



# Western Australia alcohol home delivery project: Online survey final report



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## Summary

Online alcohol delivery is one of the biggest changes to alcohol availability in recent years with the use of such services markedly increasing in Australia since the COVID-19 pandemic. In February 2022, the Western Australian government introduced new regulations for same day alcohol deliveries: purchaser identification is required to be verified at point of delivery and alcohol cannot be delivered unattended.

The current study explores the behaviours and experiences of Western Australian adults who have purchased alcohol for home delivery within the previous six months. This study was conducted during August to September 2022 and surveyed a sample of 499 Western Australian participants aged 18 to 85 years ( $M = 44.67$ ) who had used alcohol delivery services within the past six months (after which the new regulations were in place). The sample was recruited through an online panel provider, social media, and snowballing. While not a representative population sample, this study is nonetheless important as it provides insights into the online delivery experiences since the new regulations in Western Australia.

One quarter of participants indicated online alcohol delivery was their most common method of purchasing alcohol, with the majority of purchases from bottle shops and supermarkets. Next day or longer delivery was most usual delivery modality, with just under 40% of participants indicating they usually order alcohol for rapid delivery (< 2 hours; 14%) or same day delivery (25%). Convenience and price were the most selected motivations behind online alcohol delivery use.

Twenty-four percent of participants who recently used online alcohol delivery stated they have had alcohol delivered while intoxicated, 75% of which were never or only sometimes refused delivery while intoxicated. Further, 25% of those participants who ordered while intoxicated indicated they would have stopped drinking if online alcohol options were not available.

Twenty-two percent of participants indicated that their same day or rapid delivery was usually left unattended at the door. Examination of the most recent purchase for those who had purchased within the last three months demonstrated 50% of participants who had utilised same day or rapid delivery did not have their ID checked upon delivery and 8% indicated the delivery was left unattended at the door.

When specifically looking at participants identified as having high-risk drinking behaviours by their AUDIT scores, we found that participants with high-risk drinking behaviours used online alcohol delivery at an increased frequency and for a larger proportion of their total alcohol purchases. Participants with high-risk drinking behaviours were also exposed to more advertising online alcohol delivery. Lastly, 10% of participants with high-risk drinking behaviours stated their usual motivation behind ordering online alcohol delivery was due running out of alcohol during a drinking session.

The current report indicates that among our sample of Western Australians who recently made an online alcohol purchase, there was a lack of consistent adherence to the new regulations pertaining to same day and rapid alcohol online delivery. Improved training among drivers and retailers regarding ID checks, unattended delivery requirements, and identification of intoxicated individuals is required. The introduction of policy allowing for police to conduct compliance checks for online delivery of alcohol (i.e., 'mystery shopper') would aid in improving compliance with regulations. Further, expansion of the current regulations to all deliveries, rather than only those made within the same day only, is recommend.

## Introduction

Extensive research shows that easing access to alcohol supply contributes to alcohol-related harm (1). This report examines alcohol home delivery and its association with alcohol use. Alcohol home delivery is the biggest easing of alcohol supply and availability that has occurred in the last five years, with industry reports indicating online alcohol sales have increased between 50% to 500% between 2019 and 2020 (2-4). Australian online alcohol sales were estimated at \$1.8 billion in 2021 (5) and global sales are predicted to grow by 66% over the next five years (6). Whilst much of the recent growth in sales may be attributed to COVID-19 and increases in lockdowns and contactless delivery, this increase in online alcohol delivery use may be permanent. This expansion of online sales has led to increased diversity of retailers and alcohol options, ranging from wholesale wine purchases to rapid home deliveries (i.e., deliveries in less than 2 hours) from bottle shops or supermarkets. This transformation in alcohol availability has shifted consumers from being able to only access alcohol in controlled environments, such as licensed hotels, or staffed take-away outlets, to a landscape where alcohol can be delivered to the customer's door in less than two hours.

Easy access to alcohol may be particularly harmful for people who are vulnerable to alcohol use problems. Recent analysis of online alcohol retailer websites suggests that online retailers may promote risky drinking habits by promoting cheap high alcohol content products, such as bottled wine, offering “buy now pay later” options, and emphasising contactless and on demand delivery (7). Consumers who purchase through alcohol online delivery are also consistently exposed to marketing messages, discount opportunities via both email and push notifications, and reinforcement of the speed of delivery (typically 1 to 2 hours), directly encouraging impulse purchases (8). These strategies allow cheap alcohol to be conveniently accessed, potentially by intoxicated or underage individuals. A recent report from Scotland highlighted that children as young as 14 years have successfully purchased and consumed alcohol from online deliveries (9). Given the established relationship with availability of alcohol and increased harms (10, 11), it is important to understand this new shift in alcohol supply, and understand why and how consumers utilise it.

A recent Australian report highlighted differences in generational purchasing habits, with younger individuals predominantly utilising rapid delivery services, or on demand purchases, whereas older individuals used more speciality services, such as wine clubs (12). The report also highlighted that on average, those that utilised rapid

delivery services typically consumed more alcohol compared to those that utilised services with longer delivery. Further, 22% of individuals who purchased online alcohol delivery reported doing so because they were too intoxicated to drive and 27% of participants stating they would have ceased drinking if delivery was not available (12). The use of rapid alcohol home delivery has also been directly linked to the death of a man from NSW in June 2018 (13). This individual had two deliveries of three bottles of wine from a single delivery service, each only 10 minutes apart (13). This followed deliveries of three bottles of wine to his home a day, almost every day in the weeks before he died.

There is limited research investigating alcohol home delivery service use and the associated risks, however, what is available suggests the increased consumption and harms among users of such services (14, 15). On the 1<sup>st</sup> February 2022 the Western Australian (WA) government introduced new regulations regarding alcohol home delivery services (see <https://www.mediastatements.wa.gov.au/Pages/McGowan/2021/12/New-regulations-to-tighten-alcohol-home-deliveries.aspx>). These regulations are due for review 18 months after their implementation. The current report aims to describe the behaviours, experiences, and motivations behind the use of online alcohol delivery among WA adults.

Specifically, this study will use an online survey to explore the behaviours and experiences of Western Australian adults who have purchased alcohol for home delivery, including:

1. Characteristics of online orders for alcohol products
2. Characteristics of online alcohol delivery use by delivery modality (rapid, same day, or next day and longer) and age
3. Factors associated with the use of home delivery services
4. Customer experiences at the point of purchase, delivery, and beyond, and
5. Risky behaviours and harms associated with alcohol accessed via home delivery services.

## Method

### Participants and procedure

Ethics approval was obtained from Deakin University Human Ethics Advisory Group – Health (93\_2022). An online research panel sample (PureProfile) was used to recruit 486 participants. Twelve participants were removed due to qualitative information indicating they did not meet inclusion criteria (i.e., outside WA). This resulted in a final sample of 474 Western Australian adults who had utilised online alcohol home delivery services within the past six months. To reflect the WA population (16) soft quotas for age category were used: 15% 18-24 years, 18% 25-34 years, 34% 35-54 and, 33% above 55 years. Panel members residing in WA were contacted about the study via email. A link to the survey, hosted on Qualtrics, was provided in the email. Participants were provided with a Plain Language Statement at the beginning of the survey and informed consent was recorded.

A supplementary convenience sample of 25 participants were also recruited through targeted advertising on Meta (Facebook and Instagram) and Twitter, and snowballing. The advertisement directed potential participants to the survey Plain Language Statement and those who consented to take part were directed to the full survey on Qualtrics.

Eligibility criteria were assessed at the start of the survey: currently reside in Western Australia, aged 18 years or older, and had used online alcohol deliveries in the last six months. Participants were then asked about their general online alcohol purchasing behaviours and specifically around their most recent purchase. Participant responses were only recorded if they submitted the survey after the final question. The survey took an average of 9 minutes to complete. Participants were invited to enter the draw to win one of two wi-fi 11-inch iPads. To maintain participant anonymity, details for the draw were kept separate from the survey data.

### Measures

#### *Demographic information*

Participants' age (categorised as 18-24 years, 24-34 years, 35-44 years, 45-54 years, and 55+ years), gender, location (Perth or other), postcode, and household income were recorded. Postcode data were used to code for socio-economic (SES) status using the 2016 Socio-Economic Index for Areas (SEIFA) Index of Relative Socio-Economic Disadvantage (IRSD) (17). A low score on this index indicates lower-SES (relative greater disadvantage) and a high-

score indicates higher-SES (relative lower disadvantage). SEIFA-IRSD rankings within WA were then used to generate tertiles (<33%, 34-67%, >67%) of low-, mid-, and high-SES.

### *Alcohol Use Disorders Identification Test*

The Alcohol Use Disorder Identification Test (AUDIT) was utilised to assess participants alcohol consumption behaviours over the last past year. The AUDIT is a validated screening tool for both hazardous drinking behaviours and problematic alcohol use across a wide range of demographics (18). The AUDIT assesses the quantity and frequency of alcohol consumption on a typical drinking session (i.e., “How many standard drinking containing alcohol do you have on a typical day when drinking?”), potential of alcohol dependency (i.e., “During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?”) and harms stemming from alcohol use (i.e., “Have you or someone else been injured as a result of your drinking?”). Responses are recorded on five-point Likert scales (i.e., 0 = Never/ 0-1 times a month, 5 = Daily or almost daily), with responses summed to a maximum possible score of 40. A score of 1-7 indicates low-risk drinking, risky drinking is a score of 8-12, and high-risk drinking are scores  $\geq 13$ .

### *Online alcohol purchasing behaviours*

Predominately closed answer questions were utilised to capture participants general online alcohol purchasing habits, with open ended responses allowed when the provided categories were not sufficient. Survey questions were derived from Mojica-Perez et al. (12), with additional questions added to 1) reflect changes in purchasing behaviour before and after the onset of COVID-19 and 2) to capture the use of ‘buy-now pay-later’ payment options. Questions asked how often participants purchased alcohol online in the past year, usual place of purchase, time of delivery, motivations behind using online alcohol delivery, frequency of online orders compared to physically going to bottle shops, experiences with online alcohol delivery advertising, and experiences when receiving online deliveries (i.e., deliveries while intoxicated, whether ID was checked at time of delivery). Additionally, participants were asked in detail about their most recent online alcohol delivery, specifically, when it was, what type and how many beverages, motivation behind the order, how long it took to arrive, and whether they were asked to show ID at time of delivery.

### *Data analysis and reporting*

Data were analysed using Stata v.17 (19). Data were weighted according to age and gender in line with the WA adult population (16). Demographic information is provided for both unweighted and weighted data, however, the remaining results will present weighted data only. Sample sizes for all questions are included for transparency, however percentages provided are reflective of weighted data. Descriptive statistics and chi-square tests were used to analyse the data. Where overall significant differences were found, exploration of individual expected frequencies was completed, with Bonferroni adjustments completed on each analysis to reduce likelihood of Type 1 error, or false significant findings. Due to limitations of statistical software, all post-hoc analysis were completed on non-weighted data.

## Results

### Demographics

The final sample was consisted of 499 participants (51.7% female; see Table 1). Ages ranged from 18 to 85 years ( $M = 44.67$ ,  $SD = 16.48$ ), 85.71% ( $n = 426$ ) lived in Perth, 15.95% ( $n = 71$ ) were identified as having a high-risk AUDIT score and around a quarter of participants indicated online alcohol delivery was their most common method of purchasing alcohol.

Table 1 Demographics of sample

| Variable    | Unweighted |        | Weighted |
|-------------|------------|--------|----------|
|             | N          | %      | %        |
| Gender      |            |        |          |
| Female      | 258        | 51.70  | 50.37    |
| Male        | 240        | 48.10  | 49.63    |
| Non-binary  | < 5        | < 0.00 | < 0.00   |
| Age         |            |        |          |
| 18-24 years | 67         | 13.43  | 10.74    |
| 25-34 years | 94         | 18.84  | 18.44    |
| 35-44 years | 102        | 20.44  | 18.47    |
| 45-54 years | 70         | 14.03  | 16.87    |
| 55+ years   | 166        | 33.27  | 35.49    |
| Location    |            |        |          |
| Perth       | 426        | 85.71  | 85.61    |
| Other       | 71         | 14.29  | 14.39    |
| SEIFA-IRSD  |            |        |          |
| Low-SES     | 89         | 19.47  | 19.81    |
| Mid-SES     | 159        | 34.79  | 34.92    |
| High-SES    | 209        | 45.73  | 45.27    |

|  | Unweighted |       | Weighted |
|--|------------|-------|----------|
| AUDIT <sup>a b</sup>                         |            |       |          |
| Low-risk                                     | 312        | 63.80 | 65.07    |
| Risky  | 99         | 20.25 | 19.60    |
| High-risk                                    | 78         | 15.95 | 15.33    |
| Online alcohol delivery frequency            |            |       |          |
| I buy all my alcohol online for delivery     | 30         | 6.06  | 6.22     |
| I buy most of my alcohol online for delivery | 95         | 19.19 | 19.04    |
| I buy some of my alcohol online for delivery | 238        | 48.78 | 47.89    |
| I rarely buy my alcohol online for delivery  | 132        | 26.67 | 26.85    |

<sup>a</sup> Low-risk = score of 1-7, risky = score of 8-12 score and high-risk = score 13+. <sup>b</sup> n = 489

### Characteristics of online orders for alcohol products

Most participants utilised online deliveries less than monthly (57%; Table 2), and this frequency was reasonably consistent across age groups; with the exception of the 35-44 year age bracket, where the proportion of monthly use and less than monthly use was comparable (Figure 1). A chi-square test indicated there were no significant differences in delivery frequency across age groups,  $\chi^2 (12) = 20.35, p = .081$

Table 2 Frequency of online alcohol orders

| Frequency of Online Alcohol Orders (n = 499) | %     |
|--|-------|
| Daily or almost daily                        | 0.81  |
| Weekly                                       | 9.67  |
| Monthly                                      | 32.35 |
| Less than monthly                            | 57.17 |

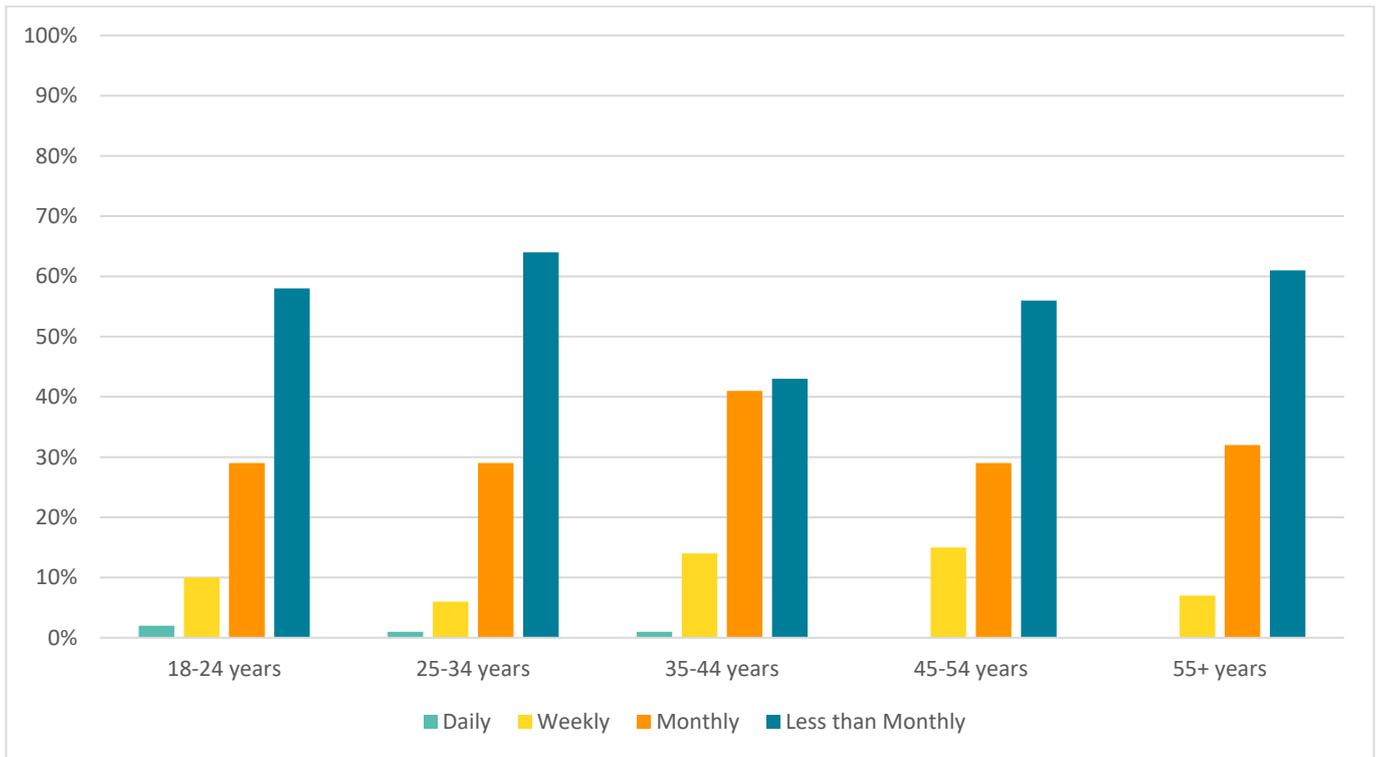


Figure 1 Frequency of online alcohol delivery by age group

Examining participants most used delivery services, ordering from bottle-shops, such as BWS or Liquorland were used by nearly three-quarters of participants (73%), with supermarkets (25%) and online wine retailers (15%) used next commonly (Table 3). This choice of retailer appeared to be consistent across age groups (Figure 2).

Table 3 Usual online alcohol delivery retailer

| Type of Delivery Retailer (n = 499)                        | %     |
|--|-------|
| Bottle-shop  | 73.64 |
| Supermarket  | 25.41 |
| Specialised online-only wine shops (e.g., Naked Wines)     | 15.03 |
| Specific winery, distiller, or brewery                     | 11.64 |
| Specialised online-only alcohol shops (e.g., Jimmy Brings) | 9.35  |
| Other <sup>a</sup>   | 3.88  |

<sup>a</sup> General online retailer that also sell alcohol (i.e., grays.com) and restaurants.

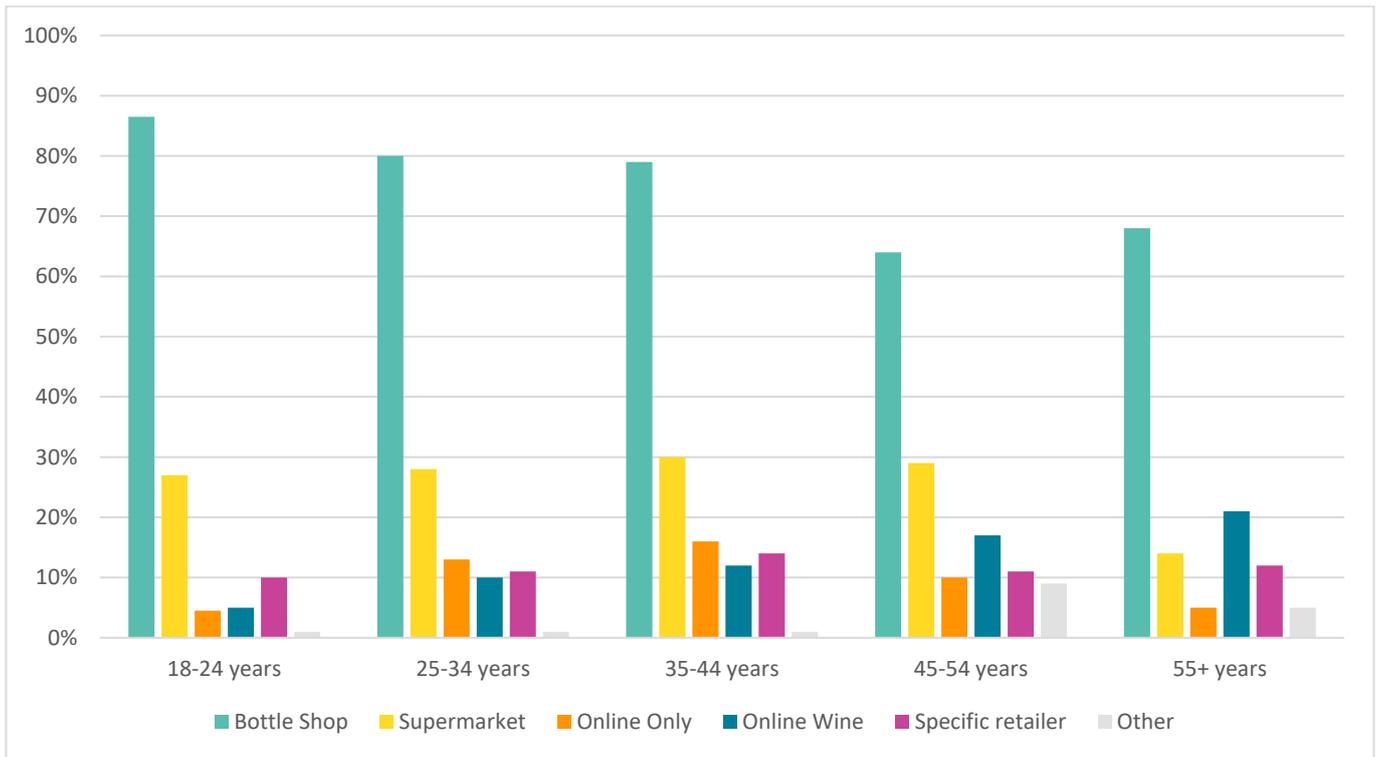


Figure 2 Frequency of type of usual delivery service by age group

Longer term deliveries were the most popular form of online alcohol delivery, with 60% of participants indicating they usually ordered alcohol with delivery for the following days (Table 4). Non-rapid, same day delivery was the next popular option (25%). This trend was reasonably consistent across age groups, with 71% of 55+ years age group predominantly using next day or longer deliveries, whereas the 35-44 years had a higher proportion of rapid deliveries (< 2 hours) compared to same day (Figure 3). A chi-square test indicated there were significant differences in delivery modality across age groups,  $\chi^2(8) = 28.82, p < .001$ . Post hoc analysis found the 55+ years group were more likely than expected to use next day delivery ( $p < .001$ ).

Table 4 Usual delivery time for online alcohol deliveries

| Delivery time (n = 499) | %     |
|-------------------------|-------|
| Rapid (< 2 hours)       | 14.23 |
| Same day                | 25.62 |
| Next day or longer      | 60.14 |

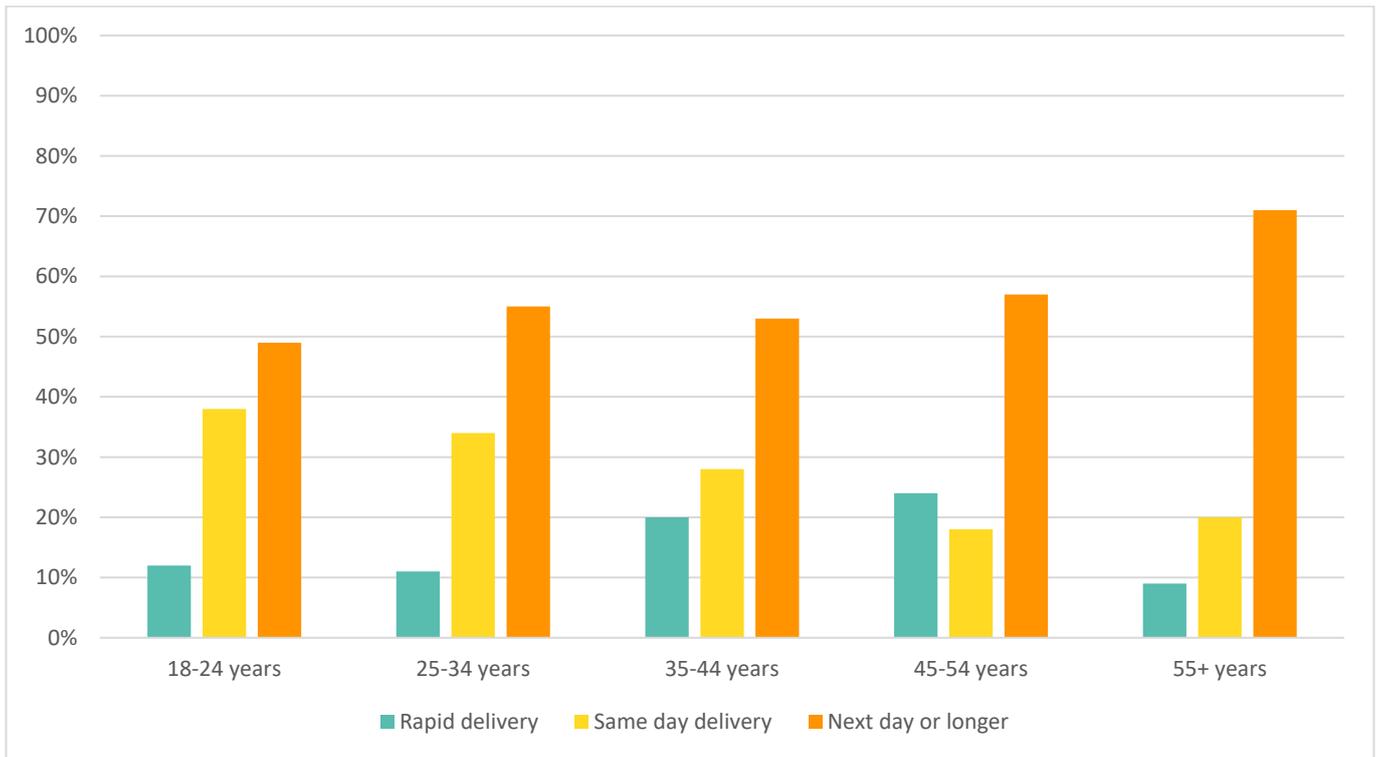


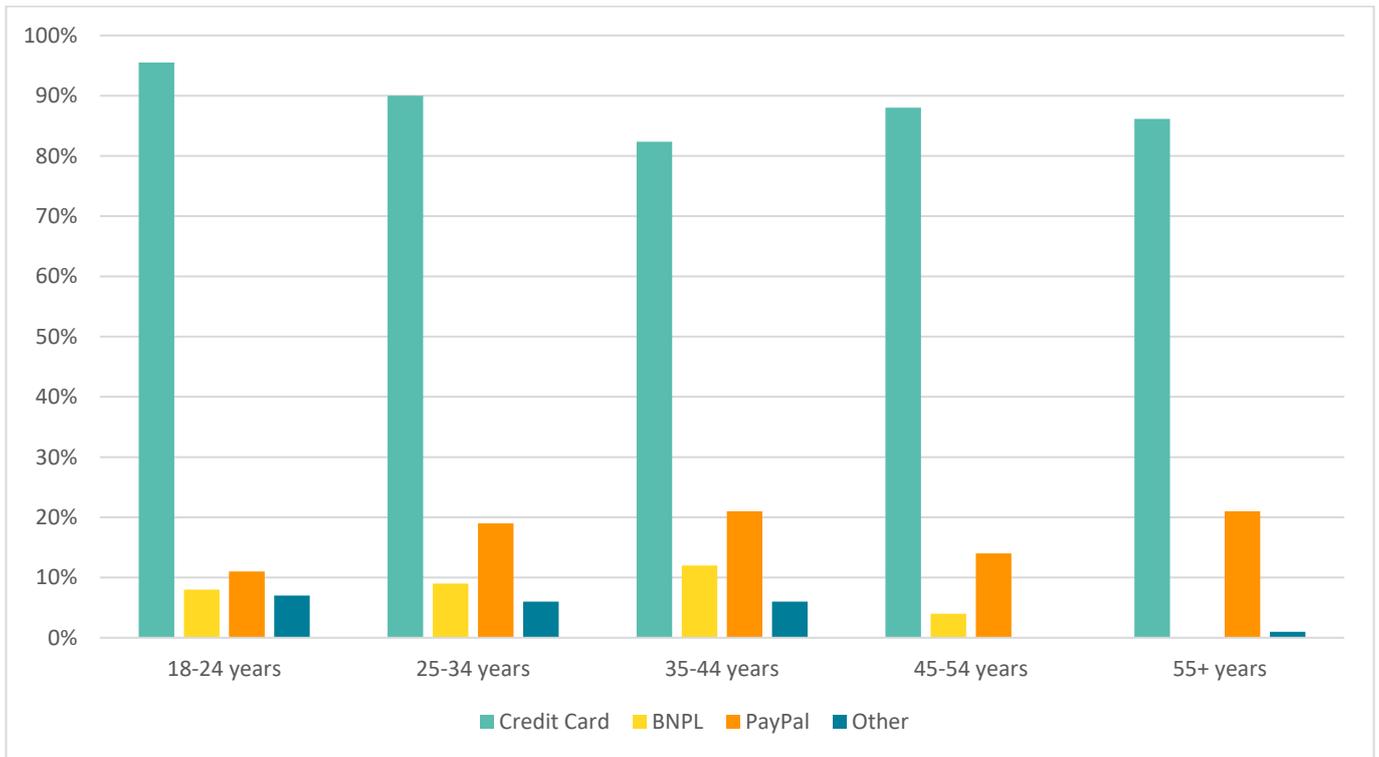
Figure 3 Frequency of usual delivery times by age group

Online alcohol deliveries were usually purchased using credit cards (87%), with full once off payment using PayPal being utilised by 18% of participants (Table 5). This trend was reasonably similar across age groups, with the exception being older cohorts (44-55 and 55+ years) who rarely utilised “buy now pay later options” (Figure 4).

Table 5 Usual payment method for online orders of alcohol

| Usual Payment Method (n = 498) | %     |
|--------------------------------|-------|
| Credit Card                    | 87.33 |
| PayPal (full amount)           | 18.45 |
| Buy now pay later              | 5.58  |
| Other*                         | 3.48  |

\*Cash at the door, partial PayPal, gift cards and Qantas points.



Note. BNPL = buy now, pay later

Figure 4 Frequency of payment method for online alcohol deliveries by age group

### Experiences when receiving online ordered alcohol

The primary reason for using online alcohol delivery service was convenience of delivery (35%), followed by being able to get the alcohol product at a cheaper price online compared to a physical store (22%; Table 6). When looking at usual motivation by age category, while convenience was still the primary motivation across age groups, this was more popular in younger cohorts (18-25 years 53.91%; 26-34 years 41.12%; 35-44 years 30.93%; 45-54 years 32.55%; 55 years and above 31.50%). No other notable age differences were evident. When looking at usual motivations by AUDIT category (i.e., alcohol consumption risk category), convenience was still the primary motivation across groups (low-risk = 37.69%, risky = 39.54%, high-risk = 26.79%), however 10% of participants with high-risk drinking behaviours stated their usual motivation was due running out of alcohol during a drinking session, compared to less than 1% of participants with low-risk and risky drinking behaviours. No other notable differences by AUDIT category were evident.

Table 6 Participant primary motivation for use of online alcohol delivery

| Usual Reason for Online Alcohol Purchase (n = 496)   | %     |
|--|-------|
| It's more convenient than going to the shops   | 35.78 |
| I can get it cheaper online  | 22.28 |
| More variety online  | 6.36  |
| I saw a specific promotion (e.g., targeted ad, app push notification, email) for cheaper online alcohol                      | 6.33  |
| I am part of a delivery service membership (i.e., beer/wine/whiskey club) which provides me with discounts and other rewards | 6.80  |
| I order it while I am ordering other groceries or food.  | 5.98  |
| COVID-19 pandemic concerns i.e. not wanting potential exposure at a store  | 4.02  |
| I am over the blood alcohol limit to drive   | 2.58  |
| I have run out of alcohol during a drinking session  | 2.38  |
| I saw general advertising for online alcohol   | 2.03  |
| Other *  | 5.28  |

\* Products only available online, vaccine mandates, work & purchasing for someone else

Two thirds of participants indicated they accepted their delivery in person (66%), with approximately 22% stating the alcohol is usually left unattended at their home (Table 7). This proportion was not consistent when looking at the primary method of delivery, with those who primarily used rapid delivery having a higher proportion of receiving the delivery at the door (89%), compared to same day (75%), or next day (58%; Figure 5). A chi-square test indicated there were significant differences in method of receiving deliveries across delivery modalities,  $\chi^2(10) = 46.16, p < .001$ . Post hoc analysis found that rapid deliveries were accepted at the door significantly more likely than expected ( $p < .001$ ) and significantly less likely than expected to be left unattended at the door ( $p = .002$ ). Next day deliveries were significantly less likely than expected to be accepted at the door ( $p < .001$ ) and significantly more likely than expected to be left at unattended at home ( $p < .001$ ) or at the post-office ( $p = .001$ ).

Table 7 Usual method of receiving online alcohol deliveries

| Method of delivery receipt (n = 498)                 | %     |
|--|-------|
| I accept the delivery in person at the door          | 66.58 |
| It gets left unattended for me to collect at my home | 22.49 |
| Someone else accepts the delivery on my behalf       | 6.12  |
| It gets left for me to collect at the post office    | 3.96  |
| Other <sup>a</sup>                                   | 0.86  |

<sup>a</sup> Click and collect and delivery to workplace

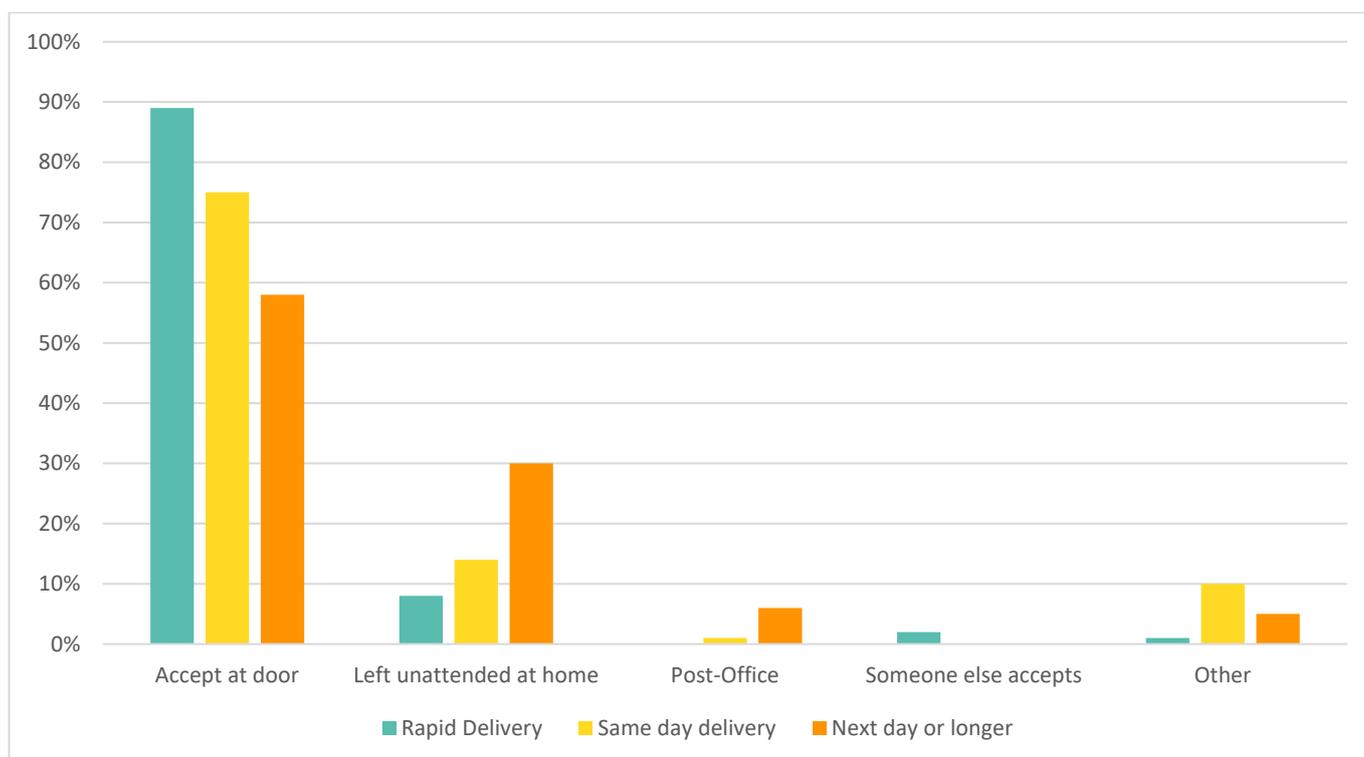


Figure 5 Frequency of delivery receipt by delivery type

Approximately one fifth of participants (19%) indicated they utilised online alcohol delivery while drinking, with 25% of these participants stating they would have ceased drinking if delivery was not available (Table 8). This trend was consistent across delivery modalities, with around 30% of rapid and next day deliveries indicating they would have ceased drinking if the delivery was not available (Figure 6). A chi-square test indicated there were no significant differences in cessation of drinking across delivery modalities,  $\chi^2(10) = 11.27, p = .354$ .

Table 8 Participant intoxication while ordering alcohol online

| Have you ordered alcohol online while drinking (n = 499)                                   | %     |
|--|-------|
| Yes (n = 103)  | 19.77 |
| Would you have stopped if delivered alcohol was not available?                             |       |
| No, I could have walked to the shop myself   | 29.29 |
| No, there was other alcohol available, I just wanted something else                        | 18.12 |
| No, someone else could have purchased the alcohol  | 12.35 |
| No, I could have driven to the shop myself   | 9.44  |
| I could have drunk a little more but was close to running out/was worried I would run out. | 6.40  |
| Yes, I would've stopped drinking   | 24.38 |

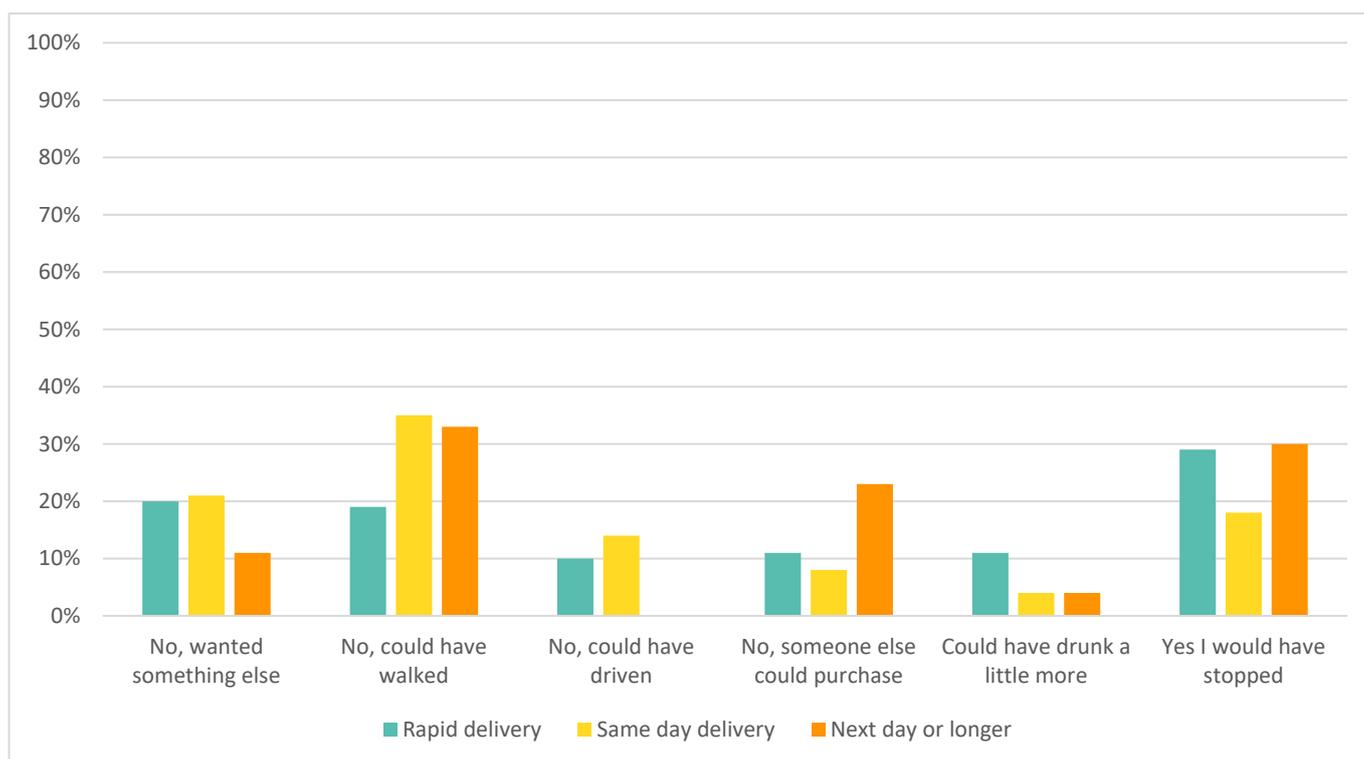


Figure 6 Frequency of ceasing drinking without delivery

Approximately one quarter (24%) of participants stated they have had alcohol delivered while intoxicated, and 77% of which were never or only sometimes refused delivery (Table 9). Of those that utilised rapid delivery while intoxicated (n = 32), just under three quarters were never refused delivery, and concerningly only 3% indicated they

were always refused delivery from rapid delivery services (Figure 7). A chi-square test indicated there was a significant difference in propensity for intoxication across delivery modality  $\chi^2(6) = 79.31, p < .001$ . Post hoc analysis found that participants who primarily used rapid delivery were significantly more likely than expected to be ‘*sometimes*’ intoxicated when receiving orders ( $p = .001$ ), and significantly less likely than expected to be ‘*never*’ intoxicated ( $p < .001$ ). Similarly, for those that normally used same day deliveries, they were significantly more likely than expected to indicate they are intoxicated ‘*most of the time*’ ( $p < .001$ ) and ‘*sometimes*’ ( $p < .001$ ) and significantly less likely than expected to be ‘*never*’ intoxicated while receiving an order ( $p < .001$ ). Participants who primarily used next day delivery were significantly less likely than expected to be intoxicated either ‘*most of the time*’ ( $p < .001$ ) or ‘*sometimes*’ ( $p < .001$ ), and significantly more likely than expected to be ‘*never*’ intoxicated ( $p < .001$ ).

Table 9 Participant intoxication while receiving delivered alcohol

| How often are you intoxicated when receiving online deliveries at the door? (n = 498)                    | %     |
|--|-------|
| Always   | 3.46  |
| Most of the time   | 6.46  |
| Sometimes  | 14.03 |
| Never  | 76.05 |
| When receiving online orders while intoxicated, how often are you refused delivery? <sup>a</sup> n = 125 |       |
| Always   | 6.33  |
| Most of the time   | 15.92 |
| Sometimes  | 13.77 |
| Never  | 63.98 |

<sup>a</sup> Not displayed to participants who responded “Never” to receiving deliveries while intoxicated

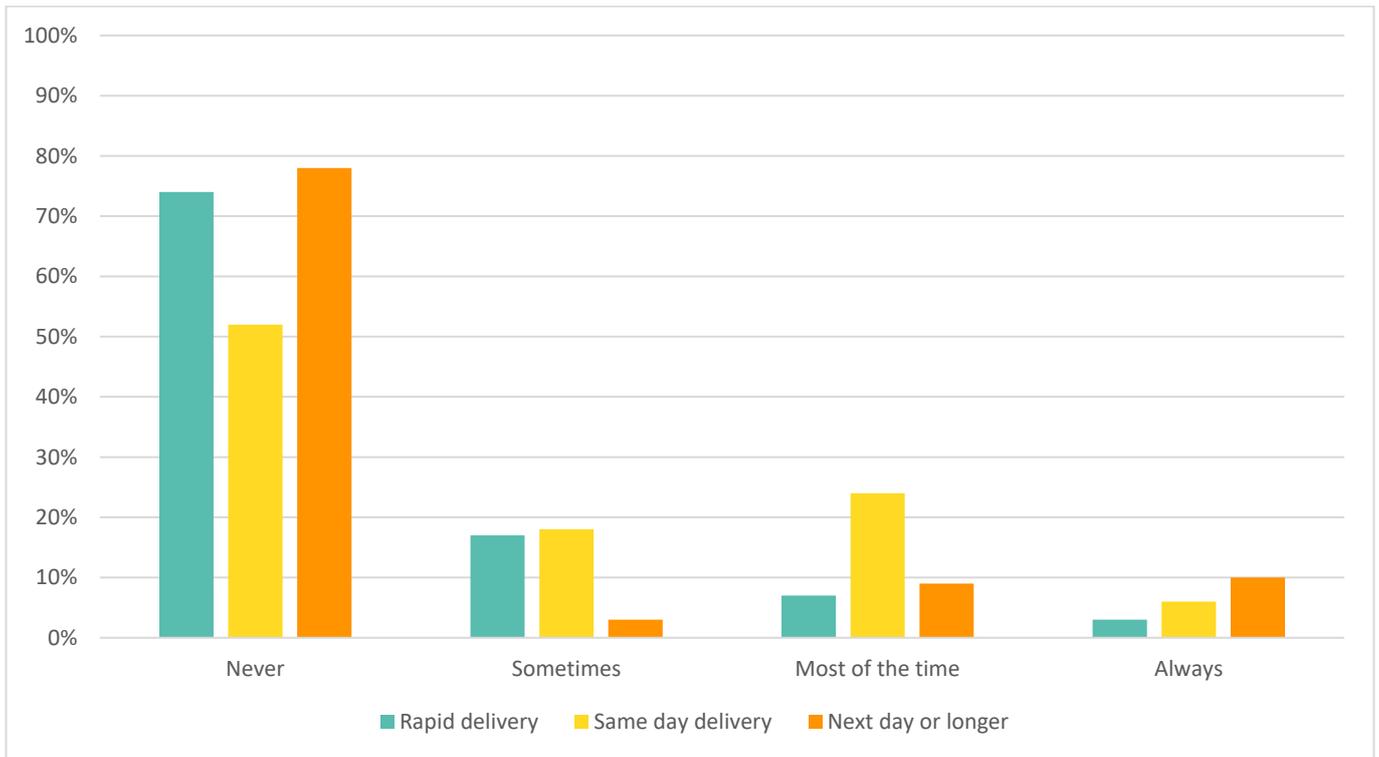
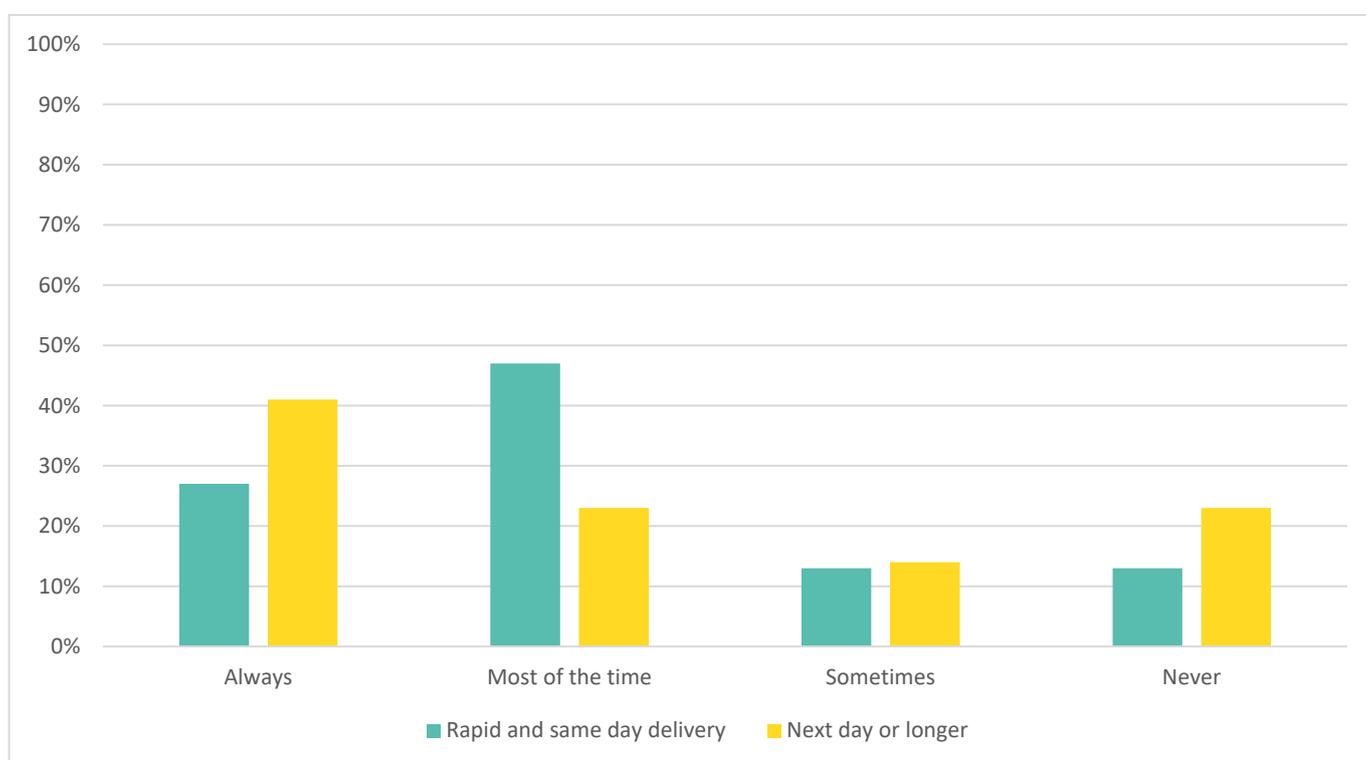


Figure 7 Frequency of delivery refusal while intoxicated

To understand the frequency of ID checking of bottle-shops compared to online delivery, we examined rates of ID checking for participants under the age of 25 years. This cut-off was chosen, as it is a typical industry requirement for ID to be asked of any patrons or customers that appear under the age of 25 years when making any alcohol purchase (20). Whilst rates of ‘always’ having ID checked were comparable between online delivery and bottle-shops (33% compared to 39%), there was a substantial difference in participants ‘never’ being asked to provide ID during an online alcohol delivery (18% compared to 3%; Table 10). When looking at ID checking by delivery modality, only around a quarter of rapid and same day (27%) delivery participants were ‘always’ asked for ID (Figure 8).

Table 10 Frequency of ID checking when purchasing alcohol for participants under 25 years

| How often does the delivery driver check your ID? (n = 67)     | %     |
|--|-------|
| Always   | 33.70 |
| Most of the time   | 34.83 |
| Sometimes  | 13.50 |
| Never  | 17.96 |
| How often does a bottle-shop attendant check your ID? (n = 67) | %     |
| Always   | 39.34 |
| Most of the time   | 26.95 |
| Sometimes  | 30.34 |
| Never  | 3.37  |



Note: Rapid and same day delivery combined due to small cell sizes.

Figure 8 Frequency of delivery driver ID checking for customers under 25 years

## Most recent online alcohol delivery purchase

Half of participants had their most recent online alcohol delivery within the last month (49%; Table 11). Approximately 15% of participants most recent online alcohol purchase was for rapid delivery, with around 60% purchasing alcohol for next day or subsequent day delivery (Table 12). This proportion of rapid delivery compared to subsequent day/s delivery was comparable to participants' usual delivery time (refer to Table 4). For most age groups participants (18-44 years), the proportion of delivery time for their most recent purchase was similar to usual their delivery time, however there was a higher proportion of rapid delivery in recent deliveries among 25-34 years compared to their usual delivery (Figure 9). Similar to usual delivery, a chi-square test indicated a significant difference in delivery modality by age group  $\chi^2(8) = 30.69, p < .001$ . Post hoc analysis found that 18–25-year-olds were significantly more likely than expected to use same day delivery ( $p = .001$ ), while participants 55+ years were significantly more likely than expected to utilise next day delivery ( $p < .001$ ), and significantly less likely than expected to use rapid ( $p = .002$ ) and same day delivery ( $p = .001$ ).

Table 11 Most recent online alcohol purchase delivery

| When was your last online alcohol purchase? (n = 499) | %     |
|---|-------|
| Within the last week                                  | 16.19 |
| 1-4 weeks   | 33.29 |
| 1-2 months  | 19.91 |
| 2-3 months  | 14.61 |
| 4-6 month   | 16.00 |

Table 12 Delivery time of most recent online alcohol purchase

| Delivery time (n = 494) | %     |
|-------------------------|-------|
| Rapid (< 2 hours)       | 15.57 |
| Same day                | 24.68 |
| Next day or longer      | 59.75 |

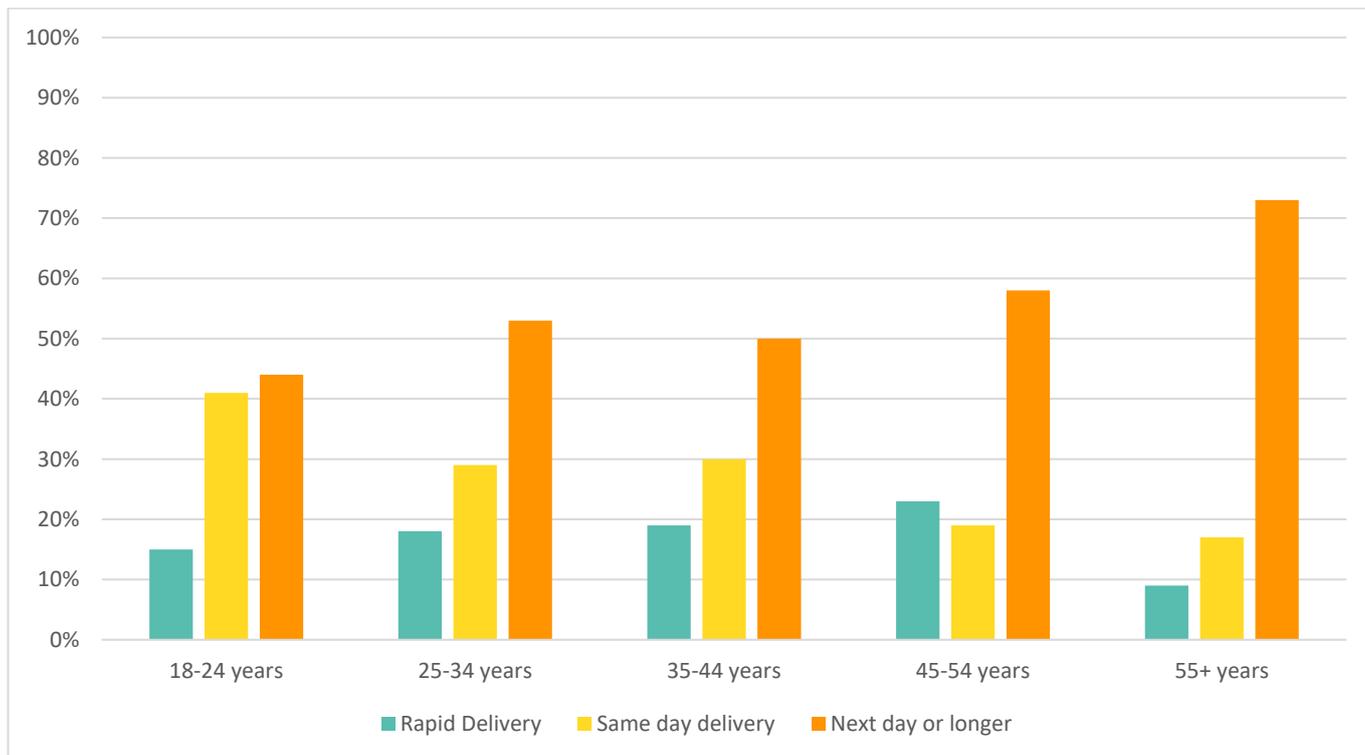


Figure 9 Most recent online alcohol delivery time by age

Similar to participants usual motivations behind most recent alcohol delivery (Table 13), the primary motivation behind participants most recent delivery was convenience (39%), followed by being able to access cheaper products online (17%; Table 13). Motivations were slightly different by delivery modality, with rapid (56%) and same day delivery (49%) having a higher reasoning of convenience compared to next day (30%). Whereas next day were had the highest proportion of price motivation (20%) compared to rapid delivery (9%). Additionally, when looking at usual motivation by age category, while convenience was still the primary motivation across age groups, this was more popular in younger cohorts (18-25 years 55.07%; 26-34 years 47.74%; 35-44 years 39.30%; 45-54 years 35.74%; 55 years and above 31.58%). No other notable age differences were evident. When looking at usual motivations by AUDIT category, convenience was still the primary motivation across groups (low-risk = 37.40%, risky = 48.30%, high-risk = 35.93%), however 12% of participants with high-risk drinking behaviours stated their usual motivation was due running out of alcohol during a drinking session, compared to less than 1% of participants with low-risk and risky drinking behaviours. No other notable differences by AUDIT category were evident

Table 13 Motivation behind most recent online alcohol purchase

| Recent Reason for Online Alcohol Purchase (n = 499)  | %     |
|--|-------|
| It's more convenient than going to the shops   | 39.21 |
| I can get it cheaper online  | 17.07 |
| More variety online  | 7.82  |
| I order it while I am ordering other groceries or food.  | 7.21  |
| I saw a specific promotion (e.g., targeted ad, app push notification, email) for cheaper online alcohol                      | 7.09  |
| I am part of a delivery service membership (i.e., beer/wine/whiskey club) which provides me with discounts and other rewards | 5.01  |
| COVID-19 pandemic concerns i.e. not wanting potential exposure at a store  | 4.36  |
| I have run out of alcohol during a drinking session  | 2.67  |
| I saw general advertising for online alcohol   | 2.34  |
| I am over the blood alcohol limit to drive   | 1.74  |
| Other <sup>a</sup>   | 5.39  |

<sup>a</sup> Only available online, safety, cash rewards program.

For most participants most recent online alcohol delivery, wine (49%), then beer (36%) were the most popular beverage types (Table 14). When examined by delivery modality, rapid and same day deliveries had a higher preference for beer compared to next day delivery, whereas wine was the most popular beverage ordered for next day/s deliveries (Figure 10).

Table 14 Beverages ordered at most recent delivery

| Beverage Type (n = 499) | %     |
|-------------------------|-------|
| Wine                    | 49.12 |
| Beer                    | 36.48 |
| Spirits                 | 24.76 |
| Premix                  | 14.81 |
| Cider                   | 7.41  |
| Cask wine               | 3.93  |

Note. As participants could select multiple options, percentages total more than 100.

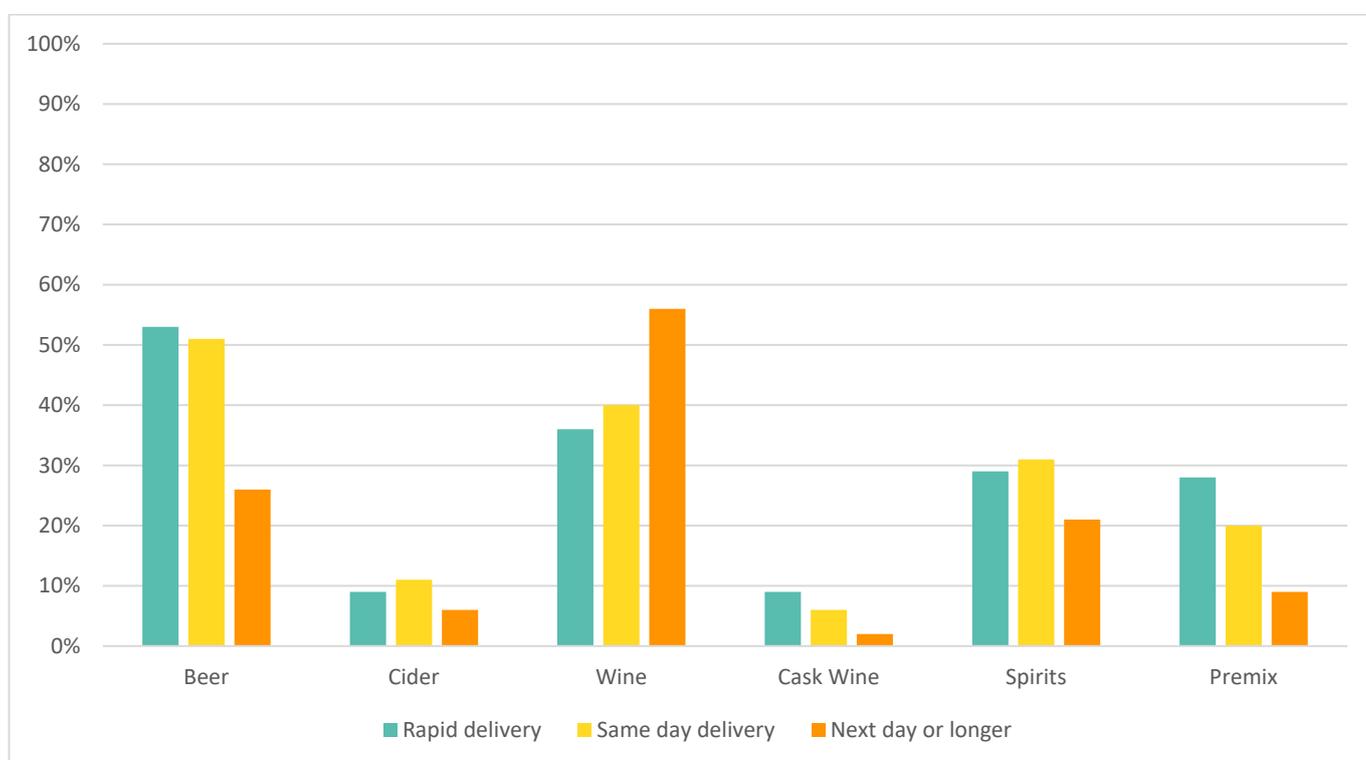


Figure 10 Ordered beverage type by delivery modality

Following the methodology outlined in Mojica-Perez et al. (12), the amount of standard drinks per most recent order were calculated for each participant (Table 15). The average standard drinks for beer purchases were slightly higher in the next day or longer category, compared to rapid or same day, however all modalities appeared to be the equivalent of approximately 16 - 18 full strength beers. Next day or longer purchases for wine were substantially higher compared to rapid or same day, which likely represents customers bulk purchasing wine to reduce the price per product (i.e., purchasing 12 bottles of wine). When comparing standard drinks by delivery

modality, next day or longer deliveries typically had the highest on average standard drinks, except for premix and spirits from regional participants (Figure 11). However, due to very small sample numbers for these beverages in regional orders (premix  $n = 6$ , spirits  $n = 14$ ), results should be interpreted with caution. When looking at standard drinks by delivery frequency, regardless of delivery frequency participants who had who ordered online for next day delivery, ordered larger volumes compared to rapid or same day delivery (Figure 12).

Table 15 Average standard drinks per recent online alcohol delivery

| Average Standard Drinks per Delivery (SD) | Beer and Cider ( $n = 169$ ) | Wine ( $n = 225$ ) | Cask Wine ( $n = 7$ ) | Spirits ( $n = 91$ ) | Premix RTD ( $n = 66$ ) | Total SD  |
|---|------------------------------|--------------------|-----------------------|----------------------|-------------------------|-----------|
| Rapid (< 2 hours)                         | 23 (3.47)                    | 28 (4.11)          | 46 (15.62)            | 46 (10.59)           | 15 (4.62)               | 42 (6.05) |
| Same day                                  | 23 (2.62)                    | 32 (5.81)          | 75 (16.39)            | 35 (6.80)            | 8 (1.22)                | 41 (4.21) |
| Next day or longer                        | 27 (2.77)                    | 81 (5.39)          | N/A                   | 59 (9.14)            | 7 (1.50)                | 71 (4.14) |

Note:  $n = 4$  participants indicated they purchased “other” beverages but did not specify type or alcohol percentage and are therefore excluded from above.

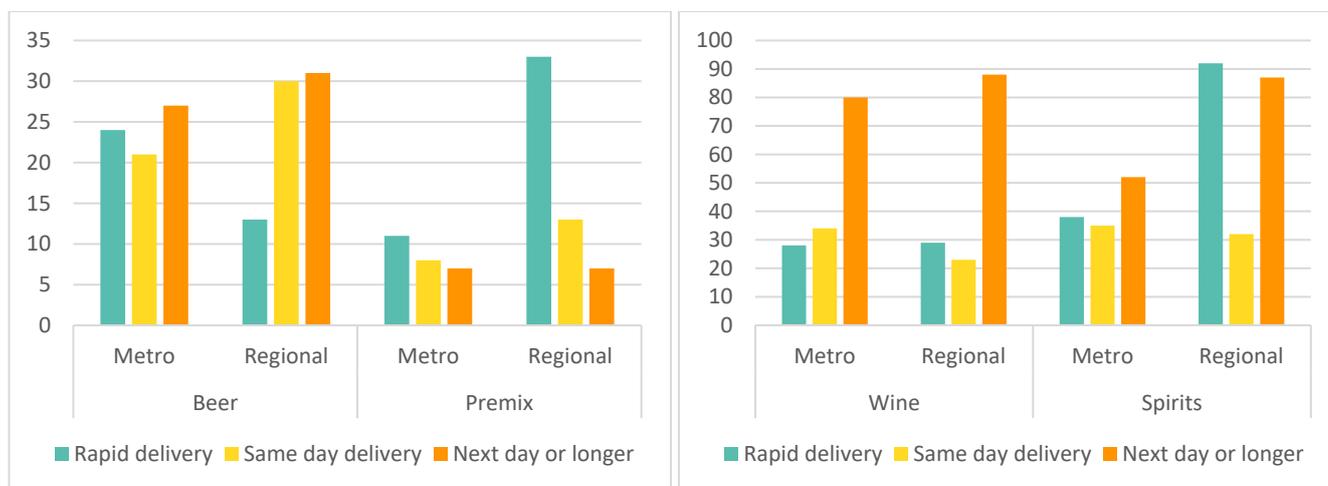
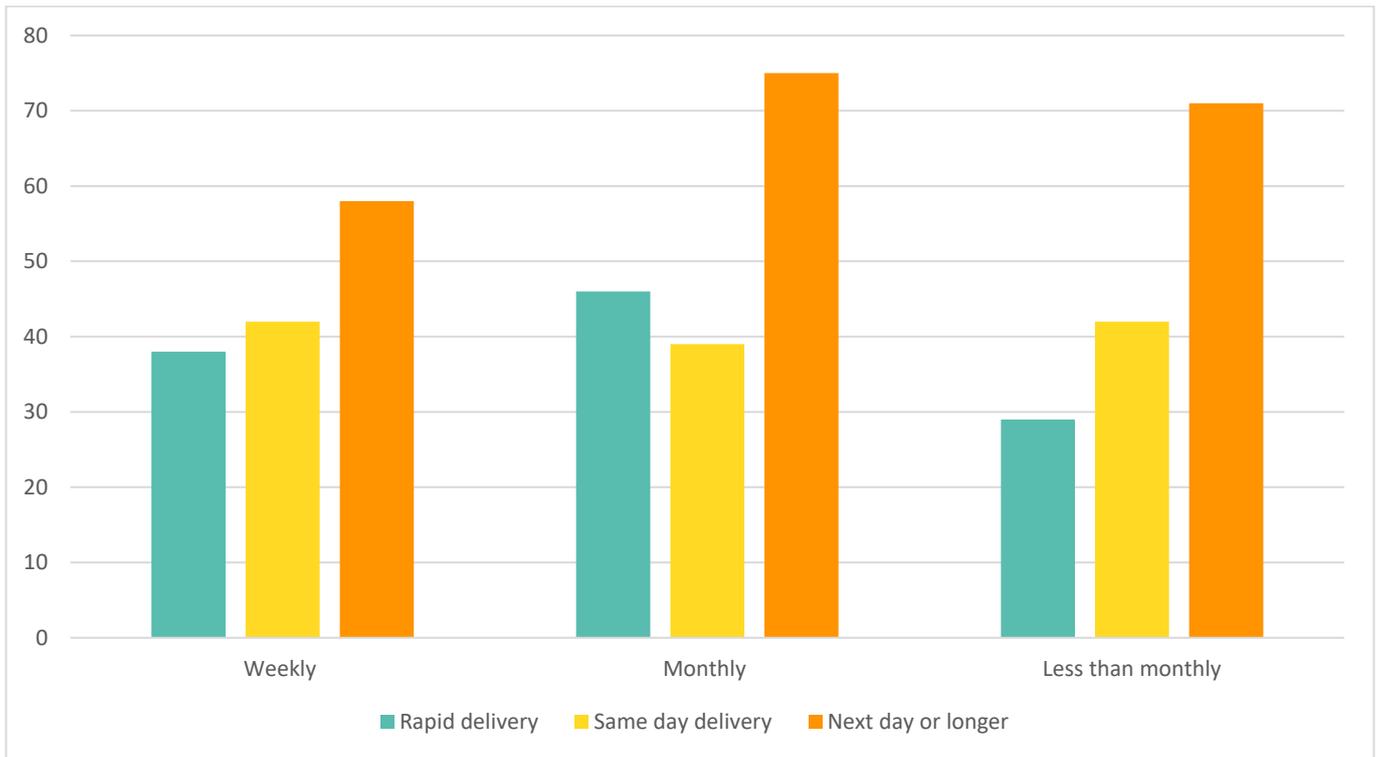


Figure 11 Average standard drinks per beverage at most recent order by delivery modality and regionality



Note: Daily use of online alcohol delivery was omitted due to  $n = 4$  valid responses.

Figure 12 Average standard drinks at most recent order by usual delivery frequency

To assess adherence to the changes in ID checking regulations for same day alcohol deliveries (see <https://www.mediastatements.wa.gov.au/Pages/McGowan/2021/12/New-regulations-to-tighten-alcohol-home-deliveries.aspx>), rates of ID checking during rapid and same day delivery within the last three months were examined. Despite new regulations stating that regardless of age, all same day deliveries are required to have ID checked, approximately 50% participants indicated they received their deliveries at the door without presenting their ID (Table 16). Chi-square test indicated no significance difference in ID checking across age groups,  $\chi^2 (4) = 3.63 p = .48$ . When examining frequency of unattended rapid, or same day deliveries, 8% of individuals indicated their most recent order in the last three months was left unattended.

Table 16 Proportion of ID checking at most recent order for same day deliveries by age category

| Did you get asked for ID before receiving your order? | No (%) | Yes (%) |
|---|--------|---------|
| 18-24 years (n = 23)                                  | 39.99  | 60.01   |
| 25-34 years (n = 25)                                  | 55.94  | 44.06   |
| 35-44 years (n = 31)                                  | 41.91  | 58.09   |
| 45-54 years (n = 23)                                  | 65.57  | 34.43   |
| 55+ years (n = 33)                                    | 50.90  | 49.10   |
| Total (n = 135)                                       | 50.86  | 49.14   |

During participants most recent delivery, approximately 17% of participants indicated they would have stopped drinking and would have consumed less alcohol if not for the availability of online alcohol delivery (Table 17). With 2% also indicating the purchase was to top up their existing alcohol supplies. Chi-square test indicated significance difference in cessation across delivery modality,  $\chi^2(10) = 58.69 p < .001$ . Post-hoc analysis found those next day or longer were significantly less likely than expected to stop drinking if the delivery was not available ( $p < .001$ ; Figure 13). When looking at whether participants would have consumed less alcohol, chi-square test indicated significance difference in reduction in drinking across delivery modality,  $\chi^2(8) = 69.97 p < .001$ . Post-hoc tests found that participants that used rapid and same day delivery were significantly more likely than expected to reduce their alcohol consumption if delivery was not available ( $p < .001$ ), while participants who used next day delivery were significantly less likely than expected to reduce their consumption ( $p < .001$ ). For participants that said they would have ceased drinking if online alcohol delivery was not available, on average they purchased an additional 29 standard drinks for both rapid delivery ( $n = 19$ ) and same day delivery ( $n = 20$ ) and 70 standard drinks for next day or longer delivery ( $n = 29$ ).

Table 17 Participant alcohol consumption with most recent online alcohol purchase

| Would you have stopped drinking if delivered alcohol was not available? (n = 488)          | %     |
|--|-------|
| No, there was other alcohol available, I just wanted something else                        | 34.06 |
| No, I could have driven to the shop myself   | 30.56 |
| Yes, I would've stopped drinking   | 17.10 |
| No, I could have walked to the shop myself   | 10.15 |
| No, someone else could have purchased the alcohol  | 5.69  |
| I could have drunk a little more but was close to running out/was worried I would run out. | 2.44  |
| Would you have consumed less alcohol if delivered alcohol was not available? (n = 488)     | %     |
| No, there was other alcohol available, I just wanted something else                        | 38.22 |
| No, I could have driven to the shop myself   | 24.81 |
| Yes, I would've stopped drinking   | 19.84 |
| No, I could have walked to the shop myself   | 11.73 |
| No, someone else could have purchased the alcohol  | 5.39  |

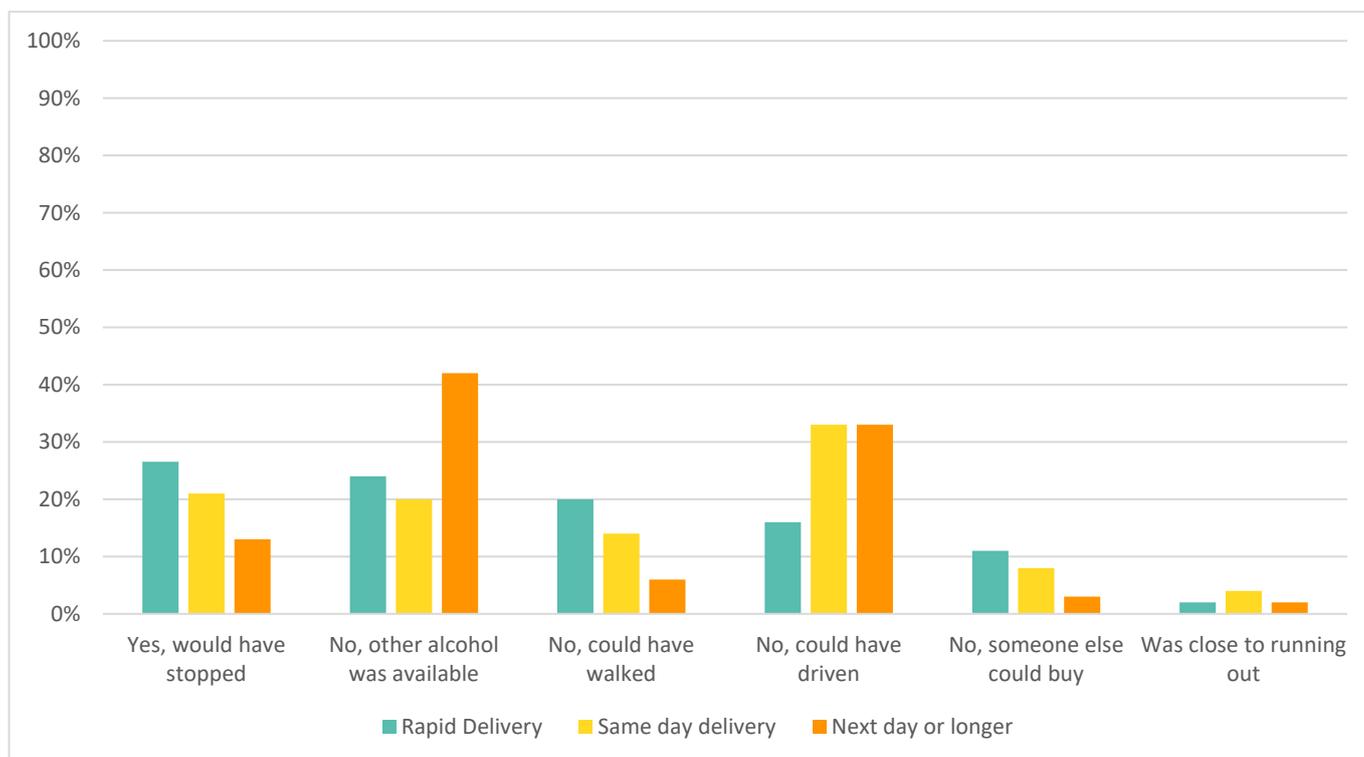


Figure 13 Participant cessation of alcohol consumption with online alcohol delivery

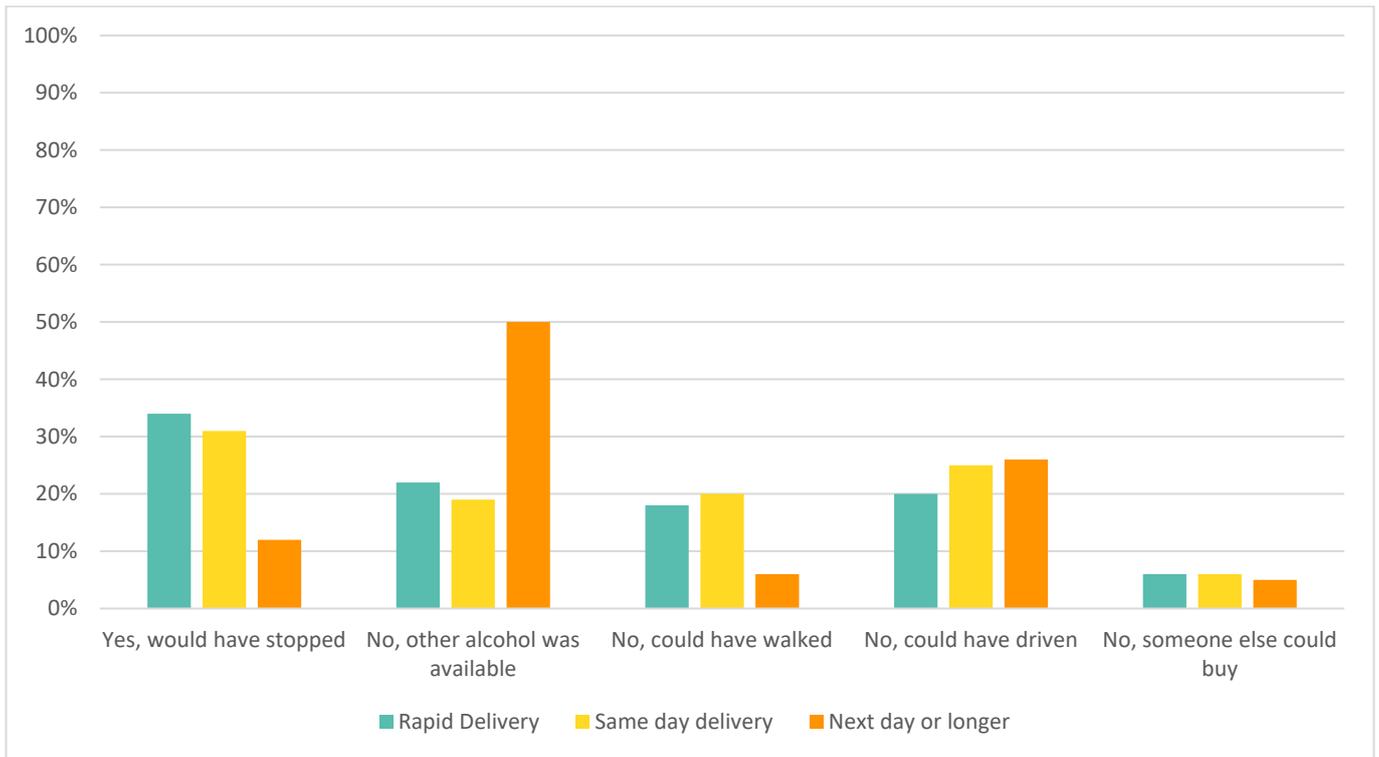


Figure 14 Participant reduction in alcohol consumption with online alcohol delivery

### Impact of COVID-19 pandemic on online alcohol purchasing behaviours

For participants who had utilised the services prior to March 2020 (57% of sample), 11% indicated their use of on decreased, approximately 20% stated it increased, around just under 70% indicated their use stayed consistent with their usage pre-COVID (Table 18).

Table 18 Changes in purchasing behaviour pre and post March 2020 (COVID-19)

| Changes in purchasing behaviour pre and post March 2020 | %     |
|---|-------|
| Had purchased alcohol online pre-March 2020 (n = 279)   |       |
| Stayed about the same                                   | 69.67 |
| Increased   | 19.33 |
| Decreased   | 11.00 |

### Exposure to online alcohol delivery promotions

Just under 95% of the current sample indicated they had witnessed advertisements or promotions for online alcohol delivery within the last month (i.e., online advertisement, push notification from app, or general marketing

email), with around 45% stating they see these promotions at least once a day (Table 19). Slightly over a third of participants (31%) indicated that they had personally received a target promotion, either through a personalised call, email, or push notification to discuss specific promotions or remind them of an uncompleted order (Table 20).

When examining witnessing advertisements by AUDIT category (Figure 15), chi-square test of association indicated a significant difference across AUDIT categories,  $\chi^2 (10) = 44.72, p < .001$ . Post-hoc analysis indicated that participants with low-risk drinking behaviours were significantly more likely than expected to witness advertisements less than once per month ( $p = .001$ ), while participants with high-risk drinking behaviours were significantly more likely than expected to witness adverts several times a day ( $p < .001$ ). Similarly, chi-square test of association indicated there was a significant difference in being directly contacted for a promotion by AUDIT category,  $\chi^2 (2) = 11.68, p = .003$ , with post-hoc analysis finding participants with high-risk drinking behaviours were significantly more likely than expected to be contacted ( $p < .001$ ).

*Table 19 Frequency of exposure to advertisements for online alcohol delivery*

| <b>How often do you see ads for online alcohol (n = 322)</b> | <b>%</b> |
|--|----------|
| Several times per day  | 11.17    |
| At least once per day  | 33.59    |
| Every couple of days   | 5.53     |
| Once per week  | 11.97    |
| Once per month   | 32.54    |
| Less than once per month                                     | 5.21     |

*Table 20 Frequency of personally targeted promotion for online alcohol delivery*

| <b>Have you been contacted to promote a sale (n = 499)</b> | <b>%</b> |
|--|----------|
| Yes  | 31.16    |
| No   | 68.84    |

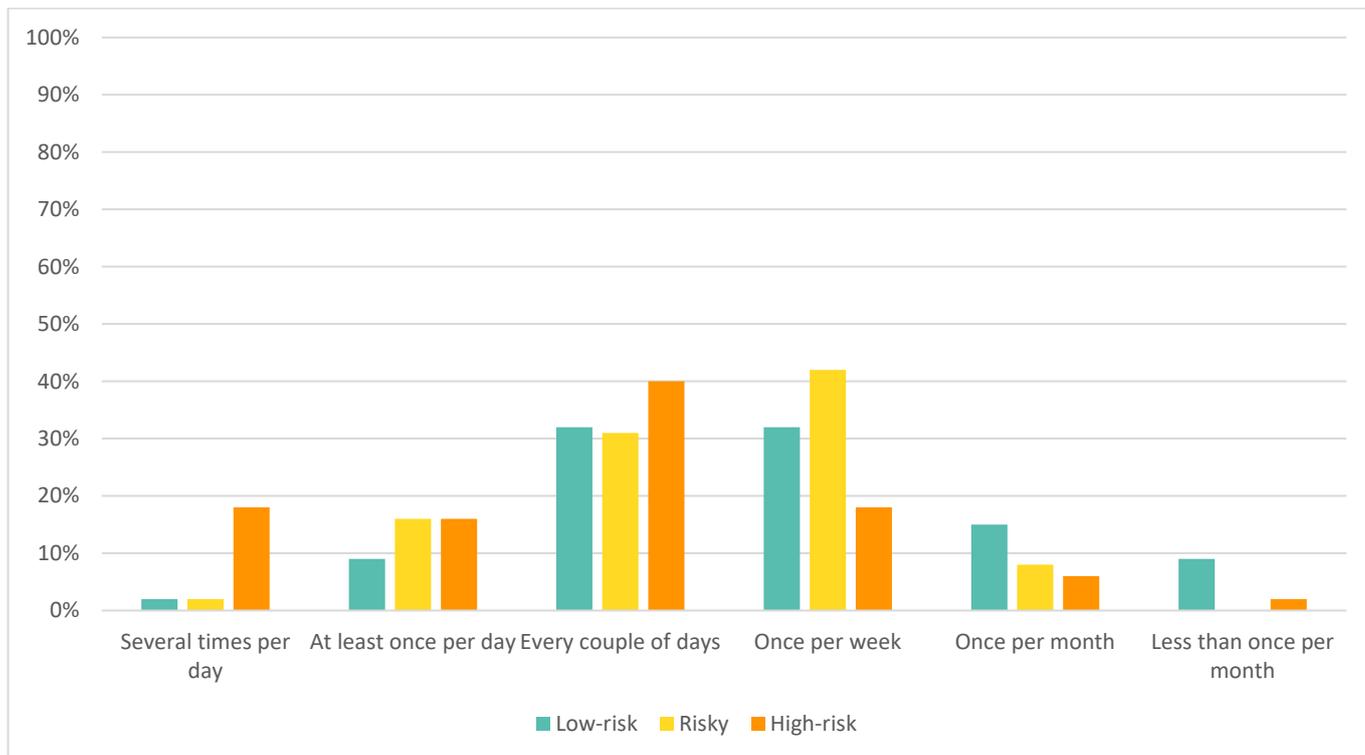


Figure 15 Frequency of witnessing online alcohol advertisements by AUDIT category

### Examination of participants with high-risk and risky drinking behaviours

The following analysis examines the differences in behaviours and motivations of online alcohol delivery, based on participants AUDIT score ( $n = 489$ ), where a score of 1-7 indicates low-risk drinking behaviour, a score of 8-12 is considered risky drinking behaviour and a score of 13 and above is considered high-risk for problematic drinking behaviour [14].

Participants that were identified as having participants with high-risk drinking behaviours used online delivery services at a higher frequency compared to participants with risky and low-risk drinking behaviours (Table 21). Similarly, participants with high-risk drinking behaviours also utilised online alcohol delivery more frequently and for a higher proportion of their orders compared to participants with low-risk drinking behaviours. Chi-square test indicated a significant difference in frequency of online alcohol orders ( $\chi^2(6) = 14.91, p = 0.26$ ), with post-hoc analysis finding participants with low-risk drinking behaviours were more likely order online alcohol less than monthly ( $p < .001$ ), and significantly less likely than expected to use online alcohol delivery monthly ( $p < .001$ ) or weekly ( $p < .001$ ). Participants with high-risk drinking behaviours more likely than expected to use online alcohol delivery daily ( $p = .001$ ), weekly ( $p < .001$ ) and monthly ( $p = .001$ ), and significantly less likely than expected to use less than monthly.

Additionally, chi-square tests indicated a significant difference in proportion of online alcohol orders of all alcohol

purchased by participants ( $\chi^2 (6) = 83.33, p < .001$ ) with post hoc analysis finding that participants with high-risk drinking behaviours purchased most of their alcohol online at a significantly higher rate ( $p = .001$ ). Taken together these findings suggest participants with high-risk drinking behaviours utilise online delivery at an increased rate, for a large proportion of their orders.

*Table 21 Proportion of usual delivery frequency of online alcohol delivery by AUDIT category*

| <b>Frequency of Online Alcohol Orders (%) (n = 489)</b>  | <b>Low-risk</b> | <b>Risky</b> | <b>High-risk</b> |
|--|-----------------|--------------|------------------|
| Daily or almost daily                                    | 0.00            | 0.09         | 4.30             |
| Weekly   | 4.66            | 12.21        | 26.81            |
| Monthly  | 26.71           | 40.9         | 48.14            |
| Less than monthly  | 68.63           | 46.04        | 20.75            |
| <b>Proportion of Online Alcohol Orders (%) (n = 489)</b> | <b>Low-risk</b> | <b>Risky</b> | <b>High-risk</b> |
| I buy all my alcohol online                              | 6.65            | 3.75         | 8.42             |
| I buy most of my alcohol online for delivery             | 16.30           | 19.67        | 31.15            |
| I buy some of my alcohol online for delivery             | 46.84           | 56.03        | 38.53            |
| I rarely buy my alcohol online for delivery              | 30.21           | 20.54        | 21.55            |

Participants with risky and high-risk drinking behaviours had similar use of delivery modality, with a higher proportion of same day and rapid delivery compared to participants with low-risk drinking behaviours (Table 22). Participants with low-risk drinking behaviours had a substantially higher use of next day or later delivery compared to participants with risky and high-risk drinking behaviours. Chi-square test indicated a significant difference in delivery modality by risky drinking category  $\chi^2 (4) = 38.12, p < .001$ . Post hoc analysis found that participants with low-risk drinking behaviours were significantly less likely than expected to use rapid ( $p = .003$ ) or same day ( $p < .001$ ) delivery, while significantly more likely than expected to use next day or later delivery ( $p < .001$ ). For participants with risky drinking behaviours, post hoc analysis found they were significantly more likely than expected to use same day delivery ( $p < .001$ ) and significantly less likely than expected to use next day delivery ( $p < .001$ ). Similarly, participants with high-risk drinking behaviours were significantly more likely than expected to use same day ( $p = .004$ ) and significantly less likely than expected to next day delivery ( $p < .001$ ). Therefore, these results suggests that

participants with high-risk and risky drinking behaviours are more likely to use same day delivery when ordering alcohol online.

Table 22 Usual online alcohol delivery modality by AUDIT category

| Frequency of modality of online alcohol orders (%) (n = 489) | Rapid delivery | Same day delivery | Next day/s delivery |
|--|----------------|-------------------|---------------------|
| Low-risk   | 11.05          | 18.88             | 70.06               |
| Risky  | 18.67          | 39.08             | 42.25               |
| High-risk  | 21.53          | 37.85             | 40.62               |

Over 90% of participants with low-risk drinking behaviours stated they have never ordered alcohol while intoxicated, compared to 65% of participants with risky drinking behaviours and 25% of participants with high-risk drinking behaviours (Table 23). Concerningly, over 50% participants with high-risk drinking behaviours were never refused delivery when receiving online alcohol deliveries, with only 12% of participants with high-risk drinking behaviours saying they were always refused.

Table 23 Frequency of intoxication when ordering and receiving online alcohol orders by AUDIT category

| How often are you intoxicated when receiving online deliveries at the door? (n = 489)                                  | Always | Most of the time | Sometimes | Never |
|--|--------|------------------|-----------|-------|
| Low-risk   | 0.06   | 2.51             | 5.37      | 91.51 |
| Risky  | 2.76   | 6.38             | 25.28     | 65.58 |
| High-risk  | 16.93  | 20.96            | 37.05     | 25.04 |
| When receiving online orders at the door while intoxicated, how often are you refused delivery? <sup>a</sup> (n = 121) | Always | Most of the time | Sometimes | Never |
| Low-risk   | 0.00   | 11.01            | 19.40     | 69.59 |
| Risky  | 0.00   | 11.05            | 12.83     | 76.11 |
| High-risk  | 12.01  | 19.22            | 12.45     | 56.32 |

<sup>a</sup> Not displayed to participants who responded "Never" to receiving deliveries while intoxicated.

When looking at usual motivation to use online alcohol delivery services by AUDIT category, convenience and price appeared to be the predominate motivations for participants with low-risk and risky drinking behaviours (Table 24). Whilst this is was similar for participants with high-risk drinking behaviours, 10% of participants with high-risk drinking behaviours also indicated their primary motivation for online alcohol delivery was due to running out of alcohol during a drinking session, compared to <1% for participants with low-risk and risky drinking behaviours.

Table 24 Usual motivation for online alcohol delivery by AUDIT category

| Usual Reason for Online Alcohol Purchase (n = 489)   | Low-risk | Risky | High-risk |
|--|----------|-------|-----------|
| It's more convenient than going to the shops   | 37.69    | 39.54 | 26.79     |
| I can get it cheaper online  | 22.55    | 19.33 | 25.24     |
| I have run out of alcohol during a drinking session  | 0.74     | 0.84  | 10.76     |
| I am part of a delivery service membership (i.e., beer/wine/whiskey club) which provides me with discounts and other rewards | 6.24     | 7.75  | 8.86      |
| More variety online  | 6.15     | 7.04  | 4.62      |
| I saw a specific promotion (e.g., targeted ad, app push notification, email) for cheaper online alcohol                      | 5.38     | 9.57  | 3.81      |
| I order it while I am ordering other groceries or food.  | 7.51     | 3.86  | 2.86      |
| I am over the blood alcohol limit to drive   | 0.74     | 6.03  | 5.02      |
| COVID-19 pandemic concerns i.e., not wanting potential exposure at a store   | 5.05     | 2.23  | 3.60      |
| I saw general advertising for online alcohol   | 1.99     | 2.11  | 2.39      |
| Other <sup>a</sup>   | 5.98     | 1.69  | 6.06      |

<sup>a</sup> Only available online, safety, cash rewards program.

### Examination of participants with high-risk and risky drinking behaviours most recent use of online alcohol delivery

When examining the most recent alcohol order participants with risky and high-risk drinking behaviours were more likely than expected to use rapid or same day delivery compared to participants with low-risk drinking behaviours (Table 25). A chi-square test indicated a significant difference in delivery time by AUDIT category  $\chi^2(4) = 40.55, p < .001$ , with post hoc analysis finding that participants with low-risk drinking behaviours were significantly less likely than expected to use rapid ( $p < .001$ ) or same day ( $p < .001$ ) delivery, while significantly more likely than

expected to use next day or longer delivery ( $p < .001$ ). For participants with risky drinking behaviours, post hoc analysis found they were significantly more likely than expected to use same day delivery ( $p < .001$ ) and significantly less likely than expected to use next day or longer delivery ( $p < .001$ ). Similarly, participants with high-risk drinking behaviours were significantly more likely than expected to use rapid delivery ( $p < .001$ ) and significantly less likely than expected to next day or later delivery ( $p < .001$ ).

Table 25 Delivery time at most recent delivery by AUDIT category

| Delivery time ( $n = 483$ ) | Rapid (< 2 hours) | Same day | Next day or longer |
|-----------------------------|-------------------|----------|--------------------|
| Low-risk                    | 10.85             | 19.02    | 70.13              |
| Risky                       | 24.02             | 35.83    | 40.15              |
| High-risk                   | 26.69             | 31.47    | 41.84              |

Regardless of delivery modality, on average participants with high-risk drinking behaviours ordered a higher volume of alcohol at their most recent order, compared to participants with low-risk and risky drinking behaviours (Figure 16).



Figure 16 Average standard drinks at most recent order by usual delivery frequency by AUDIT category

During participants most recent delivery, participants with risky drinking behaviours were most likely to have stopped drinking if online delivery was not available (20%), with similar proportions for participants with low-risk (16%) and high-risk (15%) drinking behaviours (Table 26). Due to small sample size, the average number of standard drinks ordered by those who would have stopped drinking by AUDIT category and delivery modality was unable to be completed.

*Table 26 Participant cessation of alcohol consumption with online alcohol delivery by AUDIT category*

| <b>Would you have stopped drinking if delivered alcohol was not available? (n = 488)</b>   | <b>Low-Risk</b> | <b>Risky</b> | <b>High-risk</b> |
|--|-----------------|--------------|------------------|
| Yes, I would've stopped drinking   | 16.43           | 20.19        | 15.49            |
| No, there was other alcohol available, I just wanted something else                        | 40.10           | 24.81        | 18.22            |
| No, I could have driven to the shop myself   | 32.22           | 29.47        | 26.07            |
| No, I could have walked to the shop myself   | 6.35            | 13.42        | 23.45            |
| No, someone else could have purchased the alcohol  | 2.93            | 9.11         | 13.83            |
| I could have drunk a little more but was close to running out/was worried I would run out. | 1.97            | 3.01         | 2.94             |

## Discussion

The current report aimed to explore the behaviours and experiences of Western Australian adults who have purchased alcohol for home delivery within the last six months. This time period captures the months after which new alcohol delivery regulations were put into place within Western Australia. Approximately one quarter of participants used online delivery services most to all of the time for their alcohol purchases, with the majority of online purchases completed through bottle shops and supermarkets. Rapid (< 2 hours) and same day delivery were common options used; with approximately one in seven respondents and one quarter of respondents usually using rapid and same day, respectively. However, the findings also suggested that older participants were significantly more likely than expected to use next day or longer delivery options. The overall increase in use of alcohol delivery services since the COVID-19 pandemic (3, 4) is mirrored in this sample; approximately 40% had not used such services prior to the pandemic, with 19% pre-COVID customers increased their use of online delivery since the pandemic. The increase in online alcohol sales within Australia is predicted to continue to grow (21) and necessitates that policy and legislation are continually reviewed to align with the increased ease of access to alcohol and to ensure the safety of consumers.

Participants identified several motivations for using online alcohol delivery, however convenience and pricing were the most cited reasons for using online delivery. Further, 24% of the sample indicated they would stop drinking if online alcohol delivery were not available during their current drinking session, with those who utilise rapid or same day delivery significantly more likely than expected to reduce their alcohol consumption has the online delivery option not been available. Taken together, these findings demonstrate the need for regulations to be put in place to prevent service and delivery to intoxicated individuals. Whilst this is typically presented as a core part of responsible service of alcohol (RSA) training, barriers such as being unable to identify intoxication, fear of confrontation, and low threat of enforcement have previously been cited by venue-based alcohol servers in WA as barriers to adherence to RSA practices (22). Rather than solely relying on individual deliver drivers to assess intoxication, policy, such as minimum delivery times (i.e., next day delivery or later only) should be implemented to reduce the risk of intoxicated individuals being delivered online alcohol.

To assess the adherence to WA regulations regarding ID checks and unattended deliveries for rapid and same day delivery, adherence to these regulations for those who ordered alcohol delivery for the same day at their most

recent delivery within the last three months were examined. Overall, half of this subsample received their most recent same day delivery without showing ID and 8% reported the delivery was left at the door unattended, in violation of the new regulations. Of the deliveries made while participants were intoxicated, three quarters respondents stated they were never or only sometimes refused delivery associated with these orders. The ease with which intoxicated individuals can access alcohol to facilitate further drinking is of concern and delivery drivers require sufficient training to feel confident in both identifying intoxicated individuals and refusing delivery. Additionally, just under a quarter of participants who ordered alcohol while intoxicated, indicated they would have ceased drinking if they had not been able to order online. This is consistent with the findings from Mojica-Perez et al. (12). In summary, it appears that there are improvements to be made to adherence to online alcohol delivery regulations. Increased driver and retailer training, in conjunction with stronger enforcement is required.

Ninety-five percent of the sample had seen online alcohol delivery advertising within the past month, with just under half seeing advertisements daily. One-third of the sample reported receiving direct, personalised promotions. Concerningly, participants with high-risk drinking behaviours were significantly more likely than expected to witness or receive targeted promotions compared to participants with risky or low-risk drinking behaviours. This can facilitate impulse buying and purchases that may not have been made otherwise. The exposure to advertising may also weaken the impact of alcohol control policies and promotion of safe drinking (23). Further, targeted advertising toward vulnerable groups may exacerbate harmful behaviours (24).

Concerningly, participants with high-risk drinking behaviours used online alcohol delivery more often and were significantly more likely than expected to use rapid or same day services. In addition, 10% of participants with high-risk drinking behaviours used online delivery as they have run out of alcohol during a drinking session. This is substantially higher than participants with low-risk and risky drinking behaviours (both at <1%). Participants with high-risk drinking behaviours were also significantly more likely than expected to order alcohol while intoxicated. Further, participants with high-risk drinking behaviours ordered higher volumes of alcohol, averaging 48-80 standard drinks at their most recent order (equivalent to approximately 6-10 750ml bottles of wine or 2-4 bottles of vodka). Given the rapid home delivery has recently been linked to the death of a man from NSW in June 2018 (13), there is a clear need for stronger enforcement of regulations to ensure retailers are not benefiting from vulnerable individuals.

## Limitations

The current study predominantly recruited participants using an online research panel, which may limit the external validity of the study. However, in line with recommendations (25) the data have been weighted to be more representative of the WA population. While there was also a slight over-representation of Perth-based residents (sample = 86% cf. WA population = 80%) (26), this is likely due to the availability alcohol online delivery predominantly being within the greater Perth area. Further, as indicated where appropriate in the results, cell sizes for some analyses were small, therefore, these subset of results should be interpreted with caution. Additionally, this study provides a cross-sectional snapshot of use of alcohol home delivery within WA, further surveys are needed to track changes in use and behaviours over time.

## Conclusions

Despite policy indicating the requirement to check ID at point of delivery for rapid and same day deliveries, within our sample of Western Australians who recently ordered online alcohol for delivery this is not consistently occurring. There were also some reports from participants of same day and rapid deliveries being delivered unattended to their door. Additionally, the delivery to intoxicated individuals is occurring, which facilitates continuation of a drinking session, and subsequent risk of harm. We found that within our sample, there are marked impacts of online alcohol delivery options on participants with high-risk drinking behaviours, who are using these services at an increased rate, ordering large volumes of alcohol frequently, in some cases, to continue their current drinking session. Our findings suggest a need for adequate training and oversight regarding retailer and delivery ID checks, unattended deliveries, and delivery to intoxicated individuals. The introduction of policy allowing for police to conduct compliance checks for online delivery of alcohol (i.e., 'mystery shopper') would aid in improving compliance with regulations. The introduction of a minimum delivery time (such as next day or longer) would also reduce the likelihood of harms occurring due to use of online alcohol services. Last, expansion of the current regulations to all deliveries, rather than only those made within the same day only, is recommend. Such an approach would reduce potential for confusion regarding requirements at the time of delivery.

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