

CMO Alcohol Guidelines Review

**A summary of the evidence on
understanding and response to
public health guidelines**

**A report for the Behavioural Evidence Expert
Working Group
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About this document

This document was prepared on behalf of the Secretariat to the Behavioural Evidence Expert Group by the Centre for Public Health, Liverpool John Moore University. The Behavioural Evidence Expert Group was established by the UK Chief Medical Officers to review how the public, professionals and industry understand and respond to official public health guidelines, especially in relation to alcohol.

The purpose of this document is to provide a summary of a series of systematic reviews and literature searches undertaken to inform the discussions of the Behavioural Evidence Expert Group around (i) understandings and responses to official public health guidelines in relation to a range of health-related behaviours, and (ii) understandings and responses to alcohol consumption guidelines. The interpretation, analysis and views expressed are those of the authors (Lisa Jones and Mark Bellis) and not necessarily those of the Behavioural Expert Group.

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Table of Contents

Table of Contents.....	1
Background to the review of alcohol guidelines.....	2
Methods	5
1 Do people use official public health guidance or guidelines and risk advice to help or support them to plan or make behavioural changes?	8
2 What is the public understanding of, and views on, the risks of alcohol consumption?.	14
3 What is the public understanding of alcohol units and sensible drinking levels?.....	16
4 What is the public understanding of, and views on, the risks associated with different patterns of alcohol consumption?	19
5 How do people understand and respond to messages about recommended upper limits of alcohol consumption?	19
6 Alcohol units and sensible drinking messages on alcohol product labels	21
References.....	29
Appendix 1. Summary of Australian and Canadian alcohol guidelines.....	34
Appendix 2. Example search strategies.....	37
Appendix 3. Abstracts of included systematic reviews	40
Appendix 4. Abstracts of included primary studies	45

Table of tables

Table 1. Knowledge of units by type of drink	18
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Background to the review of alcohol guidelines

Previous guidelines

Sensible Drinking guidelines (1987)

Drinking less than 21 units per week by men and less than 14 units per week by women was unlikely to damage health. (One units of alcohol being defined as 8g or 10ml of pure alcohol).

Sensible Drinking guidelines (1995)

In 1994, the Government announced that the 1987 guidelines would be reviewed in light of evidence indicating that alcohol consumption might provide protection from coronary heart disease (CHD).¹ An Inter-Departmental Working Group was established to consider the evidence and the main findings were as follows:

- They wished to move away from weekly drinking to enable people to set daily benchmarks and account for the harms associated with heavy episodic drinking.
- Men were advised that regular consumption of between 3 to 4 units per day would not accrue significant health risk, and women, regular consumption of between 2 to 3 units was advised. Consistently drinking more than the respective maximums (4 or more units a day for men and 3 or more units a day for women) was not advised as a 'sensible drinking level' because of the progressive health risk it carried. The maximum health advantages for men and women were thought to lie between drinking 1 and 2 units per day.
- However, sensible drinking guidelines are not appropriate to those aged under 16 and after an episode of heavy drinking, individuals should refrain from drinking for two days to allow physiological recovery. There are a number of occasions where individuals should be advised not to drink: before/during driving; before or during active sport (especially swimming); before using machinery, electrical equipment or ladders; before/during working and when taking medication (where alcohol is contraindicated).
- Middle-aged or elderly men and post-menopausal women may wish to consider that light drinking could benefit their health.

Review of guidelines in 2012

In January 2012, the House of Commons Science and Technology Committee published an inquiry examining the evidence base for alcohol advice in order to assess whether the guidelines needed to be updated.² The inquiry, which received submissions from a range of stakeholders, noted a number of concerns in relation to the 1995 guidelines, in particular that:

- The move to daily drinking limits could have appeared to endorse daily drinking; with the suggestion that many people may not be aware that the advice was framed in terms of regular drinking.
- More recent analyses have questioned the robustness of the evidence related to the health benefits of alcohol consumption; one of the primary rationales for the shift to daily guidelines.

The House of Commons Science and Technology Committee concluded that there were sufficient concerns about the current Government guidelines to require a thorough review of the evidence. Thus, the UK Chief Medical Officers (CMOs) have established two expert working groups to review the evidence and develop joint UK wide alcohol guidelines. The Health Evidence Expert Working Group has been asked to consider: (i) the science around the effects of alcohol on health and to agree assessments of risk associated with various levels of alcohol consumption and, if possible, with different patterns of consumption; (ii) whether the evidence suggests that current alcohol guidelines should be revised; and (iii) the evidence in terms of a life-course approach, building on current guidelines for young people and pregnancy, and to examine the possibility of different guidance for different age groups.

Development of low risk drinking guidelines

Internationally, the development of new national guidelines has most recently been undertaken in Australia and Canada.^{3,4} Development of both guidelines was based on comprehensive reviews of published evidence but different approaches were used to derive safe levels of consumption. A summary of both guidelines is presented in Appendix 1.

The Australian guidelines are based on the absolute risk of acute and chronic outcomes and daily drinking levels were estimated which would increase lifetime risk of death, injury or chronic illness by more than 1 in a 100.⁵ The Canadian guidelines are mainly based on a relative risk approach and show how different levels of consumption change pre-existing levels of risk.⁶ Estimates of daily levels of average alcohol intake and their risk relationship with a range of diseases and injuries compared to lifetime abstinence were developed.³ The overall risk of experiencing an increased risk of premature death was identified from comprehensive reviews and meta-analyses that summarised the risk of all-cause mortality, again in comparison to lifetime abstinence. Risk of premature death was used as one way of estimating the point at which the potential risks and benefits balanced each other out.³

Research questions

The Behavioural Evidence Expert Working Group has been asked to initially examine the evidence of how the public, professionals and industry understand and respond to official public health guidance (for example, in relation to diet, physical activity, alcohol consumption, and weight control) and whether this would indicate that current alcohol guidelines should be revised.

Based on the Expert Working Group's terms of reference the following key research questions were developed:

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?

Methods

A protocol was developed which set out the proposed methods that would be used to identify evidence on the understanding and response to official public health guidance and/or guidelines. The first stage of the proposed methods was to develop a map of systematic review level evidence on the understanding and response to official public health guidance and/or guidelines relating to diet, physical activity, alcohol consumption, weight control and tobacco. Following initial scoping searches it was determined that there were very few systematic reviews available, so amendments were made to the methods. The methods were extended to identify evidence used in the development of guidance and/or guidelines related to selected public health campaigns. Documents related to guideline/guidance development were examined to identify studies and evaluations of interventions, and observational evidence that addressed the research questions on understanding and response to official public health guidance or guidelines. Campaigns were selected in the areas of diet, physical activity, alcohol consumption, tobacco, and weight control. Alongside the review of public health campaigns a third step was conducted which extended the scope of the searches for evidence on public understanding and response to alcohol consumption guidelines. Short summaries of the included studies and reviews are provided in Appendix 4.

Stage 1: Mapping systematic review level evidence

A database of systematic reviews and meta-analyses was compiled from systematic searches of electronic sources (Medline, EMBASE and PsycINFO; see Appendix 2 for a sample search strategy) and reference checking of retrieved articles. Systematic reviews and meta-analyses published since 1995 that synthesized data from studies on public/professional understanding of, and responses to, guidelines/labelling relating to diet, physical activity, alcohol consumption, weight control and tobacco were eligible for inclusion.

A total of 1,377 references were identified through searches of the electronic databases. A first round of screening of titles and abstracts was conducted at this stage by a single reviewer (from a team of two). This process identified 132 potentially relevant references. Further screening of these references by another single reviewer eliminated 99 references and subsequently full text copies of 33 articles were screened in detail for inclusion. Five systematic reviews were used in the preparation of this document. Abstracts providing a summary of the included systematic reviews are provided in Appendix 3.

Stage 2: Evaluation of public health campaigns

Campaigns were selected in the areas of diet, physical activity, weight control, alcohol consumption and tobacco. The evidence identified in relation to alcohol and tobacco primarily focused on health warning labels. Where relevant evidence was identified on the

effectiveness of alcohol warning labels, this was discussed in relation to the evidence identified in Stage 3.

To be included in Stage 2, campaigns had to be: (i) based on guidance and/or guidelines related to the public health areas outlined; (ii) national or regional in scope; and (iii) developed by governmental bodies. Campaigns from each of these three areas were selected and background documentation on the development of the guidance/guidelines sought through internet-based searches. This documentation was examined to identify related studies and evaluations that addressed the research questions on understanding and responses to guidance/guidelines and broader campaigns. Further studies were sought through citation searches of retrieved references.

Five systematic reviews and 17 studies and evaluations were identified from the assessment of public health campaigns.

Stage 3: Views and attitudes towards alcohol consumption

Narrative overview

To address research questions on understanding and response to drinking guidelines, studies and evaluations of public perceptions of, and beliefs about, alcohol and alcohol-related harm were sought. The search strategy developed for the map of systematic reviews was modified to identify primary studies through searches of Medline, PsycInfo and CINAHL (see Appendix 2), and focused internet searches were conducted using selected text words from the search strategy. Additional articles were located through citation searches and further focused internet searches.

Public perceptions of and beliefs about alcohol as a risk factor

Studies were systematically sought on public perceptions of and beliefs about alcohol as a risk factor for two major disease areas for which there is a causal association with alcohol consumption, namely cardiovascular disease and cancer. Relevant studies were identified using the search strategy shown in Appendix 2. In addition, the websites of cardiovascular disease and cancer charities were examined to identify general population surveys of beliefs and perceptions undertaken by these organisations. In practice, few studies examined public perceptions about alcohol as a risk factor for cardiovascular disease. A summary of the evidence from surveys of UK populations regarding alcohol consumption and cancer risk is therefore provided.

Stage 4: Other considerations

As the labelling of alcohol products with guideline advice is an important way of communicating alcohol content,² evidence from studies on alcohol health labelling, which were identified as part of the searches conducted in Stage 3, were summarised. Further references on this topic were sought through citation searching.

PART 1

Overview of evidence on understanding and response to official public health guidance or guidelines relating to fruit and vegetable consumption, nutrition, and physical activity

1 Do people use official public health guidance or guidelines and risk advice to help or support them to plan or make behavioural changes?

How do people use guidance/guidelines and risk advice to support planning for, or making, behavioural changes?

Does peoples' understanding of, or response to, guidance/guidelines and risk advice differ by age, sex, ethnicity or other factors?

1.1 Introduction

Systematic reviews addressing how people use guidelines to support behaviour change were lacking and so the reviews and studies examined in this section were those that considered more broadly public understanding and awareness of guidelines. This section therefore considers knowledge, awareness and use of official public health guidance in the domains of diet, physical activity and weight control. We also provide a short overview of the substantial literature on the effectiveness of tobacco health warnings. Short abstracts summarising the included systematic reviews and primary studies are provided in Appendices 3 and 4 (to be completed for the final report).

Although lessons from the evaluation of guidelines targeting other health behaviours can be valuable, there are limitations that arise from drawing on research relating to the use of public health guidelines for health behaviours other than alcohol consumption. Unlike behaviours in other health contexts, alcohol is a drug with wide-ranging toxic effects and other intrinsic dangers such as intoxication and dependence.⁷ Consumption of alcohol influences mood and emotions, motor function and thinking processes, and as a drug of dependence alcohol has reinforcing properties leading to its repeated use.^{7,8} Even at relatively low doses, laboratory research studies provide evidence that cognitive responses to alcohol consumption may be associated with increased consumption or loss of control over drinking.⁹ Determinants of behaviour change (for example, constructs such as self-efficacy, perceived behavioural control and intentions) may differ across health-related behaviours^{10,11} and therefore findings associated with one type of health behaviour may not readily inform another.

1.2 Diet and weight-related guidelines

One systematic review examined research on people's response to weight-related recommendations and defined the characteristics that may influence an individual's likelihood of behaviour change.¹² The guideline characteristics identified most frequently in the included studies were content, awareness and comprehension, information source, format and tailoring. Respondents in many studies reported that guidelines were confusing,

indicating that individuals require simple, clear, specific, realistic, and in some cases, tailored guidelines. Recognition of guidelines did not signify understanding nor did perceived credibility of a source guarantee utilisation of guidelines. The authors noted a lack of studies assessing the impact of guidelines on behaviour.

A second review used a framework of three concepts (consumer awareness, understanding and use), to examine evidence related to national dietary guidelines.¹³ The included studies provided some evidence of awareness of national dietary guidelines across countries and of increasing awareness over time. Studies showed an inconsistent relationship between increased awareness and understanding; misunderstandings were common in relation to abstract (e.g. 'healthy weight') and specific (e.g. portion sizes) ideas. The authors noted that few studies explicitly measured consumer-intended or actual use of dietary guidelines. A number of the studies reviewed commented on the need for concrete behavioural examples and messages to enable consumers to use guidelines (e.g. visual examples rather than terminology).

Two systematic reviews examined consumer understanding and use of nutrition labels.^{14,15} While both reviews found high reported use of nutrition labels, Cowburn and Stockley found that studies using more objective measures suggested that actual use of nutrition labelling during food purchases may be low.¹⁵ Studies included in the review by Campos et al. suggested that consumers generally found nutrition labels useful, but there was mixed evidence with respect to the ease or difficulty of using nutrition labels, with studies indicating that consumers may have difficulty with quantitative information presented on labels.¹⁴ The studies included in this review generally showed a consistent link between the use of nutrition labels and healthier diets and the authors considered there sufficient evidence from a range of study designs to suggest that providing nutrition information on packages has a positive impact on diet. A third systematic review examined whether calorie labelling on menus at restaurants and cafeterias had an effect on consumer purchasing and eating behaviours.¹⁶ From the evidence reviewed the authors concluded that it appeared that calorie menu labelling did not have the intended effect of decreasing calorie ordering and consumption from quick-service restaurants.

Dietary guidelines have commonly been translated into visual food guides to assist consumer understanding of nutritional recommendations. A narrative review of available national food guides and methods used to develop and test the effectiveness of these nutrition education tools was undertaken as part of the revision of the Australian Dietary Guidelines in 2011.¹⁷ The review found that consumer understanding of nutrition information provided by food guides such as MyPyramid (USA), Balance of Good Health (UK) and Eating Well with Canada's Food Guide (Canada) appeared to be good. However, others have noted that as few visual food guides have been formally evaluated it is unknown whether they are useful for informing consumers about healthy eating and how to adhere to dietary guidelines.¹⁸

1.3 Recommended consumption levels for fruit and vegetables

No systematic reviews were identified that examined public understanding and awareness of guidelines for fruit and vegetable consumption. However, through the evaluation of public health campaigns, we identified evaluations of the US 5 A Day for Better Health programme,^{19,20} the Australian Go for 2&5@ campaign,²¹ the New Zealand 5+ a day programme,²² and the UK 5 A DAY campaign.²³ All four programmes were based around a simple message promoting increased consumption of fruit and vegetables. Programmes structured around the '5 a day' message have been promoted internationally since initiation of the US National Cancer Institute's 5 A Day for Better Health programme in the 1990s.

Evaluations of the various '5 a day' programmes demonstrated an increase in, or high, awareness of the message to increase vegetable and fruit consumption among the public. For example, two nationally representative surveys conducted in the US in 1991 and 1997 found significant increases in awareness of the 5 a day message over time (from 7% to 19%).²⁰ However, even with high awareness of the message, studies demonstrated that individuals were confused about the details of the '5 a day' message, particularly in relation to portion size.^{22,23} An open hand was used in the New Zealand 5+ a day campaign logo to increase familiarity with the 'palm of the hand portion size' message, but recognition of this message from the logo was found to be poor in one study.²² Taken together, these evaluations suggest that the '5 a day' campaigns have been successful in generating more positive attitudes towards fruit and vegetable consumption. However, evidence is lacking for whether '5 a day' campaigns have an impact on intentions or behaviour.^{21,23} In the UK, for example, clear increases in the awareness of the '5 a day' message between 2000 and 2007 have not been accompanied by similar changes in behaviour.^{23,24}

Recent years have seen countries begin to increase the recommended consumption levels for fruit and vegetables. In the US, for example, the '5 a day' message was replaced in 2007 by the 'Fruits and Veggies – More Matters' campaign,²⁵ which recommends 7–13 servings. In a recent study, Ungar et al. argued in support of this recent trend for higher levels of consumption, drawing on goal theory to suggest that setting higher, but still attainable, goals might be even more motivating than the '5 a day' goal up to a certain threshold.²⁶ However, as noted by Ungar et al., further research is required to determine where such a threshold lies in the context of fruit and vegetable consumption.²⁶

1.4 Physical activity guidelines

No systematic reviews were identified that examined public understanding and awareness of physical activity guidelines, but through the evaluation of public health campaigns, we located four relevant primary studies. One study assessed the impact of England's ACTIVE for LIFE campaign²⁷ and three studies examined Canada's physical activity guide (CPAG).²⁸⁻

30

Hillsdon et al. concluded that their study of England's ACTIVE for LIFE campaign* showed the limitations of using health promotion campaigns at a national level to directly stimulate short-term population level behaviour change.²⁷ Over a 2-year period, among a cohort of adults aged 16 years and older, although knowledge about the recommendations showed an increase, physical activity levels and readiness to change decreased. Two general population studies of the impact of CPAG showed low awareness of the guidelines; women, younger adults and those with higher levels of education were more likely to be aware of the guidelines.^{28,29} Both studies also found that those who were more active were more likely to be aware of the guidelines. The third study examined CPAG within a workplace setting, finding that although CPAG appeared to have some influence on physical activity, its utility was "inconsistent and unsubstantial".³⁰ An exploratory study of public perceptions of CPAG found that most participants expressed dissatisfaction with the materials; in particular the use of cartoons was not appreciated and participants questioned the credibility of the materials.³¹

The development of Australian Physical Activity Guidelines involved a period of consultation over 12 months including an assessment of consumer responses.³² The guidelines were received positively and based on self-assessment were felt to be a good motivation to be more physically active amongst many participants.³³ Similar to dietary guidelines, the guidelines were visually represented in a pyramid 'model'. The model had a high level of acceptance in consumer testing and was regarded more highly than written guidelines.³³

As noted previously in the case of Canada's Physical Activity Guide, greater awareness of physical activity guidelines has been shown among the physically active, women, younger age groups and those with a higher level of education.^{28,29} However, studies have not examined which demographic and cognitive variables predict adoption of specific recommendations within guidelines such as these. In addition, studies of dietary guidelines show an inconsistent relationship between increased awareness and understanding. Hillsdon et al. noted that the ACTIVE for LIFE campaign was better recalled by those already considering becoming more active and concluded their study by suggesting that future physical activity campaigns may result in higher levels of behaviour change if they target people ready to adopt moderate intensity physical activity.²⁷ The development of the Australian Physical Activity Guidelines, however, involved clear steps to consult with inactive consumers and Egger et al. report that it was clear from their consumer research that incorporating a hierarchical level of recommendations was more acceptable to the majority of inactive individuals than specific prescriptive guidelines.³²

1.5 Health warnings on cigarette packages

A number of studies have examined the impact of tobacco health warnings following the changes in regulatory practice that arose of the WHO Framework on Tobacco Control. A recent review of this literature identified evidence that health warnings on tobacco packaging

* The ACTIVE for LIFE campaign was used to promote the recommendation that "adults should aim to take part in at least 5 sessions of 30 minutes of moderate intensity physical activity per week".

are effective in informing consumers about the health effects of tobacco, and that they can promote smoking cessation and discourage youth uptake of smoking.³⁴ However, Hammond notes that the impact of warning labels depends upon their design. The message themes and content of tobacco health warnings vary across countries, but studies of pictorial warnings, particularly those that include graphic, fear-arousing depictions of health effects (such as throat cancer), support their effectiveness over other types of health messages. In addition, Hammond also identifies that new or updated health warnings are likely to have greater impact than 'older' warnings. It is important to note that the evidence reviewed by Hammond highlights the impact of contextual factors such as social norms around tobacco use and the strength of other tobacco control measures in the population on the effectiveness of warning labels.

Stronger and more specific warning labels began to appear on cigarette packaging in the 1970s and Hiilamo et al. have chartered how effective implementation of the World Health Organisation Framework Convention on Tobacco Control labelling provisions has stimulated diffusion of strong health warning labels (see Box 1).³⁵

Box 1. Evolution of health warning labels on cigarette packs: adapted from *Hiilamo et al.*³⁵

Hiilamo et al. analysed the evolution and diffusion of health warnings on cigarette packs around the world, categorising the diffusion of health warning labels across five generations:

Generation	Description	First implemented example (country, year)
First generation	Government requirement and vague health message warning on the side of the pack	'Caution: cigarette smoking may be hazardous to your health' (USA, 1966)
Second generation	Smoking established as a definite health hazard, or specific diseases mentioned, message on the side of the pack (or innocuous message on the front)	'Warning: Cigarette smoking can cause lung cancer and heart diseases" (Iceland, 1969–1971)
Third generation	Affirmative and visible health message on the front of the pack and or on the back of the pack	'Smoking is a main cause of cancer, diseases of the lung, and diseases of the heart and the arteries' (Saudi Arabia, 1987)
Fourth generation	Rotating detailed health messages on the front of pack	'Smokers run an increased risk of heart attacks and certain diseases of the arteries. National Board of Health and Welfare' (one of 16 HWLs) (Sweden, 1977)
Fifth generation	Graphic health warnings, pictures to reinforce the health message on front and or back of the pack	Eight cartoon graphic warning labels with images such as a pair of black lungs, a patient in bed or a diseased heart (Iceland, 1985–1996)

PART 2

Overview of evidence on understanding and response to alcohol consumption guidelines

2 What is the public understanding of, and views on, the risks of alcohol consumption?

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?

How can these factors be accounted for in the development of alcohol consumption guidelines?

2.1 Introduction

The vast majority of adults across England, Scotland, Wales and Northern Ireland consume alcohol.³⁶⁻³⁹ The proportion of adults in the UK drinking regularly above daily recommended levels is not available from national surveys, which typically report the percentage of men and women drinking above the recommended daily amounts on their heaviest drinking day of the week. Based on weekly consumption in England and Scotland, around a quarter of men and a sixth of women are drinking alcohol at levels associated with an increased risk of suffering physical or psychological harm.^{36,37} However, few studies exist that examine awareness of the risks of alcohol-related health consequences among the general population.

2.2 Perceptions of risk regarding alcohol use

An EU survey of awareness of the adverse health risks and social effects found a fairly high level of awareness that consumption of alcohol may involve risk of health harm but also that there was variation in awareness between the types of health conditions examined in the survey.⁴¹ The risks of liver disease were widely recognised, and awareness of heart disease, depression and birth defects were judged to have indicated a 'medium' level of awareness. The risks of cancer and alcohol were less widely recognised. The study also examined social factors, finding agreement among the sample that alcohol is a factor in social harms, including street violence, underperformance at school, loss of productivity, and marital difficulties. A UK survey undertaken by YouGov for the Health First report found that alcohol was widely perceived to have significant effects on health and public disorder.⁴² The majority of respondents were also of the view that alcohol affected costs both to the NHS and policing.

There is currently little research about how drinkers balance what they may perceive as the benefits of alcohol consumption against awareness of the risks of health consequences over the short to long-term. A study which explored accounts of drinking away from licensed premises, found that the majority of participants did not perceive their drinking as a source of long-term health risks.⁴³ Participants focused on shorter term consequences, and excessive

alcohol consumption was seen as a problem faced by ‘others’ who failed to manage their drinking effectively. The authors argued that the notion of a consumption threshold in ‘safe’ or ‘low risk’ drinking messages “implicitly but logically conveys the impression, however unintentionally, that those who stay below a specified drinking quantum will be ‘not at risk’”. Such findings were echoed by a small study of the level of risk factor exposure University students thought was required to increase their cancer risk.⁴⁴ The average number of units of alcohol thought to increase cancer risk was 6.9, though 3 units was the most common response provided. Among drinkers who nominated a level of drinking required to increase cancer risk, 93.9% reported a level of drinking that was higher than their own. Therefore indicating a belief among the majority of participants that there was a threshold above which cancer risk sets in, when evidence shows that no such threshold exists.

Several UK studies conducted in the last ten years have examined perceived cancer risk in the UK general population finding in general, low awareness of alcohol as a risk factor in the development of cancer. For example, two large household surveys of cancer risk factors found that 14% and 33% of respondents surveyed in 2002 and 2004, respectively, cited alcohol as a risk factor for cancer.^{45,46} A third household survey found that few respondents surveyed in 2001 were aware that alcohol was a risk for oral cancer; just 19% of respondents identified alcohol.⁴⁷ However, since 2007, the Government has commissioned a range of campaigns to communicate drinking guidelines and to improve public awareness of the risks of alcohol consumption (see Box 2).

Box 2. Summary of government campaigns addressing understanding of guidelines/risks of alcohol consumption

- “Know Your Limits” comprised a “binge drinking” campaign starting in 2006 and from May 2008, a “units” campaign. The focus was on raising awareness on the number of units in different alcoholic drinks and increasing people’s understanding of the health and lifestyle consequences of excessive drinking.
- The “Alcohol Effects” campaign started in 2009 and had a stronger focus on the health risks associated with alcohol consumption. It sought to raise awareness of the harms that can be caused by regularly drinking too much. The campaign was supported by Cancer Research UK, the British Heart Foundation and the Stroke Association.
- The “Don’t Let Drink Decide” campaign was launched in 2010 and was aimed at increasing communication between children and their parents to establish a safe and sensible relationship with alcohol. The campaign was linked to the CMO for England’s guidance on alcohol and young people.
- From late 2011, an alcohol strand was integrated into the Department of Health’s health improvement campaign, Change4Life. The alcohol strand aims to improve the public understanding of risks with a focus on increasing risk and higher risk drinkers.

2.3 Implications for guideline development

The scarcity of research on how the public judge acceptable levels of risk related to alcohol consumption limits the conclusions that can be drawn about the implications for the development of alcohol consumption guidelines. In relation to alcohol and cancer, a recent report by the Alcohol Health Alliance suggested that, as part of other measures needed to reduce the number of alcohol-related cancer cases and deaths in the UK, people who drink should be supported to: (i) understand how their current level of drinking affects their risk of cancer; (ii) drink within the most recent weekly guidelines: this may include reducing both the amount they drink regularly and the number of days a week that they drink; and (iii) address other lifestyle factors that may be working with alcohol to increase their risk of cancer, such as smoking.⁴⁸

3 What is the public understanding of alcohol units and sensible drinking levels?

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?

How can the use of knowledge and awareness of alcohol units and sensible drinking levels by the general public be improved?

3.1 Introduction

The ONS Opinions Survey Report has examined UK adult's drinking behaviour and knowledge for the period 1997 to 2009. The most recent survey shows an increase in knowledge of units over the last decade; in 2009, 90% of drinkers had heard of measuring alcohol consumption in units compared to 79% in 1997.⁴⁹ Generally, the more people drank, the more likely they were to have heard of units. In 2009, awareness of units varied by age and was greatest among those aged 45-64 years (96% compared to 80% of those aged 65 and over, and 88% of those aged 16-24 years). By occupations, those in managerial and professional occupational groupings were the most likely to have heard of measuring alcohol in units (96%), and those in routine and manual occupations the least (87%).

ONS survey respondents were asked whether they had heard of the recommended daily maximum units that people should drink; in 2009, 75% of respondents had heard of daily drinking limits compared to 54% in 1997.⁴⁹ Overall, 44% of respondents identified correctly that, for men, regularly drinking three or four units a day was the recommended maximum, and 52% identified correctly that for women, regularly drinking two or three units a day was the recommended maximum. These percentages represent an increase from 1997 and the percentage of people who said they had heard of but did not know the limits has also decreased since 1997. The survey showed that in general, heavier drinkers were more likely than those who drank little or nothing to know the recommended daily maximums.⁴⁹ Studies

that have examined knowledge of guidelines among young adults in the UK have found that that correct identification of the recommended maximum units is low.^{50,51}

3.2 Are alcohol units and sensible drinking levels used to guide consumption?

Studies show that receiving brief advice and feedback on alcohol use and harms from health professionals in primary care can reduce alcohol consumption,⁵² and a recent study suggests that screening followed by simple feedback and written information may be the most appropriate strategy.⁵³ However, evidence is lacking on how the public use more general information about alcohol units and sensible drinking levels in relation to their own consumption. As noted by Casswell,⁵⁴ mass communication may allow for little contextualising of the sensible drinking message and does not afford opportunities to check recipient's understanding. Casswell also notes that “the interpretation of the sensible drinking message will inevitably be entwined with [the health benefits] aspects of the public discourse on alcohol”.

The 2009 ONS Opinions Survey Report⁴⁹ found that of drinkers who had heard of units, 13% (12% of men and 14% of women) said they kept a check on the number of units they drank. The survey also found that women who kept a check on units were slightly more likely to do so on a weekly basis (6%) rather than on the daily basis (2%). There was no difference among men. A survey of 263 drinkers shopping at supermarkets in Scotland⁵⁵ found that few participants used the alcohol unit system to monitor their consumption (25% of women and 19% men). Drawing on international literature, a study of the awareness of the 2009 Australian guidelines among young people aged 16 to 20 years found that while participants had low awareness of the guidelines, the majority had an accurate understanding of recommendations on the safe number of drinks to avoid long-term harm and injury.⁵⁶ The results of this study also demonstrated that such knowledge did not always translate into safer drinking behaviours.

3.3 Understanding and awareness of alcohol content

As Kerr and Stockwell⁵⁷ note “understanding and adhering to safe or low-risk drinking guidelines... involve[s] accurate tracking of alcohol intake... [which] in turn requires some type of accurate information on the alcohol content of the specific beverages being consumed”. Studies suggest, however, that on the whole the general public lack an accurate understanding of the alcohol content of drink servings.

Awareness of the unit content of different types of drinks reported in the 2009 ONS survey⁴⁹ is summarised in Table 1. For beer, spirits, and fortified wine, the majority of those who had drunk these types of drinks in the last year were aware of the correct alcohol content. For wine, information given to the general public has changed over time as glass sizes and

alcohol content of wine have increased,⁴⁹ and the majority of respondents drinking wine in the last year did not correctly identify that a unit is less than a small glass of wine.

Table 1. Knowledge of units by type of drink

Type of drink	Correct	Incorrect	Don't know	Not heard of units
Beer	63%	20%	12%	5%
Wine	27%	59%*	10%	4%
Spirits	69%	10%	18%	4%
Fortified wine	62%	15%	18%	6%
Alcopops	37%	45%	14%	4%

*51% of respondents reported that a unit of wine was a small glass.

ONS *Drinking: adults' behaviour and knowledge in 2009*⁴⁹

Awareness of alcohol content was also relatively low among those drinking alcopops in the last year. A study of Scottish shoppers found that 22% of participants who preferred wine could not offer an estimate of the unit content of an average bottle of wine and 36% of participants suggested a content of seven or fewer units.⁵⁵ In addition, a study conducted in 1989 found that participants greatly underestimated the strength of drinks with high alcohol content.⁵⁸

A recent review of studies on knowledge and understanding of standard drinks and drink pouring research found that participants drink sizes typically contained greater volumes of alcohol than one standard drink.⁵⁹ The size of the overestimation was greatest for mixed drinks and spirits. In a UK study that explored estimation accuracy among the general population no evidence for systematic underestimation of the amount of alcohol in a self-defined usual glass was found.⁶⁰ However, the authors note that their sample was relatively young, educated, and affluent and that the findings are unlikely to be generalizable to a general population sample. Studies suggest a lack of accurate understanding of alcohol content of drink servings extends to young people.^{50,51} In a UK study of undergraduate students, where participants were asked to pour 'a unit' of five different alcoholic drinks, 52% of all 'units' poured were greater than one unit.⁵⁰

In a further study, Gill and O'May asked participants to pour an alcoholic drink, estimate its unit content and then respond to feedback detailing its actual unit content, and their daily limit of consumption in terms of this poured drink.⁶¹ The study found that the average self-poured drink of wine or spirit contained two units of alcohol and when made aware of their daily limit of consumption, 46% of the sample reported that they would exceed this on a single weekday or at the weekend. Around 80% of the sample reported that they did not use sensible drinking messages to guide their drinking. When asked to suggest initiatives that might help people to drink 'within a healthy limit', 36% of those who provided an answer suggested that information could be provided through the labelling/marketing of bottles, the etching of glasses or the use of standard glass sizes; however, a similar percentage (33%) were of the view that personal judgement/common sense should prevail. The majority of respondents to the Health First survey thought that alcohol product should be labelled with warnings about the potential harms of drinking; just 14% thought they shouldn't.⁴²

4 What is the public understanding of, and views on, the risks associated with different patterns of alcohol consumption?

How can the development of alcohol consumption guidelines take into account the potential conflicts between messages on episodic 'binge' drinking and regular consumption?

As with risks associated with regular consumption, studies that examine awareness of the risks of different patterns of alcohol consumption among the general population are scarce. Based on the officially used measure for 'binge drinking'[†], around a quarter of men and a sixth of women in Great Britain can be classified as 'bingers'.³⁶⁻³⁸ Holloway et al. argue that public and policy debates about alcohol have been "overly biased towards 'problem' drinking in public spaces".⁶² Such bias, in the words of Valentine et al. "has left many people who consume high levels of alcohol in very different social circumstances feeling unwarrantedly insulated from concern".⁶³ In their study of drinking behaviours in Stoke-on-Trent and Eden in Cumbria, Valentine et al. found that many participants whose home consumption far exceeded recommended weekly limits regarded their own drinking practices as unremarkable.

In considering how the development of guidelines can take into account potential conflicts between messages, it is useful to highlight that both the Australian and Canadian low risk guidelines incorporate differences in risk associated with drinking patterns. This has been addressed by making a distinction between advice on average consumption and advice on single occasion drinking (see Appendix 1).

5 How do people understand and respond to messages about recommended upper limits of alcohol consumption?

How can these factors be accounted for in the development of alcohol consumption guidelines?

Whilst noting that the problems of communicating a complex message have been 'neatly solved' by the recent Australian guidelines, Heather argues that a tendency in the UK for messages to confuse recommendations about levels of regular alcohol consumption with upper limits for amounts drunk on single occasions may have led members of the public "to view official recommendations with incredulity".^{64,65} Hawks has also noted the potential paradox that may arise in public interpretation of safe drinking guidelines, in that they may actually increase levels of per capita consumption as people drinking at lower levels than are advised as safe increase their consumption.⁶⁶

[†] Drinking more than 8 units for men and more than 6 units for women on at least one day in the last week.

PART 3

Other considerations

6 Alcohol units and sensible drinking messages on alcohol product labels

6.1 Is there evidence for the effectiveness of alcohol warning labels?

Labelling of alcohol products with guideline advice has been acknowledged as an important way of communicating alcohol content in the UK,² and pledges on alcohol labelling form part of the Government's commitment to "foster a culture of responsible drinking, which will help people to drink within guidelines".⁶⁷ Whilst labelling of alcohol products remains voluntary in the UK (see Section 6.3), other countries including Argentina, the United States, Thailand, France and South Africa have taken steps to introduce mandatory health warnings[‡]. However the scope of the mandated health messages introduced has been somewhat limited. Reviews of international experience with text-based alcohol labelling (though based mainly on US studies) have found little evidence to suggest that the introduction of warning labels has an impact on drinking behaviour, but there is evidence that labelling can lead to an increase in awareness of alcohol messages.^{68,69} In 2007, the World Health Organisation (WHO) Expert Committee on Problems Related to Alcohol Consumption considered that the "results of evaluation research on mandated health warnings on alcohol product containers do not demonstrate that exposure produces a change in drinking behaviour per se".⁸ Many have noted the contrast between findings in relation to alcohol warning labels and the evidence of impacts on smoking behaviour arising from the introduction of more graphic and larger warnings for cigarettes, with rotating messages.^{8,34} In comparison to tobacco[†], very few countries have mandated for stronger and more specific warning labels on alcohol products, and consequently there is an absence of evidence about the effectiveness (or ineffectiveness) of stronger warning labels.

6.2 The role of the alcohol industry

Public health advocates have suggested that the role of the alcohol industry and its influence on public health policies may bear some scrutiny in respect of an absence of evidence for stronger warning labels. For example in Australia, segments of the alcohol industry have reportedly played a role in delaying the introduction of mandatory alcohol health warning labels.⁷⁰ Reviewing two areas where the interests of the alcohol industry overlap with public health and academic medicine, Babor and Robaina note that "to the extent that the most effective strategies involve the reduction of alcohol consumption at the population level through regulatory and legal measures, the academic community has come into increasing conflict with the views of the alcohol industry".⁷¹ Indeed many in the public health and health promotion community have voiced concerns about the practices and activities of segments of the alcohol industry.⁷²⁻⁷⁴ In particular, corporate social responsibility (CSR) activities have

[‡] See www.icap.org/Table/HealthWarningLabels for a list of government-mandated and voluntary health warning labels used in a number of countries (last updated March 2011).

often been used by the alcohol industry to manage health-related issues.⁷¹ CSR activities have grown over the past 25 years and, while Babor and Robaina report that it was not possible for their review to determine the overall goal of these activities, they suggest that they show similarities to those used by the tobacco industry and other producers of harmful products.⁷¹ Hastings and Angus have found evidence that social responsibility campaigns sponsored by the alcohol industry may be of greater benefit to public perceptions of the commercial sponsor than to public health.⁷⁵ In practice, few research studies have explored the impact of social responsibility campaigns on drinking behaviours but an (as yet) unpublished evaluation of Drinkaware's 'Why Let the Good Times Go Bad?' campaign found counterintuitive effects.⁷⁶ University students exposed to the Drinkaware campaign messages on posters in a stimulated bar environment drank significantly more.

A key argument made by segments of the alcohol industry against the introduction of alcohol warning labels has been that there is no evidence that they change behaviour. A similar argument has been made against the introduction of graphic warning labels in Thailand, where the government has proposed to introduce mandated graphic health warnings on all alcohol products sold in the country. Such proposals have been opposed by several members of the World Trade Organization (WTO).⁷⁷ Noting that the findings of the WHO Expert Committee on Problems Related to Alcohol Consumption that exposure to health warnings does not produce a change in drinking behaviour "per se",⁸ others have argued in favour of stronger health warning labels based on the rights of the consumer not be denied important information about the risks of alcohol at the point of sale. For example, the Thai government's response to the WTO dispute has been that in noting the effect of labels on knowledge, the main benefit of the labels is their ability to educate the public about the health risks and the potential dangers of alcohol consumption.^{77,78}

6.3 Labelling of alcohol products in the UK

Agreement on the inclusion of alcohol unit content on alcohol drinks labels was first made between the UK Government and the alcohol industry in 1998.⁷⁹ Details of the UK wide voluntary agreement on alcohol labelling between the UK government and the alcohol industry is provided in Box 3. A 2008 report found that sensible drinking information was being included on alcohol products to a limited extent and that there was a wide variety in the elements included and the way they were portrayed.⁸⁰ Labels in the agreed format were found to be present on just 2.4% of samples. Increasing, albeit "modest", compliance with the inclusion of unit and health information was found in a follow-up survey conducted in 2009; adjusted for market share, 10.2% of products were found to be content compliant and 14.5% were considered 'acceptable' relating to the five required elements.⁸¹

Box 3. Voluntary agreement on alcohol labelling between the UK government and alcohol industry

In 2007, a UK wide voluntary agreement was reached to include both alcohol unit and health information on labels. The format for sensible drinking messages content was subsequently revised in 2007 and again in the 2010 in relation to the Responsibility Deal pledge. The following are the agreed unit and health information elements of the proposed label format:

- i) Unit labelling: preferably to the nearest decimal point and unit content per container; for wine and spirits, shown in addition to units per 125ml wine glass or per 25ml spirits glass.
- ii) Daily benchmarks: preference for the recommended message in a table format. "UK Chief Medical Officers recommend adults do not regularly exceed: Men 3-4 units daily; Women 2-3 units daily".
- iii) Pregnancy information: The short version of the reworded alcohol in pregnancy message as agreed by the four UK CMOs: "Avoid alcohol if pregnant or trying to conceive". As an alternative, labels may carry a logo showing the silhouette of a pregnant woman holding a wine glass with a line struck across it ("the French logo").

The following elements are optional under the 2010 Responsibility Deal pledge:

- iv) Sensible Drinking Messages: "Know Your Limits" or "Enjoy Responsibly" or 'Drink Responsibly' as heading.
- v) Drinkaware Trust: Inclusion of the website address or Drinkaware logo.

In 2011, the Coalition government launched the Public Health Responsibility Deal (an agreement between the government, the industry, and health organisations) which included a voluntary pledge on alcohol labelling ("We will ensure that over 80% of products on shelf [by December 2013] will have labels with clear unit content, NHS guidelines and a warning about drinking when pregnant). In a 2007 report, the WHO Expert Committee considered voluntary systems more broadly suggesting that they worked only to an extent where there was a "current and credible threat of regulation by government".⁸ This finding is supported by a recent scoping review undertaken as part of a wider project to help plan evaluation of the Responsibility Deal in England.⁸² The review found that voluntary agreements can be an effective policy approach if implemented appropriately and monitored independently. Bryden et al. tentatively concluded that voluntary agreements were more likely to be effective if they include substantial disincentives for non-participation and costly sanctions for non-compliance (e.g. the threat of legalisation).⁸²

6.4 Public health advocacy for alcohol product labelling

Many in the public health field (including a coalition of 70 UK organisations that pledged their support for recommendations in the Health First report⁴²) have called for the introduction of clear and factual warnings on alcohol products. Mathews et al. state that "advocacy supporting the need for warning labels must include specific recommendations regarding the

most effective composition, placement, size and messages for warning labels”.⁷⁰ In recent years, both the UK Faculty of Public Health and European Alcohol Policy Alliance (EUROCARE) have made similar calls for clear and factual warnings to be added to alcohol products to help the public understand the risks associated with alcohol consumption.^{83,84} However, the effectiveness of alcohol warning labels is likely to depend on the quality, visibility and content of the messages. Summarising the findings from experimental studies, Agostinelli and Grube note that the effectiveness of alcohol warning labels will depend on how their design and content impact on underlying cognitive and affective processes.⁸⁵ They suggest that: (i) design factors influence whether warning labels are even initially noticed; (ii) content factors influence the potential for visceral avoidance responses to be provoked; and (iii) audience factors predict differential memory for, processing of, and reactions to alcohol warning labels. EUROCARE stipulate that health warnings should amongst other things: (i) have a standard format and design; (ii) be placed in a stand location; (iii) be rotating; (iv) be determined by Ministers of Health; and (v) use images that are informational in style. However, as noted above there is currently an absence of evidence on the effectiveness (or ineffectiveness) of alcohol warning labels meeting such criteria.

SUMMARY

An overview of the evidence on understanding and response to public health guidelines

INTRODUCTION

- **The purpose of the document was to provide, based on published systematic reviews, an overview of the evidence of how the public, professionals and industry understand and respond to official public health guidelines. In practice very few systematic reviews were available and so the methods were extended to include primary studies, evaluations and surveys.**

Our main finding is a lack of evidence about how the public, professionals and industry understand and respond to alcohol consumption guidelines, and consequently how alcohol consumption guidelines support behaviour change in relation to alcohol consumption. However, utilising evidence from a broader literature in relation to other health behaviours, we find that some general lessons may be drawn from this evidence.

UNDERSTANDING & RESPONSE TO GUIDELINES RELATING TO FRUIT & VEGETABLE CONSUMPTION, NUTRITION & PHYSICAL ACTIVITY

- **While relatively little evidence is available on how the public use alcohol guidelines to support behaviour change, some work has examined awareness and impact of guidelines for physical activity, diet and weight, and fruit and vegetable consumption.**
- **Although some valuable lessons may be drawn from these areas, the difference between alcohol consumption and behaviours in other health contexts needs to be taken into account. For example, in comparison to guidelines for physical activity and fruit and vegetable consumption, which convey a relatively straightforward message of “more”, alcohol guidelines, in addition to conveying a message of “less”, also serve a purpose of supporting drinkers to understand their risk of harm in different contexts.**

Findings from systematic reviews of diet and weight-related guidelines identify content, awareness and comprehension, information source, format and tailoring as important characteristics of guidelines. Studies of national dietary guidelines, however, show an inconsistent relationship between increased awareness and understanding. Visual food guides are commonly used to assist consumer understanding of nutritional recommendations, however few have been formally

evaluated. Recent years have seen some countries increase recommended fruit and vegetable consumption levels but international experience with '5 a day' campaigns show that while a simple, positive message can have universal appeal and generate high awareness, confusion may still arise around the specifics of the message. Studies of physical activity guidelines from the UK and Canada suggest as a standalone measure they have a limited impact on physical activity levels.

UNDERSTANDING & RESPONSE TO ALCOHOL CONSUMPTION GUIDELINES

- **The majority of adults in the UK consume alcohol. Studies suggest that UK adults have fairly good awareness of some health risks related to alcohol such as liver disease but may be less aware of the risks of alcohol and cancer.**
- **Little is known about how the public judge acceptable levels of risk related to alcohol consumption. However, studies suggest in relation to their own consumption, the public are more concerned about the short-term health harms of alcohol consumption than they are about the long-term harms.**
- **Alcohol consumption guidelines need to account for the interpretation that levels of consumption below recommended upper limits are not associated with harm. This is not supported by epidemiological evidence, particularly in relation to cancer risk.**
- **In the UK there has been a tendency for messages to confuse drinking recommendations about levels of regular alcohol consumption with upper limits for amounts drunk on single occasions.**

The research evidence does not provide us with a clear idea of how drinkers balance what they may perceive as the benefits of alcohol consumption against awareness of the risks of health consequences over the short to long-term. However, some studies suggest that in relation to their own drinking, people who drink tend to focus on the short term consequences of consumption that they perceive are relevant to them. People who drink show a tendency to associate the consequences of alcohol consumption with higher levels of drinking than their own and in the case of binge drinking, with the behaviour of others.

- **Knowledge of units and sensible drinking levels has increased over the last decade but evidence is lacking about how people who drink use this information to moderate their own alcohol consumption.**
- **Accurate tracking of alcohol intake requires knowledge of the alcohol content of different drink servings and studies suggest that, on the whole, people who drink lack such an understanding.**

A diverse range of alcohol drink types are available to the public, and alcohol content may vary even between similar alcohol products. Among people who drink, surveys show that their knowledge of alcohol content varies across different types of drink products. People who drink wine appear to be the least aware of the alcohol content of a glass; to an extent because of increases in alcohol content of wine and changes in glass sizes in recent years. Drink pouring research also finds that people typically pour greater volumes of alcohol in one standard drink than they perceive.

OTHER CONSIDERATIONS

- **Mandated health warning labels have been used successfully for communicating harm messages for tobacco. However, currently there is an absence of evidence on their effectiveness for communicating sensible drinking messages and risk information in relation to alcohol.**
- **This absence of evidence may have arisen to an extent because many countries have opted for voluntary agreements requiring only text-based messages (agreements which may be less effective when they do not include substantial disincentives or costly sanctions for non-compliance) or because the scope of mandated health warnings that have been introduced has been somewhat limited.**

The effective implementation of strong health warning labels on tobacco products shows that mandated health warnings can be an effective means of informing the public about risk, and that they can promote behaviour change. However, in relation to alcohol, noting the lack of evidence for behaviour change from the evaluation of text-based health warnings, arguments supporting the rights of the consumer to be informed about the risks of alcohol have come to the fore. Whilst public health advocates have stipulated criteria for stronger health warning labels on alcohol products there is an absence of evidence on their potential effectiveness (and ineffectiveness).

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Appendix 1. Summary of Australian and Canadian alcohol guidelines

Australian guidelines to reduce health risks from drinking alcohol

Guideline 1

Reducing the risk of alcohol-related harm over a lifetime

The lifetime risk of harm from drinking alcohol increases with the amount consumed.

For healthy men and women, drinking no more than two standard drinks* on any day reduces the lifetime risk of harm from alcohol-related disease or injury.

Guideline 2

Reducing the risk of injury on a single occasion of drinking¹

On a single occasion of drinking, the risk of alcohol-related injury increases with the amount consumed.

For healthy men and women, drinking no more than four standard drinks* on a single occasion reduces the risk of alcohol-related injury arising from that occasion.

Guideline 3

Children and young people under 18 years of age

For children and young people under 18 years of age, not drinking alcohol is the safest option.

- A Parents and carers should be advised that children under 15 years of age are at the greatest risk of harm from drinking and that for this age group, not drinking alcohol is especially important.
- B For young people aged 15–17 years, the safest option is to delay the initiation of drinking for as long as possible.

Guideline 4

Pregnancy and breastfeeding

Maternal alcohol consumption can harm the developing fetus or breastfeeding baby.

- A For women who are pregnant or planning a pregnancy, not drinking is the safest option.
- B For women who are breastfeeding, not drinking is the safest option.

* The Australian standard drink contains 10g of alcohol (equivalent to 12.5 mL of pure alcohol)

Canada's Low-Risk Alcohol Drinking Guidelines

Guideline 1

Do not drink in these situations:

When operating any kind of vehicle, tools or machinery; using medications or other drugs that interact with alcohol; engaging in sports or other potentially dangerous physical activities; working; making important decisions; if pregnant or planning to be pregnant; before breastfeeding; while responsible for the care or supervision of others; if suffering from serious physical illness, mental illness or alcohol dependence.

Guideline 2

If you drink, reduce long-term health risks by staying within these average levels:

Women	Men
0–2 standard drinks* per day	0–3 standard drinks* per day
No more than 10 standard drinks per week	No more than 15 standard drinks per week

Always have some non-drinking days per week to minimize tolerance and habit formation. Do not increase drinking to the upper limits as health benefits are greatest at up to one drink per day. Do not exceed the daily limits specified in Guideline 3

Guideline 3

If you drink, reduce short-term risks by choosing safe situations and restricting your alcohol intake:

Risk of injury increases with each additional drink in many situations. For both health and safety reasons, it is important not to drink more than:

- Three standard drinks* in one day for a woman
- Four standard drinks* in one day for a man

Drinking at these upper levels should only happen occasionally and always be consistent with the weekly limits specified in Guideline 2. It is especially important on these occasions to drink with meals and not on an empty stomach; to have no more than two standard drinks in any three-hour period; to alternate with caffeine-free, non-alcoholic drinks; and to avoid risky situations and activities. Individuals with reduced tolerance, whether due to low bodyweight, being under the age of 25 or over 65 years old, are advised to never exceed Guideline 2 upper levels.

Guideline 4

When pregnant or planning to be pregnant:

The safest option during pregnancy or when planning to become pregnant is to not drink alcohol at all. Alcohol in the mother's bloodstream can harm the developing fetus. While the

risk from light consumption during pregnancy appears very low, there is no threshold of alcohol use in pregnancy that has been definitively proven to be safe.

Guideline 5

Alcohol and young people:

Alcohol can harm healthy physical and mental development of children and adolescents. Uptake of drinking by youth should be delayed at least until the late teens and be consistent with local legal drinking age laws. Once a decision to start drinking is made, drinking should occur in a safe environment, under parental guidance and at low levels (i.e., one or two standard drinks* once or twice per week). From legal drinking age to 24 years, it is recommended women never exceed two drinks per day and men never exceed three drinks in one day.

* A "standard drink" is equal to a 341 ml (12 oz.) bottle of 5% strength beer, cider or cooler; a 142 ml (5 oz.) glass of 12% strength wine; or a 43 ml (1.5 oz.) shot of 40% strength spirits (NB: 1 Canadian standard drink = 17.05 ml or 13.45 g of ethanol)

Appendix 2. Example search strategies

Stage 1: Map of systematic review level evidence

#	Search terms
1.	Feeding Behavior/
2.	Diet/
3.	Obesity/
4.	Energy Intake/
5.	(nutri* or diet* or food or eat*).ti,ab.
6.	exp Exercise/
7.	(exercise* or exert* or sport*).ti,ab.
8.	(physic* adj1 (activit* or fit*)).ti,ab.
9.	Alcohol Drinking/ or Alcoholic Beverages/ or Ethanol/
10.	(alcohol* adj (drink OR drinks OR beverage*)).ti,ab.
11.	((alcohol OR ethanol) adj1 (consumption OR drinking OR intake)).ti,ab.
12.	drinking behavio?.r.ti,ab.
13.	(beer OR wine OR spirits OR absinthe OR liquor*).ti,ab.
14.	Smoking/ or Tobacco/
15.	(smok* or cigar* or tobacco or nicotine).ti,ab.
16.	Lifestyle/
17.	(lifestyle* or life style*).ti,ab.
18.	or/1-17
19.	(guidance or guideline* or recommendation* or communication* or message* or campaign* or label*).ti,ab.
20.	Guidelines as topic/
21.	Food Labeling/
22.	Consumer Health Information/
23.	or/19-22
24.	(understand* or comprehen* or attitude* or response* or perception* or percieve* or behavior* or behaviour*).ti,ab.
25.	(risk adj1 (manage* or assess* or evaluat*)).ti,ab.
26.	Health Knowledge, Attitudes, Practice/
27.	Health Behavior/
28.	Attitude to Health/
29.	Perception/
30.	Comprehension/
31.	Consumer satisfaction/
32.	Risk assessment/
33.	or/24-32
34.	18 and 23 and 33
35.	Meta-Analysis as Topic/
36.	(metaanaly* or meta analy*).tw.
37.	Meta-Analysis/
38.	(systematic adj (review*1 or overview*1)).tw.

39.	exp Review Literature as Topic/
40.	or/35-39
41.	(cochrane or embase or psychlit or psychlit or psychinfo or psycinfo or cinahl or cinhal or science citation index or bids or cancerlit).ab.
42.	(reference list* or bibliograph* or hand?search* or relevant journals or manual search*).ab.
43.	(selection criteria or data extraction).ab.
44.	Review/
45.	43 and 44
46.	40 or 41 or 42 or 45
47.	34 and 46
48.	limit 47 to yr="1995 -Current"

Stage 3: Understanding alcohol labelling and guidelines

1.	Alcohol Drinking/ or Alcoholic Beverages/
2.	(alcohol* adj (drink OR drinks OR beverage*)).ti,ab.
3.	((alcohol OR ethanol) adj1 (consumption OR drinking OR intake OR content)).ti,ab.
4.	or/1-3
5.	(guidance or guideline* or recommendation* or communication* or message* or campaign* or label*).ti,ab.
6.	Guidelines as topic/
7.	Consumer Health Information/
8.	or/5-7
9.	(understand* or comprehen* or attitude* or belief* or response* or perception* or percieve* or behavior* or behaviour*).ti,ab.
10.	(risk adj1 (manage* or assess* or evaluat*)).ti,ab.
11.	Health Knowledge, Attitudes, Practice/
12.	Health Behavior/
13.	Attitude to Health/
14.	Perception/
15.	Comprehension/
16.	Consumer satisfaction/
17.	Risk assessment/
18.	or/9-17
19.	6 and 8 and 18
20.	limit 19 to yr="2002-Current"

Stage 3: Risk perceptions in relation to cancer and cardiovascular disease

1.	*Neoplasms/ or exp *Neoplasms by site/
2.	cancer*.ti,ab.
3.	1 or 2
4.	exp *Cardiovascular Diseases/
5.	((cardiovascular or heart or ish?emic) adj disease*).ti,ab.
6.	4 or 5
7.	((public or consumer*) adj5 (understand* or attitude* or belief* or response* or perception* or percieve* or aware*)).ti,ab.
8.	Attitude to Health/
9.	Perception/
10.	Public Opinion/
11.	or/7-10
12.	Life Style/
13.	(life style or life-style or lifestyle).ti,ab.
14.	(diet or obesity or nutri*).ti,ab.
15.	(alcohol* adj1 (drink* or beverage* or consum*)).ti,ab.
16.	(smok* or tobacco or nicotine).ti.
17.	(physical adj1 (activit* or exercise)).ti,ab.
18.	((environment* or genetic* or dietary or behavio?r*) adj1 factor*).ti,ab.
19.	Risk Factors/
20.	or/12-19
21.	3 and 11 and 20
22.	limit 21 to yr="2003 -Current"
23.	6 and 11 and 20
24.	limit 23 to yr="2003 -Current"

Appendix 3. Summaries of included systematic reviews

Bibliographic details

Boylan S., Louie J. C., Gill T. P. Consumer response to healthy eating, physical activity and weight-related recommendations: a systematic review. *Obesity Reviews* 2012; 13: 606-17.

Authors' objectives

To systematically review the evidence that examines people's response to various weight-related recommendations and define characteristics that may influence an individual's likelihood of behaviour change.

Searching

Medline, PsycInfo and ProQuest Central were searched up to April 2011; the following search terms were used: attitude, response, perception, perceive, preference, behaviour, weight, obesity, obese, body mass index, nutrition, diet, physical activity, exercise, message, recommendation, campaign, guideline, guidance, communication). Additional strategies included Google searches in May 2011 and reference screening of the identified studies.

Study selection

Articles that assessed consumer understanding of, or attitudes and responses to, public or private sector weight-related guidelines and information were selected. Articles published in both developed and developing countries were eligible but inclusion was restricted to English language publications. Articles were excluded if they were discussion papers, position statements, unrelated to health, or discussed the understanding of, or response to foods, labels or disease-specific guidelines. Two researchers independently screened abstracts and titles. Any discrepancies were discussed and resolved.

Assessment of study quality

The authors did report a formal method for the assessment of study quality, but any risk of study bias was noted for each study and risk of bias across studies that may affect the cumulative evidence was assessed.

Data extraction

Data extracted included: reference details, year of publication, country of relevance, recommendation addressed, guideline characteristic examined, methods, sample size and participant characteristics (e.g. age, percentage female, anthropometrics and education). Two researchers (SB and JCYL) independently extracted data using a custom-built database. Any discrepancies were discussed and resolved.

Methods of synthesis

The methods of synthesis were not reported but the results are presented as a narrative synthesis.

Results of the review

46 studies were included in the review. Studies were conducted in the USA, Canada, Europe, South Africa, Australia, and Japan and included studies using quantitative (n=26), qualitative (n=16) and mixed (n=4) methods. The guideline characteristics identified most frequently in the included studies were content, awareness and comprehension, information source, format and tailoring. Respondents in many studies reported that guidelines were confusing, indicating that individuals require simple, clear, specific, realistic, and in some cases, tailored guidelines. Recognition of guidelines did not signify understanding nor did perceived credibility of a source guarantee utilization of guidelines. The authors note a lack of studies assessing: the impact of guidelines on behaviour; responses to physical activity guidelines; responses among males and studies undertaken in developing countries.

Authors' conclusions

More detailed and tailored (if possible) guidelines are needed. Those responsible for developing weight-related guidelines should engage with communications or media professionals to assist accurate and effective communication of messages, thereby improving consumer comprehension of such guidelines.

Funding

Not reported

Bibliographic details

Brown K. A., Timotijevic L., Barnett J., Shepherd R., Lähteenmäki L., Raats M. M. A review of consumer awareness, understanding and use of food-based dietary guidelines. *British Journal of Nutrition* 2011; 106: 15-26.

Authors' objectives

Used a framework of three concepts (awareness, understanding and use), to summarise consumer evidence related to national food-based dietary guidelines and food guides.

Searching

Searches were conducted from inception to August 2009 in PubMed, Web of Science, EconLit, International Political Science

Abstracts, PsychInfo, EMBASE, Cochrane, International Bibliography of the Social Sciences and CINAHL. Manual searches of reference lists and Internet searches of grey literature were also conducted.

Study selection

Studies that examined national food based dietary guidelines were included. Studies in clinical/dental settings and/or involving dietary guidelines for participants with underlying health problems were excluded.

Assessment of study quality

The quality of the included studies and risk of bias was assessed using guidelines by Greenhalgh (involved judging the details available on the study aim, purpose, method, design, theoretical framework, analysis, findings, discussion, presentation and references).

Data extraction

Not reported

Methods of synthesis

The three concepts of awareness, understanding and use (from the theoretical framework developed by Grunert & Wills) were used to categorise study findings. The validity of grouping was reviewed and confirmed by the study authors. The authors note that analysing and comparing the results from the included studies was difficult due to the different rationales and study designs employed.

Results of the review

28 studies were included in the review; 16 studies referred to the US Department of Agriculture Food Pyramid. The included studies indicated that there was some awareness of dietary guidelines among general population samples, and some evidence of increasing awareness over time. However, the authors note the concept of awareness was not always clear was used interchangeably with other concepts (e.g. knowledge) across studies. Studies provided evidence that misunderstandings were common with abstract ideas, for example, confusion with guidelines that included concepts such as 'desirable weight', 'maintain or improve your weight' and 'balance the food you eat with physical activity'. Studies also showed that consumer understanding of food quantities such as portion and serving sizes was often confused. The included studies suggested mixed results for consumer understanding, and an inconsistent relationship between increased awareness and understanding. The authors noted that few studies explicitly measured consumer-intended or actual use of dietary/food guides; however a number of studies commented on the need for concrete behavioural examples and messages to enable consumers to use the guidelines (e.g. visual examples rather than terminology).

Authors' conclusions

The authors concluded that evaluation of the effectiveness of dietary guidelines is necessary to measure their contribution to population health. They note that the framework of consumer awareness, understanding and use of guidelines may be a useful way to evaluate dietary guidelines.

Funding

European Commission Sixth Framework Programme

Bibliographic details

Campos S., Doxey J., Hammond D. Nutrition labels on pre-packaged foods: a systematic review. Public Health Nutrition 2011; 14: 1496-506.

Authors' objectives

To review research on consumer use and understanding of nutrition labels, as well as the impact of labelling on dietary habits.

Searching

Searches were conducted in MEDLINE, CSA Illumina Social Sciences Subject Area, Science Citation Index, and the Cochrane Library (date of searches not provided). Additional strategies including screening the reference lists of relevant articles.

Study selection

Studies that examined consumer behaviour related to nutrition labels on prepackaged foods were eligible for inclusion if they examined the prevalence or determinants of nutrition label use, or if they measured consumer knowledge, understanding, perceptions or format preferences related to nutrition labels. Inclusion was restricted to English language publications in peer-reviewed journals or research reports completed on behalf of government agencies. The number of reviewers involved in the selection of studies was not reported.

Assessment of study quality

The authors used eight methodological evaluation criteria: 1) Is the research question well stated; 2) Is the sample/population identified and appropriate; 3) Are the inclusion/exclusion criteria described and appropriate; 4) If applicable, is the participation rate reported and appropriate; 5) Is the same data collection method used for all respondents; 6) Are important baseline variables measured, valid and reliable; 7) Is the outcome defined and measurable; 8) Is the statistical analysis appropriate. The number of reviewers undertaking assessment of study quality was not reported.

Data extraction

Details of the process of data extraction were not provided.

Methods of synthesis

The methods of synthesis were not reported but the results are presented as a narrative synthesis.

Results of the review

120 studies were included in the review. Studies were conducted in the USA, Europe, Canada, Australia and New Zealand, Thailand and Trinidad. The review found that nutrition labels are perceived as a highly credible source of information and that many consumers use nutrition labels to guide their selection of food products. However, use of nutrition labels varied across population subgroups, with label use notably lower among children, adolescents and older adults. Individuals with lower socio-economic status are also less likely to use nutrition labels. Studies suggest that consumers generally find nutrition labels useful, but there was mixed evidence with respect to the ease or difficulty of using nutrition labels. Studies indicated that many consumers may have difficulty with quantitative information presented on labels. Studies generally showed a consistent link between the use of nutrition labels and healthier diets and the authors considered there sufficient evidence from a range of study designs to suggest that providing nutrition information on packages has a positive impact on diet.

Authors' conclusions

Nutrition labels on pre-packaged foods are a cost-effective population level intervention with unparalleled reach. However, to capitalize on their potential, governments will need to explore new formats and different types of information content to ensure that nutrition information is accessible and understandable.

Funding

Popel Centre for Population Health Impact, Canadian Cancer Society

Bibliographic details

Cowburn G., Stockley L. Consumer understanding and use of nutrition labelling: a systematic review. *Public Health Nutrition* 2005; 8: 21-8.

Authors' objectives

To explore published and unpublished research into consumer understanding and use of nutrition labelling which is culturally applicable in Europe.

Searching

Twenty-four databases (list provided in the article) were searched to the end of June 2002. The following search terms were used: food, nutrition, diet, labelling, information, point-of-choice, point-of-purchase, packet, package, food industry, policy, and consumer. Additional strategies included: 1) searches of specialist journals not included in standard electronic sources; 2) screening of reference lists of relevant articles; 3) identification of unpublished research via an internet search and key international contacts.

Study selection

Studies that focused on consumer understanding and use of nutrition labelling which could be culturally applicable to a European setting (defined as research carried out in a country with an overlapping cultural heritage and perceptions to current European countries) were eligible for inclusion. Papers reporting any type of study design and any type of process or outcome measure were considered for inclusion. Articles were selected by one reviewer and no cross-checking was undertaken.

Assessment of study quality

Assessment of study quality was undertaken using adapted criteria (e.g. CRD Report 4) and studies were categorised into one of five bands ranging from high- to low-quality depending on the number of criteria met. The number of reviewers who carried out the assessment of study quality was not reported.

Data extraction

Information from each included study was collected using a standard data extraction form. Details of the data extracted were not provided. One reviewer carried out the data extraction.

Methods of synthesis

The methods of synthesis were not reported but the results are presented as a narrative synthesis.

Results of the review

103 studies were included in the review. Studies were from the USA, Canada, Australia and New Zealand, and Europe. Most studies were judged to be of moderate quality; nine studies were of high or medium-high quality. The review found that reported use of nutrition labels was high, but studies using more objective measures suggested that actual use of nutrition labelling during food purchases may be low. The evidence reviewed suggested that consumers who read nutrition labels were able to retrieve simple information and make simple calculations and comparisons between products using numerical information, but that the ability to interpret nutrition labels accurately reduced as the complexity of the task increased. Reading of labels was more accurate if consumers were familiar with the label format and interested in health and nutrition, and were less accurate with lower levels of educational achievement and increasing age.

Authors' conclusions

Improvements in nutrition labelling could make a small but important contribution towards making the existing point-of-purchase environment more conducive to the selection of healthy choices. In particular, interpretational aids can help consumers assess the nutrient contribution of specific foods to the overall diet.

Funding

European Heart Network

Bibliographic details

Swartz J. J., Braxton D., Viera A. J. Calorie menu labeling on quick-service restaurant menus: an updated systematic review of the literature. *International Journal of Behavioral Nutrition & Physical Activity* 2011; 8.

Authors' objectives

To examine whether calorie labelling on menus at restaurants and cafeterias has an effect on consumer purchasing and eating behaviours.

Searching

PubMed and Google Scholar were searched in August 2011 for studies published since 2006. Search terms included: food labeling, fast foods, choice behaviour, calorie labeling, menu labeling and point-of-purchase labeling. In addition, reference lists of articles and reviews were screened.

Study selection

Studies using an experimental or quasi-experimental design that compared a calorie labelled menu with a no-calorie menu were eligible for inclusion. Only English language, published studies that measured purchasing behaviour or consumption of ready to eat meals were included. The number of reviewers undertaking study selection was not reported.

Assessment of study quality

Assessment of study quality was undertaken using an instrument based on standard critical appraisal criteria (study design, randomization, blinding, minimization of selection bias, minimization of measurement bias, and minimization of confounding bias). Two reviewers independently assessed each study and assigned scores of 2 for good, 1 for fair and 0 for poor.

Data extraction

One reviewer extracted data from the included studies including study aims, study type, sample population, and outcomes.

Methods of synthesis

The methods of synthesis were not reported but the results are presented as a narrative synthesis.

Results of the review

7 studies were included in the review. All studies were conducted in the USA; two studies were judged to be of good quality and five were judged to be of fair quality. Two studies reported that calorie menu labels reduced the calories purchased, one reported significant reductions in calories purchased at some chains (but not others), three reported no effect on calories purchased and one reported a slight increase in calories purchased.

Authors' conclusions

From the evidence included in this review, it appears that calorie menu labeling does not have the intended effect of decreasing calorie ordering and consumption from quick-service restaurants.

Funding

Not reported

Appendix 4. Summaries of included primary studies

Summary of studies included in Part 1

Author, Year	Publication type	Country	Description	Funding
Yngve & Margetts, 2009 ¹⁸	Editorial	International	Short editorial piece on food guides summarising available evidence on impact.	Not reported
Potter et al., 2000 ¹⁹	Report	USA	Reports on the review and evaluation of the 5 A Day for Better Health programme. Chapter 5 discusses the media and health message environment that the programme operated within. Explores the effect of the environment on the delivery of the 5 A Day message.	National Cancer Institute
Stables et al., 2002 ²⁰	Research study	USA	Random digit dial surveys conducted in 1991 and 1997 (n>2,500 each year) to assess population changes in fruit and vegetable (FV) consumption and knowledge and awareness of 5 A Day messages. There was a significant increase in awareness of the 5 A Day message over time (from 7% to 19%). Message awareness was associated with significantly higher total daily intake of FV.	Not reported
Woolcott Research Pty Ltd, 2007 ²¹	Report	Australia	Results from a national evaluation of the Go for 2&5@ campaign. Three waves of national telephone surveys were conducted in 2005 (samples varied from n>500 to n>1,000). Participants were asked about the action taken as a result of the campaign. The campaign generated positive attitudes towards achieving the recommended levels of fruit and vegetable consumption but the change in fruit and vegetable consumption among adults was not significant.	Australian Government Department of Health and Ageing
Ashfield-Watt, 2006 ²²	Research study	New Zealand	National household surveys conducted in 1999 and 2000; 1999 survey focused on awareness and understanding of the 5+ a day campaign. Spontaneous awareness of the 5+ a day message was high but reported FV intake was not associated with awareness of the campaign or campaign logo. Participants displayed poor recognition of the portion size message incorporated into the 5+ a day logo.	United Fresh NZ Inc
Herbert et al., 2010 ²³	Research study	UK	Four focus groups with a sample of University students (n=40) explored participants awareness and understanding of the 5 A DAY message and the perceived benefits and barriers to the consumption of FV. All participants were aware of the 5 A DAY message but the term 'portion' was reported as difficult to interpret. There was also a lack of understanding about what could legitimately count towards the target.	Not reported
TNS, 2008 ²⁴	Report	UK	Annual survey of consumer attitudes to food, 1,093 adults participated in the 2007 study. Awareness of the 5 A DAY message ('at least 5 portions of fruit and vegetables a day') had increased since 2006 and there a slight increase in 'claimed' FV consumption of 5 or more portions a day.	Food Standards Agency

Author, Year	Publication type	Country	Description	Funding
Erinosho et al., 2012 ²⁵ Fruits and Veggies—More Matters	Research study	USA	National household survey conducted in 2007 (n=3,397). The majority of participants were unaware of the current campaign and could not correctly identify the current FV recommendations. The majority of participants were not consuming 5 daily servings of FV per day. Awareness of the campaign and knowledge of FV recommendation was associated with consumption of 5 or more daily servings of FV.	National Cancer Institute
Ungar et al., 2013 ²⁶	Research study	Germany	RCT of a one-week intervention (n=135). Participants were randomised into one of three FV instruction groups: (i) '5 a day' intervention group ("Eat five servings of FVs a day, please - if possible, three servings of vegetables and two servings of fruit"); (ii) 'Just 1 more' intervention group ("Eat one more serving of FVs a day than you usually do please"); or (iii) a control group ("Eat as usual during the next week"). At follow-up, participants in the '5 a day' group had increased their FV intake the most (p=0.37 vs. controls), compared to a weak effect in the 'Just 1 more' group.	Not reported
Hillsdon et al., 2001 ²⁷	Research study	UK	Cohort design with baseline data collection September to November 1995 (wave 1) and follow up data collected during the same period in 1996 (wave 2) and 1997 (wave 3). n=3,189 participants provided data at all three follow-ups. Assessed the impact of a national campaign (ACTIVE for LIFE campaign) on awareness of the campaign, change in knowledge of physical activity recommendations and self-reported physical activity. Less than half of participants were aware of campaign 6-8 months after the main period of advertising, and very few could recall key images unprompted. No significant differences between physical activity levels at wave 1 and wave 2. . The proportion of participants who were knowledgeable about the moderate physical activity recommendations increased between waves, but readiness to change decreased. Compared with wave 1, at wave 3 there were fewer people active at a vigorous level and more people were classified as sedentary.	Department of Health
Cameron et al., 2007	Research study	Canada	Cross-sectional telephone interviews (n=8,892) assessed awareness and knowledge of the guidelines and associated guidelines, beliefs about physical activity, intentions to be active and levels of physical activity. Very few respondents provided an unprompted response (4%); when prompted, 37% of respondents indicated that they had heard of the guidelines. Unprompted recall of the guideline was not associated with knowledge, beliefs, or intentions, but seeking information and trying three or more initiating action behaviours were. Both seeking information and initiating action were also associated with prompted recall of the guidelines. Unprompted recall of guidelines was associated with a greater likelihood of being "sufficiently active" according to the IPAQ all-domain physical activity measure, whereas prompted recall of the guidelines was not.	Public Health Agency of Canada; Interprovincial Sport and Recreation Council

Author, Year	Publication type	Country	Description	Funding
Plotnikoff et al., 2011 ²⁹	Research study	Canada	Baseline and follow-up telephone interviews (n=2,803 adults baseline interviews, n=1,423 follow-up interviews). 27% were aware of CPAG when prompted and 16% were familiar with the specific recommendations. Specific familiarity with CPAG was also greatest among women, but not education or age. Participants who reported being aware of CPAG or specifically familiar with the recommendations were more likely to be physically active (p <0.001 and p<0.01, respectively). Further analyses revealed no significant association between increases in physical activity and either general or specific awareness of CPAG after 1 year.	Health Canada; Canadian Institutes for Health Research
Plotnikoff et al., 2012 ³⁰	Research study	Canada	Cohort design based on RCT of a workplace intervention (n=202). Analyses limited to groups who received the long and short versions of the Canadian physical activity guides (CPAG) at baseline and at 6 months and who completed the baseline and 12-month assessments. Less than 10% of participants were motivated “a lot” to become more physically active after indicating they had read either version of the CPAG. When controlling for baseline activity, there was no difference in minutes of moderate activity between participants who had and hadn’t read the CPAG.	Not reported
Berry et al., 2010 ³¹	Research study	Canada	Descriptive exploratory study. Five focus groups conducted with 22 office workers explored awareness of CPAG and perception of CPAG materials. In general there was a lack of awareness and familiarity with CPAG. Participants were critical of the CPAG format.	Not reported
Egger et al., 1997 ³²	Brief report	Australia	Editorial piece describing the process and outcome of developing National Physical Activity Guidelines for Australians. Article discusses consumer testing of the guidelines finding that guidelines incorporating a hierarchical level of recommendations were more acceptable to the majority of participants than specific prescriptive guidelines.	Australian Government Department of Health and Aged Care
Egger et al., 1999 ³³	Report	Australia	Scientific background report to the National Physical Activity Guidelines for Australians.	Australian Government Department of Health and Aged Care
Hiilamo et al., 2012 ³⁵	Research study	International	Analysis of tobacco industry documents and public sources from searches of published literature, government documents, media reports, the Tobacco Labelling Resource Centre and tobacco industry documents. Information on dates of introduction and changes to health warning labels was collected and categorised focused into major areas: specificity, placement, rotation and graphic elements.	National Cancer Institute, Erkki Poikonen Foundation

Literature review matrix for studies included in Parts 2 & 3

Reference			Topic				
Author, Year	Publication type	Country	Understanding of...			Other areas	
			alcohol consumption	units/sensible drinking	recommended upper limits		risks of different patterns of consumption
Agostinelli & Grube, 2002 ⁸⁵	(Non-sys) Review	International					Effectiveness of warning labels (content, design)
Boniface et al., 2013 ⁶⁰	Cross-sectional study	UK		Measured actual and perceived amounts of alcohol in a self-defined usual glass of wines and spirits			
Bowring et al., 2012 ⁵⁶	Cross-sectional survey	Australia	Understanding of a 'safe' number of drinks among young people	Awareness of Australian guidelines among young people			
de Visser & Birch, 2012 ⁵⁰	Cross-sectional survey	UK		Knowledge of alcohol guidelines / units among University students			
Devos-Comby & Lange, 2008 ⁵⁹	(Non-sys) Review	International		Knowledge and understanding of standard drinks as well as ability to pour standard drinks			
Gill & O'May, 2006 ⁵⁵	Letter / Cross-sectional survey	UK		Recall of sensible drinking messages among shoppers			Awareness of drink labelling
Gill & O'May, 2007 ⁵¹	Cross-sectional survey	UK		Knowledge relating to UK 'Sensible Drinking' guidelines among first year female University students		Definitions of binge drinking among first year female University students	Attitudes to drink labelling initiatives

Reference			Topic				Other areas
Author, Year	Publication type	Country	Understanding of... alcohol consumption	units/sensible drinking	recommended upper limits	risks of different patterns of consumption	
Gill & O'May, 2007 ⁵¹							
Heather, 2009 ⁶⁴	(Non-sys) Review	UK			Tendency to confuse recommendations about levels of regular alcohol consumption with upper limits		
Holloway et al., 2008; ⁶² Valentine et al., 2007 ⁶³	Interviews	UK				Focuses on the domestic drinking practices in two case-study locations	
Kerr & Stockwell, 2012 ⁵⁷	(Non-sys) Review	International		Ability of consumers to utilise information about the alcohol content of beverages when expressed in different forms			
Miles et al., 2010 ⁴⁴	Letter / Cross-sectional survey	UK	Examined level of alcohol exposure people think is required to increase cancer risk				
Redeker et al., 2009 ⁴⁶	Cross-sectional survey	UK	Levels of awareness of cancer risk factors				
Sanderson et al., 2009 ⁴⁵	Cross-sectional survey	UK	Awareness of lifestyle risk factors for cancer and heart disease				
Stockwell & Stirling, 1989 ⁵⁸	Cross-sectional survey	UK		Whether the general public could use the units system to assess the strengths of drinks with low, standard and high alcohol contents			

Reference			Topic				Other areas
Author, Year	Publication type	Country	Understanding of... alcohol consumption	units/sensible drinking	recommended upper limits	risks of different patterns of consumption	
West et al., 2006 ⁴⁷	Cross-sectional household survey	UK	Knowledge of early signs and risk factors for mouth cancer				
Wilkinson & Room, 2009 ⁶⁹	(Non-sys) Review	International					International experience with and evidence of effects of alcohol warning labels

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