

Patterns of social supply of alcohol over time in New Zealand

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Patterns of social supply over time in New Zealand

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Executive summary

Main conclusions

In New Zealand, adolescents under the minimum purchase age (18 years) are commonly supplied alcohol via social sources such as parents/guardians, friends and others (social supply). Sons and daughters are most commonly supplied to, followed by friends, but friends are supplied on average greater quantities (although quantities supplied to sons and daughters are still relatively high).

There was evidence of some early impacts of a law change on social supply (through the Sale and Supply of Alcohol Act 2012). A small decrease in the frequency of social supply was found. Friends were less commonly supplied to, were supplied with fewer drinks and there was a tendency for greater supervision of social supply to friends (and to other relatives).

This report presents findings from the analysis of two national general population surveys in 2013 and 2015 which were conducted as part of the New Zealand arm of the International Alcohol Control (IAC) study. They were undertaken to better understand the patterns of social supply in New Zealand. Social supply is defined as supplying alcohol to those under the minimum purchase age for alcohol of 18 years by parents/guardians, friends and others.

Four key patterns of social supply in the past six months were investigated from the supplier's perspective:

- Prevalence of social supply
- Frequency of social supply
- Quantity of social supply
- Patterns of social supply (taking into account to whom they supplied)

These patterns were also investigated from the perspective of adolescents who were supplied. Additional contextual measures included type of beverage supplied, whether they thought the alcohol they supplied would be shared and demographics.

In December 2013 a change in social supply legislation occurred in New Zealand. The timing of these surveys allowed for assessment of the early impacts of the law change. The new legislation made it mandatory to have express consent of the parent or guardian of the minor (defined as a person under the age of 18 years) before socially supplying. It also required supply to be done in a responsible manner which could include supervising the consumption (supervision not further defined in the legislation). The national surveys in 2013 and 2015 collected measures on permission and supervision (defined in the survey as being present and overseeing the under 18 to help make sure no problems occur) to allow for early assessment of the law change and to understand if changes in these measures were associated with any changes in patterns of social supply. Statistical modelling was undertaken to assess the early impacts of the law change on prevalence, frequency and usual quantity of supply. This modelling controlled for demographics, and included the measures on permission and supervision.

Key findings

Prevalence of social supply

- The prevalence of social supply at least once to someone under 18 years of age, as reported by all survey respondents aged 16-65 years, was 8.3% in 2013 and 6.4% in 2015.
- Among adolescent drinkers aged 16-17 years, around 90% received alcohol from social sources in 2013 and 2015.

- Suppliers most commonly supplied alcohol to sons or daughters. For example, in 2015 twice as many suppliers provided alcohol to sons/daughters (48%) than provided to friends under 18 years (22%). Twenty-eight percent of suppliers provided alcohol to other relatives in 2015.

Frequency of social supply

- Suppliers on average supplied alcohol four times in the last six months in 2013 and three times in 2015. The top 10% of suppliers did so once a fortnight in both years.

Usual quantity of social supply

- On average, suppliers usually supplied seven drinks (equivalent to 7 x 330ml stubbie bottles of beer). This figure was consistent in both 2013 and 2015.
- The top 10% of suppliers usually provided around 20 drinks when they supplied.
- The usual quantity of drinks supplied to friends under 18 years was higher than the usual quantities supplied to sons or daughters (around 12 drinks compared to around 5 drinks respectively).

Patterns of social supply

- Suppliers most commonly supplied beer and ready to drinks (RTDs). In 2015, twice as many males supplied beer to sons/daughters compared to females (68% vs 31%), while twice as many females supplied RTDs to sons/daughters compared to males (41% vs 18%).
- Around one quarter of suppliers thought that the alcohol they supplied to their sons or daughters or friends would be shared (at least some of the time).
- Suppliers who reported supervising the under 18s they supplied reported supplying a lower usual quantity relative to suppliers who did not supervise - 6.5 drinks vs 10 drinks respectively.
- Males were more likely to be suppliers than females. The 18-24 year olds were more likely to be suppliers than the older age groups. Asian peoples and Pasifika were less likely to be suppliers (compared to the NZ European group).

Early impacts of the law change

- There was no statistically significant change in supplier reports of prevalence of social supply or the usual quantity supplied overall.
- Suppliers reported a small but statistically significant decrease in the frequency of social supply (changes in supervising or obtaining permission to supply did not directly contribute to the decreased frequency of supply).
- Following the law change, there was an increased tendency for suppliers to always supervise their social supply to friends under 18 years (63% in 2013 and 79% in 2015) and other relatives (53% in 2013 and 60% in 2015).
- Fewer suppliers reported supplying friends under 18 years following the law change (30% in 2013 and 22% in 2015) and supplied fewer drinks (13 drinks in 2013 and 11 drinks in 2015).

Introduction

The importance of the social supply of alcohol to under 18s

The social supply of alcohol, defined as supplying alcohol to those under the minimum purchase age for alcohol of 18 years by parents/guardians, friends and others is a significant source of alcohol for young drinkers in New Zealand. In 2011, more alcohol was obtained by teenagers aged 16-17 years via social supply than was obtained by their own purchasing (Railton et al., 2016, unpublished). There are limited published studies on social supply in New Zealand, however, those available show social supply is common (Kypri et al., 2005) with the majority of adolescent drinkers reporting obtaining alcohol from social supply. Parents are typically reported as the most common source of social supply, followed by friends (Adolescent Health Research Group, 2013). Among adolescents in Auckland, a study found that as the frequency of social supply increases, there are associated increases in quantities typically consumed, frequency of drinking and self-reported drunkenness (Huckle et al., 2008). A 2014 study, using national survey data from approximately 5,000 school students, found that social supply from friends or another adult was among the strongest predictors of belonging to a high-risk drinking group (Jackson et al., 2014). A report found that a greater proportion of 15-17 year old risky drinkers, defined as drinking five or more drinks in the past 4 weeks, received their alcohol from friends aged over 18, relative to non-risky drinkers. Non-risky drinkers were more likely to be given alcohol by their parents, relative to risky drinkers (Health Promotion Agency, 2017).

From a public health perspective, concerns about the social supply of alcohol to adolescents include consequences from drinking and the experience of related harms. Social supply is one factor which predicts whether adolescents drink alcohol or not (e.g. Chan et al., 2017; Mattick et al., 2017) and consuming alcohol may more adversely affect brain function in adolescents compared to adults (Jacobus & Tapert, 2013). Initiation of drinking has been found to be related to parental supply of alcohol, among other factors (Ryan et al., 2010). Early initiation of drinking is associated with adverse effects on physical and cognitive development and also associated with increased risk of later alcohol-use disorders and other mental health problems (Jernigan, 2001; National Institute on Alcohol Abuse & Alcoholism, 2004-5; Odgers et al., 2008; Tapert et al., 2005). Further, the social supply of alcohol is associated with the experience of alcohol-related harms among adolescents both in New Zealand e.g. unsafe sex, injury (Jackson, et al., 2014; SHORE & Whariki, 2012) and internationally (e.g. Dietze & Livingston, 2010; Kaynak et al., 2014; McMorris et al., 2011).

International research has also looked at how the various sources of social supply relate to different drinking patterns and problems among adolescents. Several Australian studies have found that social supply by friends and other sources (i.e. not parents/guardians) are common sources of alcohol for adolescent risky/heavy drinkers (Dietze & Livingston, 2010; Gilligan et al., 2012a), and that alcohol from these sources results in a higher likelihood of risky single occasion drinking, defined as more than six Australian Standard Drinks (ASD - 10 grams pure alcohol) for males, and more than four ASD for females, on any one drinking occasion at least weekly in the 12 months and alcohol-related consequences (Dietze & Livingston, 2010). This is not to say that parental supply has not been found to have an association with heavy drinking and consequences, as some studies do find this (e.g. Chan, et al., 2017; Kaynak, et al., 2014; McMorris, et al., 2011), but parents tend to be the main source of alcohol for moderate adolescent drinkers (defined as had a full glass but not more than four drinks on a single occasion in the last month) as compared to risky drinkers (defined as had more than four drinks on one or more occasions in the last month) (Gilligan, et al., 2012a; Health Promotion Agency, 2017). The volume of alcohol supplied by parents has been found to be smaller than that sourced elsewhere (Dietze & Livingston, 2010; Foley et al., 2004; White & Hayman, 2006). Studies have found, however, that parental supply with no supervision is related to heavy drinking

(Gilligan, et al., 2012a) and that the impact of parental supply may vary according to the circumstances of supervision under which alcohol is supplied (Gilligan et al., 2012b).

The suppliers

The New Zealand and international literature on social supply is, for the most part, based on reports by adolescent receivers of the alcohol. As such, there are key gaps in our understanding of supplier's self-reported behaviour even though legislation and other interventions strategies to reduce social supply are intended to influence the behaviour of the supplier (suppliers are defined as those who supply alcohol socially to under 18's). We could not identify any published studies detailing patterns of supply from the supplier's perspective in New Zealand. However, the non-peer-reviewed literature reveals that social supply is relatively common. Forty-three percent of parents with a child aged 16 years reported allowing their child to drink under their supervision (or under the supervision of another parent or caregiver) during the past four weeks (Health Promotion Agency, 2017). A study of young suppliers (aged 18-22 years), conducted in two areas in the North Island of New Zealand, indicates that the quantities supplied by young suppliers are high. The 18-22 year olds who supplied alcohol to underage drinkers reported providing, on average, the equivalent of 8-10 cans of ready-to-drink beverages. Common reasons for supplying included having control over where and how much the under 18s are drinking. Suppliers commented they thought the alcohol supplied would be shared amongst the group anyway, that it was OK if under 18s could handle their alcohol and it's better than under 18s accessing alcohol through other means. Even though the reasons given for supplying seemed to be for the purposes of protecting those under 18s, over 70% of the young suppliers said alcohol they supplied to under 18s had caused some harms: 40% said the under 18s got into a serious argument, 32% got in a physical fight and 12% of the under 18s were arrested by Police (SHORE & Whariki, 2012).

Few published studies are available internationally from the perspective of the supplier. A study of parents from Victoria, Australia found that social supply was associated with higher levels of parental monitoring, but not with parent/adolescent sociodemographic characteristics or parents' drinking patterns (Ward & Snow, 2011). A study of college students aged 23 to 24 years, from a mid-Atlantic region of the United States, found that most students (85%) provided alcohol to someone less than 21 years of age, i.e. not of legal drinking age, at least once (although it was unclear from the study whether this was lifetime supply or e.g. in the last 12 months). Provision to older minors (18-20 years) was more prevalent (82.8%) than to younger minors under 18 years (21%); it was also more frequent. Males were more likely to supply. Recipients were more commonly friends or family members rather than acquaintances or strangers (Arria et al., 2014).

Aside from understanding patterns of social supply, data from the supplier allows for comparison with adolescent reports of being supplied. A New Zealand study found that reports about recent social supply of alcohol by parents from teenagers themselves were considerably higher than those given by parents with respect to several measures - to drink when they were present 68% (reports by teenagers) vs 36% (reports by parents); to drink under other adult supervision 50% vs 17% and to drink when there was no adult supervision 36% vs 2% (Kypri, et al., 2005). Discrepancies between teenager and parent reports may be due to the fact that parents were not necessarily reporting on the same teenagers that took part in the survey, the suppliers were providing a socially desirable survey response and because of differences in the interpretation of what constitutes adult supervision (or supply).

Key gaps remain in our understanding of social supplier behaviour in New Zealand, and elsewhere, including detailed patterns of social supply; how patterns of social supply differ by age, gender and ethnicity

of supplier and if/how social supply changes over time - with the latter being of particular relevance given there has been a change in social supply legislation in New Zealand.

The New Zealand context: Change in legislation on social supply

New Zealand has experienced a legislative change with respect to social supply, providing an opportunity to assess if any change over time has occurred in response which could have important implications informing further prevention strategies. The new legislation was included in the Sale and Supply of Alcohol Act 2012 and came into effect in December 2013. The Sale and Supply of Alcohol Act 2012 made it an offence to supply alcohol to a person under 18 years of age¹, unless the person supplying the alcohol (a) is a parent or guardian of the minor, and supplies the alcohol in a responsible manner; or (b) believes on reasonable grounds that he or she has the express consent of the parent or guardian of the minor, and supplies the alcohol in a responsible manner. This means that only parents or legal guardians would be able to supply alcohol to a minor or to consent to alcohol being supplied by another adult. In both cases, any alcohol given to a minor will have to be supplied in a responsible manner (e.g. the supplier has taken steps to supervise the consumption of the alcohol supplied; food has been provided with the alcohol; or a choice of low-alcohol or non-alcoholic beverages, or both, has been offered - these and other considerations are specified in the Act). Following this law change, a report found that 74% of people agreed permission must be gained from the parents of a young person aged 16 years before providing the young person with alcohol (Health Promotion Agency, 2017).

Previously, under the Sale of Liquor Act 1989, it was illegal in New Zealand to purchase alcohol with the intent of supplying to anyone younger than 18. However, it was not an offence for a parent or guardian to supply alcohol to their own child (Sale of Liquor Act S.160(3)), or for any person to supply alcohol to a minor at a private social gathering (Sale of Liquor Act S.160(3)(d)). Criticisms of the 1989 law were that it was difficult to prove 'intent to supply' and the Act didn't provide a definition of what was considered to be a private social gathering (where it was legal to supply alcohol). The new legislation responded to this by including the requirement for 'express' consent.

We found only one study internationally that had assessed changes in social supply as reported by adolescents aged 14-17, under the legal purchase age, following changes in social supply legislation in Australia. Over the period 2010–2014, a number of Australian states legislated to make it a criminal offence for adults other than parents/guardians or those acting with the permission of parents to provide alcohol to persons under the legal age for alcohol purchase (Kelly et al., 2016). There was a significant drop in adolescent reports of parental supply for current alcohol use from 21.3% in 2004 to 11.8% in 2013. The lower prevalence of parental supply coincided with legislative changes on parental supply of alcohol to adolescents, but causality could not be determined. There was no significant change in the rate of supply of alcohol by friends from 1998 to 2010 but this rate dropped significantly in 2013 (from 24.7 % in 2010 to 17.8 %) Overall, there was a reduction in the supply of alcohol from friends and parents from 2007, and reductions in parental supply appeared more substantial than reductions in supply by friends over this period (Kelly, et al., 2016).

No study has yet assessed the impact of the legislations change in New Zealand on patterns of social supply.

¹ The minimum legal purchase age for alcohol is 18 years in New Zealand.

The current study

Based on the gaps in our understanding of social supply from the suppliers' perspective and the importance of assessing the early impacts of the new law change in New Zealand, the current study reports on patterns of social supply from the perspective of the supplier in 2013 and 2015 including:

- overall prevalence (and prevalence in relation to whom they supply)
- frequency of social supply
- usual quantity of alcohol supplied.

Statistical modelling was also undertaken to assess the early impacts of the law change (and to investigate if demographic characteristics of suppliers predict supply).

The study also provides description of 16-17 year olds' reports of being supplied to assess validation between reports of suppliers and those who were supplied.

Survey data are available to assess these key gaps in our understanding of social supply in New Zealand. The data were collected as part of the Alcohol Policy Interventions in New Zealand (APINZ) study (the New Zealand arm of the International Alcohol Control Study). The 2013 and 2015 data points were funded by the Health Research Council of New Zealand. Analyses of specific questions within these data sets allows for the assessment of patterns of social supply by suppliers and assessment of the early impact of the law change (including consent and supervision). An innovation of the APINZ study is that it adds to our understanding of the links between alcohol policy change and behaviour change. APINZ also allows for assessment of the way in which heterogeneity in the population interacts with policy change.

Methods

Data: The research uses data collected from national surveys of drinkers aged 16-65 years in 2013 and 2015 (before and after the social supply law change in New Zealand): 2013 (n = 2591) and 2015 (n = 2971). The law change relating to social supply came into force on the 18th December 2013 (the 2013 survey collected data before this time point and therefore is a baseline measure). Response rates were over 60% for each survey. Data were collected by landline and cell phone (more detail on sampling and data collection are available from Casswell et al., 2014). The APINZ surveys utilised a longitudinal cohort design with random replenishment samples.

Measures

Suppliers

Measures for suppliers were available in both 2013 and 2015 and were:

- Patterns of social supply to under 18 year olds: including prevalence of social supply, prevalence by to whom was supplied, usual quantity of social supply, frequency of supply and beverage type usually supplied.
- Demographics were: age (groups 16-24, 25-34, 35-44, 45-54 and 55-65 years), gender (male/female), prioritised ethnicity (Maori, Pasifika, Asian, NZ European), education level (low = less than 10 years of education, medium = 10-12 years of education, high = 13+ years of education).
- Policy related measures: measures to elucidate the links between alcohol policy change and behaviour change were collected to aid interpretation and impact of the effects of the legislation change. These were permission to supply alcohol to the under 18 from their parent/guardian (all of the time, most of the time, about half of the time, some of the time, none of the time) and whether the supplier supervised the under 18 while they drank the alcohol that they had supplied (all of the time, most of the time, about half of the time, some of the time, none of the time).
- Whether the supplier believed the alcohol they supplied was going to be shared was also collected.

Adolescents (recipients of the alcohol supplied)

Measures for 16-17 year olds were prevalence of social supply, usual quantity of alcohol supplied to them and frequency with which they were supplied.

Analysis

SAS 9.3 was used both to compute descriptive statistics and to fit Generalised Estimating Equation (GEE) models using the supplier's data. Given the structure of the sample design (longitudinal design with random replenishment samples) some respondents were in both the 2013 and 2015 samples. GEE was used to take into account the possible correlation between the same respondent and to provide robust standard errors for the estimates. For the models with a dichotomous outcome (prevalence) logit link was used. Usual quantity supplied was analysed using normal linear regression (ordinary least-squares regression) using log transformation. Frequency of supply was analysed assuming a Poisson distribution. For the models determining changes over time as seen in Table 1, year was included as the predictor. For the models

assessing the effects of the law change (as seen in Table 5), we included demographic variables (age, gender, ethnicity, and education level) as covariates. For evaluating the change of law, year of the survey was also included as a dichotomous explanatory variable. Interactions between demographics variables and year of the survey were also tested in these models. Supervision and permission were also incorporated in the analysis (for the measures frequency and usual quantity of supply). Sample numbers used in the analyses can be found in Appendix One.

As one person was selected per household, unequal selection probability was adjusted for. Prior to weighting, the surveys were broadly representative of the New Zealand population in terms of key demographics variables e.g. age and gender. Post-stratification weights were, however, still calculated for age, gender and prioritised ethnicity (all individuals fell within an acceptable range of weights). Pasifika were low in both the samples. Weights were applied for statistical modelling, however, when data were disaggregated into groups for descriptive analysis and where numbers were smaller i.e. some categories of suppliers, a few individuals with relatively large weights were skewing results. Therefore, descriptive statistics are presented unweighted. Even though data match the population in terms of demographics, and response rates were very good by national and international standards, this does not necessarily preclude bias in terms of supplier behaviour.

Results

Social supply to under 18 year olds

Prevalence of supply

The overall prevalence of social supply at least once in the previous six months to someone under 18 years of age, as reported by all survey respondents aged 16-65 years, was 8.3% in 2013 and 6.4% in 2015. Translating these proportions into population numbers (StatsNZ, 2017) show that approximately 240,454 people aged 16-65 years in 2013 and 191,728 people in 2015 reported supplying alcohol socially to an adolescent under the purchase age at least once.

Social supply as reported by suppliers only

Table 1: Prevalence among suppliers, frequency and quantity of supply by to whom supplied (among suppliers) in the past six months

Measures	2013	2015	P-value
<i>Sample</i>	n=214	n=190	
Prevalence^a	%	%	
Son/daughter	43.9	47.4	0.59
Friend under 18 years	30.4	22.1	0.02
Other relative	24.8	27.9	0.43
Friend of son/daughter ^b	1.9	1.6	0.82
Stranger ^b	-	-	-
Average frequency supplied	Number of times	Number of times	
Son/daughter	4	3.1	0.18
Friend under 18 years	4.5	4.4	0.18
Other relative	3	2.4	0.34
Friend of son/daughter	1	2	-
Total average	4	3.2	0.00
Average times supplied by top 10% of suppliers	12.6	12	0.53
Average usual quantity supplied (Drinks^c)	Drinks	Drinks	
Son/daughter	4.0	6.0	0.02
Friend under 18 years	13.0	11.2	0.04
Other relative	6.6	6.5	0.75
Friend of son/daughter	6.9	1.8	-
Total average	7.1	6.9	0.34
Average usual quantity supplied by top 10% of suppliers	21.5	19.9	0.49

^a Multiple responses were possible

^b n = very small

^c a drink was defined as 10g (12.7ml) absolute alcohol

Prevalence of social supply (among suppliers only)

Table 1 reports to whom suppliers reported supplying at least once in the past six months. Sons/daughters were most commonly supplied to in both 2013 and 2015, followed by friends, other relative and friend of son/daughter. Although supply to a stranger was asked about only two people reported doing so, as such, supply to a stranger is not reported on further.

Proportions of social supply remained relatively stable over the two years (2013 and 2015); however, the proportion of 16-65 year olds who supplied to friends decreased from 30% in 2013 and 22% in 2015 ($p = 0.02$).

Frequency of social supply

Table 1 also shows the average frequency with which suppliers supplied, including by to whom they supplied and the average frequency of supply by the top 10% of those who supplied.

The total average frequency of supply was 4 times in the previous six months in 2013 and 3 times in 2015 ($p = 0.002$). The average frequency of supply to sons/daughters was 4 times 2013 and 3 times in 2015. The number of times alcohol was supplied to friends remained constant at around 4.5 times in both years; supply to another relative was 3 times in 2013 and 2.4 times in 2015.

The top 10% of suppliers, on average, provided alcohol 13 times in 2013 and 12 times in 2015 in the last six months.

Usual quantity of alcohol supplied

The total average number of drinks supplied by suppliers in the past six months was 7 drinks in both 2013 and 2015 - equivalent to 7 x 330ml stubbie bottles of beer (a drink was defined as 10g absolute alcohol). The largest quantities were supplied to friends (around 12 drinks), followed by other relatives and son/daughters. The usual quantity of supply by the top 10% of suppliers was, on average, 22 drinks in 2013 and 20 drinks in 2015 (Table 1).

With respect to supply across the years the usual quantity supplied by parents in the past six months increased from 4 drinks in 2013 to 6 drinks in 2015 ($p = 0.02$), while supply to friends decreased from 13 drinks in 2013 to 11 drinks in 2015 ($p = 0.04$). Total average supply remained constant at 7 drinks (Table 1).

Sharing of alcohol supplied

Suppliers were asked “did the [e.g. son/daughter] you supplied alcohol to in the last six months usually share the alcohol you gave them with their friends or others?” Response options included yes/no/sometimes.

Table 2: Suppliers reported alcohol they supplied would be shared in the past six months

Supplier thought the alcohol they supplied would be shared (%)	2013	2015
Son/daughter		
Yes	11.7	14.4
Sometimes	5.3	4.4
Friend under 18 years		
Yes	23.0	26.1
Sometimes	-	-
Other relative		
Yes	11.3	16.9
Sometimes	5.6	3.7
Friend of son/daughter^a		
Yes	25.0	0
Sometimes	0	33.0

^an = very small

Less than one fifth of suppliers reported they thought the alcohol they supplied would usually be shared at least some of the time, in relation to son/daughter and other relative in 2013 and 2015. Around one quarter of suppliers thought the alcohol they supplied to a friend under 18 would be shared (23% in 2013 and 26% in 2015) (Table 2).

Beverage types supplied

Table 3: Usual type of beverage supplied in past six months

% of suppliers	Beer		RTDs		Wine		Spirits		Cider		Low alcohol beer	
	2013	2015	2013	2015	2013	2015	2013	2015	2013	2015	2013	2015
% suppliers total												
Son/daughter	48.9	44.4	23.4	27.7	18.0	5.5	2.1	4.4	6.4	15.6	1.0	2.2
Friend under 18 years	40.0	35.7	41.5	33.3	9.2	4.7	6.1	19.0	3.0	4.7	0.0	0.0
Other relative	35.8	28.3	41.5	41.5	7.5	5.6	7.5	9.4	7.5	13.2	0.0	0.0
Friend of son/daughter ^a	50.0	33.3	50.0	33.3	0.0	0.0	0.0	0.0	0.0	33.0	0.0	0.0
% suppliers male^b												
Son/daughter	60.0	67.8	12.0	18.2	21.1	4.0	1.7	0.0	5.1	8.2	0.0	1.8
Friend under 18 years	45.3	55.7	39.4	21.1	10.6	3.2	4.8	14.8	0.0	0.0	0.0	0.0
Other relative	51.8	30.2	29.0	42.5	2.0	0.0	8.6	6.0	8.6	21.3	0.0	0.0
% suppliers female												
Son/daughter	41.7	31.4	30.4	40.6	15.4	5.4	2.5	7.0	8.0	14.3	2.0	1.4
Friend under 18 years	35.7	13.4	37.7	53.7	12.4	2.1	8.2	25.1	6.1	5.8	0.0	0.0
Other relative	19.4	30.2	55.1	46.1	9.4	12.7	12.1	11.7	4.1	8.7	0.0	0.0

^a n = very small - could not be disaggregated by gender

^bA small number of respondents had missing gender - they are included in the total % but could not be included in the proportions disaggregated by gender

In both 2013 and 2015, the most common type of beverages supplied to sons/daughters were beer (49% in 2013 and 44% in 2015), followed by ready to drinks (RTDs) (23% and 28% respectively). In terms of supply to friends under 18 years, in 2013 40% of suppliers usually supplied beer and 42% reported usually supplied RTDs. In 2015, these proportions were 36% and 33% respectively (Table 3).

Wine and spirits were supplied by fewer suppliers as compared to beer and RTDs, although 19% of suppliers usually supplied spirits to friends under 18 years in 2015 (this proportion was 6% in 2013) (Table 3).

The proportion of suppliers that usually supplied wine to sons/daughters in 2013 was 18%; this proportion was 6% in 2015.

The proportion usually supplying cider to sons/daughters was 6% in 2013 and 16% in 2015 and for other relatives 8% and 13% respectively (Table 3).

Of suppliers, in 2015, twice as many males supplied beer to sons/daughters compared to females (68% vs 31%), while twice as many females supplied RTDs to sons/daughters compared to males (41% vs 18%). More females supplied spirits relative to males (Table 3).

Assessing the effects of the law change on social supply

Supervision and permission

Permission to supply and supervising while supplying were key aspects of the new law change, and as such, the surveys asked suppliers: How often did you supervise the [e.g. friend under 18 years] while they drank the alcohol you supplied? The following definition of supervise was read out: *Definition of supervise is: being present and overseeing the under 18 to help make sure no problems occur.* Suppliers were also asked: How often did you have permission from the [e.g. friend under 18 years]'s parents or guardians to supply the alcohol?

Response options were all of the time, most of the time, about half of the time, some of the time and none of the time and are reported below in Table 4.

Table 4: Permission to supply and supervising while supplying in the past six months

	Son/daughter		Friend under 18 years		Other relative		Friend of son/daughter ^a	
	2013	2015	2013	2015	2013	2015	2013	2015
Supplier supervised %								
All of the time	69.1	64.4	63.1	78.6	52.8	60.3	75.0	100.0
Most of the time	12.7	6.6	16.9	7.1	0.0	5.6	0.0	0.0
About half of the time	7.4	10.0	3.1	7.1	7.5	5.6	0.0	0.0
Some of the time	1.1	6.6	9.2	2.3	11.3	9.4	0.0	0.0
None of the time	9.5	12.2	7.6	4.7	28.3	18.8	25.0	0.0
Permission to supply %								
All of the time	-	-	36.9	30.9	79.2	75.5	100.0	66.0
Most of the time	-	-	4.6	0.0	1.8	0.0	0.0	0.0
About half of the time	-	-	3.1	0.0	1.8	3.7	0.0	0.0
Some of the time	-	-	7.7	11.9	3.7	1.8	0.0	0.0
None of the time	-	-	47.7	54.8	13.2	18.8	0.0	33.0

^a n = very small

Permission

Around one third of suppliers reported that they had permission to supply friends under 18 years in 2013 and 2015, these proportions were higher with respect to other relative (around 76% in 2015) (Table 4).

Supervision

The proportion of suppliers reporting they supervised the under 18's all or most of the time was relatively high in both 2013 and 2015 (between 53% and 100%) (Table 4).

The proportion of suppliers that supervised friends under 18 years all of the time was 63% in 2013 and 79% in 2015 and for other relatives 53% and 60% respectively. Supervision of son/daughter all of the time was 69% in 2013 and 64% in 2015 (supervision most of the time was 13% in 2013 and 7% in 2015) (Table 4).

Measuring the impact of the legislation change

To further assess if the law change may have resulted in any change in social supply, statistical models were computed. The purpose of the models was to understand if any change has occurred in patterns of social supply, as reported by the suppliers, before vs after the law change 2013 v 2015 (i.e. prevalence, frequency or quantity) while assessing other factors that may have contributed to possible changes such as supplier demographics characteristics (age, gender, ethnicity and education level).

Measures directly related to the law change i.e. assessing whether the supplier had permission to supply and/or supervised while supplying were also available from the survey in 2013 and 2015 and were included in the models to understand if these measures predicted change in social supply over time (we could not include measures of permission or supervision in the prevalence model because it is not relevant for non-suppliers in the population).

Interactions were also included in the models to determine if any groups changed their patterns of social supply differently relative to the overall effect over time (and to assess if permission and supervision contributed to change in patterns of social supply over time).

Table 5 presents the model estimates, confidence intervals and p-values for three separate models assessing changes in social supply over time in prevalence of supply, frequency and usual quantity of supply.

Table 5: Modelling change over time in social supply before vs after law change: prevalence, frequency and quantity in the past six months^a

	Prevalence				Frequency				Quantity			
	Odds ratio	Lower CI	Upper CI	P value	Estimate	Lower CI	Upper CI	P value	Estimate	Lower CI	Upper CI	P value
<i>Year</i>												
2015 vs 2013	0.87	0.68	1.10	0.24	-0.33	-0.60	-0.07	0.01	0.20	-0.02	0.42	0.08
<i>Gender</i>												
Male vs Female	1.35	1.02	1.77	0.03	0.03	-0.27	0.33	0.85	-0.10	-0.34	0.14	0.42
<i>Age group</i>												
25-34 vs 18-24	0.31	0.16	0.61	0.00	-0.34	-0.72	0.04	0.08	-0.73	-1.37	-0.09	0.02
35-44 vs 18-24	0.64	0.44	0.94	0.02	0.07	-0.49	0.63	0.80	-0.64	-1.07	-0.22	0.00
45-54 vs 18-24	1.21	0.88	1.67	0.25	0.08	-0.46	0.63	0.76	-0.82	-1.22	-0.42	<.0001
55-65 vs 18-24	0.27	0.15	0.48	<.0001	0.01	-0.64	0.67	0.97	-1.06	-1.55	-0.58	<.0001
<i>Ethnicity</i>												
Asian vs NZ European	0.35	0.16	0.74	0.01	-0.49	-0.82	-0.16	0.00	-0.48	-1.03	0.07	0.09
Maori vs NZ European	1.05	0.69	1.60	0.83	-0.11	-0.56	0.34	0.63	0.35	-0.04	0.75	0.08
Pasifika vs NZ European	0.25	0.08	0.73	0.01	0.21	-0.57	0.98	0.60	1.22	0.23	2.22	0.02
<i>Education</i>												
High vs Low	1.23	0.58	2.59	0.59	-0.21	-0.92	0.50	0.56	-0.17	-0.74	0.40	0.56
Medium vs Low	1.19	0.56	2.50	0.65	-0.02	-0.81	0.77	0.96	0.12	-0.53	0.77	0.72
<i>Supplier had permission</i>												
Yes vs no	-	-	-	-	0.01	-0.32	0.34	0.94	-0.22	-0.52	0.08	0.15
<i>Supplier supervised</i>												
Yes vs no	-	-	-	-	0.17	-0.27	0.61	0.45	-0.65	-0.94	-0.36	<.0001

^a Sample numbers included in the models can be found in Appendix One

Patterns of social supply before vs after the law change

There was no change in the prevalence of being a supplier ($p = 0.24$) or in the quantity of alcohol usually supplied socially (as reported by suppliers) between 2013 and 2015 ($p = 0.08$) i.e. before vs after the law change (Table 5).

There was a significant decrease in the frequency of social supply, as reported by the suppliers, between 2013 and 2015 and the size of the decrease was small i.e. average frequency of supply decreased by one occasion (est -0.33, $p = 0.01$). Interactions showed that just the Pasifika suppliers significantly increased their frequency of social supply between 2013 and 2015 (relative to the NZ European group).

There was no significant difference in the quantity supplied by suppliers who had permission to supply from the minor's parent or guardian compared to those who did not have permission ($p = 0.15$). However, suppliers who reported supervising the teenagers they supplied reported supplying a lower usual quantity relative to suppliers who did not supervise (6.5 drinks vs 10 drinks respectively – not tabulated ($p < 0.001$)). No significant relationships between permission or supervision and frequency of supply were found (Table 5). Nor were any interactions significant.

Relationship between demographics characteristics of suppliers and social supply

The relationships between the demographic characteristics of suppliers and the prevalence, frequency and usual quantity of supply in the past six months were tested in the statistical models reported in Table 5.

With respect to being a supplier, males were significantly more likely to be suppliers (compared to females) and the 25-34, 35-44 and 55-65 year age groups were significantly less likely to be suppliers (compared to 18-24 year olds). Asian peoples and Pasifika were significantly less likely to be suppliers (compared to the NZ European group). No significant effect of education was found regarding the likelihood of being a social supplier (Table 5).

With respect to the frequency of supply, Asian peoples supplied less frequently compared to the NZ European group (Table 5).

All age groups supplied less quantity compared to 18-24 year olds. Pasifika supplied a higher usual quantity as compared to the NZ European group. There was no relationship between education level and quantity of supply (Table 5).

For descriptive statistics of the demographic characteristics of suppliers, see Appendix One.

Social supply as reported by 16-17 year olds

The following section reports social supply from the perspective of 16-17 year olds (younger ages were not included in the surveys). Responses from the 16-17 year olds are taken from the same surveys as the supplier reports in both 2013 and 2015. However, the adolescents are not from the same households as the suppliers. Further, reports from suppliers presented in the above section can reflect supply to a wider age range than 16-17 years. Reports of being socially supplied, by the 16-17 year olds, are presented descriptively only.

The 2015 survey did not represent 16-17 year olds as well as the 2013 survey i.e. there are smaller numbers of 16-17 year olds available for analysis in 2015 (2013 $n = 187$; 2015 $n = 55$).

Prevalence of being supplied

Overall, 88% and 91% 16-17 year old drinkers reported being socially supplied at least once in the past six months in 2013 and 2015 respectively. This differs markedly from the around 7% of the population that report being suppliers. However, the proportion of the population of adolescents most likely to be supplied alcohol, those aged 14-17 years, comprised 8.3% of the New Zealand population aged 16-65 years (the survey age range) in 2015 (data obtained from <http://www.stats.govt.nz/infoshare/>), therefore we may not expect the overall prevalence of social supply to be high at the population level.

Around 63% of 16-17 year old drinkers who were socially supplied reported supply from a parent in both 2013 and 2015. About 44% reported being supplied by a friend in 2013 and 25% reported the same in 2015. Around 15% reported being supplied by another relative in both years (Table 6).

Table 6: Proportion of 16-17 year olds reporting social supply by source in the past six months

% of 16-17 year olds	2013	2015
Parents	64.3	62.5
Friend	43.6	25
Other relative	16.2	14.1
Stranger by alcohol shop	2.7	1.5
Other stranger	0	1.5
Partner/boyfriend/girlfriend	0.46	0
Parent of a friend	1.39	0

Frequency and usual quantity of supply

The average frequency with which the 16-17 year old drinkers reported being supplied in the past six months was 13.5 in 2013 and 29 times in 2015 (keeping in mind that the 16-17 year olds were less well represented in the 2015 survey).

The average usual quantity that 16-17 year old drinkers reported being supplied in the past six months in 2013 was 17.9 drinks, defined as 10g absolute alcohol, and 12.2 drinks in 2015.

Discussion

Public health concerns about the social supply of alcohol to adolescents include consequences from early initiation of drinking, heavier drinking and the experience of related harms. While the evidence base on social supply has been increasing, there remain key gaps in our understanding including investigation of supplier's self-reported behaviour. The availability of national general population surveys in 2013 and 2015 allowed for the description of patterns of social supply in New Zealand by suppliers (as well as among those who are supplied, adolescents aged 16-17 years). Additionally, the timing of the surveys facilitated the assessment of the early impacts of the more restrictive social supply law in New Zealand implemented on December 1st 2013.

Patterns of social supply

In these surveys social supply to teenagers was common. Around 8% of New Zealand drinkers aged 16-65 years reported supplying to underage drinkers (8% in 2015 and 6% in 2013). Teenagers aged 14- 17 years in New Zealand are about 8% of the population.

Suppliers were asked how often they supplied alcohol socially. The frequency with which suppliers provided alcohol to underage drinkers in the past six months, was on average, four times in 2013 and three times in 2015. However, the top 10% of suppliers provided alcohol on average once a fortnight in both 2013 and 2015.

Previous New Zealand research has found that the usual quantities of alcohol that suppliers supply are high (SHORE & Whariki 2012) and this was confirmed by the current study. Suppliers reported supplying an average of seven drinks, defined as 10g absolute alcohol, in both 2013 and 2015 (in the past six months). When the top 10% of suppliers were analysed, it was found that they supplied on average 20 drinks when they supplied. Suppliers most commonly supplied beer and ready-to-drinks and this reflects the alcohol beverage preferences of adolescents in New Zealand (Adolescent Health Research Group, 2013). The supply of cider became more common in 2015 and likely reflects the increase in the types and flavours of ciders now available, including in supermarkets.

The frequency and usual quantities with which the 16-17 year olds, who were being supplied to, reported were considerably higher than those reported by the suppliers. Discrepancies between reports may be expected as the adolescents are not from the same households as the suppliers. In addition, reports from suppliers can reflect supply to a wider/younger age range than 16-17 years. However, it is also possible that social desirability affected supplier's reports. The reports of large quantities being supplied is consistent with previous New Zealand research that found that more alcohol is obtained by teenagers aged 16-17 years via social supply than obtained by own purchasing (Railton, et al., 2016, unpublished).

Who was supplied?

In 2013, almost half of the suppliers reported supplying to sons and daughters but friends and other relatives were also commonly supplied. These findings are consistent with previous findings from the Youth'12 survey that also found parents to be the most common source of alcohol followed by friends (Adolescent Health Research Group, 2013).

With respect to how often and how much was supplied, sons and daughters were supplied alcohol more often than others but the quantities supplied were smaller, compared with supply to friends. This is in keeping with international research, based on adolescent reports, that found that the volume of alcohol supplied by parents is smaller than other sources (Dietze & Livingston, 2010).

Around one quarter of suppliers thought that the alcohol they supplied to their sons or daughters or friends would be shared (at least some of the time). This proportion is lower than found in a previous New Zealand study, conducted in two North Island localities, where around 60% of suppliers aged 18-22 years reported they thought the alcohol they supplied to friends under the purchase age would be shared (Shore & Whariki 2012). However, the current study reports perceptions of sharing alcohol by supplier's aged 16-65 years, a much wider age range, which may be contributing to this difference.

Demographics and social supply

Males were significantly more likely to be suppliers and younger people (18-24 year olds) were both more likely to be a supplier and to supply higher quantities than the older age groups. Asian peoples and Pasifika were significantly less likely to be suppliers (compared to the NZ European group) and Asian peoples supplied less frequently compared to the NZ European group. These patterns seem to broadly reflect drinking patterns in these groups and suggest that patterns of supply are complementary to patterns of

drinking, i.e. males and young people consume more alcohol than other population groups (Ministry of Health, 2015), Pasifika and Asian people tend to have higher rates of abstainers and drink less frequently (Ministry of Health, 2015).

Assessing the early impacts of the law change - change in patterns of supply

The analysis found no change in the prevalence of supply or the quantities supplied but there was a small, and statistically significant, decrease in the frequency of social supply overall. This suggests an early, albeit small, impact of the law change.

Other indications of change were related to supply to friends under 18 years. Fewer suppliers were observed to supply to friends under the purchase age between 2013 and 2015 (30% vs 22%). Reports from the 16-17 year olds also suggested they were supplied less commonly by friends (however adolescent reports are limited by small numbers in 2015). The usual quantity of supply to friends under 18 years, as reported by suppliers, on average decreased by 2 drinks between 2013 and 2015. There was also an increased tendency for suppliers to always supervise their supply to friends and other relatives following the law change. Both before and after the law change suppliers who supervised provided a lower usual quantity of alcohol as compared to suppliers who did not supervise (6.5 drinks versus 10 drinks). International research has found that the supervision of social supply is related to moderate consumption among adolescents (Gilligan et al 2012a).

Supply to sons and daughters showed less change following the law change in relation to supervision (69% in 2013 and 64% in 2015) and quantity of supply on average increased by 2 drinks from parents/guardians. However, these changes in usual drinks supplied (a decrease to friends and increase to sons and daughters) seem to have evened out at the population level as no significant change in usual quantity supplied was found when modelled.

Conclusion

In New Zealand, adolescents under the minimum purchase age (18 years) are commonly supplied alcohol via social sources such as parents/guardians, friends and others (social supply). Sons and daughters are most commonly supplied to, followed by friends, but friends are supplied on average greater quantities (although quantities supplied to sons and daughters are still relatively high).

There was evidence of some early impacts of a law change on social supply (through the Sale and Supply of Alcohol Act 2012). A small decrease in the frequency of social supply was found. Friends were less commonly supplied to, were supplied with fewer drinks and there was a tendency for greater supervision of social supply to friends (and to other relatives).

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Appendix One

Supplier sample numbers

Sample numbers	2013	2015
<i>Overall prevalence</i>		
Yes	214	190
No	2377	2781
<i>Prevalence by supplier</i>		
<i>Son/daughter</i>		
Yes	94	90
No	120	100
<i>Friend under 18 years</i>		
Yes	65	42
No	149	148
<i>Other relative</i>		
Yes	53	53
No	161	137
<i>Friend son/daughter</i>		
Yes	4	3
No	210	187
<i>Frequency</i>		
Suppliers	214	190
Top 10%	38	21
<i>Quantity</i>		
Suppliers	214	190
Top 10%	24	38

Demographic characteristics of suppliers: descriptive statistics

Demographic characteristics of suppliers	2013	2015
<i>Gender</i>		
Male	51.9	43.2
Female	48.1	56.8
<i>Mean age</i>		
Suppliers	33.3	34.0
<i>Ethnicity</i>		
Maori	10.3	15.3
Pasifika	2.8	1.1
Asian	3.3	2.1
NZ European	83.6	81.6
<i>Education level</i>		
Low (Under 10 years education)	5.1	3.2
Medium (11-12 years)	56.2	59.9
High (13+ years)	38.8	36.9