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Update of Canada's Low-Risk Alcohol Drinking Guidelines: Summary of Evidence on Understanding and Response to Alcohol Consumption Guidelines

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About this Document

This document was produced by Cochrane Canada for the Canadian Centre on Substance Use and Addiction. It was prepared for Cochrane Canada by Dr. Nancy Santesso, Matthew Melo and Dr. Angela Barbara.



Summary of Findings

The information in this report will be useful to guideline developers trying to determine the acceptability and feasibility of recommendations and those creating knowledge translation products to communicate recommendations. The report can also help developers to pose the right questions to the public when developing and evaluating different products and strategies, and highlights content that may need to be addressed in those products and strategies.

Key Messages

- There appears to be little understanding among the public about what a standard drink is, and most times people overestimated the standard drink size. The public also overestimated the number of daily and weekly drinks recommended in guidelines. Typically, people indicated that those recommendations were unrealistic and did not want to count drinks.
- Views about the amount of alcohol consumption that was not sensible or that was harmful were often associated with excessive intake or “problem drinking,” but people often noted that their own drinking was not a problem.
- Less than half the people who responded to surveys were aware of the harms of alcohol intake, and there was less awareness in people who drink at high or very high-risk levels. While some people were aware of the harms, they still had a positive attitude toward alcohol use, especially in social situations.
- The applicability to their own lives of guidelines generally and guidelines specifically for low-risk drinking was questioned by the public with many reasons given for why guidelines might not be applicable. For example, individual tolerance levels and physical reactions to alcohol can differ, and the effects of different types of alcohol on an individual can also differ.
- People suggested that guidelines should include strategies to help apply the low-risk drinking recommendations, such as refusing drinks when not really wanted or eating while drinking.
- While participants in the studies indicated that a health agency should provide recommendations, they preferred advice rather than strict rules or patronizing messages.



Introduction

Canada's first Low-Risk Alcohol Drinking Guidelines (LRDGs) were published in November 2011. The guidelines were developed under the auspices of the Canadian Centre on Substance Use and Addiction (CCSA) by an independent expert working group, with members drawn from Canadian addiction research agencies (Butt, et al., 2011). The LRDGs provided people living in Canada with advice on how to minimize relative long-term risk of serious diseases caused by the consumption of alcohol over a number of years (e.g., liver disease, some cancers) and relative short-term risk of injury or acute illness due to the overconsumption of alcohol on a single occasion. In addition, they provided specific recommendations for situations and circumstances that are especially hazardous and for which abstinence or only occasional light intake was advised (e.g., women who are pregnant or planning to become pregnant, teenagers, persons on medication). The guidelines also included tips for safer alcohol use and definitions of a standard drink.

The LRDGs are being updated using the GRADE ADOLPMENT process, which involves the review and use of evidence and decisions from previously published guidelines to either adopt, adapt or develop *de novo* recommendations (Schünemann et al., 2017). For the update, the guideline group will use Canada's LRDGs from 2011 and guidelines and supporting systematic reviews from the United Kingdom (U.K.) and Australia (Butt, et al., 2011; National Health and Medical Research Council, 2020; U.K. Chief Medical Officers, 2016). As with these previous guidelines, evidence for benefits and harms of alcohol consumption will be used, as well as evidence for other considerations such as public values, acceptability, feasibility, equity and resources, to make recommendations about alcohol use and for the knowledge mobilization of the recommendations.

In 2016, a report was prepared for the Behavioural Evidence Expert Group for the U.K. guidelines to address these other considerations (Jones & Bellis, 2016). The report summarized the literature from systematic reviews and primary studies published from 1995 to 2012 about the understanding of and behavioural responses to alcohol consumption guidelines. At the time, there was little evidence related to alcohol guidelines. For this reason, the report also included the understanding and perspectives related to public health guidelines and labelling for other products, such as food, physical activity and tobacco. In addition, Jones and Bellis included literature about the use of alcohol and views not specifically related to guidelines. Since the publication of this report in 2016, research into the views of the public toward low-risk drinking guidelines has grown. The current report updates the earlier report based on the research published since 2012.

Methods

Objective and Inclusion Criteria

We conducted an update of the 2016 evidence report to summarize literature focusing on the public understanding, perceptions, views, attitudes and responses to alcohol consumption guidelines. As with the 2016 report, we covered public views and perspectives related to several factors:

- Guidelines as a support for planning or making behavioural changes;
- Understanding of risks of alcohol consumption on short- and long-term harms, such as cancer and heart disease;
- Understanding of alcohol units or standard drinks;



- Understanding of sensible drinking levels, frequency and patterns of drinking, and limits; and
- Perceptions of alcohol labels based on guidelines.

(See Appendix A for the questions used for the 2016 report.)

Like the 2016 report, we used a hierarchical approach to the evidence. Evidence directly addressing alcohol consumption guidelines was sought from systematic reviews, and when not available we sought evidence from primary studies directly related to alcohol consumption guidelines. When there was little evidence from those sources, we sought evidence from systematic reviews related to alcohol consumption but indirectly related to guidelines or from systematic reviews related to other public health guidelines and labelling for food, physical activity or tobacco.

If we found direct evidence for this update, we did not include the indirect evidence summarized in the 2016 report. We set a priori inclusion criteria for the individual primary studies and the studies assessed in the systematic reviews. Studies could be quantitative or qualitative, and had to address our focus. We focused on public understanding, so we did not include studies that were primarily about the perceptions of healthcare professionals (as educators and providers of care) nor about specific subgroups (such as people with mental health or substance use disorders, bowel disease or recovering from cancer). We also excluded studies measuring current alcohol consumption or awareness; experimental studies measuring the effects of interventions (e.g., warning labels, taxation or negative versus positive messaging); studies in laboratory settings; and studies about the impact of alcohol industry advertising and campaigns.

Search and Selection of Systematic Reviews and Primary Studies

We updated the search conducted for the 2016 report by first searching for systematic reviews and then for primary studies. We performed two searches in the Epistemonikos database (Appendix B). Epistemonikos regularly scans multiple health-related databases for systematic reviews, including the databases that were searched for the 2016 report. We searched for systematic reviews addressing understanding, views, responses or attitudes toward public guidelines related to nutrition, physical activity, alcohol or tobacco, and guidelines or recommendations on any topic. We used terms similar to those used for the previous search strategy, but which could be broader given the specificity of Epistemonikos to systematic reviews. We restricted the search to reviews published in the last 10 years (June 2011 to June 2021). We also examined the citations of relevant reviews for additional reviews.

We updated the search for primary studies from the 2016 report, restricting the search from 2012 to July 2021 (Appendix B). In addition, we performed a search in Google using the terms “alcohol,” “guideline,” “perceptions,” “views,” “attitudes” and “public” and reviewed the first 100 results. This search led us to institutes conducting research in alcohol consumption, and we reviewed those websites for relevant reports.

Two investigators screened the titles and abstracts of the systematic reviews and the primary studies in Covidence (<https://www.covidence.org/>) using a piloted form to identify potentially relevant articles. They then downloaded the full text of potentially relevant articles and screened the full text.



Data Extraction and Analysis

Two investigators extracted data from the included studies using a piloted Excel spreadsheet. We extracted data for the country, number of participants, methods and main characteristics of the participants, including age and sex. We extracted the terms used by the authors for sex and gender, since in most cases it was not clear how the terms were applied. We also extracted the terms used by the authors for different levels of drinking according to risk. We used a deductive approach to extract the findings of the studies and reviews based on the 2016 report and used headings for:

- 1) use of guidelines or advice
- 2) risks of alcohol consumption
- 3) risks for cancer or heart disease
- 4) alcohol units
- 5) sensible drinking
- 6) patterns of drinking (including setting)
- 7) alcohol labelling
- 8) improving consumption
- 9) other

The summaries of the evidence were drafted by one investigator and verified by a second investigator.

Results of the Search

The first search for systematic reviews in Epistemonikos resulted in 229 articles, and the second search resulted in 130 articles. We identified 28 reviews of possible relevance and, after both investigators screened the full text of the reviews, we included 13 reviews. The search for primary studies found 3,171 citations; 91 were potentially relevant and 41 primary studies were included. Appendix C provides a table of the characteristics of the included primary studies.

Summaries of the Evidence

Overview of Reviews on Understanding and Response to Official Public Health Guidance or Guidelines Related to Nutrition and Physical Activity

Five systematic reviews included primary studies that address how people use guidelines to support behavioural change, or studies that explore or measure public knowledge, awareness and use of public health guidelines for nutrition and physical activity. The first systematic review synthesized evidence about public and patient awareness, knowledge and attitudes toward guidelines across all topics, clinical or public health (Loudon, et al., 2014). It included 26 studies published between 2000 and 2012, with data from about 25,000 people from Canada, the United States (U.S.), the U.K., South Korea and Australia. A major theme across the studies was that participants doubted whether guidelines were personally applicable, but when applicable they felt guidelines could likely



help them make decisions about and manage their health. Studies found that participants wanted trustworthy guidelines and suggested that one way to ensure trustworthiness would be to receive approval of the recommendations from their doctors.

Three systematic reviews synthesized evidence related to the understanding of nutrition guidelines. One of these reviews examined research on public response to recommendations related to weight (Boylan et al., 2012). This review covered 43 articles published between 1978 and 2010 with data on individuals from the U.S., Australia, the U.K., South Africa, the Netherlands, New Zealand, Japan and Turkey. The sample sizes of the included articles ranged from 23 to 14,331. Many studies in the review found that guidelines were perceived as confusing and should be simpler. This review also found that it was important that guidelines were applicable and needed to be more tailored to the individual. However, this review found that the credibility of a guideline did not lead to its use. Individual studies reported that recommendations that could reduce pleasure may not be adhered to, and negatively framed or high-threat messages rather than positively framed messages may be more persuasive for behavioural change.

A second review used a framework of three concepts – consumer awareness, understanding and use – to examine evidence related to national dietary guidelines (Brown et al., 2011). The review included studies on individuals from the U.S., the Netherlands, Chile, New Zealand, Mexico (Baja California), the U.K., Denmark, Thailand, Grenada, China and South Africa. The authors reported some evidence of awareness of national dietary guidelines across countries and increasing awareness over time, but increased awareness did not always mean better understanding. They also reported that misunderstandings were common when nonspecific or abstract wording was used (e.g., “healthy weight”) and understanding could be improved with concrete concepts. In addition, portions and serving sizes were often misunderstood, and using examples could be helpful. The authors noted that few studies measured consumer-use of dietary guidelines.

The third review synthesized evidence for population adherence to and awareness of nutrition guidelines in the U.S. (Haack & Byker, 2014). Thirty-one studies were included with samples sizes ranging from 28 to 215,000 people. Overall, the authors concluded there was adequate awareness of the guidelines, but it decreased with age. Awareness did not appear to be positively associated with adherence to the guidelines. The authors suggested the lack of association could be related to individuals not being able to apply the guidelines to their daily lives. While most people believed that guidance could help them, less than half would use the guidance to influence their diet. Individual studies showed that most people trusted the guidelines, but they did not use them to plan meals. From many studies, women were more aware of, had greater knowledge of and adhered more to nutrition guidelines than men, but the rationale for this association was not clear. The authors of one of the reviews suggested it may be related to women placing more importance on healthy behaviours in general (Boylan et al., 2012).

One systematic review was found that synthesized evidence about public knowledge and awareness of Canadian Physical Activity and Sedentary Behaviour Guidelines (LeBlanc et al., 2015). This review included six studies published between 2013 and 2014, ranging in sample size (when reported) from about 300 to 1,000 people. The evidence suggested that few people were “very familiar” with the guidelines, but after being made aware of them, almost all agreed or strongly agreed with the recommendations in the guidelines. Half of the included studies found that the participants felt that the guidelines would be important in their own lives or helpful. In one of the studies, participants asked for more clarification about how to put the recommendations into practice.



Views and Understanding About Risks of Alcohol Consumption for Cancer or Heart Disease

The updated search found one systematic review that assessed awareness of the link between alcohol consumption and cancer, but it was not specifically related to the use of guidelines (Scheideler & Klein, 2018). Fifteen studies were specific to the awareness, understanding and views about the risk of cancer or heart disease and alcohol consumption guidelines. These studies are in addition to one international survey described in a 2012 report (TNS Opinion & Social, 2010).

The systematic review included 32 peer-reviewed studies from 16 countries published between 1991 and 2017 (Scheideler & Klein, 2018). None of the studies were conducted in Canada, 14 were conducted after 2010, and most of the studies included over 1,000 people. In general, awareness of the link between cancer and alcohol seemed to increase over time, with a typical range of awareness in from 20%–50% of participants in studies published after 2010. However, the authors noted one study that was conducted in the U.K. between 1999 and 2001 that revealed very low awareness: only 3% of women identified alcohol consumption as a risk factor for breast cancer. Few studies ($n = 7$) asked whether reducing intake of alcohol could reduce risk of cancer. These studies were published before 2003. Most of the studies found that about 80% of people recognized that a reduction in alcohol consumption could reduce cancer risk. The authors only noted one study in which the specific type of alcohol was perceived to have an effect on risk: beer was considered by 40% of respondents to be particularly a risk for cancer.

The authors noted some general trends in awareness by participant characteristics, but they were not consistent across all studies:

- There did not appear to be a relationship between education and identification of alcohol as a risk factor;
- Women and younger people may be more aware of the risks; and
- Greater awareness did not seem to be associated with countries with higher consumption.

A European Union survey of awareness of the adverse health risks and social effects was not included in the systematic review. This survey involved 27 member states of the European Union (TNS Opinion & Social, 2010). It found a “fairly high level of awareness” health risks of alcohol consumption in general, but awareness varied according to the risk: there was a higher awareness the risks of liver disease, “medium” awareness of the risks of heart disease, depression and birth defects and less awareness about the risks of cancer.

Since the Scheideler and Klein systematic review, additional studies have been published showing similar estimates of knowledge (Bocquier et al., 2017; Bowden et al., 2014; Buykx et al., 2015; Coomber, Mayshak et al., 2017; Martin et al., 2018; Rosenberg et al., 2018). Of note, the results of the large Global Drug Survey 2017 with about 76,000 participants from 29 countries (including Canada) was published (Winstock et al., 2020). For this study, participants were asked about different health messages, some related to the risks of cancer or heart disease associated with alcohol consumption. The authors reported that 62% of people found the message about drinking less and reducing the risks of seven different cancers was new to them. Females were more likely than males to rate the message about cancer and the message that heart disease is a major cause of death among people with heavy alcohol use as new. In addition, 40% of respondents indicated that the cancer message would make them consider drinking less.



A study in Canada was also published since the systematic review (Weerasinghe et al., 2020). It evaluated the use of health warning labels on alcohol. Surveys were conducted of about 1,700 adults. Before the intervention when warning labels were added, 32% of the respondents had knowledge that alcohol is a carcinogen. Another survey, also in Canada, with over 800 adults found that 25% of the participants knew that drinking alcohol can cause cancer (Vallance et al., 2020).

We found seven studies that specifically addressed understanding and views of cancer or heart disease risk and alcohol consumption guidelines or messages (Bocquier et al., 2017; Coomber, Mayshak et al., 2017; Health Research Board, 2012; Khadjesari et al., 2019; Martin et al., 2018; May et al., 2017; Meyer et al., 2019). Two studies involving focus groups or a survey found that participants may weaken or deny risk messages (Bocquier et al., 2017; May et al., 2017, 2021). The focus group study of 38 participants conducted in Australia found that participants considered cancer an unavoidable disease, and it may be futile to attempt to try to reduce the risk, including by drinking less (May et al., 2017, 2021). Similar results came from the survey conducted in France in which participants had other beliefs that may work to deny risks from alcohol (Bocquier et al., 2017).

Knowledge about the risks of specific cancers varied. In France, focus groups found that participants agreed that alcohol consumption had risks including for different types of cancers, but less for breast cancer (Santé publique France & Institut national du cancer, 2017). However, risks were often seen as related to very high consumption of alcohol and not very probable. A survey in the U.K. was conducted to evaluate a mass media campaign mounted in 2015 to increase knowledge about the risk of breast cancer and alcohol (Martin et al., 2018). The baseline data indicated that about 60% of people ($n = 572$) understood that the risk of cancer is increased with alcohol use; about 85% understood the risk for liver cancer, but only 33% for breast cancer. Similarly, focus group interviews with 35 women in Australia found that most women were not aware of the risk of breast cancer and alcohol, but they viewed alcohol as generally unhealthy (Meyer et al., 2019). In a survey of over 1,000 people in Ireland, the risks for breast and bowel cancers were also less well understood (Health Research Board, 2012). In general, participants were not aware of risks with specific types of cancer (Coomber, Mayshak et al., 2017).

Two studies addressed views about the messaging related to cancer risk (Khadjesari et al., 2019; Meyer et al., 2019). Women from focus groups in Australia suggested that messages specifically about the risk of breast cancer should provide facts and clearly describe how alcohol intake increases risk (Meyer et al., 2019). Interviews with 20 people in the U.K. found participants perceived the messages about alcohol use and cancer “inconsistent and not as strong or simple” as messages about smoking and health risks (Khadjesari et al., 2019).

Views and Understanding About Alcohol Units

We found two systematic reviews published since 2012 that addressed standard drinks and seven primary studies. One review – which included studies from Australia, the U.K., Canada, Belgium, France, Romania, Lithuania, Spain and Hungary – synthesized evidence up to January 2016 about standard drink labels, but also explored understanding of standard drinks (Wettlaufer, 2018). Most studies found that many people who drink, as well as healthcare and alcohol service workers, are unfamiliar with what a standard drink is, but many overpour a standard drink and thus underestimate their alcohol consumption. Most participants in the studies also underestimated the number of standard drinks in a container.

The other review synthesized evidence from 28 studies published up to 2016 that assessed knowledge of standard drinks and conducted free-pour assessments (Schultz et al., 2017). The studies found that individuals typically consume more than the standard drink volumes, and more



than half of the free-pour assessment studies reported overpouring (11 of 18 studies). Individuals tended to overpour or identify drinks that were much more than the standard size, especially for liquor, fortified wine and malt liquor, and when using larger and wider glasses (26 of 28 studies).

We included additional primary studies that explored views and perceptions about standard drinks and national surveys about awareness of units. Although about 30% of respondents in a U.S. survey of over 1,300 people indicated they knew standard drink sizes, almost half of them could not indicate the sizes when asked (Sprague & Vinson, 2017). Similarly, a survey of about 1,000 participants in Ireland found that 40% had heard of a standard drink size, but less than 10% could indicate the size or the weekly number of drinks recommended (Health Research Board, 2012). In a survey of 559 university students in the U.K., knowledge across many questions related to the content of alcohol guidelines was low (de Visser et al., 2021). Specifically, knowledge was low for the unit content of drinks, while certainty in their knowledge was moderate. Students indicated that the guidelines for units were generally not useful and not realistic, and that more information would not be helpful. Students were generally not motivated to adhere to the guidelines, but about 72% indicated they did. In additional analyses, the authors reported that greater motivation to adhere to the guidelines was correlated with greater perceived realism and usefulness of the guidelines. Interviews with 66 adults in the U.K. found that participants measured alcohol consumption by counting bottles or drinks, not units¹ (Lovatt et al, 2015). Interviews ($n = 12$) and a survey ($n = 614$) of younger adults in the U.K. reported that most found it difficult to determine how many units are in a drink based on the unit-based guidelines, and only 30% could accurately estimate units (Furtwangler & de Visser, 2017a, 2017b). In addition, respondents to the survey indicated on average that they seldom or never counted units or used the guidelines to monitor their intake (Furtwangler & de Visser, 2017a). This was true in the focus groups conducted in France where participants mainly gauged drinking by feelings and not by counting drinks (Santé publique France & Institut national du cancer, 2017). If considered, units were typically measured by the size of glass, but the authors noted that some, especially older men, refused to count the number of glasses.

Views and Understanding About Patterns, Context and Reasons for Alcohol Use

We found one systematic review of six qualitative studies of views about alcohol consumption among men ages 45 to 60 years old in the U.K. (Parke et al., 2018) and another review exploring sensible drinking (Muhlack et al., 2018). We also found 27 studies (mainly surveys) that addressed understanding and views about patterns of alcohol consumption. We have presented the findings focusing on patterns of alcohol use as well as context and reasons for drinking alcohol. Findings were typically explored in relation to harms and risks.

Patterns of Alcohol Use

Levels of Alcohol Consumption

The systematic review of acceptable drinking levels synthesized 20 qualitative studies in adults aged 30 to 60 years up to 2015 in the U.K., Scotland, England, Norway, Australia and Japan (Muhlack et al., 2018). It found that acceptable drinking was considered *respectable* drinking, which was defined as appropriate for a person's stage of life or age. Acceptable was when a person could still

¹ Units are a fundamental concept used in U.K. alcohol guidelines. One unit is 8 grams (g) of alcohol, the equivalent to 10 millilitres (ml) of pure alcohol, which is the amount of alcohol the average adult can process within an hour.



meet their work and home responsibilities after drinking, and would not display drunken behaviours. Studies indicated that older people would need to consider their ability to handle alcohol and would likely drink less depending on their ability. The included studies found that acceptable drinking was also defined by the setting and context: a larger consumption of alcohol occurred when out of the house and during informal events that were not work related or when work was finished.

Regarding levels of consumption, a survey in Australia of over 11,000 people found that about half the sample responded that they did not know about the level of consumption that equated with low risk; more women and adults older than 60 years responded that they did not know (Chapman et al., 2020). A U.K. survey of 972 participants found that just over 70% agreed that there is no safe level of drinking (Rosenberg et al., 2018). Interviews with 48 young adults in Australia who drink found that there was a lack of understanding about what was a harmful intake of alcohol (Pettigrew, Biagioni et al., 2016). Regarding perceptions of limits, interviews and focus groups of 60 Australian young adults found that the “personal limits” that were often mentioned would be dictated by their own alcohol tolerance levels. In addition, they believed that the higher the tolerance level, the fewer the negative short-term consequences that would occur (Biagioni et al., 2017).

Two studies evaluated public responses to draft low-risk alcohol guidelines: one in Australia (Wilkinson, 2012) and the other in the U.K. (Stautz et al., 2017). The first study was published in 2012 and reported on the public comments received in 2007 on draft alcohol guidelines in Australia (Wilkinson, 2012). Twenty-eight individuals, as well as individuals on behalf of organizations, made comments wanting stricter messages about daily or weekly drink limits and that no level of drinking is safe. In the second study, tweets were assessed in response to public consultation for guidelines in the U.K. in January 2016, of which 1,709 were from members of the public (Stautz et al., 2017). Most tweets did not express a sentiment toward the guideline. However, after dividing the tweets into themes, the authors indicated that more themes were unsupportive (61% from the public). The most common theme involved comments to support or encourage people to drink, and the authors included quotes for “not drunk enough” and “getting smashed.” The other top themes were disagreement with and ignoring the guideline and that the guideline limits do not consider the pleasure alcohol can provide. In this study (Stautz et al., 2017) and another study of 30 people in Denmark (Jarvinen, 2012), participants questioned the science behind the limits, and additionally questioned why limits are different across guidelines and in other countries.

The level of alcohol was often considered in association with whether it was problematic. A study of interviews of 20 primary care patients in the U.K. reported that participants claimed “they would cut down if their doctor advised them to; however, they were told their drinking was not a problem and were therefore happy to continue” (Khadjesari et al., 2019). The systematic review of qualitative research in men ages 45 to 60 years old in the U.K. and other studies from Denmark, Canada and France also found that participants referred to “problem drinkers.” The review found studies where participants talked about other people who had “problematic drinking,” but their own drinking as unproblematic (Parke et al., 2018). The study with 30 participants from Denmark found a similar reference to “problem drinkers” who need alcohol every day, but that participants did not identify with that group (Jarvinen, 2012). Older adults in focus groups in Canada noted that drinking can be a problem and harmful (Canham et al., 2020). Participants in focus groups in France noted that problem drinking was about drinking alone without consideration of amount (Santé publique France & Institut national du cancer, 2017).

There were few studies that specifically addressed perceptions about the number of drinks people could have per day or per week according to the guidelines. Interviews with 12 university students in the U.K. reported that they agreed with having at least two alcohol-free days a week, but not with the number of daily drinks because they would not be able to reach “their goal of getting drunk on a



night out” (Furtwangler & de Visser, 2017b). Similarly, in focus groups of 66 people in the U.K., the daily drinking guidelines (2–4 units; 1 unit = 10 ml/8 g ethanol) were seen as realistic for people who drank every day, but not for people who only drank on weekends (Lovatt et al, 2015). A similar study of 20 interviews with people in the U.K. also found a difference in perceptions of daily versus weekly drinking: binge drinking in younger adults was perceived by older adults as concerning, and daily drinking of a bottle of wine by older adults was perceived by younger adults as concerning (Khadjesari et al., 2019).

More studies evaluated knowledge of recommendations for daily and weekly number of drinks. A large national survey of over 150,000 respondents was conducted between 2001 and 2016 in Australia (Islam et al., 2019). The survey found that 56% of people overestimated the number of drinks a person can consume daily to avoid harm, with females showing better knowledge, heavy drinkers showing less knowledge. Younger people from 2007 to 2010 were more likely than older people to overestimate the number of drinks (Livingston, 2012). Slightly fewer people overestimated the maximum number of drinks to reduce the risks of short- or long-term harms in a different survey of about 1,000 people in Australia (Coomber, Jones et al., 2017). About 70% estimated at or below the number, and overestimation related to the number of drinks occurred more often in men. Again, people with high-risk alcohol use were less likely to provide an accurate estimate, but the survey also found that higher education was related to accurate estimates. People drinking above guidelines in another Australian survey of 1,255 people were also less likely to know the recommended number of drinks (Cotter et al., 2013). They were also less likely to agree that regular moderate alcohol consumption may lead to serious health consequences over the long term, compared with people who did not drink or drank below the guideline limits. Another survey of over 5,550 older adults in Australia found that more than half of the respondents overestimated by one standard drink the mean number of drinks an adult could drink every day for many years without adversely affecting their health (Chapman et al., 2020). Similarly, in a U.K. survey of over 11,000 people from 2001 to 2016, about 30% of respondents overestimated the limit of drinks per week (Holmes et al., 2016). This same survey between 2015 to 2017 asked almost 17,000 participants about capability, opportunity and motivation to stay within limits (Stevely et al., 2018). It found that about 85% of respondents would find it easy to drink within the limits because their lifestyle makes it easy, but that only 25% track units or are concerned about drinking more units than what is good for them. In a survey of 559 university students in the U.K., knowledge was low for maximum number of units and alcohol-free days per week. Certainty in their knowledge was moderate (de Visser et al., 2021).

Excessive or Binge Drinking

The systematic review of men aged 45 to 60 years in the U.K. found that drinking with the intention of getting drunk was identified in many of the included qualitative studies (Parke et al., 2018). Participants reported a need to “feel out of control, or to let off steam, and getting drunk was a means of achieving this.” Drinking in this age group was “civilized” and different from youthful drinking, which was done by those with less experience and lower alcohol tolerance. The participants perceived that the goal of youthful drinking was to “get drunk quickly,” which increased aggression and caused public nuisance. In contrast, a survey of adolescents in Australia found that 50%–85% of adolescents stated that binge drinking is harmful, foolish, bad, unpleasant and unenjoyable (Jones et al., 2016). Only 2%–11%, described binge drinking as enjoyable, pleasant, good, wise or beneficial. Similarly, 87% of young adults in the U.K. — primarily in university — indicated that exceeding alcohol thresholds was “an entirely negative physical and affective state” (Burgess et al., 2019). Another study of interviews with 30 participants in Denmark found that although guidelines indicate never to binge drink, participants indicated that occasional binge drinking is a part of socializing and would not start counting drinks (Jarvinen, 2012).



Studies also addressed whether excessive or binge drinking is associated with harms. A survey in Canada of 1,662 adults of legal age to purchase alcohol found that 93% believed that drinking in excess (above the current LRDGs) puts them at risk of short-term injury and harm. About 96% said they believed that drinking in excess puts them at long-term risk for health problems. Men were half as likely as women to agree that drinking puts them at long-term risk for health problems (McNally et al., 2019). A survey in France of 3,348 individuals found that only 28% of respondents agreed that “alcohol is dangerous only when you are drunk” (Bocquier et al., 2017). There were two surveys conducted in Australia reporting on perceived harm of alcohol in general, and actual intake with perceived harm. The first survey included 1,061 people and found that people drinking at high-risk levels were less likely to respond with “probably” or “definitely true” to potential harms of drinking compared to people drinking at low-risk levels (Coomber, Jones et al., 2017). The second survey included 2,168 people who consumed alcohol at least twice a month (Pettigrew, Jongenelis et al., 2016). This study found that 80%–90% were aware of harmful effects when pregnant, operating machinery or driving. About 50%–70% were aware that alcohol intake has unfavourable health effects such as heart disease, hypertension, cancer, stroke and liver damage. However, only 50% of people with alcohol intake at high or very high-risk levels considered their drinking to be somewhat or very harmful. Studies of young people in the U.K. found that few referred to long-term harms and thought they did not need to think about long-term health because they were young (Furtwangler & de Visser, 2017b; Burgess et al., 2019). In Ontario, a survey of students reported that the perceived risk associated with binge drinking has remained stable since 2011 (Boak et al., 2020).

Protective Behavioural Strategies

Further analysis of the survey in Australia of 2,168 people who consumed alcohol at least twice a month was conducted to determine how often protective behavioural strategies are used to reduce alcohol-related harms (Jongenelis et al., 2016). Such strategies include eating while drinking, counting drinks, refusing drinks or alternating drinks with non-alcoholic beverages. The study found that respondents sometimes use the strategies, with less than half using them often or always; and lower consumption was related to greater use of strategies. The authors noted that “refusing drinks when you really don’t want it” was most strongly related to lower consumption. However, use of strategies was not related to beliefs in the long-term effects on health, but it was related to belief in more immediate harmful effects. In addition, females tended to use the strategies more often than males. Focus groups in France found that people used similar strategies based on physical signs but only to pause drinking until feeling well enough to continue (Santé publique France & Institut national du cancer, 2017).

Context and Reasons for Drinking Alcohol

The systematic review of qualitative studies of men ages 45 to 60 years in the U.K. found that a key reason for drinking was to relax or to “escape from everyday routines.” However, the authors noted that people may not be able to distinguish between using alcohol to relax versus to cope. Alcohol was also perceived as part of socialising, having fun and building friendships (Parke et al., 2018).

With respect to setting, the systematic review also found drinking in pubs or bars was an important part of socializing and sharing problems, and good for mental health (Parke et al., 2018). A study reviewed in the earlier report on drinking behaviours in the U.K. (Jones & Bellis, 2016) found that about two-thirds of participants drank at home. Many people who drank more than the weekly limits considered it “unremarkable” (Valentine et al., 2007). A report of a survey of over 1,000 people in Ireland stated that drinking in licensed premises decreases with age from 95% of those ages 18 to 24 years to 80% for those ages 65 years and older (Health Research Board, 2012). In the U.K.,



drinking at home or family functions meant a lower threshold for drinking compared to going out as there was concern about how they would be judged (Burgess et al., 2019).

Views and Understanding About Adherence to Alcohol Consumption Guidelines and How to Improve Adherence

Two studies reported that participants felt knowledge of guidelines alone could change alcohol consumption. About 43% of adults from Prince Edward Island who filled out a survey believed that knowledge of Canada's Low-Risk Alcohol Drinking Guidelines would change how much Islanders drink (McNally et al., 2019). The other study reported that only 7% of 972 adults in the U.K. who drank alcohol were "planning on cutting down" after the release of the new U.K. guidelines in 2016 the U.K., while one-third (33%) planned to always, often or sometimes use the new guidelines to keep track of their own drinking (Rosenberg et al., 2018).

Seven studies found that participants felt that guidelines were not applicable to their situations. Interviews of 20 participants in the U.K. reported that low-risk drinking guidelines were not relevant to them and they could decide what was an acceptable level of drinking based on how it would impact their life (Khadjesari et al., 2019). The focus groups conducted in France found that participants also thought that guidance may not make sense for individuals since there are so many types of alcohol and people react differently to it (Santé publique France & Institut national du cancer, 2017).

Another study interviewed 30 participants in Denmark, defined by the study as working- to upper-class, to explore whether people could relate to the limits for safe drinking from the National Health Board (Jarvinen, 2012). Middle- and upper-class participants understood and were willing to follow the guidance, but they did not need "health agencies to interfere" with their drinking. No participants stressed the importance of limits to reduce health risks but instead focused on the positive aspects and cultural and social importance of drinking. As a consequence, the authors suggested that it may not be helpful for guidelines to focus on risk to change behaviour.

Interviews with 12 university students and a survey of a further 614 university students in the UK found that participants were not motivated to adhere to the guidelines as they did not feel concern about how much they were drinking. They did not think the unit-based guidelines applied to their patterns of drinking. Based on the survey results, they were slightly motivated and found the unit-based guidelines moderately useful (Furtwangler & de Visser, 2017a, 2017b). Similarly, in a focus group study of older adults in Canada, the participants questioned whether low-risk drinking guidelines would make much difference to the lives of older adults, as it would likely not make sense to ask an older person to change their habits (Canham et al., 2020). However, the comments were qualified by whether the person had a health problem. Participants in this study also noted that guidelines should not be seen as strict rules, and instead it should be possible to incorporate them into a one's life in "personally negotiated ways." People younger than 25 in focus groups in the U.K. also suggested that guidelines should provide advice and leave choices about alcohol consumption to individuals (de Visser et al., 2013).

Participants in three studies provided suggestions about messaging for low-risk drinking guidelines. The study in which university students from the U.K. were interviewed found that most participants felt that messaging about the risks of alcohol consumption could be similar to messaging about smoking and focus on the harms to individual health (Furtwangler & de Visser, 2017b). Interviews with 20 people in the U.K., also compared messages about smoking versus alcohol, and indicated that messages about alcohol use and cancer were "not as strong or simple" (Khadjesari et al.,



2019). Based on focus groups with people younger than 25 years, the study reported that they also felt that negative health consequences should be conveyed, particularly those related to body image for females. However, participants observed that extreme consequences are likely less common than campaigns suggest, and issues of problem drinking would not be personally relevant (de Visser et al., 2013). Similar suggestions were made by 74% of 4,000 participants in a U.K. survey who indicated they would be more likely to follow low-risk guidelines if the risk of developing disease, particularly dementia, was conveyed (Jones et al., 2019). Participants ($n = 35$) from Australia who were interviewed also suggested that messages should focus on negative short-term effects of alcohol (e.g., mood, next-day effects), effects on appearance (e.g., weight) and effects on memory (Meyer et al., 2019). Two studies also addressed views about the messaging related to cancer risk (Khadjesari et al., 2019; Meyer et al., 2019). Women from focus groups in Australia suggested that messages about the risk of breast cancer should provide facts and clearly describe how intake increases risk (Meyer et al., 2019).

We found one systematic review and seven primary studies that provided a greater understanding of how alcohol warning labels in association with guidelines and messages are perceived by the public. Published in 2012, the review included 10 studies primarily published before 2000 and in the U.S. and focused on perceptions of alcohol labels by adolescents (Scholes-Balog, 2012). It found that studies consistently reported that health labels increased recognition of the health risks of alcohol but might not change beliefs.

In general, the studies found that adolescents perceived alcohol labels and the messages positively and as believable. However, the authors noted that there was little research to conclude whether the positive perceptions could be sustained over time. Most of the primary studies found that half or more of the participants agreed that alcohol products should be labelled (Buykx et al., 2015; Coomber, Jones et al., 2017; Health Research Board, 2012; Schoueri-Mychasiw et al., 2020; Vallance et al., 2018; Vallance et al., 2020). In Yukon, Canada, 36 interviewees found the information on the labels as new, useful and important. They felt the labels had the potential to inform people who drink about the risks of alcohol consumption and to influence the decision to purchase alcohol as a product that may have an impact on health (Vallance et al., 2018).

There were some suggestions from the studies about what types of information should be included on labels. About 50% of 800 participants in a survey in Canada agreed that health warnings should be included with standard drink information, and about 30% agreed that drinking limits should be included (Vallance et al., 2020). The Ipsos survey in Ireland of 1,000 people found that 80%–100% supported labels including information on alcohol strength, the number of calories, alcohol-related harms and the ingredients (Health Research Board, 2012). In contrast, half of the 12 university students interviewed in the U.K. found that information about units on labels did not help them to understand units or motivate them to monitor their alcohol intake (Furtwangler & de Visser, 2017b).



Discussion

The principal aim of this review was to identify and summarize public understanding, perceptions, views, attitudes and responses to various low-risk alcohol drinking guidelines from around the world. We found 13 reviews and 41 studies, and four key areas for public views and understanding emerged:

1. Risks of alcohol consumption for cancer or heart disease;
2. Alcohol units;
3. Patterns, context and reasons for alcohol use; and
4. Adherence to alcohol consumption guidelines.

Although we separated the findings into these areas, there is considerable overlap. We present them together in the following discussion to better understand how this information can be used to develop recommendations for the updated Low-Risk Alcohol Drinking Guidelines and their knowledge mobilization.

There appears to be little public understanding about what a standard drink is and most times people overestimated the standard drink size. The systematic reviews of public health guidelines for nutrition made similar conclusions: participants had difficulty with portion sizes and servings, and visual examples may help.

The public also overestimated the number of daily and weekly drinks recommended in guidelines, and overestimating appeared more common in people who were drinking at high- and very high-risk levels, as well as in males. A common issue in the studies was how realistic the guidelines were. Some studies indicated that the daily and weekly amounts were unrealistic, especially for weekend drinking, while other surveys found that a large majority would find it easy to drink within the limits. There also appears to be some confusion about what is harmful, exceeding a daily amount often or exceeding a weekly amount.

Regardless of the misunderstandings about size and amounts, a consistent finding across studies was that people did not count drinks and may not count drinks in future. This finding raises the question as to whether the concern about people understanding a standard drink size and number of drinks is more important to address than promoting an awareness about keeping track of drinks.

There was consistency across the literature that the public understands there is a link between harms, whether short or long term, and alcohol consumption. There appeared to be some agreement across studies that more immediate harms (e.g., drinking and driving) were better known than long-term harms (e.g., cancer, heart disease). A comprehensive review of studies found that awareness about the link between cancer and alcohol consumption was generally low, from 20%–50% since 2010.

When explored, most studies found that participants understood that reducing alcohol consumption could reduce the risk of cancer, although the link with breast cancer may be less well understood. It seems the association may not be perceived at lower intakes of alcohol, since much of the literature found that participants often linked harms with excessive or high alcohol intake. In contrast were findings that people who drink at high- or very high-risk levels appeared less likely to identify that their drinking was associated with greater harm. Nonetheless, many studies found that participants did identify that excessive drinking may be related to greater harms.

Many studies suggested a lack of insight by people about their level of drinking or about the definition of excessive alcohol consumption. Studies often reported that participants distanced



themselves from the issue or identified other people as “problem drinkers,” but did not feel their own drinking was a problem. Excessive or binge drinking was defined as a severe problem and few identified with it. Excessive drinking meant someone needed alcohol every day, someone who drank alone, or someone who did not consider the amount of alcohol they consumed. Excessive drinking was perceived often as harmful and unpleasant, although one study found that occasional binge drinking was part of socializing. Given that people did not consider themselves as “problem drinkers,” it is not clear whether people would consider themselves at risk of harmful effects or think that guidelines warning about these risks would be applicable to them.

This concern by people that guidelines may not be applicable to them was identified in the review of public attitudes toward all types of guidelines and specifically toward alcohol guidelines. Many reasons were offered for why recommendations for low-risk drinking may not be applicable to individuals and would need to be personalized. Participants in the studies suggested that personal tolerance levels to alcohol may be different, and that limits need to be set according to individual effects or feelings and be dependent on whether the person had other health problems. Additionally, limits were thought to vary depending on the type of alcohol consumed and usual patterns of drinking. Changing drinking habits, particularly in older adults, was also seen as not likely to be effective. Alcohol continues to be viewed positively in social situations as a means to unwind and have fun with friends when going out or at home, and as a way to distinguish between work and relaxation. Because of these attitudes, adhering to recommendations was viewed as a personal decision that needed to be fit into or tailored to personal lives.

There are some inconsistencies across studies and reviews addressing alcohol or other public health guidelines about how to improve perceptions of low-risk drinking guidelines. One consistent finding appeared to be that recommendations and messaging from organizations and agencies were expected. But the messaging should not be patronizing and should be framed as advice, rather than as strict rules. To again address issues of applicability, individuals wanted information presented so they could make their own decisions and incorporate guidelines into their lives as they saw fit.

Few studies addressed if and how strategies could be provided to help people use the recommendations. Some strategies were mentioned by participants, such as refusing drinks when not really wanted or eating while drinking. However, it might be necessary to clarify the purpose of strategies, as participants in one study indicated that the strategies were used not to limit intake but to ensure consumption could continue over a long period.

There was inconsistency about how to frame messages, particularly about harms. Some studies indicated negative framing could have more impact on behaviours, but other studies indicated positive framing might be more successful. The studies provided some information about perceptions of health warning labels on alcohol products. In general, this type of information was viewed positively and most participants appeared to support its use, with the exception of information about units, which again was not perceived as useful.

Limitations

This review provides information about how the public understands low-risk alcohol drinking guidelines, what they consider when hearing messages about the guidelines, and how the guidelines can be used. The goal was to find evidence that directly addresses these topics specific to alcohol consumption guidelines. In 2016, there was little direct evidence, but this review has shown there is a growing body of literature. Given the topic area, we limited our inclusion criteria to qualitative research, typically from focus groups and interviews, but we also included surveys that asked questions about perceptions, views and attitudes. While qualitative research is ideal to inform the



“how” and “what” about understanding, views and attitudes, we also extracted any quantitative data available from surveys, although the richness of the data was lacking.

We did not include studies whose goal was to evaluate the effects of guidelines or messages, or of strategies to improve their uptake. However, it is possible that those studies may have also measured acceptability or feasibility, or reported on perceptions as a secondary goal. By excluding those studies, we would have missed that data. We also restricted our inclusion criteria to the general public and excluded studies with very specific populations, such as people with substance use disorders or recovering from cancer. It was thought that guidelines could be perceived differently in those groups and may not apply to the public, although we did not explore this hypothesis. We hoped to find more information about whether there were sex and gender differences in views and attitudes, but most of the literature did not make this distinction. Instead, we have reported any differences or analyses in the terms used by the authors. In future studies, authors may make distinctions that would better inform the evidence.

There were many large surveys and articles published from teams that included similar authors. We were attentive to possible duplicate publications based on a common data repository. However, it is possible that we may have missed some overlaps and double counted results, which might make some conclusions appear more common than they were. We have not assessed confidence in the evidence using the CERQual (confidence in the evidence from reviews of qualitative research) approach and communicated it using levels of confidence from very low to high. Instead, we have indicated our degree of certainty when making conclusions by using terms such as “may” or “the evidence suggests” for evidence in which we have lower confidence, and terms such as “likely” or “commonly” to convey greater confidence.

Implications

Despite not always finding consistent information from the evidence about understanding and perceptions of guidelines, and how to improve them, there are a few key implications of this work. Guideline developers making judgments about the acceptability and feasibility of recommendations can use this information to assess evidence for those criteria. For knowledge mobilization, this work is not meant to determine whether a specific knowledge product or strategy would be more successful, but it can be used to prompt those involved in mobilization to pose the right questions to the public when developing and evaluating products and strategies. This work also highlights that certain content may need to be addressed in those products, such as perceptions of “problem drinking” and feelings of confusion about alcohol serving sizes. It also provides support for developing multiple products and strategies. For example, to reach people with different views, some products may need to communicate messages with negative framing, while others may need positive framing.



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Appendix A: Questions Used for the 2016 CMO Alcohol Guidelines Review

Questions used for the U.K. Chief Medical Officers review to gather evidence on the understanding of and response to public health guidelines (Jones & Bellis, 2016).

Understanding and response to official public health guidance or guidelines

- 1) Do people use official public health guidance or guidelines and risk advice to help or support them to plan or make behavioural changes?
 - a) If so, how do people use guidance/guidelines and risk advice to support planning for, or making, behavioural changes?
 - b) Does peoples' understanding of, or response to, guidance/guidelines and risk advice differ by age, sex, ethnicity or other factors?

Understanding and response to alcohol consumption guidelines

- 2) What is the public understanding of, and views on, the risks of alcohol consumption?
 - a) How does the public judge acceptable levels of risk regarding the health and social consequences of alcohol consumption, in relation to their own or others alcohol consumption?
 - b) How can these factors be accounted for in the development of alcohol consumption guidelines?
- 3) What is the public understanding of alcohol units and sensible drinking levels?
 - a) How is knowledge about, and awareness of, alcohol units and sensible drinking levels used by the general public in relation to their own alcohol consumption?
 - b) How can the use of knowledge and awareness of alcohol units and sensible drinking levels by the general public be improved?
- 4) What is the public understanding of, and views on, the risks associated with different patterns of alcohol consumption?
 - a) How can the development of alcohol consumption guidelines take into account the potential conflicts between messages on episodic 'binge' drinking and regular consumption?
- 5) How do people understand and respond to messages about recommended upper limits of alcohol consumption?
 - a) How can these factors be accounted for in the development of alcohol consumption guidelines?



Appendix B: Updated Search Strategies

Search for Systematic Reviews

EPISTEMONIKOS 1 June 2021

(title:(guideline* OR guidance*) OR abstract:(guideline* OR guidance*)) AND (title:(public OR population) OR abstract:(public OR population)) AND (title:(food OR diet OR alcohol OR drink* OR smok* OR tobacco OR exercis* OR physical activit*) OR abstract:(food OR diet OR alcohol OR drink* OR smok* OR tobacco OR exercis* OR physical activit*)) AND (title:(behavi* OR attitud* OR perception* OR perspective* OR knowledge* OR satisfaction OR understand* OR response* OR perceive*) OR abstract:(behavi* OR attitud* OR perception* OR perspective* OR knowledge* OR satisfaction OR understand* OR response* OR perceive*))

EPISTEMONIKOS 8 June 2021

title:(guideline* OR guidance* OR recommendation*) AND title:(behavi* OR attitud* OR perception* OR perspective* OR knowledge* OR satisfaction OR understand* OR response* OR perceive*)

Search for Primary Studies

Embase <1996 to 2021 July 06>; Ovid MEDLINE(R) <1996 to July 06, 2021>; APA PsycInfo <1987 to June Week 4 2021>; EBM Reviews - Cochrane Central Register of Controlled Trials <June 2021>; Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <2017 to July 06, 2021>

alcohol drinking/ or alcoholic beverages/
(alcohol* adj (drink* or drinks or beverage*).tw.
((alcohol or ethanol) adj1 (consumption or drinking or intake or content)).tw.
1 or 2 or 3
(understand* or comprehen* or attitude* or belief* or response* or perception* or perceive* or behavior* or behaviour* or knowledge or view*).tw.
(risk adj1 (manage* or assess* or evaluat*).tw.
health knowledge, attitudes, practice/
health behavior/
attitude to health/
perception/
comprehension/
consumer satisfaction/
risk assessment/
5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
(guidance or guideline* or recommendation* or communication* or messag* or campaign*).tw.
guidelines as topic/
consumer health information/
15 or 16 or 17
4 and 14 and 18
case report/ or conference abstract/ or conference abstract.pt.
19 not 20
limit 21 to yr="2012 - 2017"
limit 21 to yr="2017 -Current"
remove duplicates from 22
remove duplicates from 23
24 or 25



Appendix C: Characteristics of Included Primary Studies

Author and year	Number of people and type of population	Country	Age	Methodology
Biagioni 2017	Sixty 18–21-year-old drinkers	Australia	Age range = 18-21 years old	Interviews and focus groups
Boak 2020	14,142 students in grades 7-12 from 263 schools	Canada	Age range = 12-18 years old	Survey
Bocquier 2017	3,348 individuals who reported drinking alcoholic beverages in the past year	France	19% were 15-25, 16% were 26-34, 20% were 35-44, 19% were 45-54, and 26% were 55-75	Survey
Bowden 2014	2,700 adults above the age of 18	Australia	Ages 18+	Survey
Burgess 2019	150 adults who were mostly university students	U.K.	Mean age = 23.3 years old	Interviews
Buykx 2015	2,482 adults	Australia	Mean age = 46.8 years old	Survey
Buykx 2018	1,850 drinkers	U.K.	Mean age = 48 years old	Survey
Canham 2020	66 older adults and senior-serving health and social service providers	Canada	Age range = 51-86, mean age = 70 years old	Focus groups
Chapman 2020	11,886 Older Adults	Australia	34% were 50-59 and 66% were 60+	Survey
Coomber 2017	1,061 drinkers	Australia	Age range = 18-45, mean age = 33.2 years	Survey
Coomber 2017	1,061 drinkers	Australia	Age range = 18-45, mean age = 33.2 years old	Survey
Cotter 2013	1,255 drinkers	Australia	Ages 18+	Survey
de Visser 2013	75 young people living in South-East England	England	Age range = 13-25 years old	Focus groups
de Visser 2021	559 U.K. university students	U.K.	Mean age = 22.8 years old	Survey
Furtwangler 2017	12 individuals who drink alcohol	U.K.	Age range = 19-28 years old	Interviews
Furtwangler 2017	614 university drinkers	U.K.	Age range = 18-30 years old	Survey
Holmes 2016	11,845 18+ individuals who live in private households in England	U.K.	Ages 18+	Survey
Ipsos 2012	1,020 individuals	Ireland	Ages 18+	Survey
Islam 2019	153,820 individuals	Australia	Ages 20+	Survey
Jarvinen 2012	30 individuals who drank more than 21 units a week (men) or more than 14 units a week (women)	Denmark	Average age = 43 years old	Interviews



Author and year	Number of people and type of population	Country	Age	Methodology
Jones 2016	549 individuals including 221 secondary school students, 104 parents of adolescents and 224 adult community members	Australia	No mean age or age range reported	Survey
Jones 2019	3,948 individuals	U.K.	Mean age = 62 years old	Survey
Jongenelis 2016	2,168 Australian drinkers	Australia	Mean age = 37.8 years old	Survey
Khadjesari 2019	20 university educated participants	U.K.	Mean age = 46 years old	Interviews
Livingston 2012	46,466 responses from the National Drug Strategy Household Surveys conducted in 2009 and 2010	Australia	Ages 18+	Survey
Lovatt 2015	66 adults who drink alcohol at least twice a year	U.K.	Age range = 19-65 years old	Focus group
May 2017	38 people who self-identified as low-to-moderate alcohol consumers and have had no previous cancer diagnosis nor a family member diagnosed with cancer	Australia	18-65 years old	Focus group
May 2021	38 people who self-identified as low-to-moderate alcohol consumers and have had no previous cancer diagnosis nor a family member diagnosed with cancer	Australia	18-65 years old	Focus group
McNally 2019	1,662 adults of legal age to purchase alcohol	Canada	7% were 19-25, 20.8% were 26-40, 34.3% were 41-55, 32.3% were 56-70, and 5.7% were 71+ years old	Survey
Meyer 2019	35 women who had no previous breast cancer diagnosis	Australia	Age range = 45-64 years old	Interview
Pettigrew 2016	2,168 drinkers who drink at least twice a month	Australia	Mean age = 37.8 years old	Survey
Pettigrew 2016	Forty-eight 18-21-year-olds involved in a study of young drinkers	Australia	Mean age = 20 years old	Introspections (emailed written responses)
Rosenburg 2018	972 adults who drank alcohol	U.K.	15% were 18-25, 19% were 26-35, 24% were 36-45, 30% were 46-55, and 12% were 56+ years old	Survey
Santé publique France & Institut national du cancer 2017	72 people	France	18-60 years old	Focus groups



Author and year	Number of people and type of population	Country	Age	Methodology
Schoueri-Mychasiw 2020	2,049 individuals of the legal drinking age who had consumed one or more alcoholic drinks within the last 30 days	Canada	Mean age = 47 years old in the intervention site and 41.2 in the comparison site	Randomized controlled trial
Sprague 2017	1,331 patients from a family and internal medicine clinic	United States	Mean age = 49.6 years old	Survey
Stautz 2017	2,291 twitter accounts	U.K.	No ages reported	Written responses on Twitter
Stevely 2018	16,779 adult drinkers	U.K.	Ages 18+	Survey
Vallance 2018	36 people who drink	Canada	Mean age = 42 years old	Focus groups
Vallance 2020	836 adults	Canada	44.98% were 19-44 years old, and 55.02% were 45+	Survey
Wilkinson 2012	103 responses to Australian alcohol guidelines	Australia	No ages reported	Written comments
Winstock 2020	75,969 individuals who drank in the past 12 months	28 different countries	Mean age = 27 years old	Survey