

ABSTRACT

We used the 1997 Ontario Drug Monitor, a population-based, random-digit dialling survey of 2,776 adults, to obtain a baseline assessment of alcohol drinking by Ontarians against the 1997 low-risk drinking guidelines of the Addiction Research Foundation and the Canadian Centre on Substance Abuse. Average weekly alcohol consumption and the frequency of exceeding the daily limit, estimated using the graduated frequency scale, were determined for the population overall, and by sex and age group (18-44 and 45+ years). Most Ontarians drank alcohol in a pattern associated with a low risk of health consequences. About 10% of women and 25% of men drank in a style associated with some increase in acute or long-term risk. Younger men were most likely to drink in a risky pattern. Most drinkers of middle age or older, for whom cardiovascular disease is a significant health risk, consumed alcohol in a pattern associated with cardiovascular benefit.

ABRÉGÉ

L'indicateur de la consommation de drogues en Ontario 1997, un sondage téléphonique aléatoire mené auprès d'un échantillon représentatif de 2 776 adultes, a servi pour faire une évaluation de base de la consommation d'alcool parmi les adultes ontariens par rapport aux directives de la consommation à faible risque établies en 1997 par la Fondation de la recherche sur la toxicomanie et le Centre canadien de lutte contre la toxicomanie. Les chercheurs ont déterminé les moyennes hebdomadaires de consommation d'alcool et la fréquence à laquelle les limites quotidiennes étaient dépassées, estimées à l'aide de l'échelle de fréquence graduée, pour la population en général, et par sexe et groupe d'âge (18 à 44 ans, et 45 ans et plus). Pour la plupart, les habitudes de consommation d'alcool des Ontariens étaient associées à de faibles risques de conséquences pour la santé. Environ 10 % des femmes et 25 % des hommes buvaient de manière à accroître leurs risques aigus ou à long terme. Ce sont les jeunes hommes qui buvaient de manière plus risquée. La plupart des buveurs d'âge moyen ou plus âgés, qui courent un plus grand risque de maladies cardiovasculaires, consommaient l'alcool de manière à tirer les avantages cardiovasculaires de l'alcool.

Do Ontarians Drink in Moderation? A Baseline Assessment Against Canadian Low Risk Drinking Guidelines

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Alcohol is associated with wide-ranging consequences for health and well-being. Alcohol causes liver disease and cancer of the upper aerodigestive system,¹⁻⁴ and is associated with cancer of the breast^{4,5} and lower gastrointestinal tract.⁶⁻⁹ Other adverse effects include certain cardiovascular disorders, trauma, fetal effects, abuse and dependence.^{1-4,10} However, many moderate drinkers never experience serious adverse effects, and alcohol use is associated with a significantly reduced risk of chronic diseases involving atherosclerosis and thrombosis, namely, coronary heart disease, peripheral vascular disease, and ischemic stroke.¹⁰⁻¹³

Recommendations that set upper limits on alcohol intake are useful in clinical settings,¹⁴⁻²⁰ in broad-based prevention initiatives and in formulating healthy public policy.^{14,21-24} Internationally, many agencies have attempted to define levels or patterns of alcohol use that represent a low risk of harm.^{14,16} Some have also attempted to define levels associated with maximum net benefit.²²⁻²⁵

Canadian guidelines referring to 'moderate' or 'low-risk drinking' have appeared

periodically since the 1970s.^{26,27} In 1994, low-risk drinking guidelines were disseminated following an international conference on health benefits and risks.^{21,28} In October 1997, revised guidelines were released by the Addiction Research Foundation (ARF) and the Canadian Centre on Substance Abuse, from a process initiated by the Ontario Ministry of Health.²⁹ These guidelines have now been endorsed by various national and provincial government and non-government agencies.³⁰

The 1997 guidelines recommend that men and women limit weekly alcohol intake to no more than 14 and 9 standard drinks* (SDs), respectively. Also, alcohol intake on any one day should generally be limited to 2 SDs. Caution should be taken to avoid intoxication and injury, and circumstances were identified where abstinence may be warranted. The guidelines are intended to represent low risk of the most important forms of harm and to address usual drinking over many years. Fuller discussion of the rationale for the guidelines is available.^{29,30}

Several agencies involved with health promotion have inquired about the number of Ontarians who drink within or exceed these guidelines. However, most available health surveys include simple alcohol use measures that do not describe drinking patterns as discussed in the guidelines. A survey designed explicitly for this purpose would have to address both usual drinking patterns and all the various spe-

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* One standard drink is equal to one 341 mL (12 oz.) bottle of beer (5% alcohol); one 142 mL (5 oz.) glass of table wine (12% alcohol); one 43 mL (1.5 oz.) serving of spirits (40% alcohol) or one 85 mL (3 oz.) serving of fortified wine, such as sherry or port (18% alcohol).

TABLE I
Percent of Drinkers who Exceed Individual Elements of ARF/CCSA 1997 Low-risk Drinking Guidelines

Age Group (years) Unweighted N	Males			Females		
	19+ N=1037 % 95% CI	19 to 44 N=611 % 95% CI	45+ N=426 % 95% CI	19+ N=1125 % 95% CI	19 to 44 N=710 % 95% CI	45+ N=415 % 95% CI
Weekly average is higher than sex-specific limit	15 (12, 17)	20 (16, 24)	7 (4, 10)	8 (6, 10)	9 (6, 11)	8 (5, 11)
Exceeds daily limit:						
Never	20 (18, 23)	13 (10, 16)	31 (26, 37)	38 (35, 41)	28 (24, 32)	59 (54, 65)
Less than once per month	30 (26, 33)	28 (24, 32)	32 (27, 37)	37 (33, 40)	39 (35, 44)	31 (25, 36)
1 to 3 times per month	20 (17, 23)	24 (19, 27)	16 (11, 19)	15 (12, 17)	19 (16, 23)	5 (2, 7)
One or more times per week	30 (27, 33)	35 (31, 40)	21 (17, 26)	11 (8, 13)	13 (10, 16)	5 (3, 8)

Source: Addiction Research Foundation: Ontario Drug Monitor, 1997.
 Non-abstainers, 19 years of age and older; Ontario Drug Monitor survey, 1997

cial circumstances described, some of which lack specific objective definitions.

This report provides a baseline assessment of alcohol consumption by Ontario adults against two core elements in the 1997 guidelines: namely, average alcohol consumption exceeding sex-specific weekly limits, and the frequency of exceeding the daily limit of 2 SDs. Data are from a 1997 telephone survey of alcohol and drug use with more complex drinking behaviour questions.

METHOD

The Ontario Drug Monitor is an annual representative telephone survey of Ontario adults (18 years and older) conducted by ARF.³¹⁻³⁴ In 1997, 2,776 interviews were completed, for an estimated response rate of 67%.^{34,35} Random digit dialling was used to sample private households in six geographical strata. One respondent per household was selected at random. The survey methods and their limitations are detailed elsewhere.^{32,33}

Non-abstainers (any alcohol in the past year) were given a definition for standard drinks and asked about their alcohol use over the past year.³⁴ Average weekly alcohol consumption was estimated using a graduated frequency scale,^{31,36,37} a series of questions about how often each of several specified amounts of alcohol were consumed.³¹ Respondents were first asked the largest number of drinks they had on one occasion in the past year. They were then asked a series of questions with the following format:

“How often did you have AT LEAST EIGHT, BUT LESS THAN TWELVE drinks of beer, wine, or liquor of any kind on ONE occasion?”

The question was asked for the following amounts: 12 or more drinks per occasion; 8 to 11 drinks; 5 to 7 drinks, 3 or 4 drinks, and 1 or 2 drinks (starting with the largest amount per occasion reported in the past year). The response options ranged from ‘more than once per day’ and ‘about every day’ to ‘less than once a month’.

The volume categories were assigned the value of the mid-point of the range (e.g., 5 to 7 = 6 drinks; and, ‘12 or more’ = 13). This number of drinks was multiplied by the number of occasions per year. Summing across all categories gives the total number of drinks for the year and the basis of a weekly average.³¹ For example, a person who had one drink per day, weekly, plus 5 to 7 drinks per day once per month was given a weekly average as follows:

Total annual drinks = 1 drink x 52 occasions + 6 drinks x 12 occasions = 124 drinks

Weekly average = 2.4 drinks.

This is the standard derived variable for the survey.³¹ The frequency of exceeding the daily limit was calculated from the same questions as the total number of all occasions on which any quantity greater than 2 SDs was consumed.

Results are presented by gender within two age groups: 19 (legal drinking age) to 44 years, and 45 years and older. Age 45 is a common break point for public health program planning, and approximates the age at which cardiovascular disease risk becomes important. Percentages are based on data weighted to account for unequal sampling probabilities. Confidence limits

appropriate to the stratified survey design were obtained using the statistical package Stata, version 5.0.³⁸ Missing data prevented 77 and 100 respondents (2.8 % and 3.6% of the unweighted sample) from being categorized by age and usual drinking behaviour, respectively.

RESULTS

Fifteen percent of men and 8% of women averaged more than the recommended gender-specific weekly limits of 14 and 9 SDs per week, respectively (Table I). Male drinkers under 45 years of age exceeded weekly limits more often than older men, or women in either age group. Male drinkers also exceeded the daily limit of two SDs more often than women. Thirty percent of male drinkers had three or more SDs at least once a week, compared with 11% of female drinkers. Although older men exceeded the daily limit less often than younger men, this was not a rare occurrence in either group – 35% and 21%, respectively, did so one or more times per week. In contrast, only 13% of younger women and 5% of older women regularly exceeded the daily limit.

In summary, 17% of men and 24% of women in Ontario were abstainers (Table II) with the highest rate among older women (34%). In all age-sex specific groups the majority used alcohol, and in a manner generally consistent with the low-risk drinking limits, i.e., they did not average more than the recommended maximum weekly intake limits, nor regularly exceed recommended daily limits. However, 30% of men aged 19 to 44 years tended to exceed one or other limit on a regular basis.

TABLE II
Summary of Drinking Behaviour of Ontarians with Reference to the 1997 ARF/CCSA Low-risk Drinking Guidelines.

Age Group (years) <i>Unweighted N</i>	Males						Females					
	19+		19 to 44		45+		19+		19 to 44		45+	
	N=1231		N=691		N=540		N=1469		N=844		N=625	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Abstainer	17	(15, 20)	14	(11, 17)	22	(18, 26)	24	(21, 26)	18	(15, 21)	34	(30, 38)
Exceeds neither limit	58	(55, 61)	56	(51, 60)	61	(57, 66)	66	(63, 69)	70	(67, 74)	59	(55, 64)
Exceeds either weekly limit, or daily limit on a weekly basis	25	(22, 28)	30	(26, 34)	17	(13, 21)	10	(8, 12)	12	(9, 15)	6	(4, 9)

Source: Addiction Research Foundation: Ontario Drug Monitor, 1997.

Percent (and 95% confidence interval) of all Ontario adults 19 years of age and older. Ontario Drug Monitor survey, 1997

DISCUSSION

Knowing the prevalence of drinking patterns associated with increased or decreased risk of important public health consequences is necessary to assess the impact of alcohol use on morbidity, mortality and economic costs.³⁹⁻⁴¹ It also permits identification of groups at risk, allowing preventive efforts to be better targeted toward reducing harm or maximizing benefit.

Information about drinking patterns can be far more important than measures of average or total volume of intake in determining risk.⁴²⁻⁴⁴ Aggregate indicators of alcohol use (i.e., per capita intake) also have much lower associations with alcohol-related harm than is sometimes assumed.^{43,45-47} Different drinking patterns may be associated with a net increase or decrease in overall morbidity and mortality.^{39,40,48} Drinking patterns should also be considered by age and sex, as these characteristics largely determine the relative weight of adverse versus beneficial effects (e.g., for young people an increased risk of alcohol-related injury outweighs any further reduction in their low risk of ischemic cardiovascular disease).^{10,13,40,48-50}

The majority of Ontario adults drink alcohol in a manner consistent with a low risk of adverse consequences. However, roughly one quarter of men, and around 10% of women, drink in a manner representing some level of increased risk either acutely or over the long run. That males and younger adults are more likely to exceed recommended low-risk limits is consistent with evidence showing these groups to be at elevated risk of alcohol-related harm.³

It is not implied that an individual who exceeds the low-risk drinking guidelines is

experiencing alcohol abuse or dependence, nor necessarily will suffer adverse consequences. What does it mean to be consuming in a 'low-risk' manner, and how were the recommended upper limits derived?

Weekly limits relate primarily to the risk of chronic health outcomes (such as liver disease and cancer at various sites), while acute consequences (notably trauma) are more closely associated with the amount consumed per occasion, blood alcohol content, and intoxication.^{4,10,12,30,42,51} Several chronic disease outcomes (such as some cancers) have a positive association with alcohol use and no obvious threshold of risk;^{13,51} risk increases on a (more or less) linear basis as the total dose over time increases.^{13,30,48} In contrast, a cardiovascular benefit is achieved with quite modest consumption, roughly one drink every second day. No additional protection is afforded by a higher average intake, nor occasions of heavy drinking.^{4,10,12,13,52} For average consumption, the point at which the risks outweigh benefits is driven by the overall likelihood of these disparate outcomes.⁴⁸

Sex-specific weekly limits were determined following a review of studies presenting dose-response information for relevant long-term health consequences, including major overviews and meta-analyses (e.g., ref. 51). The chosen limits are consistent with current evidence on the point at which beneficial health effects are outweighed by adverse effects as indicated by global measures such as all-cause mortality.

The chosen daily limits are conservative, and believed to reflect a genuinely low risk of acute consequences of alcohol use (including accidents, violence and potential legal consequences of impairment) for most drinkers.³⁰ However, risk associated

with acute intake varies considerably across individuals and settings. For example, the risk of injury also depends on individual body composition, tolerance, and environmental hazards. For most of the forms of harm in this category of acute effects, risk increases with each additional drink taken at that time, but it is impossible to make quantitative statements about changes in risk that are broadly applicable. Because of the multi-factorial nature of the risk of injury, and many other alcohol-related problems, future studies are unlikely to produce highly specific statements about the exact amount of alcohol at which generalized risk markedly increases.

The high proportion of young adults exceeding the guidelines does not necessarily say that the guidelines are unrealistic. The guidelines have a specialized focus – that of minimizing the risk of alcohol-related adverse health consequences. Alcohol use, even within these guidelines, is unlikely to afford any net health benefit for young people.^{48,49} Currently, there is no strong evidence that alcohol use early in life affords cardiovascular protection in older adulthood.^{12,13}

Roughly 60% of Ontarians age 45 and older drink in a pattern associated with a low risk of adverse effects and some cardiovascular benefit and so probably do not warrant specific intervention into their drinking behaviour. Older adults are more likely to receive a net benefit from drinking moderately, relative to abstinence. Although, 22% of men and 34% of women at an age where cardiovascular disease is significant drank no alcohol, most authorities recommend that abstainers not generally be encouraged to drink for cardiovascular benefits.^{13,24} The risks need to be carefully considered for the individual,

and one should not assume that taking up drinking is a desirable change. Most abstainers have solid reasons for not using alcohol.¹³ Other measures to prevent cardiovascular disease should likely be considered first, including smoking cessation, physical activity and control of blood pressure. The remaining 17% of men over 45 and 8% of women this age who exceed the low-risk guidelines would be well advised to reduce their use of alcohol, not increase it, for health reasons.

The methodology used has limitations, including an inability to assess the circumstances in which alcohol is used, or individual differences in tolerance or risk of alcohol dependence. Further, there is no standard measure of drinking patterns. Most general health surveys are poorly suited to this task, and comparative data with relevant measures of drinking patterns are not readily available. Ironically, more complex alcohol use measures (which describe patterns of drinking) also tend to perform better for simpler measures such as total intake.³⁷ However, most surveys are likely to omit the very heaviest drinkers in a population and so underestimate the proportion at risk.

Although the 1997 guidelines on low risk drinking are unlikely to be the last word, they offer reasonable recommendations to individuals who wish to avoid adverse consequences. They also provide an important counterpoint to overly simplistic messages that drinking is good for health. This study offers one estimate of the proportion of Ontarians at increased risk, bringing us closer to monitoring alcohol use and estimating risk in a manner that is defensible in light of what is now known about both beneficial and harmful effects.

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