Review of "The Effects of Alcohol Container Labels on Consumption Behaviour, Knowledge, and Support for Labelling: A Systematic Review"

One-Minute Summary

- Alcohol is classified as a human carcinogen by the International Agency for Research on Cancer. In Canada, alcohol caused approximately 650,000 emergency department visits, 118,000 hospitalizations, and 17,000 deaths in 2020. Unlike tobacco and cannabis, alcohol is exempt from most product labelling requirements in Canada. **Alcohol container labels (ACLs),** which provide messaging to consumers at point of sale and pour/consumption, are interventions of interest to reduce population alcohol harms.

- The authors of this article conducted a systematic review (SR) on the impact of ACLs with health warnings, standard drink information, low-risk drinking guidance or multiple of these, on three outcome categories: alcohol consumption behaviours, knowledge of label message and support for labels. Results were summarized narratively, risk of bias was assessed for each publication, and impact statements with certainty of evidence were reported for outcomes based on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.[1] This SR included 40 publications from 1989 onward which studied 31 ACLs and generated impact statements for 17 specific outcomes within the three overall outcome categories of interest. Examples of ACLs can be viewed in Appendix A.

- For **ACLs with multiple or comprehensive messages**, results showed large effect sizes for decreased consumption (moderate certainty) and decreased mean standard drinks sold per capita (high certainty).

- For **health warning ACLs**, results showed moderate to large effects for slowed alcohol consumption rate (low certainty) and decreased alcoholic drink selection (moderate certainty). There were small effects on decreased consumption during pregnancy (low certainty), decreased consumption quantity per occasion (low certainty) and decreased alcohol consumption before driving (moderate certainty). Null effects were suggested for other outcomes (i.e., general alcohol consumption, alcohol consumption frequency, alcohol-impaired driving, standard drinks purchased, knowledge of health risks, support for these labels) ranging from very low to moderate certainty.

- For **standard drink ACLs**, null effects were suggested for drink selection for higher alcohol content (moderate certainty) and support for standard drink labels (low certainty).

- For **low-risk drinking guidance ACLs**, a moderate effect size was suggested for increased support for low-risk drinking guidance labels (very low certainty). A null effect was suggested for knowledge of sex-specific drink limit recommendations (moderate certainty).

- Across the studies, support for health warning ACLs varied widely, ranging from 24% to 84%. In contrast, support for pregnancy-specific health warning ACLs ranged from 72% to 85%, and standard drink ACLs ranged from 66% to 95%). Only a single estimate was available for support for low-risk drinking guidance ACLs (60%).

- The authors concluded that ACLs may reduce some alcohol consumption behaviours, with multiple rotating messages being particularly effective. The effects of ACLs may be impacted by individual drinking behaviour and health literacy. Support for ACLs is generally high. Overall, ACLs may be an effective component of policy that aims to reduce population alcohol harms.

Additional Information

- Overall, the majority of GRADE certainty of evidence ratings across the varied consumption, knowledge and support outcomes in this SR were very low or low (13 outcomes), some were moderate (eight outcomes) and only one was assessed at high certainty of evidence.

- Sensitivity analyses that excluded high risk of bias data resulted in a slight increase in the certainty rating of two outcomes of health warning labels from very low to low: little to no effect on consumption frequency, and little to no effect on knowledge of health risks.

- Subgroup data were explored for two participant factors: drinking status and health literacy. This data was available for five health warning ACL outcomes, one standard drink ACL outcome, one low-risk drinking guidance ACL and one multiple message ACL outcome.

  - For **ACLs with multiple or comprehensive messages**, those with higher health literacy were less likely to report reducing alcohol consumption due to label exposure.

  - Effects of **health warning ACLs** to decrease alcohol consumption appeared smaller in participants who drank more or who reported higher health literacy. Those who drank more were less likely to support health warning ACLs, especially those who reported binge drinking. Those with higher reported health literacy or more education appeared more supportive of health warning ACLs compared to those with lower health literacy or lower education. Knowledge of alcohol driving risks increased more in drivers who also reported alcohol consumption.

  - Support for **standard drink** and **low-risk drinking guidance ACLs** may be lower in participants who drink or who have low health literacy, and was substantially lower among those who reported binge drinking (for standard drink ACLs only).

- There was considerable heterogeneity in ACL designs and outcome measures across the included publications. This was acknowledged as a limitation by the systematic review authors, and is the reason meta-analyses were not appropriate for this body of evidence.

- Suggested areas for future research included: standard drink and low-risk drinking guidance labels, as there was limited evidence for these compared to health warning labels in this SR; real-world evidence from well-controlled, quasi-experimental studies involving repeated exposure to the label in a salient, everyday context; further exploration of the causal pathway(s) that link ACL design and implementation to health outcomes; and additional details on subgroup effects on ACL effectiveness.

PHO Reviewer's Comments

It should be made clear that the results for each outcome of this SR comprised two components: 1) the effect size and 2) the certainty of evidence. Both are important to consider when drawing conclusions from this work, and a notable strength of this SR is the inclusion of summary of findings tables which clearly described impact statements and the strength of certainty in those impacts, based on the GRADE approach. Effect sizes (i.e., null, small, moderate, large or very large, as described in the main results section) were assigned for each outcome based on thresholds set in consultation with subject matter experts. The methods state odds ratios were converted to risk ratios for effect size categorization, suggesting a systematic approach to assigning effect sizes, however the exact conversion methods are not reported. Overall, some additional methods details could further strengthen this otherwise comprehensively reported SR.

Overall, the results of this SR suggest ACLs are generally supported by the public and may reduce some alcohol consumption outcomes, especially health warning and multiple message ACLs. The extent of impacts may vary based on drinking status and health literacy, with weaker associations observed among people who binge drink and who have higher health literacy. The certainty of evidence ratings were mostly very low or low in this SR, therefore further high-quality research would very likely impact the certainty of evidence.

When interpreting these overall findings in the context of Ontario, one may consider some additional factors. It is expected that the effectiveness of ACLs would in part come from the population-level reach and repeated exposures over time. The real-world implementation of ACLs is extremely challenging to feasibly replicate using study designs that allow the lowest risk of bias (i.e., randomized controlled trials). From a policy standpoint, ACLs may serve as a minimally invasive, low cost and wide-reaching approach towards reducing population alcohol harms by providing information, which enables informed choices among consumers or potential consumers.[2,3] Proactive efforts to minimize alcohol harms are pertinent to the current Ontario context, where changes to alcohol policy are expected in the near future that will increase alcohol availability to the public through expanded outlet options.[4,5] There are potential synergistic effects of ACLs when combined with other alcohol and health related interventions or policies. For example, sharing of health, standard drink and/or low-risk drinking guidance messages through non-label mediums (e.g., using recent update to Canada's Guidance on Alcohol and Health); regulations on alcohol marketing practices; policies on pricing or taxation; regulations on physical availability; or other multi-faceted alcohol policies.[3,6-8] Finally, while evidence in this SR was mixed, the effects generally ranged from no effect to beneficial effects. There was no evidence to suggest ACLs to be significantly associated with harmful effects (e.g., ACLs were not found to increase alcohol consumption or reduce knowledge).

Critical Appraisal

A critical appraisal of this SR was conducted using A MeaSurement Tool to Assess systematic Reviews (AMSTAR 2), which is composed of 16 questions.[9] AMSTAR 2 strongly recommends against combining individual item answers to create an overall score for a systematic review. Instead, it recommends users consider the potential impact of an inadequate rating for each item. The full critical appraisal tool with all responses is available on request.

There were minimal risk of bias items of concern with this SR, as the majority of AMSTAR 2 questions were answered with "Yes" which denoted a positive result. Key strengths included: registered *a priori* methods, clear and transparent reporting of methods for each SR process (i.e., research question, search strategy, screening, extraction, risk of bias assessment and synthesis), detailed description of included publications, and the assessment of certainty of evidence using the GRADE approach. Several AMSTAR 2 questions related specifically to meta-analysis were not relevant to the appraisal of this SR. Overall, this SR was considered methodologically strong by the reviewers' completing this synopsis.

There were two potential risk of bias items that were not adequate to the degree that AMSTAR 2 requires. It is worth noting that relevant efforts were still implemented to minimize these risks of bias. First, data extraction was not performed completely independently in duplicate, and agreement levels between extractors were not reported. The potential impact of extraction not being completed in duplicate, especially for more complex data, could be erroneous judgements in selection of data for the SR research question or human error in extraction.[9] Efforts to minimize risk of bias included: data extraction forms were developed and piloted *a priori*, final extraction completed by one author was verified with a second author, any discrepancies were resolved through discussion or consultation with a third author, and detailed extraction methods and templates were reported, which suggest a systematic and consistent approach to extraction and allow replicable methods. Next, AMSTAR 2 states authors should justify the exclusion from the review for each potentially relevant study, and this was not reported in this SR. The risk of not fully accounting for excluded studies is they remain invisible and the impact of their exclusion from the SR is unknown.[9] While the individual references for all excluded records are not reported, this SR summarized the number of full texts excluded for each of the relevant exclusion criteria in their PRISMA flow diagram.

Additional References

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Appendix A

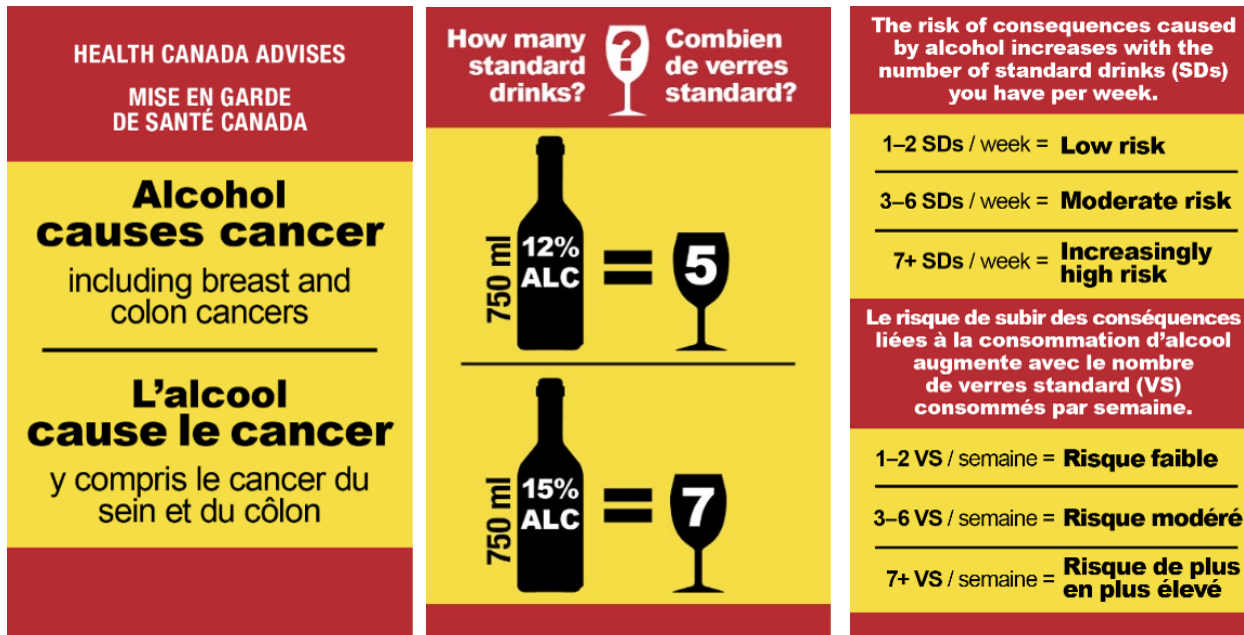**Figure 1: Alcohol Container Label Examples**

Image source: Health Canada. Public awareness of alcohol-related harms survey 2023 [Internet]. Ottawa, ON: Government of Canada; 2024 [updated 2024 Jan 19; cited 2024 Jul 15]. Figure 5, Images of labels shown to respondents (from left to right: warning label, standard drinks label, risk label). Available from: https://health-infobase.canada.ca/alcohol-related-harms-survey/

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