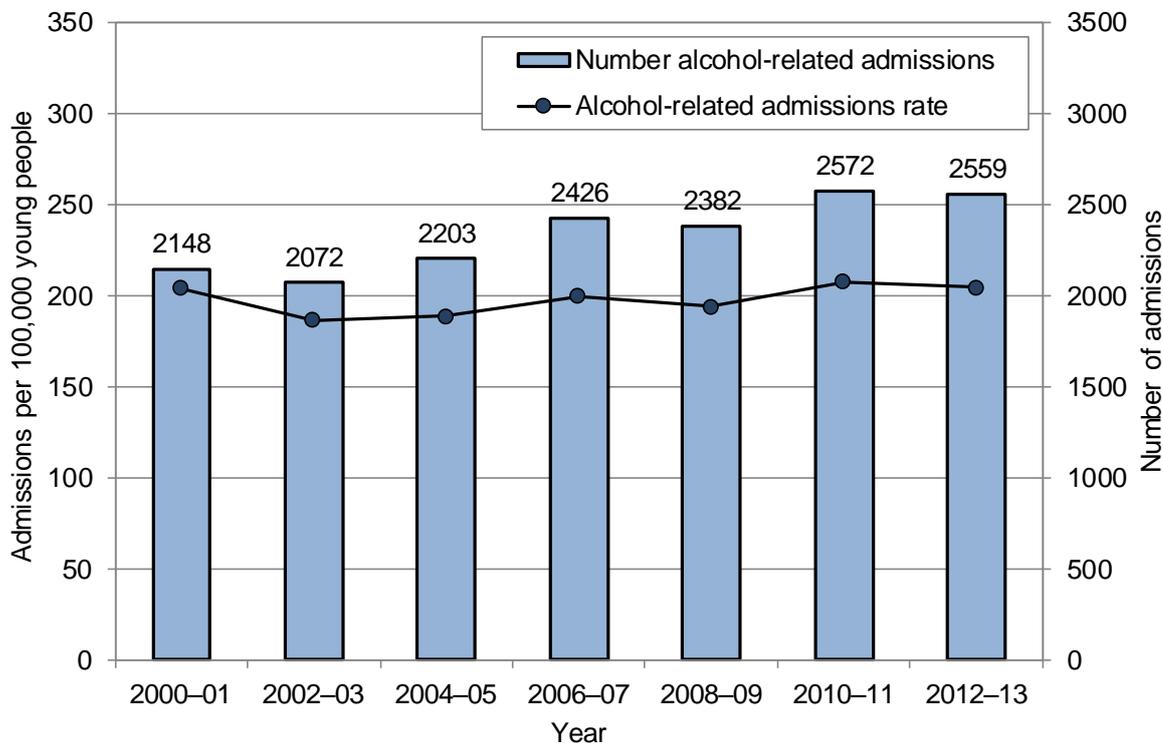
Note 3: Due to inconsistent uploading of ED cases to the NMDS, all admissions with an ED specialty code on discharge have been excluded (see the appendix for a more detailed discussion of this issue). While this filtering is likely to remove a large number of alcohol-related cases, it has been undertaken with a view to enhancing the comparability of admission rates across DHBs.

New Zealand Distribution and Trends

New Zealand Trends

In New Zealand during 2000–2013, alcohol-related hospital admissions in young people were relatively static. While on average 1,168 admissions occurred per year, it is likely that this reflects a significant undercount, as identification relies on hospital staff at the time of discharge listing alcohol as a contributory cause, as well as coders assigning alcohol-related diagnoses in cases where alcohol contributed to, but was not the sole reason for admission (**Figure 1**).

Figure 1. Alcohol-related hospital admissions in young people aged 15–24 years, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed; numbers are per two-year period

New Zealand Distribution by Primary Diagnosis

In New Zealand during 2009–2013, alcohol was listed as a contributory cause in a large number of hospital admissions. However, only 8.6% of these admissions had acute intoxication or the toxic effects of alcohol listed as the primary diagnosis. In 47.4% of cases an injury was the primary diagnosis, with head and upper limb injuries playing a particularly prominent role.

In addition, 34.5% of admissions had a mental health condition (including alcohol dependence) listed as the primary diagnosis. Schizophrenia and depression/other mood disorders were the most frequent diagnoses recorded. Poisoning by drugs, medicines, or substances was listed as the primary reason in 11.9% of admissions (**Table 1**).

Care is required with interpreting these figures. As a result of inconsistent uploading of emergency department (ED) cases to the National Minimum Dataset, ED cases have been removed. These figures, therefore, reflect the more severe end of spectrum as it is likely that many cases of acute intoxication or minor injury were dealt with in the ED setting.

Table 1. Alcohol-related hospital admissions in young people aged 15–24 years by primary diagnosis, New Zealand 2009–2013

Primary diagnosis	Number: total 2009–2013	Number: annual average	Rate per 100,000	Percent of admissions
Young people aged 15–24 years				
Mental and behavioural disorders				
Alcohol: acute intoxication	444	88.8	14.30	7.1
Alcohol: other mental/behavioural disorders	172	34.4	5.54	2.7
Alcohol: dependence	156	31.2	5.02	2.5
Schizophrenia	388	77.6	12.50	6.2
Other schizotypal and delusional disorders	298	59.6	9.60	4.7
Reaction to stress/adjustment disorder	218	43.6	7.02	3.5
Depression/other mood disorders	387	77.4	12.46	6.2
Bipolar affective disorder	123	24.6	3.96	2.0
Other mental and behavioural disorders	428	85.6	13.79	6.8
Gastrointestinal system				
Gastritis/upper gastrointestinal bleeding	134	26.8	4.32	2.1
Other gastrointestinal conditions	107	21.4	3.45	1.7
Injury and poisoning				
Head injury	715	143.0	23.03	11.4
Neck injury	63	12.6	2.03	1.0
Shoulder/upper arm injuries	96	19.2	3.09	1.5
Elbow/forearm injuries	304	60.8	9.79	4.8
Wrist/hand injuries	317	63.4	10.21	5.0
Lower limb injuries	305	61.0	9.82	4.9
Poisoning*	750	150.0	24.16	11.9
Toxic effect of alcohol	96	19.2	3.09	1.5
Other injuries	336	67.2	10.82	5.3
All other diagnoses				
Other conditions	451	90.2	14.53	7.2

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; *poisoning includes drugs, medicines, and biological substances



New Zealand Distribution by External Cause of Injury

In New Zealand during 2009–2013, 47.4% of alcohol-related hospital admissions in young people had an external cause of injury (e-code) recorded. Of all alcohol-related admissions, 11.7% were associated with an episode of self-harm, and 7.5% with an assault.

Alcohol-related injury associated with a fall was 7.5%, and 7.1% with inanimate mechanical forces. Injuries sustained while the young person was the occupant of a car accounted for 4.9%, with the majority occurring as the result of a car colliding with a stationary object, or overturning (**Table 2**).

Table 2. Listed external causes of injury for alcohol-related hospital admissions in young people aged 15–24 years, New Zealand 2009–2013

Primary external cause of injury	Number: total 2009–2013	Number: annual average	Rate per 100,000	Percent of admissions
Young people aged 15–24 years				
Alcohol-related hospital admissions				
Intentional self-harm	735	147.0	23.67	11.7
Assault	472	94.4	15.20	7.5
Falls	470	94.0	15.14	7.5
Mechanical forces: inanimate	445	89.0	14.33	7.1
Undetermined intent	151	30.2	4.86	2.4
Transport: car occupant collide stationery object	137	27.4	4.41	2.2
Transport: car occupant overturning/non-collision	116	23.2	3.74	1.8
Transport: car occupant, other injury	57	11.4	1.84	0.9
Transport: pedestrian	68	13.6	2.19	1.1
Transport: motorbike	43	8.6	1.38	0.7
Transport: cyclist	26	5.2	0.84	0.4
Transport: all other	35	7.0	1.13	0.6
Thermal injury	29	5.8	0.93	0.5
Poisoning: alcohol	45	9.0	1.45	0.7
Poisoning: other substances	55	11.0	1.77	0.9
Other external causes	96	19.2	3.09	1.5
No external cause of injury listed*	3,308	661.6	106.55	52.6
Total alcohol-related admissions	6,288	1,257.6	202.53	100.0

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed; *includes non-injury admissions

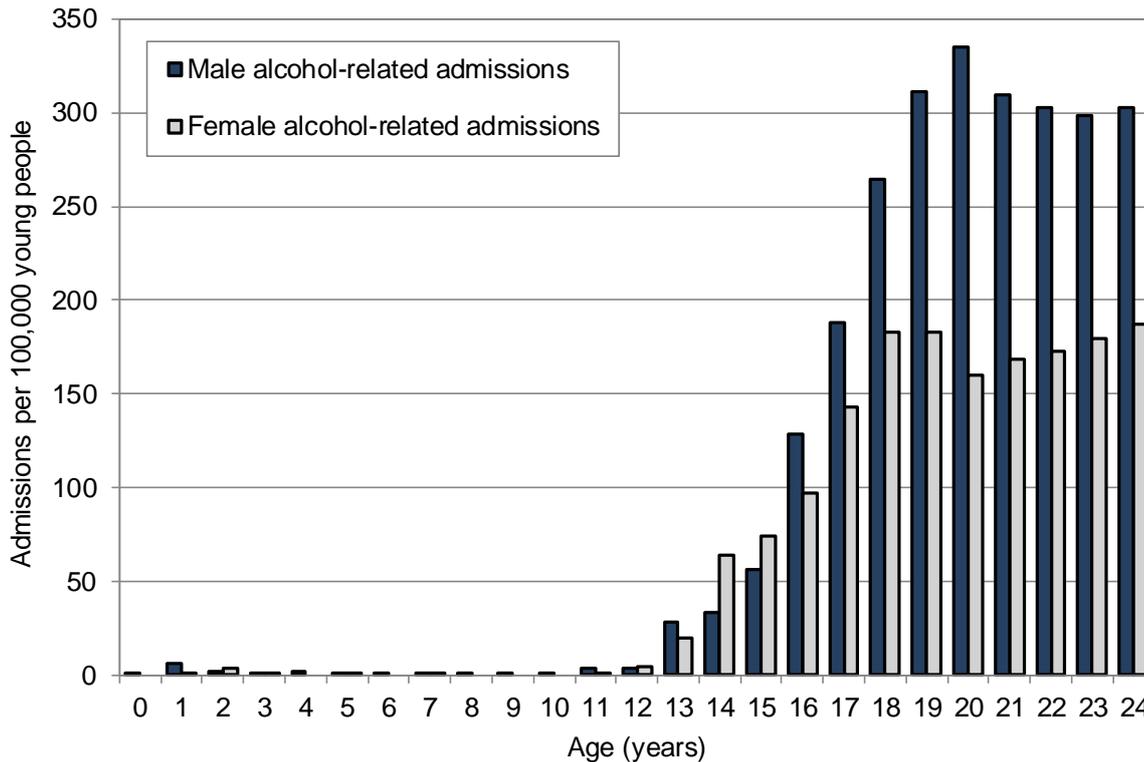
New Zealand Distribution by Age and Gender

In New Zealand during 2009–2013, alcohol-related hospital admissions were relatively infrequent in children, but rose rapidly during the teenage years. While gender differences were less marked for those in their early teens (13–15 years), a marked male predominance was evident from 16 years of age onwards (**Figure 2**).

New Zealand Distribution by Ethnicity, Gender, and NZDep decile

In New Zealand during 2009–2013, alcohol-related hospital admissions were *significantly higher* for males, and for those from less deprived to most deprived areas (NZDep decile 3–10). Rates were also *significantly higher* for Māori young people than for Pacific or European/Other young people (**Table 3**). Similar ethnic differences were seen during 2000–2013 (**Figure 3**).

Figure 2. Alcohol-related hospital admissions in children and young people by age and gender, New Zealand 2009–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ estimated resident population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; emergency department cases removed

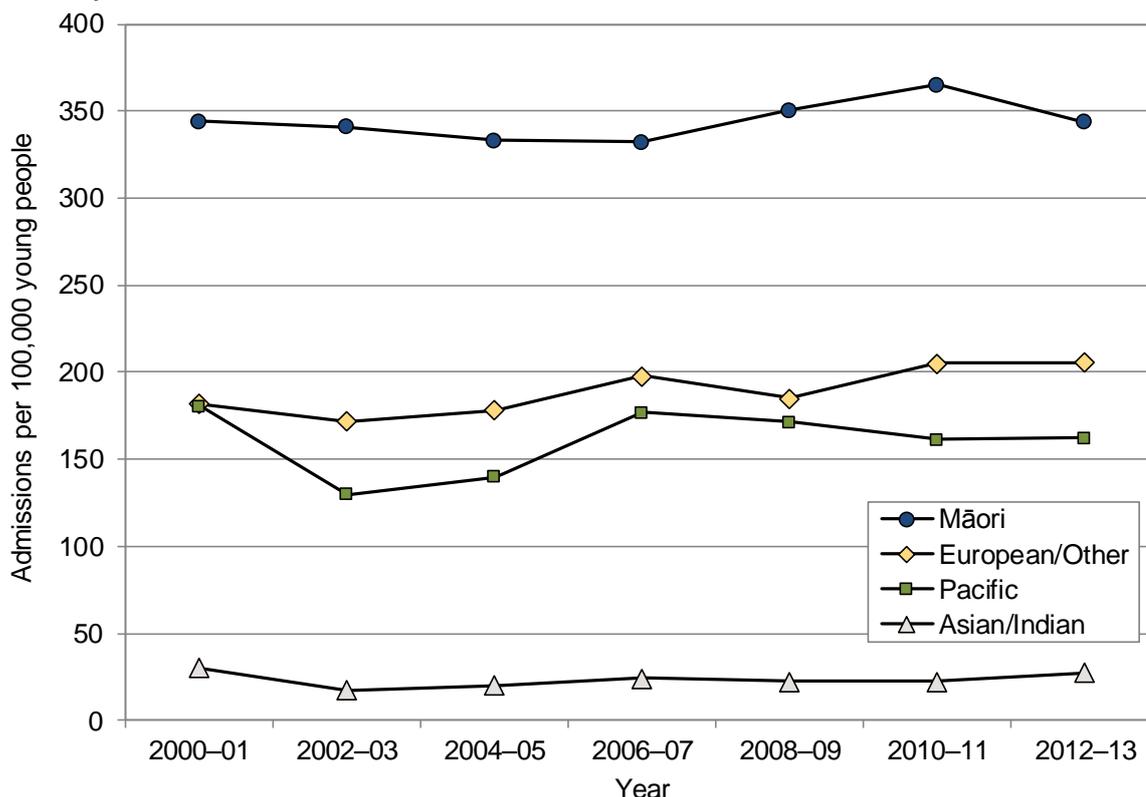
Table 3. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, gender, and NZ Deprivation Index decile, New Zealand 2009–2013

Alcohol-related hospital admissions							
Young people aged 15–24 years							
Variable	Rate	Rate ratio	95% CI	Variable	Rate	Rate ratio	95% CI
NZ Deprivation Index decile				NZ Deprivation Index quintile			
Decile 1	122.1	1.00		Deciles 1–2	114.2	1.00	
Decile 2	107.6	0.88	0.75–1.03	Deciles 3–4	147.7	1.29	1.16–1.44
Decile 3	147.4	1.21	1.04–1.41	Deciles 5–6	183.0	1.60	1.45–1.77
Decile 4	148.0	1.21	1.04–1.41	Deciles 7–8	238.5	2.09	1.90–1.41
Decile 5	175.9	1.44	1.25–1.66	Deciles 9–10	270.4	2.37	2.16–2.59
Decile 6	190.3	1.56	1.35–1.80	Prioritised ethnicity			
Decile 7	238.5	1.95	1.70–2.24	Māori	353.3	1.77	1.68–1.87
Decile 8	238.4	1.95	1.71–2.23	Pacific	162.8	0.82	0.74–0.90
Decile 9	263.9	2.16	1.90–2.46	Asian/Indian	25.4	0.13	0.11–0.15
Decile 10	277.0	2.27	1.99–2.58	European/Other	199.5	1.00	
Gender							
Female	154.8	1.00					
Male	248.8	1.61	1.53–1.69				

Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed; rates are per 100,000; Rate ratios are unadjusted; Ethnicity is level 1 prioritised



Figure 3. Alcohol-related hospital admissions in young people aged 15–24 years by ethnicity, New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed; Ethnicity is level 1 prioritised

South Island DHBs Distribution and Trends

South Island DHBs vs. New Zealand

In Nelson Marlborough during 2009–2013, alcohol-related hospital admissions in young people were not significantly different from the New Zealand rate, while rates in the remaining South Island DHBs were *significantly higher* in than the New Zealand rate (**Table 4**). In Nelson Marlborough, South Canterbury, the West Coast, and Southern DHB during 2000–2013, alcohol-related hospital admissions in young people were consistently higher than the New Zealand rate, while in Canterbury rates were similar to the New Zealand rate (**Figure 168**).

While the number of alcohol-related admissions per year ranged from 13.8 in the West Coast to 167.0 in Canterbury, in reality it is likely that the number was much higher due to the limitations of the National Minimum Dataset in identifying alcohol-related admissions in this age group.

South Island DHBs Trends

In Nelson Marlborough, South Canterbury, the West Coast, and Southern DHB during 2000–2013, alcohol-related hospital admissions in young people were consistently higher than the New Zealand rate, while in Canterbury rates were similar to the New Zealand rate (**Figure 4**).



Table 4. Alcohol-related hospital admissions in young people aged 15–24 years, South Island DHBs vs. New Zealand 2009–2013

DHB	Number: total 2009– 2013	Number: annual average	Rate per 100,000	Rate ratio	95% CI
Young people aged 15–24 years					
Alcohol-related hospital admissions					
Nelson Marlborough	166	33.2	219.6	1.08	0.93–1.26
South Canterbury	166	33.2	519.2	2.56	2.20–2.99
Canterbury	835	167.0	235.9	1.16	1.08–1.25
West Coast	69	13.8	378.8	1.87	1.48–2.37
Southern	596	119.2	252.2	1.25	1.14–1.35
New Zealand	6,288	1,257.6	202.5	1.00	

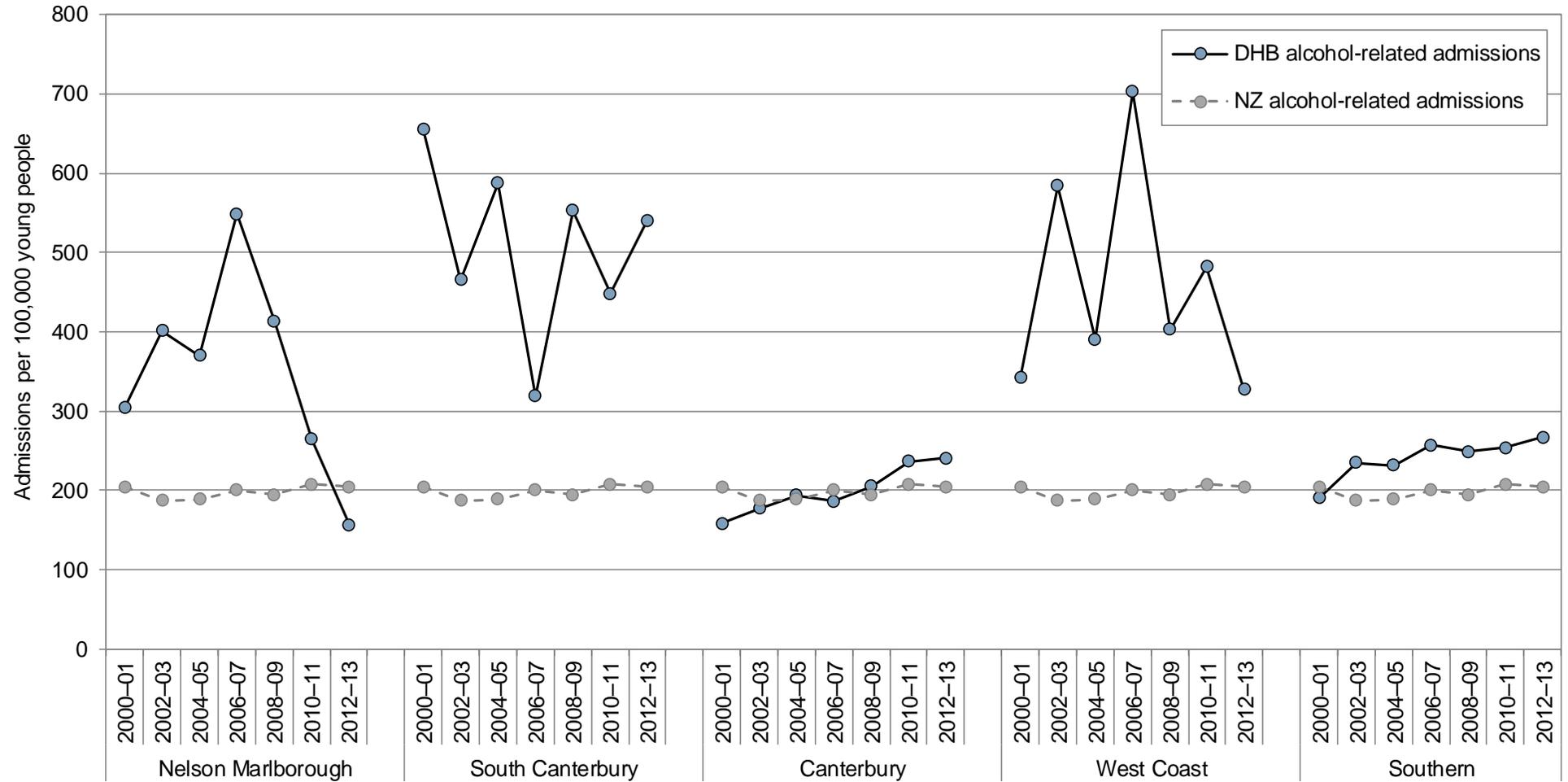
Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population;
 Note: Admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes;
 Emergency Department cases removed

Local Policy Documents and Evidence-based Reviews Relevant to the Prevention of Alcohol-related Harm

Table 5 (on page 337) provides an overview of New Zealand alcohol and addiction policy documents and international evidence based reviews and guidelines that address reducing alcohol use and alcohol-related harm in young people.



Figure 4. Alcohol-related hospital admissions in young people aged 15–24 years, South Island DHBs vs. New Zealand 2000–2013



Source: Numerator: National Minimum Dataset; Denominator: Statistics NZ Estimated Resident Population; Note: admissions with any mention of alcohol in first 15 diagnostic codes or first 10 external cause codes; Emergency Department cases removed

Table 5. Local policy documents and evidence-based reviews relevant to the reduction of alcohol-related harm in young people

Ministry of Health publications
<p>Ministry of Health. 2014. Transition Planning Guidelines for Infant, Child and Adolescent Mental Health/Alcohol and Other Drugs Services 2014. Wellington: Ministry of Health. http://www.health.govt.nz/publication/transition-planning-guidelines-infant-child-and-adolescent-mental-health-alcohol-and-other-drugs</p> <p>This guideline for DHBs is intended to promote consistent practice across infant, child and adolescent mental health (ICAMH), and youth-focused alcohol and other drug (AOD) services, and to assist DHBs to develop and implement planning processes for young people transitioning out of and between these services. The website has downloadable planning template examples for a transition plan, a transition planning checklist, and a checklist for service managers and clinical leads.</p>
<p>Ministry of Health. 2012. Rising to the Challenge: The Mental Health and Addiction Service Development Plan 2012–2017. Wellington: Ministry of Health. http://www.health.govt.nz/publication/rising-challenge-mental-health-and-addiction-service-development-plan-2012-2017</p> <p>This plan provides direction for planners, funders and providers of mental health and addiction services on Government priority areas for service development. It focuses on four key areas:</p> <ul style="list-style-type: none"> • making better use of resources • improving integration between primary and secondary services • cementing and building on gains for people with high needs • delivering increased access for all age groups (with a focus on infants, children and youth, older people and adults with common mental health and addiction disorders such as anxiety and depression). <p>Section 5 deals with services for infants, children and young people. It states that the Ministry of Health will work with key stakeholders to develop an agreed set of outcome measures and key performance indicators which will be used to measure progress in implementing the Plan. In the meantime, DHBs are expected to monitor access to specialist services and monitor waiting times for mental health and alcohol and drug (AOD) service separately. Specialist child and youth mental health services and AOD services (DHB and NGO) are expected to enhance delivery and integration of services within primary care, schools and other health services, enhance the flexibility and responsiveness of services, support a coordinated response to meeting the needs of children in care, and support a co-ordinated multi-agency response for youth with complex multi-agency needs.</p>
International guidelines
<p>Jonas D E, Garbutt J C, Brown J M, et al. 2012. Screening, Behavioral Counseling, and Referral in Primary Care to Reduce Alcohol Misuse. Comparative Effectiveness Review No. 64. AHRQ Publication No. 12-EHC055-EF. Rockville, MD: Agency for Healthcare Research and Quality. http://effectivehealthcare.ahrq.gov/ehc/products/269/1134/CER64_AlcoholMisuse_FinalReport_20120608.pdf</p> <p>This review aimed to assess the effectiveness of screening followed by behavioural counselling or adolescents and adults with alcohol misuse in primary care settings. It included 23 RCTs and six systematic reviews. None of the included studies randomised subjects, practices or providers to receive either screening or a comparator and none reported follow up with referrals as an outcome. Trials generally enrolled those with risky or hazardous drinking but excluded those with alcohol dependence. No studies addressed the question of whether or not screening followed by a behavioural counselling intervention, with or without referral, results in reduced morbidity or mortality or changes in other long term (>6 months) outcomes (e.g. health care utilisation, sick days). There was adequate evidence that several screening instruments detect alcohol misuse in adults with acceptable sensitivity and specificity but no studies addressed harms of screening. Overall, the evidence found supported the effectiveness of behavioural interventions for improving several intermediate outcomes (moderate to low strength of evidence, depending on the population and outcome). For young adults and college students there was moderate strength evidence that interventions were effective in reducing consumption (5 out of 5 studies at 6 months follow up) and heavy drinking episodes (one meta-analysis of 3 studies of in-person interventions and one meta-analysis of 2 studies of web-based interventions, both at 6 months follow up), low-strength evidence from one trial (Project TrEAT, 226 young adults) that behavioural interventions were effective in decreasing motor vehicle events (9 vs. 20 motor vehicle crashes with injury, $p<0.05$ and 114 vs. 149 total motor vehicle events, $p<0.05$, in the intervention compared to the control group, both after 48 months of follow up), emergency department visits (103 vs. 177, $p<0.01$) and arrests for controlled substance/liquor violations (0 vs. 8, $p<0.01$) and moderate strength evidence that they resulted in fewer consequences relating to academic role expectations (two NZ trials, 576 and 104 participants, rate ratio between 0.70 and 0.80). In contrast to the findings of adult studies, some of the benefits of interventions in college students that were significant at six month follow up were no longer significant at 12 month follow up. The review authors stated that this could be due to the natural history of drinking in college students or could indicate a need for additional booster sessions in this population. Five RCTs comparing different types/intensities of interventions did not provide sufficient evidence to draw firm conclusions about whether some types or intensities of intervention are more effective than others. There was no evidence of harms from interventions, aside from the opportunity cost of the time spent participating in the interventions. The review authors concluded that behavioural counselling interventions improve behavioural outcomes for adults with risky/hazardous drinking and brief multi-component interventions have the best evidence of effectiveness.</p>

National Institute for Health and Care Excellence. 2010. **Alcohol-use disorders: preventing harmful drinking**. London: NICE. <https://www.nice.org.uk/guidance/ph24/resources/guidance-alcoholuse-disorders-preventing-harmful-drinking-pdf>

This guidance was written for government, industry and commerce, the NHS and all those whose actions affect the population's attitude to, and use of, alcohol. It states that alcohol is a major public health problem and, on the basis of the best available evidence, it identifies the policy options that are most likely to be successful in reducing alcohol-related harm. It states that the evidence indicates that policy change is likely to be more effective and more cost-effective than actions undertaken by local health professionals however it provides recommendations for practice covering the use of screening and brief interventions. The policy recommendations cover price (excise tax and minimum pricing), availability (making it less easy to buy alcohol), and marketing (protecting children from exposure to alcohol advertising). The practice recommendations cover licensing, resources for screening and brief interventions, children and young people aged 10–15 at risk from their alcohol use, screening and brief interventions for young people and adults, extended brief interventions for adults, and referral. Appendix C contains the evidence statements derived from two effectiveness and two cost-effectiveness reviews. These evidence reviews, together with a 2014 evidence update, can be found here: <https://www.nice.org.uk/Guidance/PH24/Evidence>.

Evidence-based medicine reviews

Scott-Sheldon LA, Carey KB, Elliott JC, et al. 2014. **Efficacy of alcohol interventions for first-year college students: a meta-analytic review of randomized controlled trials**. *J Consult Clin Psychol*, 82(2), 177–88

The patterns of high-risk alcohol use established during the first year college (university) can have adverse consequences including poor academic performance, unprotected sex, alcohol abuse and injury or death. This review included studies published up to April 2013 that met the all following criteria:

- (a) they examined an individual- or group-level intervention to reduce alcohol use,
- (b) they sampled first-year college students,
- (c) they were RCTs with a comparison group,
- (d) they measured alcohol use, and
- (e) they provided sufficient statistical information to permit calculation of effect sizes (ES).

The review authors identified 41 such studies, with 62 separate interventions, involving 24,294 students in total. They calculated weighted mean effect sizes (d_+) using fixed- and random-effects models. Compared to controls of any kind, students receiving an intervention reported a lower quantity and frequency of drinking and fewer problems, but effect sizes were small (d_+ values in the range 0.07 to 0.14). Effect sizes were greater when the interventions were compared to assessment only (d_+ values in the range 0.11 to 0.19). In bivariate regression analyses intervention content had a moderating effect on intervention efficacy indicating that providing personalised feedback on consumption, problems or risks; strategies to moderate drinking behaviour, challenges to alcohol expectancies and encouraging students to set alcohol-related goals all help first-year students reduce their quantity and frequency of their alcohol intake. The authors recommend that all new college students should receive screening for risky alcohol use within their first few weeks on campus and that those who report drinking should receive a brief proactive intervention which includes the components identified in their meta-analysis as being helpful.

Foxcroft DR, Tsertsvadze A. 2012. **Universal alcohol misuse prevention programmes for children and adolescents: Cochrane systematic reviews**. *Perspect Public Health*, 132(3), 128–34

This review brings together the findings from three Cochrane reviews (undertaken by the authors), which addressed the effectiveness of “universal” interventions for children and adolescents (aged ≤ 18 years). The reviews covered school-based, family-based and multi-component universal alcohol misuse prevention programmes. The interventions typically did not focus on the prevention of alcohol misuse alone, but rather had a psychosocial orientation designed to have an impact on a range of health and lifestyle behaviours. The reviews included 85 RCTs in total, 53 relating to school based interventions (142,738 participants), 12 relating to family-based interventions ($n=14,595$) and 20 relating to multi-component programmes ($n=57,545$). Most trials were conducted in North America and most were at risk of bias due to some or all of the following: inappropriate unit of analysis, moderate to high attrition, selective outcome reporting, and potential confounding. Meta-analysis was not possible due to heterogeneity between studies. Some of the generic psycho-social and life skills programmes and most of the family-based and multi-component programmes were shown to be effective. There was insufficient evidence to determine whether multiple interventions were superior to single interventions. The most commonly seen positive effects across the interventions were reductions in drunkenness and binge drinking. The review authors concluded that universal prevention programmes can be effective but, due to the variability of results between studies, particular attention should be paid to programme content and delivery context. They stated that, ideally, future implementations of such programmes in different settings should include evaluation studies and that future studies should provide more detailed reporting of programme content and context so that comparisons between studies could identify the features associated with successful interventions.

Thomas RE, et al. 2011. **Mentoring adolescents to prevent drug and alcohol use**. *Cochrane Database of Systematic Reviews* doi:10.1002/14651858.CD007381.pub2
<http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD007381/frame.html>

This review assessed the effectiveness of structured mentoring programmes to prevent alcohol and drug use. The review included four RCTs with 1,994 participants (aged 12 years in two trials and 9–16 years in two trials), conducted among deprived populations in the US. Two RCTs found that mentoring reduced the rate of initiation of alcohol (pooled RR for mentoring compared to no intervention 0.71, 95% CI 0.57–0.90). A third trial found no significant difference and the fourth RCT did not assess alcohol use. One RCT found significantly less “illegal” drug usage (RR 0.54, 95%CI 0.35–0.83). No adverse effects were detected. There was limited scope for the interventions to be effective due to low rates of commencing alcohol and drug use during the intervention period, probably reflecting the youth of the study participants.

Other relevant publications

Holm AL, Veerman L, Cobiac L, et al. 2014. **Cost-effectiveness of preventive interventions to reduce alcohol consumption in Denmark.** PLOS One, 9(2), e88041.

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0088041>

This paper reports on an analysis of the cost-effectiveness of six interventions aimed at reducing alcohol abuse in the adult population of Denmark: a 30% increase in taxation, raising the minimum drinking age, advertising bans, limiting hours of retail sales and brief and longer interventions for individuals with alcohol problems. In Denmark the minimum legal age for purchasing alcohol in retail outlets is 16 years and the minimum age for drinking in bars and restaurants is 18. The evaluation of health effects considered changes in incidence, prevalence and mortality of alcohol related diseases and alcohol-related injury. Net costs were based on health care costs from Danish national registers and calculated as the sum of intervention costs and cost offsets related to reductions in treatment of alcohol-related outcomes. The researchers evaluated cost-effectiveness by calculating incremental cost-effectiveness ratios (ICERs) for each intervention. They found that three of the interventions (taxation, advertising band and limiting retail sales) were cost saving and the other three interventions were all cost-effective. Net costs ranged from €8 million per year (NZ\$12.6 million) for longer individual interventions to €-17million (NZ\$26.7 million) for advertising bans. Effectiveness ranged from 115 disability-adjusted life years (DALYs) per year for increasing the purchase age to 18 years to 2,900 DALYs for banning advertising. The total annual effect of implementing all the interventions was estimated to be 7,300 DALYs at a net cost of €-30million. The researchers concluded that population-wide interventions were more effective than interventions focused on individuals and that highest priority should be given to the interventions with the highest probability of being cost saving: banning alcohol advertising, limiting hours of retail sales and increasing taxation.

Alcohol and Public Policy Group. 2010. **Alcohol: no ordinary commodity—a summary of the second edition.**

Addiction, 105(5), 769–79. <http://onlinelibrary.wiley.com/doi/10.1111/j.1360-0443.2010.02945.x/abstract>

This article is a summary of the book *Alcohol: No Ordinary Commodity* (2nd edn). The first part of the book explains why alcohol is not an ordinary commodity and reviews epidemiological data that establishes alcohol as a major contributor the global burden of disease, disability and death in countries of all incomes. It also describes how global corporations have consolidated international beer and spirits production and expanded their operations in Eastern Europe, Latin America, Asia and Africa. The second part of the book reviews the scientific evidence for strategies and interventions to prevent or minimise alcohol-related harm in seven key areas: pricing and taxation, regulating the physical availability of alcohol, modifying the drinking context, drink-driving countermeasures, restrictions on marketing, education and persuasion strategies, and treatment and early intervention services. The final part of the book addresses local, national and international policy-making and rates the public health effectiveness of strategies and interventions. It states that, overall, the strongest and most cost-effective strategies include taxation to increase prices, restrictions on the physical availability of alcohol, measures to address drink-driving, brief interventions with at-risk drinkers, and treatment of people with alcohol dependence.

Other relevant New Zealand publications

Ministry of Justice. 2014. **The Effectiveness of Alcohol Pricing Policies: Reducing harmful alcohol consumption and alcohol-related harm.** Wellington: Ministry of Justice. <http://www.justice.govt.nz/publications/global-publications/e/the-effectiveness-of-alcohol-pricing-policies>

This is the report of a study conducted as part of the Government's consideration of measures to reform New Zealand's alcohol laws. It investigates the potential impact of a minimum price regime on reducing harmful alcohol consumption. It notes that previous studies have suggested that imposing a minimum price per standard drink could reduce harmful alcohol consumption particularly among young people who are the greatest consumers of low cost, high alcohol volume products. The study focused on two minimum pricing options for a standard drink: \$1.00 and \$1.20. It concluded that both pricing options provided net benefits to society but that an excise tax increase to bring the minimum alcohol price up to the same levels would have much greater benefits since it would raise the price of all alcohol (not just the lowest-priced alcohol) and would therefore have a greater impact on consumer behaviour. On the basis of this report, the Ministry of Justice recommended that a minimum price not be considered for introduction for five years since this would allow time for the impact of the alcohol reforms to be assessed and for learning from the experiences of other countries such as Scotland and the UK should they introduce minimum pricing.

Kypri K, Vater T, Bowe SJ, et al. 2014. **Web-based alcohol screening and brief intervention for university students: a randomized trial.** JAMA, 311(12), 1218–24.

This study aimed to evaluate a national web-based alcohol screening and brief intervention programme. Emails containing hyperlinks to the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) screening test were set to 14,991 New Zealand university students aged 17–24 years. Participants who screened positive were randomised to either undergo screening alone or receive ten minutes of assessment and feedback on alcohol expenditure, peak blood alcohol concentration, and alcohol dependence, as well as access to help and information. After five months, a fully automated outcome assessment measured six primary outcomes: drinking frequency, consumption per typical occasion, volume of alcohol consumed, and academic problem score, and whether participants exceeded medical guidelines for acute harm (binge drinking) and chronic harm (heavy drinking). There were 5,135 students screened of whom 4,322 screened positive and were randomised, and 83% were followed up. Compared to control participants, intervention participants consumed less alcohol per occasion (median 4 vs. 5 drinks, rate ratio 0.93; 99.17% CI 0.86–1.00; $p=0.005$). There were no differences for drinking frequency, total volume of alcohol consumed, or academic problem scores. Differences in risks of binge drinking and heavy drinking were not statistically significant. In a sensitivity analysis that accounted for attrition, the effect on alcohol consumption per typical occasion was no longer statistically significant. The researchers concluded that the intervention did not produce significant reductions in frequency or overall volume of drinking or academic problems but there remained a small possibility that it may have led to a small reduction in the amount of alcohol consumed in a typical drinking occasion.

Connor J, Cousins K, Samaranyaka A, et al. 2014. **Situational and contextual factors that increase the risk of harm when students drink: Case-control and case-crossover investigation.** Drug Alcohol Rev, 33(4), 401–11.

This paper reports on the results of a web-based survey of full-time students ages 17–25 years at five New Zealand universities, the 2013 Tertiary Student Health Survey. Survey questions aimed to identify situational and contextual factors associated with unintentional injury, assault, unsafe sex, sexual assault and drink-driving/riding. There were 2,683 participants who provided data for this study (a 49% response rate). For the seven days preceding the survey, 7.4% of men and 4.9% of women reported at least one of the defined events while they were drinking or soon afterwards. The researchers compared the situational and contextual characteristics of these events with the circumstances of the last drinking occasion for participants who did not experience an adverse event (a case-control analysis) and they compared the circumstances of each adverse event with the circumstances of the adverse event sufferer's own last drinking occasion (a case-crossover analysis). In both the case-control and case-crossover models, the number of drinking locations and getting more drunk than expected were strongly associated with risk of an event, independent of consumption (total number of drinks). In the case control analysis, total number of drinks, drinking with close friends, and drinking later and into the morning, were also associated with increased risk. After controlling for drinking and contextual factors there were no gender differences. The researchers concluded that, to reduce the risk of alcohol-associated adverse events, strategies to reduce the duration and volume of alcohol consumption should be considered, for example earlier closing of licenced premises.

Connor J, Psutka R, Cousins K, et al. 2013. **Risky drinking, risky sex: a national study of New Zealand university students.** Alcoholism: Clinical & Experimental Research, 37(11), 1971–8.

This study aimed to estimate the association of risky sexual behaviour with usual drinking pattern, drinking at the time of the sexual event, and beliefs that alcohol will positively affect sexual experiences. It used data from a cross-sectional web-based survey of randomly-selected New Zealand university students, the 2009 Tertiary Student Health Survey. The survey collected event-level data (drinking, partner type, and condom use at last sexual intercourse) as well as contextual data (usual alcohol consumption [AUDIT-C score], history of binge drinking, alcohol-related sexual enhancement expectancies). The researchers used regression models to estimate associations and potential mediating factors. There were 2,921 survey respondents (a 50.6% response rate). All the analyses were weighted to take account of the oversampling of Māori students. After weighting, of those respondents who had ever had sex, 32% indicated they had been drinking and 56% that they had used a condom at last sex; 10.7% reported that their last sexual intercourse was with a non-regular partner and without a condom ("risky sex") (12.3% of men; 9.8% of women; $p=0.159$). For both men and women, alcohol-sex expectancy scores and current drinking (AUDIT-C) scores were independently associated with quantity of alcohol at last sex. For both men and women, the association of current drinking or expectancy with risky sex was mediated by alcohol at last sex. The researchers concluded that heavy drinking appears to be an important and potentially modifiable factor among the complex factors contributing to risky sexual behaviour and negative sexual health outcomes. They stated that addressing the environmental determinants of hazardous drinking could reduce negative sexual outcomes in university students and other young people, that continuing promotion of condom use is needed and that further integration of health promotion efforts relating to alcohol and sexual health is warranted.

Fergusson D, Boden J. 2011. **Alcohol use in adolescence**. In Prime Minister's Science Advisory Committee (Ed.), Improving the Transition Reducing Social and Psychological Morbidity During Adolescence: A report from the Prime Minister's Chief Science Advisor. Auckland: Office of the Prime Minister's Science Advisory Committee.
<http://www.pmcsa.org.nz/wp-content/uploads/Improving-the-Transition-report.pdf>

This chapter examines the use and misuse of alcohol by young people in New Zealand, describes the harms associated with alcohol misuse, and outlines policy options for regulating alcohol use and reducing alcohol-related harms. It states that there is increasing international evidence for effective policies to reduce alcohol-related problems in young people. These policies include raising alcohol taxation; regulating the availability of alcohol; regulation of drink driving; restrictions on alcohol marketing; and development of effective treatment services. It states that the following interventions are not, or only marginally, effective: warning labels on alcohol containers and public service advertisements encouraging responsible drinking. It endorses the recommendations in the Law Commission report (see below) especially increasing the cost of alcohol, raising the drinking age, having a zero-tolerance policy towards drink driving in under-21s, greater investment in treatment services for young people with significant alcohol-related problems and further restrictions on advertising, hours of sale, number of outlets and supply of alcohol in premises frequented by young people.

The Law Commission. 2010. **Alcohol in our lives: Curbing the harm. A Report on the review of the Regulatory Framework for the sale and Supply of Liquor (NZLC R114)**. Wellington. The Law Commission.

<http://www.lawcom.govt.nz/project/review-regulatory-framework-sale-and-supply-liquor/publication/report/2010/alcohol-our-lives>

This very comprehensive report is the result Law Commission's work examining and evaluating New Zealand's laws and policies relating to the sale, supply and consumption of liquor in New Zealand. The report is structured in four parts: Part 1 reviews the case for reducing alcohol-related harm. Part 2 discusses recommendations for controlling the supply of alcohol. Part 3 addresses proposals for reducing the demand for alcohol and Part 4 examines recommendations for limiting alcohol-related problems. Chapter 16 summarises the evidence regarding alcohol-related harm and young people and outlines the rationale for, and probable impact of, policy changes relating to minimum purchase age, drinking in public places, supply of alcohol to minors, the role of parents, and the age at which people may sell alcohol. It recommends increasing the minimum purchase age to 20 in all licenced premises; prohibiting anyone under 20 from possessing or drinking alcohol in public, including in cars on roads (even if accompanied by a parent or guardian); making it an offence for anyone to supply alcohol to a minor on private property unless that person is the young person's parent or guardian or a responsible adult approved by the parent or guardian; making it an offence for a parent, guardian or approved adult to supply alcohol to a minor in an irresponsible manner; and prohibiting anyone under 20 from being employed to sell alcohol.

Websites

Health Promotion Agency (HPA). <http://www.hpa.org.nz/> accessed July 2014.

The HPA is Crown entity established on 1 July 2012 to lead and support national health promotion initiatives. It also performs functions previously undertaken by the Alcohol Advisory Council (ALAC). Their website had a variety of alcohol-related resources, including the HPA's Early intervention Addiction Plan 2013–17,

http://www.alcohol.org.nz/sites/default/files/04634_HPA_Early_intervention_addiction_plan_revisedjuly_online_FA.pdf, which, although dealing with all forms of addition, has a particular focus on alcohol. The plan addresses the way the system, in particular the primary health care system, identifies and responds to problem alcohol use, and the interface between health promotion and intervention.

The HPA also maintains another website: <http://www.alcohol.org.nz/> with additional resources including legislation and local strategies, statistics and research.

AMPHORA Alcohol Public Health Research Alliance. <http://www.amphoraproject.net/> accessed July 2014.

The AMPHORA project was a four-year €4 million project launched in 2008 and co-financed by the Seventh Framework Programme (FP7) of research of the European Commission and coordinated by the Hospital Clínic de Barcelona (HCPB) in Spain. Its three main objectives were to:

- Provide new scientific evidence for the most effective public health measures to reduce the harm done by alcohol
- Promote the translation of science into policy and disseminate new knowledge to policy makers
- Collaborate with partner organisations from 13 European countries and counterparts from all member states.

The project website is not the most user-friendly, but it has a lot relevant material. The AMPHORA e-book **Alcohol Policy in Europe: Evidence from AMPHORA** provides an overview of the findings of the project's studies. It can be found here: http://www.amphoraproject.net/view.php?id_cont=45&PHPSESSID=kcqh5uof4r5107rkvui7vs4oi1.

Drug and Alcohol Findings. <http://findings.org.uk/> accessed July 2014.

This is the website of Drug and Alcohol findings, a UK-based partnership project managed by Alcohol Concern, DrugScope, the National Addiction Centre, Alcohol Research UK, and the editor, Mike Ashton. The project aims to provide practitioners providing drug and alcohol interventions with summaries of UK-relevant research, place the findings from research in context, and explore the implications of the findings for practice. The topic search page, http://findings.org.uk/topic_search.htm, groups documents by broad themes and, by checking boxes, users can find publications in their area of interest.

Note: the publications listed were identified using the search methodology outlined in Appendix 1.