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COMMENTARY

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The unacceptability of evidence on acceptable risks

The new Canadian drinking guidelines offer important steps forward in considering the extent of life lost to alcohol and recognizing that risks from alcohol increase continuously with rising consumption. However, the continued reliance upon questionable evidence to underpin decisions on the acceptability of alcohol-related risks needs addressing by future studies.

In 2012, Room & Rehm wrote that the process by which health authorities set alcohol drinking guidelines suggested that those involved had 'drawn a deep collective breath and simply voted for specific cut-off levels' ([1], p. 137). More famously, Richard Smith described the 1995 UK guidelines that he helped to set as 'plucked out of the air' [2]. Since then, there have been significant efforts to impose greater rigour on the development of guidelines, particularly by using epidemiological models to identify levels of alcohol consumption that correspond to a level of 'acceptable risk' that is identified a priori. This approach has now been used in countries including Denmark, Australia, the United Kingdom and France [3].

The Canadian process described by Shield *et al.* builds usefully upon this by describing a continuum of risk, separated into zones, rather than a single guideline level [4]. This shift is a welcome and long overdue development, given plentiful evidence of risks at all levels of alcohol consumption and no clear threshold above which risks increase especially rapidly [5]. However, there are practical challenges to this approach which Shield *et al.* do not address. It is unclear what numerical guideline(s) should appear in the limited space provided for health messages on bottles and cans. Media focus on the low-risk level of two standard drinks a week also raised eyebrows internationally, and perhaps also in Canada, as a rather prohibitive message; although it partly reflects Canada's generous definition of a standard drink (i.e. 13.5 g of pure alcohol compared to 10.0 g in Australia and 7.9 g in the United Kingdom). Future guideline developers may wish to consider the adjectives they use to describe different levels of risk (e.g. low, increasing, moderate and little), which media messages ensure that the public consider the full range of the continuum, and whether the continuum leads to better understanding of alcohol-related risks than the traditional single guideline.

Despite the potential advantages of this new approach, an important problem remains at the heart of the guideline development process. The new Canadian low- and moderate-risk thresholds are still based, broadly, on the level of alcohol consumption that corresponds respectively to a 1 in 100 and 1 in 1000 life-time risk of death from alcohol. These figures in turn come from: (i) the observation that a 1 in 1 000 000 risk of premature death is an international standard for regulation of environmental hazards and (ii) work by Starr published in 1969 suggesting that people will accept 1000 times greater risk when engaging with a hazard voluntarily rather than involuntarily [6]. The reliance upon Starr's work seems to date back to the 2009 Australian guidelines [7], but is explained more fully by Rehm *et al.* [8]. The reason for relying upon Starr's work is unclear, as he describes his analyses as exploratory and his conceptualization of risk as incomplete [6], limitations that should be immediately obvious to anyone who reads it. More recent research on risk extends far beyond consideration of voluntariness to also encompass consequences, emotional states, perceived control, novelty and knowledge [9]. It is also highly questionable whether a 1969 analysis of general risks provides valid evidence for setting acceptable risk thresholds for alcohol in a different country half a century later.

This problem is further complicated by the fact that the new Canadian modelling focuses upon years of life lost (YLLs) rather than deaths as their key outcome. In many ways this development is welcome, as it allows recognition of the fact that alcohol deaths often occur early in the life-course, due to both the acute consequences of intoxication and the relatively low average age of death for major alcohol-attributable conditions such as liver cirrhosis. To our knowledge, however, while the evidence on acceptable levels of mortality risk may be outdated and limited, evidence regarding the acceptability of lost years of life is non-existent. The Canadian modelling attempts to address this by converting YLLs into an equivalent number of deaths, but this relies upon a number of strong assumptions that still require testing, including regarding whether risk acceptability varies across different outcomes.

There is much to commend about the new Canadian drinking guidelines, but further evidence on the acceptability of alcohol-related risks and how these might differ between populations and across outcomes is urgently needed if we are to continue improving the empirical basis for low-risk drinking guidelines. Otherwise, we risk simply transferring the power of opaque decision-making away from those developing guidelines and into the hands of the modellers who provide them with evidence.

KEYWORDS

Alcohol, drinking guidelines, epidemiology, epidemiological modelling, guideline development, risk acceptability

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John Holmes: Writing—original draft (equal); writing—review and editing (equal). **Colin Robert Angus:** Writing—original draft (equal); writing—review and editing (equal).

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None.

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