ADDRESSING ALCOHOL HARM IN ADOLESCENTS

Technical Report 3: Rainbow analysis. Methods and data tables

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YOUTH19 A Youth2000 Survey
Alcohol Healthwatch Whakatūpato Waipiro
University of Otago Te Whare Wānanga o Otāgo New Zealand

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Introduction

About the project

'Addressing alcohol harm in adolescents' is a research and advocacy project, undertaken as partnership between Alcohol Healthwatch and the Adolescent Health Research Group (the team behind the Youth2000 survey series). The project began in January 2022, funded by a nib foundation Health Smart Grant. Additional funding from the Health Promotion Agency/Te Hiringa Hauora (which has since become part of Te Whatu Ora – Health New Zealand) was received in June 2022, enabling us to expand the scope of the project. The project's goals are:

1. Add to the evidence base about adolescent drinking and alcohol-related harm in Aotearoa New Zealand
2. Inform evidence-based policy and community-level action to reduce hazardous drinking and eliminate disparities in alcohol harm among young people
3. Build community health literacy around alcohol harm and how to reduce it effectively.

Phase 1. The first phase of the project investigated patterns of alcohol use and self-reported alcohol harm in secondary students overall. The findings were released in September 2022.

Phase 2. The second phase of the project focuses on three priority populations at greater risk of alcohol harm during adolescence: Māori, Pacific and Rainbow youth. This report and the associated factsheet and webinar are key outputs from phase two.

Webinars and factsheets. The project outputs include a series of seven factsheets and four webinars (Sept 2022 – Feb 2023) to disseminate the key findings and promote evidence-based policy and community action to address adolescent alcohol harm.

All of the project outputs, including webinar recordings, can be found on the Youth19 website (www.youth19.ac.nz) and the Alcohol Healthwatch website (www.ahw.org.nz).

About this report

This report presents findings about adolescent alcohol use and experience of alcohol harm among Rainbow secondary school students, and the methods used to reach those findings. There is an associated factsheet and webinar, which present key findings for a general audience.

As far as we are aware, this is the first study to provide an in-depth picture of alcohol use and alcohol harm among Rainbow secondary students in Aotearoa New Zealand.

Terminology

This report uses 'Rainbow' as an umbrella term for people who identify as Takatāpui or LGBTQI+ meaning Lesbian, Gay, Bisexual, Transgender, Queer (or Questioning) and Intersex. The plus indicates that the Rainbow community is diverse and goes beyond LGBTQI to encompass other sexuality- and gender-non-conforming identities. Takatāpui is a Māori concept meaning 'intimate companion of the same sex.' It has been reclaimed to embrace all Māori who identify with diverse genders, sexualities and sex characteristics.[1]

Why does adolescent drinking matter?

Alcohol is a significant contributor to health loss and health inequity in Aotearoa New Zealand, and hazardous drinking often begins in adolescence. Although many young people do not drink alcohol at all, those who do drink are particularly vulnerable to alcohol harms.[2] For a number of reasons, adolescents experience more harm per drink than older age groups.[3] Drinking alcohol at a young age can cause serious short and long term harms, such as injuries, depression, suicidality, unwanted sex, and having performance at school affected.[2 4] Some alcohol-related harms, such as negative impacts on brain development, are irreversible.[5] There is evidence that alcohol intoxication at a young age puts people at greater risk of substance use disorders and mental health problems in adulthood.[6] Therefore preventing alcohol harm among adolescents is important.

The context for alcohol use among Rainbow secondary school students

To prevent alcohol harm among Rainbow youth, it is essential to understand the contextual factors that influence alcohol use for youth in general, and for Rainbow youth specifically. Heavy alcohol use in adolescence has historically been normalised as a social activity and rite of passage in New Zealand, but for some Rainbow young people drinking may be a coping mechanism associated with growing up in a cisheteronormative society that normalises cisgender and heterosexual identities and pathologises other identities.[7 8] Rainbow adolescents experience higher rates of discrimination, violence and structural disadvantage compared to their cis-heterosexual (non-Rainbow) peers, as well as higher prevalence of mental health problems that are often associated with the stress produced by this discrimination.[9-12]

New Zealand qualitative research with Rainbow participants (including 16-19 year olds) found that drinking was perceived as an activity fundamental to meeting other Rainbow people.[8] Alcohol was seen as giving people courage to mix and socialise with others. The lack of inclusive and alcohol-free settings that provide opportunities for socialising and building community may further enable alcohol use among Rainbow youth.[8]

Rainbow young people are diverse and belong to many other communities (e.g. ethnic groups), and so drinking patterns and harm will be influenced by a wide range of factors and settings that relate to other aspects of their experience.

Methods

The findings in this report are based on data from the 2012 and 2019 waves of the Youth 2000 survey series (also known as Youth12 and Youth19). More detailed information about the methods for these surveys is available elsewhere[13-16] and is summarised briefly below.

Ethics

Each survey wave was approved by the University of Auckland Human Participants Ethics Committee, Reference Numbers 2005/414 (2007), 2011/206 (2012) and 2018/023450 (2019).

Defining Rainbow

We constructed the Rainbow variable based on students' answers to questions about sexual attraction, gender identity (from 2012), and sexual orientation (from 2019) – see Table 1. It is important to note that the questions included in the Youth 2000 surveys have developed over time, as awareness and understanding about sexual and gender diversity has increased, and therefore the way that the Rainbow group is defined has also changed over time. See Appendix 1 for details of question wording and response options.

Sexual attraction. Students who responded that they were attracted to the same sex or were attracted to both males and females, or multiple sexes, were included in the Rainbow group. Those who responded 'I'm not sure', 'neither' or 'I don't understand this question' were not included, since previous analysis found the majority who responded in this way were in early adolescence. Not experiencing sexual attraction or being unsure about sexual attraction at age 12, 13 or 14 is not necessarily an indicator of LGBTQI+ status, since sexual maturity is often achieved in mid- to late adolescence. However, we acknowledge that this approach may have incorrectly excluded some (sexually mature) Asexual individuals from the Rainbow group, particularly in 2012. (In 2019 those with a sexual orientation of Asexual are likely to have been included in the Rainbow group via the sexual orientation question).

Transgender identity. In 2012 students were asked 'Do you think you are transgender?' (see Appendix 1 for full question wording). Those who responded 'Yes' or 'I'm not sure' were included in the Rainbow group. In 2019 a 'trans' variable was derived from responses to the gender identity question (Intro2. Response options: I am a boy/man, I am a girl/woman, I identify another way), and the question above about being transgender (Sex44, worded slightly differently in 2019). If participants responded "another way" or said yes to Sex44, they were asked a new transgender identity question (Gender1: 'Which of the following best describes you?' Response options: Trans boy or man, Trans girl or woman etc – see Appendix 1 for all response options). Those whose responses indicated their gender identity differed from their sex assigned at birth or they were unsure of their gender identity were included in the Rainbow group. People typically have a stable gender identity by about three years of age[17] so uncertainty about gender identity among high school students is strongly suggestive of non-cis gender identity.

Sexual orientation. In 2019 students were asked 'Which of the following best describes your sexual orientation?' Students who chose response options 'Bisexual', 'Pansexual', 'Takatāpui','Gay or Lesbian,' or 'Something else' were included in the Rainbow group, whereas 'Straight', 'Mostly straight', 'I am not sure yet', and 'I don't understand the question' were not included.

Note that students who fulfilled any one of the three criteria above were counted as Rainbow. For example, someone who answered 'both sex attracted' and chose 'mostly straight' would be included

in the Rainbow group based on the sexual attraction question. Similarly, a person who said they were attracted to neither sex and identified as 'Something else' would be included in the Rainbow group based on the sexual orientation question.

Table 1: Construction of the Rainbow variable

2007	2012	2019
Sexual attraction **Sex26 = 2,3** (same or both sex attracted)	**Sexual attraction** **Sex26 =2,3,** (same or both sex attracted) **OR** **Gender identity** **Sex44=1,3** (trans/non-binary or not sure)	**Sexual attraction** **Attract = 1** (same or both sex attracted) **OR** **Gender identity** **trans = 1,2** (trans/non-binary or not sure) **OR** **Sexual orientation** **Sex47 = 3,4,5,6,8** (bisexual, pansexual, takatāpui, gay or lesbian, something else)

Sampling methods

The sampling frame was secondary school students. All waves used a two-stage clustered sampling design with randomly selected schools and, within these, randomly selected students. In 2001, 2007 and 2012, one-third of NZ's secondary schools were selected and in each participating school of >150 students, 20% of the roll was invited to participate. In schools with fewer students, 30 students were randomly selected. The last wave (2019) sampled schools from three regions (Auckland, Tai Tokerau and Waikato), an area that includes 47% of NZ's secondary school population. In each region 50% of schools were randomly sampled and 30% of students on their roll were invited to participate. In 2019, all Kura Kaupapa Māori (Māori immersion schools) from the three regions were also invited, with all Kura students asked to participate. In all waves, in participating schools, parents and caregivers were given information about the survey and could opt for their child to be excluded. Non-excluded students were randomly selected from school rolls and gave their own written consent at the start of the survey. Participation was anonymous.

Response rates

School response rates were 84% (2007), 73% (2012) and 57% (2019). Student response rates were 74%, 68% and 60% respectively. The number of participating schools and students and overall participant characteristics by survey wave are provided elsewhere.[13]

Survey design and administration

The self-report questionnaires were delivered via digital devices using M-CASI technology (text on screen and read aloud with headphones for privacy in English or Māori) during school time. The branching questionnaire design minimised exposure to irrelevant questions. The questionnaires covered demographics, identity, and key health and wellbeing indicators. (The full Youth19 questionnaire is available here: https://bit.ly/3MGdD39). The survey items used in the current research project are detailed in Appendix 1.

Geocoding

While the survey was being administered, a research assistant asked each student to enter the address of the place they usually live into a custom web app that resolved and saved their census meshblock number without storing their specific address. Each student's meshblock was stored in a database against their unique survey 'login' and later coupled with their survey responses. Meshblock data was used to determine NZ Deprivation Index (NZDep2018) decile, and urban/small town/rural designation.

Measures

Indicators of alcohol use were i) lifetime use of alcohol (i.e. ever/never had more than a few sips), ii) current use of alcohol (i.e. students who continued to drink at the time of the survey), iii) frequency of alcohol use, iv) prevalence and frequency of binge drinking (5+ drinks/session) in the past month, v) quantity consumed on a typical drinking occasion, vi) sources of alcohol, and vii) experiences of alcohol harm. The survey questions and details about derivation of measures are provided in Appendix 1.

The study explored potential risk and protective factors in the home, school and neighbourhood environments, and tested their association with high-risk drinking. Details about these measures are provided in Appendix 1.

Weighting and national estimates

Analysis was conducted using the 'survey' package in R (R Statistical Foundation). Data were initially weighted using inverse probability of selection (IPS) weights [calculated for each student as: (total number of schools ÷ schools that participated) × (total number of eligible students in the student's school ÷ students from that school that participated)]. Generalised raking was used to correct for non-response and to calibrate the results of each survey wave to the national secondary school population in terms of school decile, student age, gender, and ethnicity. Further details about weighting and calibration are available elsewhere.[14] All of the findings presented in this report are national estimates.

Analysis

Because the definition and composition of the Rainbow group has changed greatly over time (e.g. the proportion of participants identified as females and Asian students has increased – see Table 4) we do not present trends in alcohol use here, as we have in other factsheets and reports in this series. Findings for Rainbow adolescents are not comparable over time.

To explore drinking patterns among Rainbow in 2019, we used the full data set including Kura Kaupapa Māori.

Data on alcohol harm was not collected in the 2019 survey. To investigate self-reported alcohol harm, we used the 2012 survey's 9-items about alcohol harm (e.g. got injured, had unprotected sex,

had unwanted sex, performance at school affected etc) – see Appendix 1 for details. We calculated the proportion of current drinkers who reported experiencing each type of harm, comparing Rainbow and non-Rainbow students using descriptive statistics.

We then derived a total harm score (range 0-27) for current drinkers. For each harm indicator, a score of 1 was given if the harm was experienced more than a year ago, 2 if the harm had been experienced once or twice in the past year, and 3 if it had been experienced 3 or more times the past year. This aggregate measure enabled us to investigate adjusted differences in average alcohol harm score between Rainbow and non-Rainbow. We used multiple regression technique to model the difference in alcohol harm between Rainbow and non-Rainbow, then added age, sex assigned at birth, ethnic group and neighbourhood deprivation to the model to estimate baseline differences adjusting for these potential confounders. We then included alcohol use variables (frequency of alcohol use, amount of alcohol typically consumed, frequency of past month binge drinking), to test the extent to which drinking patterns mediated differences in self-reported alcohol harm between groups.

In the absence of self-reported alcohol harm data for 2019, we categorised participants into four 'risk of alcohol harm' categories, based on self-reported patterns of alcohol use in 2019. The categories were: non-drinker, small risk, high risk, very high risk. The term 'small risk' was used to differentiate from official Ministry of Health 'lower risk drinking guidelines' and reflects the fact that no level of alcohol use is completely free from risk. Appendix B provides a flow chart of the categorisation process. Non-drinkers were defined as those who had never drunk alcohol (more than a few sips) or who reported that they did not drink any more. The criteria for the remaining groups are detailed in Table 2 and Appendix B.

Criteria were based on expert input from advisory group members and 2012 findings about the relationship between drinking patterns and harm in secondary school students overall (see Technical Report 1).[18] For example, we found no difference in average harm score between those who reported no alcohol use in the last month and those who reported alcohol use on one occasion. Therefore, once a month or less was considered a low-risk frequency. For each drinking measure, criteria differed for those aged under 16 years and those 16 and over, reflecting the observation that younger people experienced greater harm at the same level of consumption in 2012.[18]

Table 2: Criteria for categorisation into risk of alcohol harm groups.

	Small risk of harm		**High risk of harm**		**Very high risk of harm**	
	<16 yrs	**16+ yrs**	**<16 yrs**	**16+ yrs**	**<16 yrs**	**16+ yrs**
Frequency	Once in last 4 weeks or less	Once in last 4 weeks or less	2-3 times a month	2-3 times a month to once a week	Once a week or more often	Several times a week/most days
Typical quantity	1 drink	1-2 drinks	2-4 drinks	3-9 drinks	5+ drinks	10+ drinks
Binge drinking in past 4 weeks	None	None	Once	1-3 times	More than once	Weekly or more often

As detailed in the flow chart in Appendix B, current drinkers were categorised as 'very high risk' if they met at least one criterion for that category. The remaining drinkers were then assessed for the

'high risk' category. Those who did not meet any of the 'high risk' criteria were classified as 'small risk'.

We used logistic regression to investigate the relationship between high-risk/very-high-risk drinking (grouped) and selected risk and protective factors in 2019. Non-drinkers/small risk (grouped) were the reference group. All models were adjusted for age, sex assigned at birth, ethnic group and NZ Deprivation Index band (low, med, high), and results were expressed as odds ratios (OR) and 95% confidence intervals (95% CI).

Limitations

Limitations must be borne in mind when interpreting these findings.

The definition used to define Rainbow students is imperfect, and it is possible that a small number of young people who identified as Rainbow (in particular Asexual youth) may have been misclassified as non-Rainbow, or vice versa.

The questions used to define Rainbow students have changed over time, and in addition a higher proportion of young people (particularly those identified in the survey as female or Asian) appear to be naming and disclosing Rainbow identities in the most recent survey. As a result, the demographics of the Rainbow group has changed markedly over time, and valid trend analysis is not possible.

Students who did not participate (e.g. they were absent from school or refused) may have higher levels of alcohol use than those who took part in the survey, leading to underestimates of alcohol use. Furthermore, secondary school students are at lower risk of alcohol harm than adolescents outside the school setting, e.g. attending alternative schools, or NEET (not in employment, education, or training).[19] Findings about alcohol use and alcohol harm in secondary school students are not generalisable to adolescents who have left or been excluded from school, and Rainbow young people may be over-represented in this group.[20] Further research is needed to better understand drinking patterns and alcohol harm in adolescents outside the school setting.

School and student response rates have decreased over time, increasing the possibility of selection bias.

The 2019 survey was regional, rather than national. National estimates have been calculated and presented, but these could be biased by regional differences over and above demographic differences (e.g. differences in drinking culture).

It is important to note that associations between risk and protective factors and alcohol outcomes may or may not be causal – causality cannot be determined in cross-sectional surveys of this nature.

The 2019 findings are the most recent available from the Youth2000 series on alcohol use, yet because of major social changes since 2019 (including changes associated with the Covid19 pandemic) drinking patterns may have changed since 2019. Indeed, recently published findings from the 'What about me' survey[21] and the New Zealand Health Survey[22] indicate that hazardous drinking among adolescents may have risen sharply since 2019.

Our 'risk of harm' categorisation took account of higher harm in younger (<16 years) compared with older students reporting the same level of drinking, but did not account for higher harm per drink in

female students.[18] Therefore, the risk of harm measure may underestimate risk of harm in the Rainbow population, which in 2019 was two-thirds female.

Data on experience of alcohol harm was not collected in the 2019 survey, so the alcohol harm findings presented here are the most recent available (2012), but somewhat dated. A further limitation of the alcohol harm findings is that they are based on self-report and focus on immediate and tangible consequences of drinking. There are other important harms associated with alcohol use that may be imperceptible to young people and not picked up in the study, e.g. there is evidence that adolescent alcohol use can contribute to depression and suicidality and put people at greater risk of developing alcohol dependence in adulthood.[6 23] Such 'invisible' impacts of alcohol use are not identified in this study, but are important to consider, particularly for Rainbow Youth who experience very high levels of psychological distress and suicidality.[9]

Data Tables

Characteristics of Rainbow sample

The proportion of Rainbow students in the Youth2000 sample increased from 4% in 2007 to 12% in 2019 (Table 3). The composition of the Rainbow sample has changed over time (Table 4). In 2019 the Rainbow secondary school population differed substantially from the non-Rainbow population in terms of age and sex (Table 5).

Table 3: Rainbow young people as a proportion of the total sample, 2007 – 2019, unweighted*

	2007		**2012**		**2019**	
	N	%	N	%	N	%
Total survey sample	9098	100%	8487	100%	7311	100%
Rainbow	343	4%	546	7%	879	12%

*Note that proportions are not weighted so should not be interpreted as proportions of the national secondary school Rainbow population.

Table 4: Characteristics of Rainbow sample achieved, 2007 – 2019, unweighted*

	2007		**2012**		**2019**	
	N	Proportion of Rainbow sample (%)	N	Proportion of Rainbow sample (%)	N	Proportion of Rainbow sample (%)
Sexual attraction						
Same-sex attracted	73	21%	59	11%	124	14%
Attracted to both of multiple sexes	270	79%	242	44%	551	63%
Transgender/gender-diverse						
Trans = yes	-	-	96	18%	58	7%
Trans = not sure	-		201	37%	115	13%
Sexual orientation						
Bisexual	-	-	-	-	350	40%
Pansexual	-	-	-	-	77	9%
Takatāpui	-	-	-	-	1	0.1%
Gay or lesbian	-	-	-	-	85	10%
Something else	--	-	-	-	90	10%
Gender identity						
Boy/man	-	-	-	-	258	29%
Girl/woman	-	-	-	-	588	67%
Identify another way	-	-	-	-	36	4%
Sex assigned at birth#						
Male	165	48%	206	38%	260	30%
Female	178	52%	340	62%	619	70%

Ethnic group (prioritised)						
Māori	62	18%	109	20%	149	17%
Pacific	20	6%	98	18%	88	10%
Asian	36	10%	78	14%	239	27%
Other	19	6%	36	7%	61	7%
NZ European	206	60%	225	41%	342	39%
Neighbourhood deprivation						
NZ Dep band 1 (least deprived)	130	38%	167	31%	228	26%
NZ Dep band 2	128	37%	156	29%	347	39%
NZ Dep band 3 (most deprived)	84	24%	213	39%	216	26%
N/A	1	<1%	10	2%	88	10%

*Note that proportions are not weighted so should not be interpreted as proportions of the national secondary school Rainbow population. #See Appendix 1 for the derivation of 'sex assigned at birth'.

Table 5: Characteristics of the Rainbow and non-Rainbow secondary school population, weighted national estimates, 2019

		Rainbow % [95% CI]	**Non-Rainbow % [95% CI]**
Age group	**Under 16 years**	48% [44.3, 51.3]	57% [56.9, 58.1]
	16 years and over	52% [48.7, 55.7]	43% [41.9, 43.1]
Sex assigned at birth#	**Male**	34% [30.3, 36.9]	51% [50.1, 51.6]
	Female	66% [63.1, 69.7]	49% [48.4, 49.9]
Ethnic group (prioritised)	**Māori**	24% [20.2, 27.3]	20% [19.3, 20.6]
	Pacific	6% [4.5, 7.2]	9% [8.8, 9.7]
	Asian	12% [10.1, 13.9]	12% [11.4, 12.0]
	Other	7% [4.6, 8.4]	5% [5.1, 5.6]
	NZ Euro	52% [47.1, 56.8]	54% 53.1, 54.5]
Neighbourhood deprivation	**NZ Dep band 1 (most deprived)**	30% [26.3, 34.2]	34% [32.6, 36.3]
	Band 2	45% [41.3, 48.3]	40% [37.9, 41.6]
	Band 3 (least deprived)	25% [21.5, 28.4]	26% [24.2, 27.4]

#See Appendix 1 for derivation of 'sex assigned at birth'

Drinking patterns

Drinking patterns for Rainbow secondary students are outlined in Tables 6 and 7 below. As shown in Table 8 there was no evidence of elevated drinking levels in Rainbow students in 2019, after adjustment for demographic variables. Key sources of alcohol for Rainbow students are shown in Table 9, and are similar to those for the general population.[18]

Table 6: Drinking patterns, Rainbow secondary school students, 2019

Indicator	**n(N)**	**Weighted %**	**95% CI**
Never used alcohol	382 (801)	39.6	[35.6, 43.6]
Ever used alcohol	419 (801)	60.4	[56.4, 64.4]
Current alcohol use	344 (799)	52.4	[48.1, 56.7]
Past month alcohol use	246 (799)	36.1	[31.4, 40.7]
Drinks weekly or more often	67 (799)	9.3	[6.7, 12.0]
Past month binge drinking among population	157 (793)	23.5	[20.5, 26.5]
Past month binge drinking among current drinkers	157 (388)	45.2	[40.4, 50.1]
Typically 10+ drinks per session among population	38 (795)	4.8	[3.2, 6.5]
Typically 10+ drinks per session among current drinkers	38 (340)	9.3	[6.0, 12.5]

Table 7: Quantity typically consumed, Rainbow current drinkers, 2019

	n(N)	Weighted prevalence (%)	95% CI
1-2 drinks	128 (340)	40.6	[35.1, 46.1]
3-4 drinks	80 (340)	21.0	[17.2, 24.8]
5-9 drinks	94 (340)	29.1	[24.0, 34.3]
10+ drinks	38 (340)	9.3	[6.0, 12.5]

Table 8: Comparison of drinking patterns, Rainbow versus non-Rainbow, 2019

Indicator	**Odds ratio, Rainbow (ref non-Rainbow) unadjusted [95% CI]**	**Odds ratio, Rainbow (ref non-Rainbow) adjusted for age, sex, ethnicity, NZ Dep [95% CI]**	**p-value**
Current alcohol use	1.26 [1.06, 1.50]	1.09 [0.90, 1.32]	NS
Past month binge drinking among population	1.12 [0.92, 1.36]	0.93 [0.77, 1.11]	NS

Typically 10+ drinks per session among population	0.74 [0.50, 1.10]	0.68 [0.48, 0.98]	<0.05

Table 9: Usual sources of alcohol, Rainbow current drinkers aged under 18 years, 2019

	n (N = 306)	**Weighted %***	**95% Confidence Interval**
I buy it myself	31	7.9	[5.0, 10.8]
Friends give it to me	144	45.1	[38.9, 51.2]
My sibling gives it to me	48	13.7	[9.2, 18.1]
My parents give it to me	157	51.5	[46.6, 56.3]
I get it from home without my parents' permission	68	22.4	[17.9, 26.8]
Another adult I know gives it to me	41	15.9	[12.5, 19.3]
I get someone else to buy it for me	85	22.0	[16.6, 27.4]
I take or steal it from somewhere else (not home)	11	3.5	[0.7, 6.4]
None of these	15	4.4	[3.0, 5.8]

*Note students could choose as many categories as relevant, so percentages do not add up to 100%.

Alcohol harm

Rainbow students reported high levels of alcohol harm in 2012, particularly injuries, unsafe sex and unwanted sex (Table 10). The average harm score was substantially higher for Rainbow than non-Rainbow students (Table 11a), and this difference remained statistically significant after adjusting for demographic factors and drinking patterns (Table 11b).

Table 10: Prevalence of alcohol harm indicators in past 12 months, current drinkers, 2012

	Rainbow (N=278)		**Non-Rainbow (N=3330)**	
	n	**Weighted % (95% CI)**	**n**	**Weighted % (95% CI)**
Had friends or family tell you to cut down your alcohol drinking	40	14.6 [10.1, 19.1]	346	10.4 [9.1, 11.8]
Had your performance at school or work affected	29	9.1 [5.8, 12.5]	183	5.5 [4.6, 6.3]
Had unsafe sex (no condom) when you had been drinking alcohol?	57	19.5 [14.3, 24.6]	365	10.9 [9.8, 12.1]
Had unwanted sex when you had been drinking alcohol?	34	12.2 [8.5, 15.9]	134	3.9 [3.3, 4.5]
Done things that could have got you into serious trouble (e.g. stealing, etc.) when you had been drinking alcohol?	45	16.3 [11.2, 21.5]	416	12.2 [11.2, 13.2]
Been injured when you had been drinking alcohol?	57	20.6 [15.5, 25.7]	498	15.7 [14.0, 17.3]
Been injured and required treatment by a doctor or nurse when you had been drinking alcohol?	17	6.0 [3.1, 9.0]	92	2.7 [2.2, 3.3]
Injured someone else when you had been drinking alcohol?	18	6.7 [3.6, 9.8]	147	4.2 [3.4, 4.9]
Had a car crash when you had been drinking alcohol?	9	2.2 [0.9, 3.6]	43	1.2 [0.8, 1.5]

Note: Caution is required when interpreting unadjusted differences between Rainbow and non-Rainbow groups, since the demographic composition of the groups differ**.**

Table 11a: Average alcohol harm score, Rainbow and non-Rainbow current drinkers, 2012

	Rainbow	**Non-Rainbow**
Average harm score	2.9 [2.3, 3.6]	1.8 [1,7, 1.9]

Table 11b: Mediation analysis of differences in alcohol harm score between Rainbow and non-Rainbow students, 2012

	Linear regression estimate - difference in harm score between rainbow and non-Rainbow	**P-value**
Model 1: Unadjusted	1.15	<0.001
Model 2: Adjusted for sex assigned at birth, age, ethnicity and NZ Dep	1.11	<0.001
Model 3: Adjusted for sex assigned at birth, age, ethnicity, NZ Dep and drinking patterns*	0.68	<0.01

*****Drinking patterns = frequency of alcohol use, typical quantity consumed, frequency of past month binge drinking

Table 12: Risk of alcohol harm categories, weighted estimates, 2019

	Non-drinker % [95% CI]	**Small risk % [95% CI]**	**High risk % [95% CI]**	**Very high risk % [95% CI]**
Rainbow (N=800)	47.5 [43.2, 51.8]	12.5 [10.4, 14.6]	28.9 [25.1, 32.7]	11.1 [8.3, 13.8]
Non-Rainbow (N=6325)	53.4 [51.8, 55.0]	9.5 [8.6, 10.5]	24.6 [23.3, 25.8]	12.5 [11.4, 13.6]

Note: Caution is required when interpreting unadjusted differences between Rainbow and non-Rainbow groups, since the demographic composition of the groups differ**.**

Risk and protective factors

Although most Rainbow students reported presence of many potential protective factors in their lives in 2019, exposure to these factors was generally lower among Rainbow than non-Rainbow students (Table 13), and exposure to potential risk factors was higher (Table 14). (However, caution is required in making comparisons as these results are not adjusted for demographic differences between Rainbow and non-Rainbow groups.) After adjustment for age, sex and socioeconomic deprivation, the factors most strongly associated with high-risk drinking for Rainbow students were lack of close parental monitoring, not feeling safe at home (Table 15), past or present Oranga Tamariki/CYFS involvement, and experience of sexual abuse or coercion (Table 16).

Table 13: Exposure to potential protective factors, Rainbow and non-Rainbow secondary school students, 2019

	Rainbow	**Non-Rainbow**
	Weighted % [95% CI]	**Weighted % [95% CI]**
High parental monitoring	86.5 [83.7, 89.4]	91.9 [90.7, 93.1]
Mother cares a lot/some	92.7 [91.1, 94.4]	97.7 [97.2, 98.2]
Father cares a lot/some	82.3 [76.6, 87.9]	92.4 [91.5, 93.3]
At least one parent cares a lot	86.7 [84.5, 88.9]	94.4 [93.7, 95.0]
Feel safe at home	82.7 [78.6, 86.9]	94.3 [93.4, 95.1]
Get enough quality time with family	56.0 [51.6, 60.4]	74.4 [73.3, 75.6]
Teachers at school care	74.9 [71.7, 78.0]	80.2 [79.2, 81.1]
School is supportive of people who are sexuality/gender diverse	66.7 [61.4, 72.0]	65.5 [63.2, 67.8]
All/most teachers are supportive of students of diverse genders/sexualities*	76.6 [72.7, 80.5]	-
All/most students are supportive of students of diverse genders/sexualities*	76.9 [73.2, 80.5]	-
Sense of belonging at school	77.9 [74.3, 81.4]	86.0 [85.1, 86.9]
Feel safe in the neighbourhood all the time	48.2 [43.9, 52.5]	59.9 [58.4, 61.5]
There is an adult outside family who I trust to share my feelings with	42.1 [36.9, 47.3]	53.2 [51.4, 54.9]
There is an adult outside family who accepts me for who I am	58.5 [54.1, 62.9]	73.5 [72.2, 74.8]
I have at least one friend who I trust to share my feelings with	83.9 [81.3, 86.5]	87.8 [86.8, 88.7]
I have at least one friend who accepts me for who I am	90.0 [88.0, 92.0]	93.5 [92.9, 94.0]

I have at least one friend that I can talk to face-to-face (not online, text or social media) most days	90.0 [87.6, 92.3]	95.2 [94.9, 95.6]

*These questions were only asked of Rainbow students. Note: Caution is required when interpreting unadjusted differences between Rainbow and non-Rainbow groups, since the demographic composition of the groups differ**.**

Table 14: Exposure to potential risk factors, Rainbow and non-Rainbow secondary school students, 2019

	Rainbow	**Non-Rainbow**
	Weighted % (95% CI)	**Weighted % (95% CI)**
Witnessed adult hit or hurt another child at home	11.1 [8.0, 14.1]	7.3 [6.8, 7.8]
Been hit or hurt by an adult at home	12.5 [10.1, 14.8]	9.6 [8.7, 10.5]
Witnessed adults at home hit or hurt each other	7.5 [5.3, 9.8]	5.7 [5.1, 6.2]
Past or present Oranga Tamariki/CYFS involvement	13.0 [10.8, 15.3]	8.0 [7.2, 8.8]
Sexual abuse or coercion	33.9 [29.7, 38.0]	16.0 [15.1, 16.9]
Housing deprivation	35.8 [32.8, 38.9]	26.6 [25.2, 28.0]
Been bullied because I am lesbian, gay, bisexual or gender diverse (or people thought I was)	14.7 [10.4, 19.0]	-

Note: Caution is required when interpreting unadjusted differences between Rainbow and non-Rainbow groups, since the demographic composition of the groups differ**.**

Table 15: Association between lack of potential protective factor and high-risk/very-high-risk drinking, Rainbow secondary school students, 2019

		Unadjusted Odds Ratio [95% CI]	**Adjusted Odds Ratio* [95% CI]**	**Adjusted Model P-value**
Parental monitoring	High	1.00	1.00	
	Low	2.70 [1.59, 4.58]	2.63 [1.38, 5.04]	<0.01
Mum cares a lot/some	Yes	1.00	1.00	
	No	1.10 [0.58, 2.07]	0.96 [0.44, 2.12]	NS
Dad cares a lot/some	Yes	1.00	1.00	
	No	1.05 [0.64, 1.73]	1.02 [0.57, 1.83]	NS
At least one parent cares a lot	Yes	1.00	1.00	
	No	1.25 [0.78, 2.02]	1.35 [0.74, 2.47]	NS

Feel safe at home	Yes	1.00	1.00	
	No	1.91 [1.19, 3.05]	2.26 [1.29, 3.96]	<0.01
Enough quality time with family	Yes	1.00	1.00	
	No	1.29 [0.99, 1.67]	1.37 [1.03, 1.83]	<0.05
Teachers at school care	Yes	1.00	1.00	
	No	1.41 [1.02, 1.94]	1.50 [1.05, 2.15]	<0.05
School supportive	Yes	1.00	1.00	
	No	1.13 [0.79, 1.16]	1.67 [1.27, 2.20]	<0.001
All/most teachers supportive	Yes	1.00	1.00	
	No	0.86 [0.66, 1.13]	0.77 [0.53, 1.11]	NS
All/most students supportive	Yes	1.00	1.00	
	No	1.52 [1.00, 2.33]	1.65 [1.08, 2.54]	<0.05
Sense of belonging at school	Yes	1.00	1.00	
	No	2.14 [1.38, 3.34]	1.85 [1.23, 2.79]	<0.01
Feel safe in the neighbourhood	Yes	1.00	1.00	
	No	1.23 [0.90, 1.69]	1.26 [0.88, 1.82]	NS
Adult outside family to share feelings with	Yes	1.00	1.00	
	No	0.66 [0.49, 0.89]	0.69 [0.49, 0.96]	<0.05#
Adult outside family who accepts me for who I am	Yes	1.00	1.00	
	No	0.59 [0.43, 0.81]	0.61 [0.41, 0.92]	<0.05#
Have at least one friend to share feelings with	Yes	1.00	1.00	
	No	1.27 [0.87, 1.85]	1.13 [0.75, 1.71]	NS
Have at least one friend who accepts me for who I am	Yes	1.00	1.00	
	No	0.45 [0.25, 0.83]	0.39 [0.20, 0.79]	<0.01#
Have a friend to talk to face-to-face	Yes	1.00	1.00	
	No	0.72 [0.49, 1.06]	0.79 [0.49, 1.06]	NS

*Adjusted for age, sex and neighbourhood deprivation (NZDep: high, mid, low). NS = no statistically significant association.

#Lack of these factors was significantly associated with *lower* odds of high-risk drinking (i.e. they turned out to be risk rather than protective factors)

Table 16: Association between risk factors and high-risk/very-high-risk drinking, Rainbow secondary students, 2019

		Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio* (95% CI)	Adjusted Model P-value
Witnessed adult hit or hurt another child at home	No	1.00	1.00	
	Yes	0.83 [0.46, 1.51]	0.89 [0.50, 1.60]	NS
Been hit or hurt by an adult at home	No	1.00	1.00	
	Yes	0.71 [0.46, 1.09]	0.82 [0.53, 1.27]	NS
Witnessed adults at home hit or hurt each other	No	1.00	1.00	
	Yes	0.89 [0.54, 1.50]	1.11 [0.47, 2.61]	NS
Past or present Oranga Tamariki/CYFS involvement	No	1.00	1.00	
	Yes	2.10 [1.35, 3.26]	2.22 [1.31, 3.77]	<0.01
Sexual abuse or coercion	No	1.00	1.00	
	Yes	2.29 [1.66, 3.18]	2.09 [1.47, 2.98]	<0.001
Experience of housing deprivation, past 12 months	No	1.00	1.00	
	Yes	1.07 [0.84, 1.38]	1.13 [0.78, 1.64]	NS
Bullied because of sexuality/gender identity	No	1.00	1.00	
	Yes	1.33 [0.85, 2.09]	1.48 [0.96, 2.27]	NS

*Adjusted for age, sex and neighbourhood deprivation (NZDep: high, mid, low)

NS = no statistically significant association

Appendix A: Derivation of variables, including survey question wording and response options

Rainbow criteria	Survey question and response options	Variable definition
Sexual attraction	(2019) Who are you attracted to? Response options: The opposite or a different sex (e.g. I am a male attracted to females or I am a female attracted to males) The same sex (e.g. I am a male attracted to males or I am a female attracted to females) I'm attracted to males and females I'm not sure Neither I don't understand this question (2012) Who are you sexually attracted to? Response options: The opposite sex (e.g. I am a male attracted to females or I am a female attracted to males) The same sex (e.g. I am a male attracted to males or I am a female attracted to females) Both sexes (e.g. I am attracted to males and females) I'm not sure Neither I don't understand this question (2007) Same wording as 2012, but 'I do not understand this question' response option was omitted	Students reporting attraction to the same sex or both sexes were defined as Rainbow.
Transgender identity	(2019) Are you (or might you be) transgender or gender-diverse? By this, we mean that your current gender is different from your gender at birth (e.g. trans, non-binary, Queen, fa'afafine, whakawahine, tangata ira tane, genderfluid or genderqueer). Response options: Yes No I'm not sure I don't understand this question Students who responded 'Yes' or 'not sure' to the question above, or responded 'I identify	Students responding 'Yes' or 'I'm not sure' to the transgender question, and/or identifying with any transgender identity were defined as Rainbow

	another way' to the gender identity question were asked: Which of the following best describes you? Response options: Trans boy or man Trans girl or woman Non-binary, genderqueer, genderfluid Agender Takatāpui Whakawahine Tangata ira tane Fa'afafine Fa'atatama Akava'ine I'm not yet sure of my gender Something else, please state: I don't understand this question (2012) Do you think you are transgender? This is a girl who feels like she should have been a boy, or a boy who feels like he should have been a girl (e.g. Trans, Queen, Fa'faffine, Whakawahine, Tangata ira Tane, Genderqueer) Response options: Yes No I'm not sure I don't understand this question	
Sexual orientation	(2019) Which of the following best describes your sexual orientation? Response options: Straight Mostly straight Bisexual Pansexual Takatāpui Gay or lesbian I am not sure yet Something else, please state: I don't understand this question	Students who responded Bisexual, Pansexual, Takatāpui, Gay or lesbian, or Something else were defined as Rainbow.

Outcome Variable	Survey question & response options	Variable definition
Ever/never drunk alcohol	We would like to now ask some questions about alcohol. By this we mean beer, wine, spirits, pre-mixed drinks. Have you ever drunk alcohol (not counting a few sips)? Response options: Yes/No	Ever = 'Yes' Never = 'No'
Current drinker	During the past 4 weeks, about how often did you drink alcohol? Response options: Not at all - I don't drink alcohol now Not in the last 4 weeks Once in the last 4 weeks Two or three times in the last 4 weeks About once a week Several times a week Most days	Current drinker = ever drunk alcohol (based on the question above) AND gave a response to this question other than 'Not at all – I don't drink now'
Past month alcohol use	As above	Based on the response 'Once in the last 4 weeks' or more often
Drinks weekly or more often	As above	Based on the response 'About once a week' or more often
Past month binge drinking	In the past 4 weeks, how many times did you have 5 or more alcoholic drinks in one session? Response options: None at all Once in the past 4 weeks Two or three times in the past 4 weeks Every week Several times a week	Based on the response 'Once in the past 4 weeks' or more often
Quantity consumed	How many alcoholic drinks do you usually have in one session? Response options: 1 drink 2 drinks 3 to 4 drinks 5 to 9 drinks 10 to 20 drinks More than 20 drinks	Responses were grouped: 1-2 drinks, 3-4 drinks, 5-9 drinking, 10+ drinks
Source of alcohol	When you drink alcohol how do you usually get it? (You may choose as many as you need) Response options: I buy it myself Friends give it to me My brother or sister gives it to me My parents give it to me	

	I get it from home without my parents' permission Another adult I know gives it to me I get someone else to buy it for me I take or steal it from somewhere else (not home) None of these	
Past year alcohol harm (2007, 2012)	How many times in the last 12 months have you... • had friends or family tell you to cut down your alcoholic drinking? • had your performance at school or work affected by your alcohol use? • had unsafe sex (no condom) when you had been drinking alcohol? • had unwanted sex when you had been drinking alcohol? • done things that could have got you into serious trouble (e.g. stealing, etc.) when you had been drinking alcohol? • been injured when you had been drinking alcohol? • been injured and required treatment by a doctor or nurse when you had been drinking alcohol? • injured someone else when you had been drinking alcohol? • had a car crash when you had been drinking alcohol? Response options: Never Not in the last 12 months Once or twice in the last 12 months Three or more times in the last 12 months	For each specific type of harm, past year harm was based on the response 'Once or twice in the last 12 months' OR 'Three or more times in the last 12 months.' Note that 'been injured' and 'been injured and required treatment by a doctor or nurse' were not mutually exclusive categories.
Alcohol harm score (2012)	Based on the 9 items above	Items were scored 0 for 'never', 1 for 'Not in the last 12 months', 2 for 'Once or twice in the last 12 months' and 3 for 'Three or more times in the last 12 months' Scores were added to derive an alcohol harm score (range 0-27)
Risk of alcohol harm (2019)	Alcohol harm data was not available in 2019. Instead, we used data on 1) frequency of alcohol use, 2) quantity consumed, and 3) frequency of binge drinking (see survey questions above) to derive risk of alcohol harm.	Four categories: 1) Non-drinker 2) Small risk of harm 3) High risk of harm 4) Very high risk of harm

		The criteria for these categories are set out in Table 2 (p10).

Demographic Variable	**Survey question & response options**	
Age	How old are you? Response options: Under 12, 12, 13, 14, 15, 16, 17, 18, 19, Over 19 years	Age was grouped in two ways: 13 and under, 14, 15, 16, 17, 18 and over, or binarised (under 16, 16 and over). Note that in 2019 only 25 students were aged under 13 years, and 24 were aged over 18. Over 99% of the sample were aged 13-18 years. About 96% were aged under 18 years.
Sex assigned at birth	(2007, 2012) What sex are you? Response options: Male Female (2019) Transgender and unsure individuals were asked: What sex were you at birth, even if it is different today? Response options: Male Female Indeterminate	For 2007 and 2012, 'What sex are you?' was used to define sex at birth for all participants. (The survey did not include a question about sex assigned at birth). For 2019, the sex of cis-gender individuals was based on the gender identity question below (How do you describe yourself? Boy/man, girl/woman). For transgender and those unsure about their gender, sex assigned at birth was based in 'What sex were you at birth, even if it is different today?'
Gender identity	(2019) How do you describe yourself? Answer options: I am a boy or a man I am a girl or a woman I identify in another way	
Deprivation (NZ Dep 2018)	N/A	Deprivation is based on the student's home address and corresponding NZ Deprivation Index categorisation for that mesh block. The NZ Deprivation Index is based on 9 Census measures. Further details are available elsewere.[24]
Ethnicity	Which ethnic group do you belong to? (You may choose as many as you need)	Respondents were categorised into one of five ethnic groups using the Ministry of Health prioritisation method: Māori> Pacific> Asian> Other> European.

	167 response options	Those with multiple ethnicities were assigned to the group with the highest priority, e.g. those identifying as Māori and Pacific were classified Māori, those identifying as Pacific and Asian were classified as Pacific. The European group included NZ European and other European (e.g. French, Croatian).

Risk/protective factor	**Survey question & response options**	
Parental monitoring	Does your family want to know who you are with and where you are? Response options: Always Usually Sometimes Almost never	High = 'Always' or 'Usually' Low= 'Sometimes' or 'Almost never'
Mother/Father cares	How much do you feel the following people care about you: My mum (or someone who acts as your mum) My dad (or someone who acts as your dad) Response options: A lot Some A little Not at all Does not apply to me	Yes = A lot/some No = A little, not at all 'Does not apply to me' was treated as missing
Enough quality time with family	I feel like I get enough quality time with my family/whānau. Response options: Strongly agree Agree Neutral Disagree Strongly disagree	Yes = 'Strongly agree' or 'Agree' No = 'Neutral' 'Disagree' or 'Strongly disagree'
Feel safe at home	Do you feel safe at home, or the place you live? Response options: Yes, all the time Yes, most of the time Sometimes No, mostly not Not at all	Yes = All/most of the time No = Sometimes, No mostly not, or Not at all
School supportive	My school or course is supportive of people who are or might be sexuality diverse (e.g. lesbian, gay or bisexual) or gender diverse Response options: Yes No	Yes/No

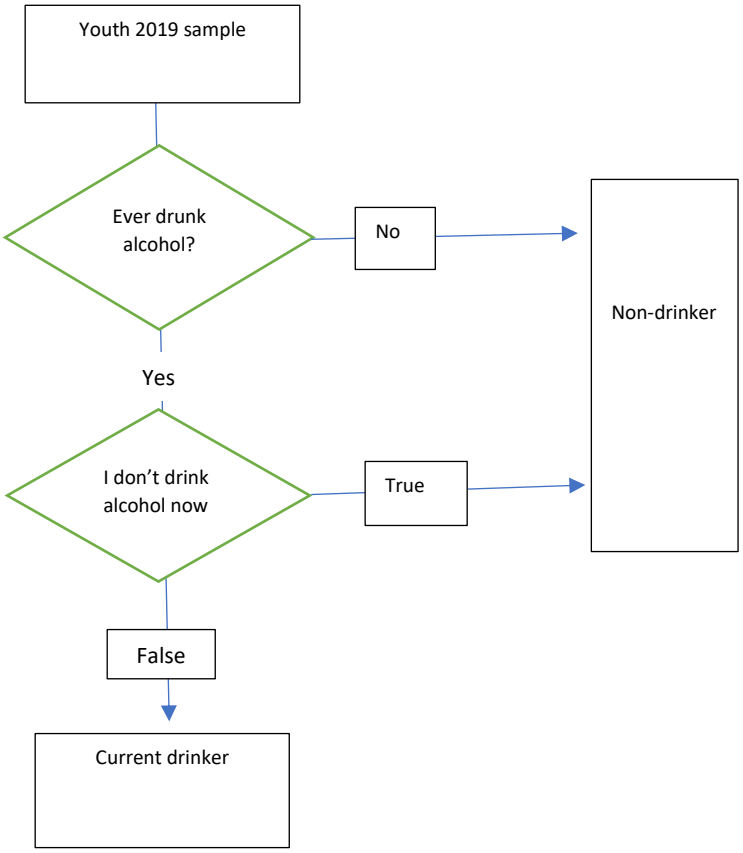
Teachers supportive	How many teachers at your school are supportive of students of diverse genders and sexualities? Response options: All teachers Most teachers A few teachers None	Yes = All/most No = A few/none
Students supportive	How many students at your school are supportive of students of diverse genders and sexualities? Response options: All students Most students A few students None	Yes = All/most No = A few/none
Teachers at school care	Do you feel that teachers/tutors care about you? Response options: Yes No Doesn't apply	Yes = Yes No = No/Doesn't apply
Sense of belonging at school	Do you feel like you are part of your school, alternative education or course? Response options: Yes No	Yes/No
Feel safe in neighbourhood	Do you feel safe in your neighbourhood? Response options: All the time Sometimes Not often Never	Yes = 1 (All the time) No = 2,3,4 (Sometimes, not often, never)
Adult outside family I trust to share my feelings with	There is an adult outside of my family/whānau who I can trust to share my feelings with Response options: Strongly agree Agree Neutral Disagree Strongly disagree	Yes = Strongly agree/agree No = Neutral/Disagree/ Strongly disagree
Adult outside family who accepts me	There is an adult outside of my family/whānau who accepts me for who I am Response options: Strongly agree Agree Neutral Disagree Strongly disagree	Yes = Strongly agree/agree No = Neutral/Disagree/ Strongly disagree
Friend I trust to share my feelings with	I have at least one friend who I can trust to share my feelings with	Yes = Strongly agree/agree

	Response options: Strongly agree Agree Neutral Disagree Strongly disagree	No = Neutral/Disagree/ Strongly disagree
Friend who accepts me	I have at least one friends= who accepts me for who I am Response options: Strongly agree Agree Neutral Disagree Strongly disagree	Yes = Strongly agree/agree No = Neutral/Disagree/ Strongly disagree
Friend I talk to face to face	I have at least one friend that I can talk to face-to-face (not online, text or social media) most days Response options: Strongly agree Agree Neutral Disagree Strongly disagree	Yes = Strongly agree/agree No = Neutral/Disagree/ Strongly disagree
Adults hit or hurt you at home	In the last 12 months have adults in your home hit or physically hurt you? Yes No	Yes/No
Witnessed violence to another child at home	In the last 12 months have adults in your home hit or physically hurt a child (other than yourself)? Yes No	Yes/No
Witnessed violence between adults at home	In the last 12 months have adults in your home hit or physically hurt each other? Yes No	Yes/No
Past or present OT/CYFS involvement	Have you ever been involved with Oranga Tamariki (OT) or Child, Youth and Family Services (CYFS)? E.g. someone was worried about your safety or protection. Yes No	Yes/No
Experience of sexual abuse or coercion	Have you ever been touched in a sexual way or made to do sexual things that you didn't want to do? (including sexual abuse or rape) Yes No Not sure	Yes = Yes or Not sure No = No
Youth voice (open text questions)	What do you think are the biggest problems for young people today?	

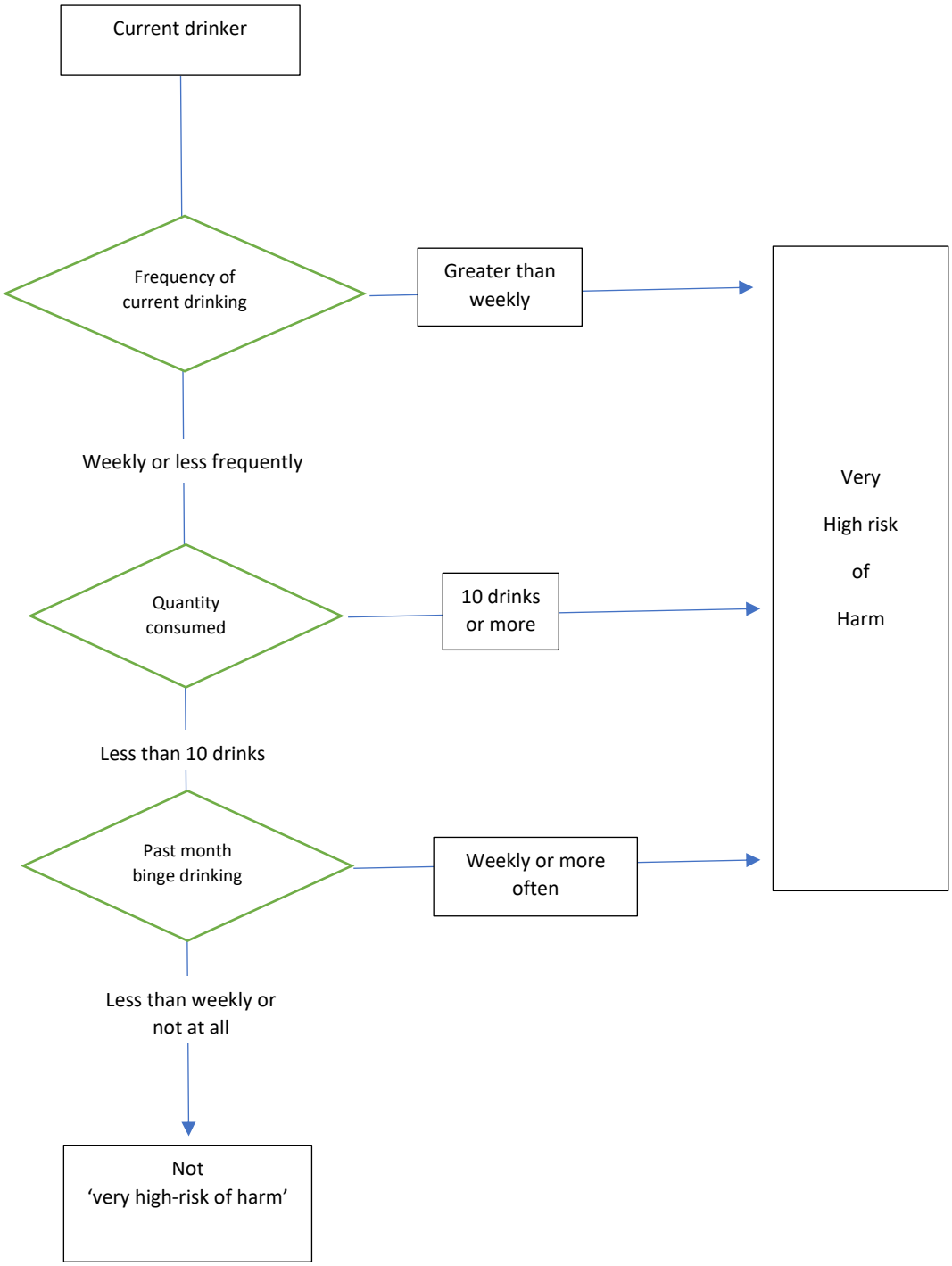
	What do you think should be changed to support young people in New Zealand better?	

Appendix B: Flow diagram for 'Risk of alcohol harm' categorisation

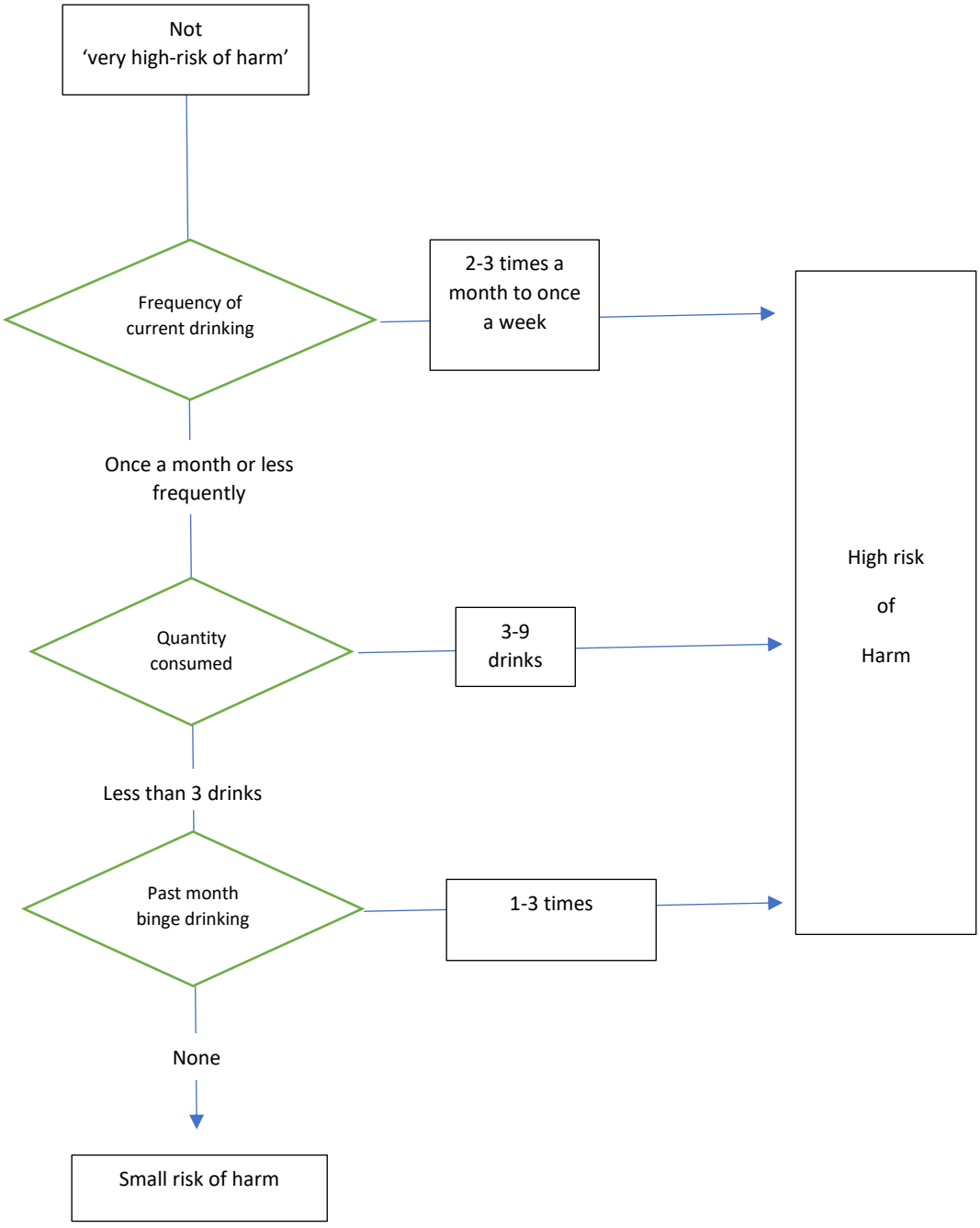
Step 1: Non-drinker categorisation



Step 2: Very high risk of harm categorisation, age 16 and over



Step 3: High risk of harm categorisation, age 16 and over



References

1. Kerekere E. Takatāpui: Part of the whānau. Third Edition. Auckland: Tiwhanawhana Trust and Mental Health Foundation 2021.
2. Health Promotion Agency. Understanding alcohol use and subsequent harms in young people. An evidence summary. Wellington: Health Promotion Agency, 2020.
3. National Health and Medical Council. Australian Guidelines to Reduce Health Risks from Drinking Alcohol. Canberra: Commonwealth of Australia, 2020.
4. Gluckman P. Youth suicide in New Zealand: A discussion paper. Wellington: Office of the Prime Minister's Chief Science Advisor, 2017.
5. de Goede J, van der Mark-Reeuwijk KG, Braun KP, et al. Alcohol and Brain Development in Adolescents and Young Adults: A Systematic Review of the Literature and Advisory Report of the Health Council of the Netherlands. *Adv Nutr* 2021;12(4):1379-410. doi: 10.1093/advances/nmaa170 [published Online First: 2021/02/03]
6. Newton-Howes G, Cook S, Martin G, et al. Comparison of age of first drink and age of first intoxication as predictors of substance use and mental health problems in adulthood. *Drug Alcohol Depend* 2019;194:238-43. doi: 10.1016/j.drugalcdep.2018.10.012 [published Online First: 2018/11/23]
7. Pitoňák M. Mental health in non-heterosexuals: Minority stress theory and related explanation frameworks review. *Mental Health & Prevention* 2017;5:63-73. doi: 10.1016/j.mhp.2016.10.002
8. Adams J, Asiasiga L, Neville S. Drinking Cultures of Rainbow New Zealanders. Wellington: Health Promotion Agency, 2019.
9. Fenaughty J, Clark T, Choo W, et al. Sexual attraction and young people's wellbeing in Youth19. New Zealand: University of Auckland, Victoria University of Wellington, 2021.
10. Veale JF, Peter T, Travers R, et al. Enacted Stigma, Mental Health, and Protective Factors Among Transgender Youth in Canada. *Transgend Health* 2017;2(1):207-16. doi: 10.1089/trgh.2017.0031 [published Online First: 20171201]
11. Fenaughty J, Ker A, Alansari M, et al. Identify survey: Community and advocacy report. Auckland: Identify survey team/University of Auckland, 2022.
12. Fenaughty J, Sutcliffe K, Fleming T, et al. Youth19 brief: Transgender and diverse gender students: Adolescent Health Research Group, 2021.
13. Fleming T, Peiris-John R, Crengle S, et al. Youth19 Rangatahi Smart Survey, Initial Findings: Introduction and Methods. New Zealand: The Youth19 Research Group, The University of Auckland and Victoria University of Wellington, 2020.
14. Rivera-Rodriguez C, Clark T, Fleming T, et al. National estimates from the Youth '19 Rangatahi smart survey: A survey calibration approach. *PLoS One* 2021;16(5):e0251177. doi: 10.1371/journal.pone.0251177 [published Online First: 2021/05/15]
15. Adolescent Health Research Group. The health and wellbeing of New Zealand secondary school students in 2012: Youth'12 prevalence tables: University of Auckland, 2013.
16. Adolescent Health Research Group. Youth'07: The Health and Wellbeing of Secondary School Students in New Zealand. Technical report. . Auckland, New Zealand: The University of Auckland, 2008.
17. Perry DG, Pauletti RE, Cooper PJ. Gender identity in childhood: A review of the literature. *International Journal of Behavioral Development* 2019;43(4):289-304. doi: 10.1177/0165025418811129
18. Ball J, Zhang J, Kim A, et al. Addressing Alcohol Harm in Adolescents. Technical Report 1: Methods and overview of findings. Wellington: University of Otago, 2022.

19. Clark T, Smith J, Raphael D, et al. Kicked out ofschool and suffering: The health needs of alternative education youth in New Zealand. *Youth Studies Australia* 2010;29 doi: 10.3316/ielapa.568511567672961
20. PPTA Rainbow Taskforce. Affirming diversity: inclusion for sexuality and gender minorities. . Te Wehengarua Annual Conference. Wellington, 2017.
21. Ministry of Social Development. What about me? The national youth health and wellbeing survey 2021. Wellington: New Zealand Government, 2022.
22. Ministry of Health. *New Zealand Health Survey Annual Data Explorer* Ministry of Health; 2021 [Available from: https://minhealthnz.shinyapps.io/nz-health-survey-2020-21-annual-data-explorer/_w_686ed0d9/#!/home accessed 26 July 2022.
23. McManama O'Brien KH, Becker SJ, Spirito A, et al. Differentiating adolescent suicide attempters from ideators: examining the interaction between depression severity and alcohol use. *Suicide Life Threat Behav* 2014;44(1):23-33. doi: 10.1111/sltb.12050 [published Online First: 2013/07/31]
24. Atkinson J, Salmond C, Crampton P. NZDep2018 Index of Deprivation, Interim Research Report. Wellington: University of Otago, 2019.