Office for Health Improvement & Disparities

Closed consultation

Potential health impacts of changing the alcohol free descriptor: evidence review

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Contents

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Introduction

Updating low-alcohol descriptors guidance

The Office for Health Improvement and Disparities (OHID), which is part of the Department of Health and Social Care (DHSC) in England, has launched a public consultation on updating labelling guidance for no and low-alcohol alternatives. It will seek views on options for updating the guidance on the labelling of ‘alcohol free’ and ‘low alcohol’ products (also known as NoLo products). The aim of updating the guidance is to increase substitution of alcoholic drinks with NoLo alternatives among people who drink above low risk levels.

The government’s recommendations for how NoLo alcohol drinks may be described are set out in DHSC’s England-only Low-alcohol descriptors: guidance (https://www.gov.uk/government/publications/low-alcohol-descriptors). Its purpose is to support the alcohol manufacturing and retail industries to market their products responsibly, with the aim of protecting the public and informing consumers. This guidance replaced the Food Labelling Regulations 1996 which expired on 13 December 2018.

The consultation covers questions on the most appropriate conditions of use for low-alcohol descriptors, including questions about changing the alcohol free descriptor to 0.5% alcohol by volume (ABV) and the labelling of these products.

Low-alcohol descriptors

The low-alcohol descriptors guidance sets out how the government expects manufacturers and retailers to describe low-alcohol drinks.

Using low-alcohol descriptors is voluntary. If they are used, this guidance suggests the following current conditions for their use, as follows.

Alcohol free
The term alcohol free should only be applied to a drink from which the alcohol has been extracted if it contains no more than 0.05% ABV, and the products should also include the ABV (or state that they contain no alcohol) on the label to use the descriptor.

De-alcoholised

The term de-alcoholised should only be applied to a drink from which the alcohol has been extracted if it contains no more than 0.5% ABV and the product should also include an indication of its alcoholic strength (or state that it contains no alcohol).

Non-alcoholic
The term non-alcoholic should not be used in conjunction with a name commonly associated with an alcoholic drink. There is an exception for non-alcoholic wine where it is derived from unfermented grape juice and is intended exclusively for communion or sacramental use. The labelling or advertising of these non-alcoholic wines should make it clear that it is exclusively for such use.

Low alcohol
A low alcohol drink must be 1.2% ABV or below and an indication of its maximum ABV should be included on the label.

Wine-based drinks

Currently, under retained EU regulation 1308/2013, products that are similar to wine cannot be described as wine if their alcohol content is below 8.5% (or 4.5% ABV for wines that have a Protected Designation of Origin or Protected Geographical Indication). Instead, these products must use terms such as ‘wine-based drink’. We will use this term in this report.

Potential impact of changing the alcohol free descriptor

This document summarises available evidence to assess the potential impact of changing the alcohol free descriptor from 0.05% ABV to 0.5% ABV and you should read this alongside the consultation document. It includes:

- a statistical commentary on alcohol free and low alcohol sales in England
- an overview of the use of the alcohol free descriptor internationally
- a review of the evidence published on known risks to consumers of having the ‘alcohol free’ descriptor set at 0.5% ABV, paying attention to potential impacts on pregnant women, drivers, and people in recovery from alcohol dependence
- the effect of alcohol free products on blood alcohol concentration (BAC)

A statistical commentary on alcohol sales

Background

To assess the potential impact of changing the alcohol free descriptor ABV threshold from 0.05% ABV to 0.5% ABV, it is necessary to understand the context of these products in the alcohol market. This section analyses data for manufacturers' and retailers' own-label branded products taken from Kantar Worldpanel's commercial consumer panel (https://www.kantar.com/uki).

Method

Kantar Worldpanel data provides volume sales and nutrition information for retailers and manufacturers in Great Britain and runs for the year ending September 2022. Using the alcohol category to create an alcohol-specific subset of the data, we outlined the:

- proportion of total alcohol sales for NoLo products (less than or equal to (≤) 1.2% ABV)
- demographic makeup of the people buying alcohol by beverage type

Our analysis focuses on the volume of products purchased rather than the number of products on the market.

Kantar's sample of households reflects the demographic makeup of the British population with demographic sample targets based on:

- region
- social class
- age of main shopper
- household composition
- household size

The data are weighted to provide a representative picture of purchasing over the time and offers a large sample containing a total of 3,002,808,458 litres of alcohol products purchased over the year (including 58,011,817

litres of NoLo products). Data covers household sales of alcohol products and does not include out-of-home drinking (such as in a pub or nightclub). The coverage of ABV information on products in the data is high (greater than (>) 99%), however the accuracy of recorded ABV is variable. We checked the percentage ABV of all NoLo products against product websites and we manually recoded if incorrect. This resulted in the ABV of 74 product configurations being updated (39.2% of all NoLo products configurations).

The first part of this analysis only reports products according to their listed percentage ABV and not the descriptors they are using. For example, a 0.5% ABV product in the Kantar dataset may still describe itself as ‘alcohol free’, despite guidance suggesting this term should be used for products ≤ 0.05% ABV.

Statistical commentary on sales of NoLo alcohol

Products within the % ABV descriptor ranges of alcohol free (≤ 0.05% ABV), de-alcoholised (> 0.05% and ≤ 0.5% ABV), and low alcohol (> 0.5% and less than (<) 1.2% ABV) accounted for 1.9% of total off-trade alcohol sales in England for the year ending September 2022 (see table 1). The largest category were products within the alcohol free descriptor range (1.4% of total sales), followed by products within the de-alcoholised descriptor range (0.5%), then products within the low strength descriptor change (0.1%).

Table 1: percentage of total alcohol sales by strength (using the NoLo descriptor ranges) and beverage type percentage of entire sales including higher strength alcohol)

Product type	Alcohol free sales ≤ 0.05% ABV	De-alcoholised sales ≥ 0.05% and ≤ 0.5% ABV	Low alcohol sales ≥ 0.5% and ≤ 1.2% ABV	Total sales ≤ 1.2% ABV
Beer	0.946	0.172	0.002	1.121
Cider	0.277	0.071	0.023	0.371
Wine-based drinks (note 1)	0.142	0.076	0.061	0.279
Spirits (note 2)	0.029	0.132	0	0.162

Product type	Alcohol free sales ≤ 0.05% ABV	De-alcoholised sales ≥ 0.05% and ≤ 0.5% ABV	Low alcohol sales ≥ 0.5% and ≤ 1.2% ABV	Total sales ≤ 1.2% ABV
Total	1.394	0.452	0.086	1.932

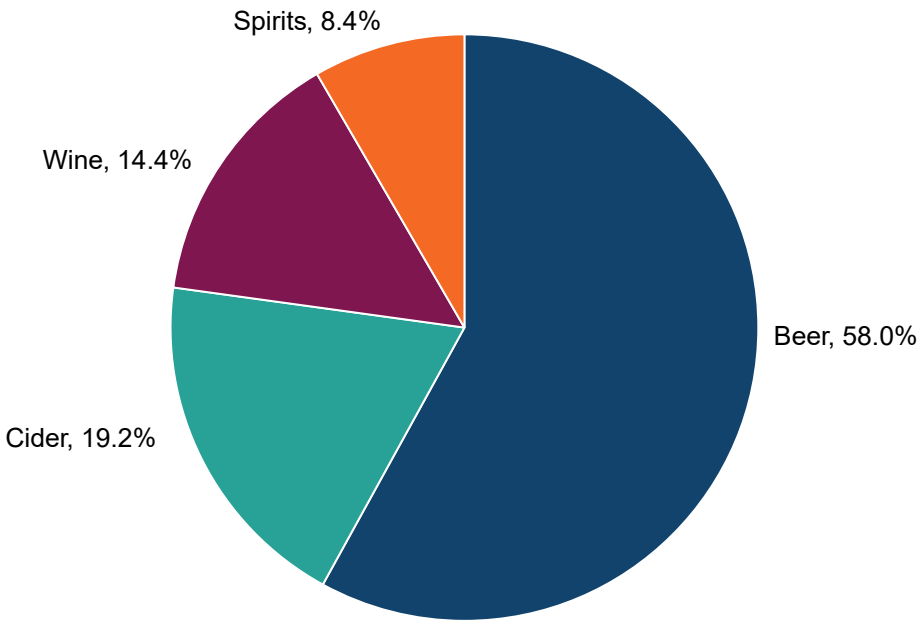
Note 1: includes sales of still, sparkling and fortified wine-based drinks.

Note 2: includes sales of flavoured alcoholic beverages.

Figure 1 is a pie chart showing the proportion of total NoLo alcohol sales (products ≤ 1.2% ABV) by beverage type. Of the NoLo products sold in the year ending September 2022:

- 58.0% were NoLo beers
- 19.2% were NoLo ciders
- 14.4% were NoLo wine-based drinks
- 8.4% were NoLo spirits

Figure 1: proportion of total sales of NoLo products (≤ 1.2% ABV) by beverage type



Note: wine-based drinks includes sales of still, sparkling, and fortified wines; spirits include sales of flavoured alcoholic beverages.

The majority of volume sold as NoLo products were within the alcohol free descriptor range (72.2% of all volume sold as NoLo products), followed by

de-alcoholised (23.4%), and low alcohol (4.5%) (see table 2).

The largest volume of NoLo beers, NoLo ciders, and NoLo wine-based drinks purchased were within the alcohol free descriptor range, whereas most NoLo spirits were within the ‘de-alcoholised’ descriptor range.

Table 2: percentage of NoLo sales by strength (using the NoLo descriptor ranges) and beverage type

Product type	Alcohol free sales ≤ 0.05% ABV	De-alcoholised sales ≥ 0.05% and ≤ 0.5% ABV	Low alcohol sales ≥ 0.5% and ≤ 1.2% ABV	Total sales ≤ 1.2% ABV
Beer	84.4	15.4	0.2	58.0
Cider	74.7	19.2	6.2	19.2
Wine-based drinks (note 1)	50.9	27.3	21.7	14.4
Spirits (note 2)	18.1	81.9	0	8.4
Total	72.2	23.4	4.5	100

Note 1: includes sales of still, sparkling and fortified wines.

Note 2: includes sales of flavoured alcoholic beverages.

Figure 2 shows the volume of NoLo sales by descriptor range and beverage type and Figure 3 shows the number of NoLo product configurations available for sale by beverage type.

Products tend to cluster around the existing descriptor thresholds. It is possible that if the alcohol free descriptor was changed to ≤ 0.5% ABV there might be more variability across the strength range potentially offering more consumer choice. Alternatively, it is possible that the change of the alcohol free descriptor threshold may result in shifting of average strength of NoLo products up towards the new threshold, reducing the availability of ≤ 0.05 ABV products and increasing the overall amount of alcohol in the market in the NoLo product category. The anticipated market response is unknown.

Figure 2 is a stacked bar chart showing the total volume of sales of NoLo products in litres (sold at less than 1.2% ABV) by beverage type (beer, cider, wine-based drinks, and spirits). Within each beverage category, the bar

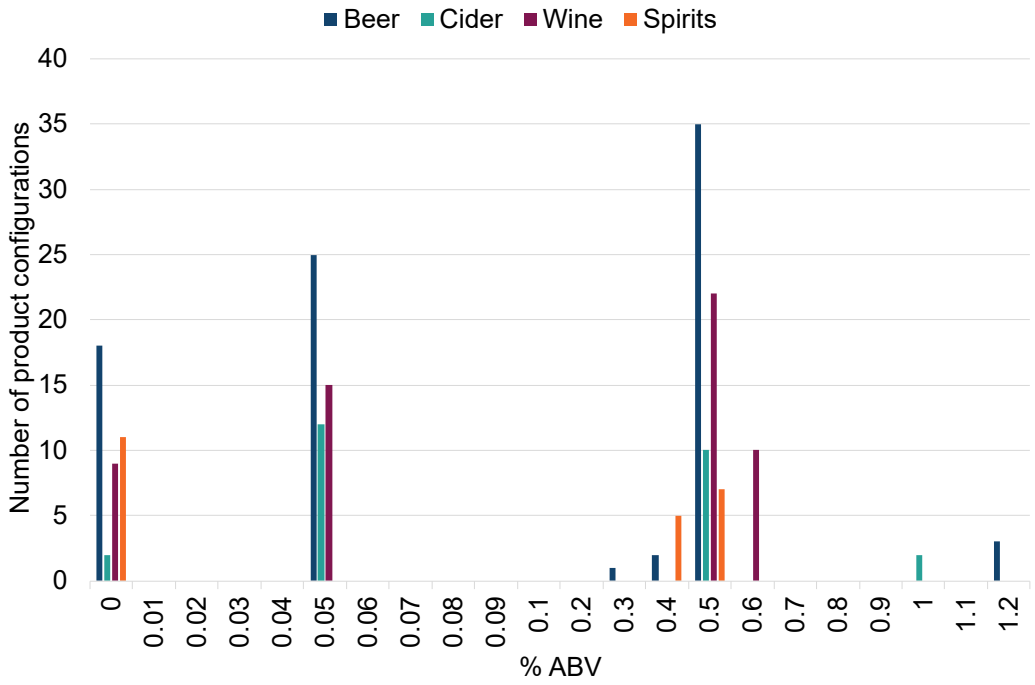
chart shows how many of the litres of product sold were ‘alcohol free’, ‘de-alcoholised’ or ‘low alcohol’.

Figure 2: total volume of sales in litres by descriptor range and beverage type

Descriptor	Beer	Cider	Wine	Spirits	Tota
Alcohol free	28,399,844	8,310,334	4,269,559	877,663	41,857,40
De-alcoholised	5,174,159	2,131,821	2,290,842	3,975,117	13,571,94
Low strength	73,720	686,995	1,821,761	0	2,582,47

Figure 3 is a bar chart showing the number of product configurations available for sale between 0.0% and 1.2% ABV. Products tend to cluster around 0.0% ABV, 0.05% ABV and 0.5% ABV, which reflects existing descriptor thresholds.

Figure 3: the percentage ABV of NoLo product configurations available for sale



Note: the figure uses maximum ABV so a product ≤ 0.5% ABV would be counted as 0.5%.

The use of descriptors in products sold as NoLo

The Kantar data can only provide information on sales of NoLo products according to their listed percentage ABV and not the descriptors they are using. For example, a 0.5% ABV product in the Kantar dataset may still describe itself as alcohol free, despite guidance suggesting this term should be used for products ≤ 0.05% ABV.

To understand the use of descriptors, we extracted any relevant descriptions of strength from product labels using a combination of product websites and from the websites of online sellers of these products. This revealed a wide range of terms used to describe the strength of NoLo products including:

- alcohol free
- de-alcoholised
- low alcohol
- non-alcoholic
- ultra-low
- zero
- alcohol removed
- without alcohol
- no alcohol

Alcohol free descriptor
Low-alcohol descriptors: guidance (https://www.gov.uk/government/publications/low-alcohol-descriptors) states that the term alcohol free may only be used for products that contain ≤ 0.05% ABV. The alcohol free descriptor was used on the label for 73.2% of litres sold as NoLo beer. Of litres sold which used the alcohol free descriptor, 90.1% used the descriptor in line with the guidance (≤ 0.05% ABV) and 9.9% used the descriptor for products > 0.05% ABV.

The alcohol free descriptor was used on the label for 74.7% of litres sold as NoLo cider. Of litres sold which used the alcohol free descriptor, 100% used the descriptor in line with the guidance (≤ 0.05% ABV).

The alcohol free descriptor was used on the label for 69.5% of litres sold as NoLo wine-based products. Of litres sold which used the alcohol free descriptor, 66.6% used the descriptor in line with the guidance (≤ 0.05% ABV) and 33.4% used the descriptor for products > 0.05% ABV.

The ‘alcohol free’ descriptor was used on the label for 79.9% of litres sold as NoLo spirits. Of litres sold which used the ‘alcohol free’ descriptor, 20.1% used the descriptor in line with the guidance (≤ 0.05% ABV) and 79.9% used the descriptor for products > 0.05% ABV.

De-alcoholised descriptor

The low-alcohol descriptor guidance states that the term de-alcoholised may only be used for products that contain ≤ 0.5% ABV. The de-alcoholised descriptor was only used for NoLo products sold as wine-based drinks (4.0% of litres sold as a NoLo wine-based drinks had the de-alcoholised descriptor). Of litres sold as NoLo wine-based drinks, 25.3% had the term alcohol removed listed on the label. This suggests that this descriptor, a synonym of de-alcoholised, is the preferred term used by producers, despite not featuring in the government’s guidance. The term alcohol removed was not identified for any NoLo beer, cider, or spirits products.

Responses to the government’s previous consultation on the use of low-alcohol descriptors (https://www.gov.uk/government/consultations/low-alcohol-product-labelling) indicated that the term de-alcoholised does not resonate well with the public since it is not easily understood. This may explain its fairly low use.

Low strength descriptor

We did not identify the low strength descriptor on the labels of any products listed in the Kantar dataset. Although we identified use of the term ultra-low for NoLo spirits, this term was only used for 2.4% of litres sold as NoLo spirits suggesting its use is not widespread.

Zero

The term zero had fairly widespread use, despite not featuring in the government’s guidance on descriptors. Of the 26.5% of litres sold as NoLo beer which used the term zero, 74.7% of litres sold were for products with a listed ABV of > 0% (25.3% of litres sold were for products with a listed ABV of 0%). The vast majority had a listed ABV of ≤ 0.05% ABV.

Of the 21.1% of litres sold as NoLo wine-based drinks, which used the term zero, 87.2% of litres sold were for products with a listed ABV > 0% (12.8% of litres sold were for products with a listed ABV of 0%).

Only one NoLo cider used the term zero, but this had a listed ABV of ≤ 0.05% amounting to 5.8% of litres sold as NoLo ciders.

No NoLo spirits used the term zero.

Producers and retailers should consider the appropriateness of the use of zero for products with an ABV > 0% since this might be misleading to consumers.

Non-alcoholic descriptor

The low-alcohol descriptors guidance state that the term non-alcoholic must "not be used in conjunction with a name commonly associated with an alcoholic drink". There is an exception for non-alcoholic wine where it is derived from unfermented grape juice and is intended only for communion or sacramental use. The labelling or advertising of non-alcoholic wine should make this clear.

While some products are clearly alcohol free versions of alcoholic counterparts that share similar names and branding, for example Beck's Blue is the non-alcoholic version of Beck's lager, other products do not have an alcoholic counterpart, for example Seedlip (a non-alcoholic spirit). This means the guidance allows NoLo products that do not share the name and branding of an alcoholic product to use the non-alcoholic descriptor, while products that do share the name and branding of an alcoholic product are not. This could be seen as somewhat inconsistent from the perspective of both public health and consumer information.

Overall, 7.6% of litres sold as NoLo beer had the term non-alcoholic (the majority were products ≤ 0.5% ABV), as did 3.4% of litres sold as NoLo spirits (the majority were products ≤ 0.5% ABV). Non-alcoholic was not used on any NoLo wine-based drinks or ciders in the Kantar dataset.

Conclusion and implications for policy

Overall, volume sales of NoLo alcohol are very small, accounting for 1.9% of total off-trade alcohol sales, with about:

- 1.4% for alcohol free
- 0.5% for de-alcoholised
- 0.1% for low strength

Among NoLo products only, beer accounted for the greatest proportion of sales, followed by cider, wine-based drinks, and spirits. Beer was also the most purchased product among those with a percentage ABV within the alcohol free range. Sales of products within the low strength descriptor range made up a minority of total NoLo sales (4.5%). The relatively small size of the NoLo market needs to be considered by policy makers when assessing possible health benefits from the use of these products at a population level. However, at an individual level, if consumers replace, rather than add to, the consumption of alcohol, reduced levels of alcohol consumption and risk are possible.

Our data shows that the correct application of the term alcohol free (in line with the guidance) is variable, perhaps demonstrating the limitations of a non-statutory approach. Not all brands choose to use this descriptor, and

while 100% of litres sold as NoLo ciders using the alcohol free descriptor did so correctly, 79.9% of litres sold as NoLo spirits and using this term used it incorrectly for products > 0.05% ABV.

The de-alcoholised descriptor was only used for NoLo wine-based drinks. However a considerably larger proportion of sales of NoLo wine-based drinks carried the term alcohol removed compared to de-alcoholised. The term zero had fairly widespread use despite not featuring in the government's guidance on descriptors, and there is an indication that many NoLo beers and wines use this term when the actual ABV is > 0%. Consideration should be given to the appropriateness of using the term zero for products with an ABV > 0% since this might be misleading to consumers.

International practice

Background

OHID is interested in understanding the use of alcohol free descriptors internationally, alongside any potential risks or unintended consequences associated with the use of these descriptors.

There are a range of terms that are used internationally to describe alcohol free products, such as:

- non alcoholic
- no alcohol
- alcohol free
- zero alcohol

Permitted terms, their definitions and the extent to which products are regulated vary by country (Okaru and Lachenmeier 2022), and some countries do not have an established definition (World Health Organization 2023). For example, across the EU there is no consistency in the definition of alcohol free and there are no EU-wide regulations on which descriptors may be used to refer to products below 1.2% ABV. So, member states can determine their own rules and as such their alcohol free definitions vary.

The policy on low-alcohol descriptors in the UK is a devolved matter. England is the only UK nation to publish guidance on low-alcohol descriptors.

A 2022 narrative review described and compared the percentage ABV thresholds for products which can be described as containing no alcohol used in different countries (see table 3). We supplemented the data in the table with online hand searches.

The most commonly used term to describe no alcohol products in Europe is alcohol free, although some countries use other terms such as non-alcoholic.

Table 3: international strength thresholds for products described as containing no alcohol

Country	ABV%
Finland	≤ 2.8%
Iceland	≤ 2.25%
France	≤ 1.2%
Italy	≤ 1.2%
Lithuania	< 1.2% for all products; < 0.5% for beer
Slovenia	≤ 1.2%
Japan	≤ 1.0%
Spain	≤ 1.0%
Norway	≤ 0.7%
Australia	≤ 0.5%
Austria	≤ 0.5%
Belgium	≤ 0.5%
China	≤ 0.5%
Croatia	≤ 0.5%
Cyprus	≤ 0.5%
Czech Republic	≤ 0.5%
Denmark	≤ 0.5%

Country	ABV%
Germany	≤ 0.5%
Hungary	≤ 0.5%
India	≤ 0.5%
New Zealand	≤ 0.5%
Nigeria	≤ 0.5%
Portugal	≤ 0.5%
South Africa	≤ 0.5%
Sweden	≤ 0.5%
Turkey	≤ 0.5%
USA	≤ 0.5%
Canada	≤ 0.4%
Netherlands	≤ 0.1%
UK	≤ 0.05%

Source: Okaru and Lachenmeier 2022

The most common permitted strength for no alcohol products identified was ≤ 0.5% ABV, while the highest was ≤ 2.8% ABV in Finland. The UK had the lowest permitted strength at ≤ 0.05% ABV.

Responses to the consultation on the low-alcohol descriptors in 2018 (https://www.gov.uk/government/consultations/low-alcohol-product-labelling) suggested that a lower ABV threshold used to describe alcohol free products in the UK may lead to a commercial disadvantage compared with producers in the EU and beyond. Testing this hypothesis would require a detailed data set on sales by manufacturer and retailer across multiple countries, which is not currently available. And to confirm this claim, researchers would need to understand whether consumers are less likely to buy alcohol free beverages labelled at 0.05% ABV compared to 0.5% ABV. While it is possible that the UK's current descriptors guidance leads to a commercial disadvantage for UK producers, it is also possible that consumers buying alcohol free products prefer lower ABVs.

Conclusion

The most commonly used strength threshold for alcohol free is ≤ 0.5% ABV, with a range from < 0.05% ABV to ≤ 2.8% ABV. The UK was the only country identified with an ABV threshold for an alcohol free descriptor as low as 0.05% ABV. While it has been suggested that this may cause a commercial disadvantage for UK producers who follow the current labelling guidance, we do not have the data available to evidence this.

Impact of alcohol free beverages on pregnancy, driving and recovery from dependence

Context and aims

We carried out a rapid evidence review of the international evidence published on known risks to consumers of having the alcohol free descriptor set at 0.5% ABV. We focused on the potential impacts to:

- pregnant women
- drivers
- people in recovery from alcohol dependence

This review was initially completed by Public Health England (PHE) in 2019 and updated by OHID in 2023.

Methods

To balance time and resource constraints, the search strategy took a pragmatic approach (searching Medline, Embase and CINAHL databases), which included:

- data from an Organisation for Economic Co-operation and Development (OECD) country

- studies published in the English language only
- studies published between January 2014 to May 2023 inclusive
- primary and secondary research including any study design
- studies focusing on the adult population only

We chose to search for studies from 2014 as the widescale availability of NoLo products is a relatively new phenomena. So, combined with preliminary searches, we did not anticipate finding much published literature before this time.

We excluded:

- grey literature (research produced outside of the traditional academic publishing channels)
- animal samples
- studies that did not focus specifically on the consumption of alcohol free products (defined here as < 1.0% ABV to account for higher international standards)

Searches were first undertaken in 2019 and run again in May 2023.

Search terms were deliberately wide and included a range of synonyms for alcohol free since there is a lack of research in this area. You can find the synonyms we used in appendix 1. To supplement the searches, we also carried out forward and backward searching (checking citations and reference lists of screened papers) and handsearching (a manual process to identify literature not found through the electronic database searches).

Results

We list the results of the literature search in table 4. These results are the number of papers identified from each search after deduplication for each electronic database and by area of interest. We screened the papers against the eligibility criteria for inclusion and we outline this process in appendix 2. The search identified:

- no relevant papers about driving
- only one relevant paper about people in recovery from alcohol dependence
- only one about pregnancy

Table 4: results of literature search strategy by pregnancy, driving, recovery from dependence and electronic database

Source	Pregnancy	Recovery	Driving
CINAHL	523	22	16
Embase	583	117	32
Medline	1108	36	43
Handsearching	1	1	0

Alcohol free products and pregnancy

Research on alcohol free products and pregnancy

The rapid evidence review did not identify any studies relevant to the effect of consuming alcohol free products on pregnancy outcomes. However, a response to a previous consultation on the low-alcohol descriptors in 2018 highlighted one study from 2010 as being relevant. So we have considered it below, but we recognise it falls outside the eligibility period stated in our inclusion criteria. The narrow search parameters such as inclusion years or country of origin may have affected the ability of the search to identify relevant papers. However, there is a lack of research in this area.

The study promoted abstinence from any alcohol during pregnancy, including abstinence from alcohol free beverages. This is because no safe level of consumption in pregnancy can be determined so this recommendation ultimately eliminates any risk of harm to the child (Goh and others 2010). This is relevant, considering lab-based testing of alcohol free products has identified higher amounts of alcohol than listed on the product labels (Goh and others 2010).

The study analysed the contents of products claiming to be alcohol free or low alcohol in the Canadian market and found that 13 of the 45 analysed beverages (29%) contained ethanol levels that were higher than what was declared on the label. For example, products labelled as containing alcohol concentrations of 0.0% ABV had levels of up to 1.8% ABV. Though the clinical relevance of these findings were not reported, these results suggest that women consuming alcohol free beverages might still be exposed to considerable amounts of alcohol, particularly if they consume several drinks in one sitting. Abstinence from these products would eliminate any risk.

UK low risk drinking guidelines for pregnancy

The UK chief medical officers' low risk drinking guidelines (https://www.gov.uk/government/publications/alcohol-consumption-advice-on-low-risk-drinking) state that if you are pregnant or think you could become

pregnant, the safest approach is not to drink alcohol at all, to keep risks to your baby to a minimum. These guidelines were developed after reviewing a range of evidence and through consultation with an expert group.

These guidelines recognise the wide range of impact alcohol can have on the fetus, including:

- low birth weight
- preterm birth
- being small for gestational age
- a range of lifelong conditions known under the umbrella term of ‘fetal alcohol spectrum disorders’ (FASD)

The severity and nature of FASD is linked to the amount drunk and the developmental stage of the fetus at the time. The more alcohol consumed, the greater the risk.

Research that aimed to find out the effects of consuming alcohol during pregnancy on a fetus or baby can be difficult to interpret, and though the chief medical officers recognised that the risks of small amounts of consumption are probably low, they could not establish a completely safe level. Research has acknowledged that it is not possible to accurately determine a safe period or dose when alcohol would not affect the fetus (Sarman 2018).

Alcohol in other food products

We recognise that the evidence shows alcohol is a constituent of many fermented and non-fermented foods, such as bread, fruit juice and yogurt. For example, research has found levels of 1.2g alcohol per 100g of bread and up to 0.77g of alcohol per litre of fruit juice (Gorgus and others 2016). This means that many consumers, including pregnant women, are exposed to very low levels of ethanol in these foods which require no labelling to indicate its presence. While this might be a useful comparison to think about the possible risks from very low doses of alcohol, there are nutritional gains associated with the consumption of bread or yogurt which people cannot get from alcohol free products.

Also, despite some products containing very low levels of alcohol, they are labelled as alcohol free. Whereas most products labelled as ‘free from’, such as ‘free from milk’ or ‘nut free’, are generally understood not to contain those allergens.

Irrespective of whether the alcohol free descriptor is changed, pregnant women may benefit from clear information that products labelled as alcohol free contain some alcohol.

Alcohol free products and people in recovery from dependence

Research on alcohol free products and people in recovery

The rapid evidence review identified one systematic review relevant to the effect of consuming alcohol free products on people in recovery from alcohol dependence (identified through handsearching). The narrow search parameters such as inclusion years or country of origin may have affected the ability of the search to identify relevant papers. However, there is a lack of research in this area.

The systematic review identified 10 studies which explored the use of NoLo products in very heavy drinkers and people with alcohol use disorders (AUD) (Caballeria and others 2022). Very heavy drinkers and people with AUD tended to have stronger physiological responses (such as cravings and desire to drink) to alcoholic and NoLo drinks compared to people who were not heavy drinkers and did not have AUD. Additionally, the increase in cravings or desire to drink increased with the severity of alcohol dependence. This might suggest that NoLo products could trigger cravings and lead to drinking or relapse among the heaviest drinkers and people with AUD. Despite this, many studies included in the review used placebos. Participants thought they were receiving full strength alcohol, so it was difficult to separate the physiological effects of NoLo products and standard strength alcohol products.

There is an established scientific literature on how physiological responses to alcohol products (known as cue reactivity) contribute to continued drinking and risk of relapse in very heavy drinkers (Kroczek and others 2018, Drummond 2000, Garland and others 2012, Papachristou and others 2014). The smell or sight of an alcoholic beverage can increase cravings and desire to drink, which in turn influences behaviour (drinking and risk of relapse). The look, smell, and taste of NoLo products can be the same as standard strength alcohol products, so it is possible NoLo products might lead to the same physiological responses and influence drinking, but more research is needed.

Need for more research

Researchers would need to conduct primary research to find out the extent to which alcohol free products and their marketing act as a cue, potentially facilitating the risk of relapse among people in recovery from alcohol dependence.

It is highly plausible that people in recovery from alcohol dependence avoid products at any ABV, and this may be due to cue reactivity, the alcoholic content, or both. If this were the case, changing the descriptor to 0.5% ABV

is unlikely to have any impact. However, it is important that consumers are fully aware of the products they are buying, and the use of the alcohol free descriptor implies that the product contains absolutely no alcohol. Requirements that alcoholic products ≤ 1.2% ABV have the same labels as their alcoholic counterparts could mitigate this risk, since it alerts the consumer of the presence of alcohol.

Alcohol free products and driving

The rapid evidence review did not identify any studies relevant to the effect of consuming alcohol free products on driving. The narrow search parameters such as inclusion years or country of origin may have affected the ability of the search to identify relevant papers, however there is a lack of research in this area.

However, to provide context on the impact of changing the ‘alcohol free’ descriptor from 0.05% ABV to 0.5% ABV, we estimated the impact of this change on blood alcohol concentration (BAC), which we discuss in the next section.

Alcohol free products and blood alcohol concentration

Background

The amount of alcohol consumed by a person can be measured by their blood alcohol concentration (BAC). This is expressed as the mass of alcohol per unit weight of blood. So, a BAC of 0.10 means that there are 0.10g of alcohol for every 100 millilitres (ml) of blood. As alcohol consumption increases, so does BAC.

The Widmark formula

The Widmark formula enables an approximate estimation of BAC for a given amount of alcohol consumption, given an individual’s body weight, sex, and amount consumed in a given period (see equation 1) (Widmark

1981). As demonstrated by Widmark, the BAC measurement is directly proportional to the amount of alcohol consumed and inversely to an individual's body weight.

Equation 1:

BAC = (alcg ÷ (bodyg × R)) × 100

Where:

- alcg = alcohol consumed in grams
- bodyg = body weight in grams
- R = a gender constant (0.55 for women and 0.68 for men)

Using this formula, it is possible to crudely estimate a range of hypothetical scenarios to understand the impact of consuming alcohol of different ABVs. We estimated BACs for men and women, of average height, for a range of weights, with a focus on the difference in BAC between the current and proposed 'alcohol free' descriptor threshold (0.05% ABV and 0.5% ABV respectively).

Crude estimates of blood alcohol concentration (BAC)

We show the hypothetical scenarios estimated using the Widmark formula in table 5. For these scenarios we assume the average height of men and women in the UK. We use these heights alongside body mass index (BMI) (see equation 2) assuming 3 scenarios, which were the:

- mid-point of the standard healthy weight range (defined as a BMI between 18.5 and 24.9)
- mid-point of the standard overweight range (defined as a BMI between 25 and 29.9)
- first-point in the standard underweight range (defined as a BMI of less than 18.5, so we chose the upper-point because of no obvious mid-point)

We also used the typical gender constants (alcohol distribution ratio) for men and women.

Equation 2:

BMI = kg ÷ m2

Where:

- kg = weight in kg
- m = height in metres

Table 5: hypothetical scenarios assumed in Widmark formula to estimate BAC

Variable	Men	Women
Average UK height (m)	1.778	1.644
BMI for underweight	18.4	18.4
BMI for healthy weight	21.8	21.8
BMI for overweight	27.5	27.5
Underweight (kg)	58.2	49.7
Healthy weight (kg)	68.8	58.8
Overweight (kg)	86.8	74.2
r (gender constant)	0.68	0.55

We show the hypothetical drinking scenarios in table 6. The scenarios assume a person has a single drink on a single drinking occasion of one hour only. We chose a period of one hour since, for the 0.5% ABV and 0.05% ABV examples, using the formula to estimate BAC suggests these become negative, which is implausible. The examples used are:

- a standard UK pint of beer at 0.05% ABV, 0.5% ABV and 4.0% ABV
- a large glass of 12.5% ABV wine
- a single shot of 37.5% ABV vodka

Since the Widmark formula requires the grams of alcohol contained in each drink, standard UK measures were converted to millilitres. We then used the ABV of each drink to calculate the volume of alcohol contained in each drink in millilitres. Finally, we converted this into grams, based on the density of alcohol (1ml = 0.789g).

Table 6: drinks used in hypothetical BAC calculations

Beverage type	ABV	Beverage volume in ml	Alcohol in ml	Alcohol in g
Pint of beer	0.05%	586	0.293	0.231
Pint of beer	0.50%	586	2.930	2.312
Pint of beer	4.00%	586	23.440	18.494
Large glass of wine	12.5%	250	31.250	24.656
Shot of vodka	37.5%	25	9.375	7.397

After converting the body weights from kilograms to grams, we used all variables in the Widmark formula to estimate the different BACs for different strength products. You can see the results in tables 7 and 8. For reference, the legal drink driving limit in England and Wales is 0.08%, and for many countries across Europe, including Scotland, is 0.05%.

Table 7: estimated BAC for underweight, normal weight, and overweight for a range of alcohol products after consuming one drink in one hour (men)

Body weight	0.05% pint of beer	0.5% pint of beer	4% pint of beer	12.5% glass of wine	37.5% shot of vodka
Underweight	0.000584	0.005845	0.046757	0.062336	0.018701
Healthy weight	0.000494	0.004944	0.039555	0.052735	0.01582
Overweight	0.000392	0.003918	0.031342	0.041784	0.012535

Table 8: estimated BAC for underweight, normal weight, and overweight for a range of alcohol products after consuming one drink in one hour (women)

Body weight	0.05% pint of beer	0.5% pint of beer	4% pint of beer	12.5% glass of wine	37.5% shot of vodka
Underweight	0.000845	0.008452	0.067616	0.090145	0.027044
Healthy weight	0.000715	0.00715	0.057202	0.076261	0.022878

Body weight	0.05% pint of beer	0.5% pint of beer	4% pint of beer	12.5% glass of wine	37.5% shot of vodka
Overweight	0.000567	0.005665	0.045324	0.060425	0.018128

For all ABVs, women have a higher BAC at any given dose compared to men, and for both men and women BACs decreases as you move from a BMI of underweight to overweight. For a pint of 0.05% ABV beer (the current alcohol free descriptor threshold) and 0.5% ABV (the proposed alcohol free descriptor threshold), the observed BACs are extremely low.

To put the current (0.05% ABV) alcohol free descriptor threshold into context, in one hour of drinking 0.05% ABV beer a healthy weight adult woman would have to drink:

- 107 pints to reach the same BAC as if they consumed one large glass of 12.5% ABV wine
- 80 pints to reach the same BAC as if they consumed one pint of 4% ABV beer
- 32 pints to reach the same BAC as one shot of 37.5% ABV vodka

The equivalent for a 0.5% ABV beer is:

- 11 pints to reach the same BAC as if they consumed one large glass of 12.5% ABV wine
- 8 pints to reach the same BAC as if they consumed one 4% ABV pint of beer
- 3 pints to reach the same BAC as one shot of 37.5% ABV vodka

Though the difference between 0.05% ABV and 0.5% ABV is not insignificant, it is highly implausible that people will drink alcohol free products with the intention of an intoxicating effect given the volume needed to reach a BAC equivalent to one drink of normal strength beer or wine.

Alcohol free products and driving

The rapid evidence review did not identify any studies relevant to the effect of drinking alcohol free products on driving. However, to provide context on the impact of changing the alcohol free descriptor from 0.05% ABV to 0.5% ABV, we can use our crude estimates of BAC above. These are viewed in

context of the levels of consumption required to obtain a BAC where risk on the road significantly increases.

PHE's evidence review The public health burden of alcohol and the effectiveness and cost-effectiveness of alcohol control policies (https://www.gov.uk/government/publications/the-public-health-burden-of-alcohol-evidence-review) sets out the relationship between alcohol consumption and road traffic crashes. It found an increased risk of being involved in a fatal or non-fatal crash with increasing levels of alcohol consumption. Risk typically starts to increase from doses above 40mg of alcohol per 100ml of blood (0.04%) with accelerating increasing at risk greater than 10mg (0.1%).

For example, to reach a BAC of 0.04% where risk on the road increases, an underweight woman would have to drink:

- 47.3 pints of 0.05% ABV beer in one hour, equivalent to 7.8 pints in 10 minutes
- 4.7 pints of 0.5% ABV beer in one hour, equivalent to 0.78 pints in 10 minutes

We gave the example of an underweight woman because for any given dose the BAC is highest compared to normal weight and overweight women, as well as underweight, normal weight and overweight men.

For both examples, it is unlikely consumers will be drinking at this rate. These estimates are in line with published evidence from a German drinking experiment (Thierauf and others 2012) (this article could not be included in this evidence review since it was not available in English, however the findings reported in the abstract were available in English). Seventy-eight participants were asked to drink 1.5 litres of non-alcoholic beer (ethanol content of 0.41% to 0.42% ABV) within one hour. The maximum measured BAC was 0.0056% suggesting that even after consumption of extremely high volumes of alcohol free beer, negative implications on driving are unlikely.

Limitations

In this report, we have provided estimates of BACs after drinking a single drink. The formula does allow us to add a term relating to elapsed time to show BAC several hours following consumption. However, as people process about one unit of alcohol an hour regardless of how many units they drink and given the very low BAC levels for the 0.05% ABV and 0.5% ABV examples, the results will be negative or zero, so we have not done this.

Importantly, calculations based on the basic Widmark formula are only estimates, and do not take into account other potentially important modifying factors such as individualised constants that explicitly consider body mass, height and age (Tam and others 2005). Also, we could factor in other aspects of how a person's body processes alcohol (or metabolic pathway, including resorption deficiency and elimination rates) from the start of drinking to improve estimates (Tam and others 2005, Posey and others 2007). As such, these estimates cannot be used in real life to estimate whether an individual is fit to drive. But the estimates are sufficient for understanding a crude estimate of the relative BACs of different strength products.

Conclusion

While the difference between 0.05% ABV and 0.5% ABV is not insignificant, it is unlikely that changing the alcohol free descriptor from 0.05% ABV to 0.5% ABV will have an impact on drivers choosing to drink these products. This is because of the implausible quantities that people would need to drink to reach a BAC associated with risk on the road.

There is a risk that marketing of alcohol free products, especially where alcohol free products and cars or driving are shown together, could impact on generalised perceived norms towards drinking and driving. We would recommend further research to understand this since it might undermine the effectiveness of current approaches to drink-driving campaigns.

Summary

This report has outlined the results of an electronic literature search exploring the impact of drinking alcohol free products on:

- pregnancy
- driving
- people in recovery from alcohol dependence

We found very little evidence across these 3 areas.

Drawing on other types of evidence has enabled recommendations across these 3 areas.

Pregnancy

Without any known safe level for alcohol consumption during pregnancy, it might be sensible to abstain from alcohol free products if pregnant or trying to get pregnant. This is especially true if some products contain higher than reported levels of ethanol, which if consumed in large quantities, could amount to a notable level of exposure to ethanol.

Clear labelling relating to drinking during pregnancy on all alcohol free products (and other low strength products) might be one way of communicating these potential risks to pregnant women. Though research has shown that pregnant women are exposed to low levels of ethanol through the consumption of fermented and non-fermented foods which do not require labelling, these have nutritional benefits in a way that alcohol free beverages do not.

Driving

Drawing on our work estimating approximate BACs, we found that improbable quantities of 0.5% ABV products would have to be consumed (equivalent to 5 pints in a single hour) to reach levels associated with a significant risk of road crashes. So, changing the alcohol free threshold to 0.5% ABV is unlikely to have a notable impact on drivers. We would recommend conducting further research to understand the impact of alcohol free products on perceived norms towards drinking (alcoholic drinks) and driving.

People in recovery from alcohol dependence

There is some evidence to suggest that in people with AUD or heavy drinking patterns, drinking NoLo products could increase their desire and craving to drink. Also, alcohol-related cues from NoLo products might trigger physiological responses like those experienced when drinking alcohol. However, it is unclear what the impact of changing the alcohol free descriptor to 0.5% ABV will have on people in recovery from alcohol dependence.

If people in recovery know these products have the potential to induce cravings and consciously avoid them, then any change to the descriptor is somewhat irrelevant. But if this group do drink these products, the impact of

increasing the descriptor could potentially be an issue if the ethanol content acts as a cue that could lead them to relapse.

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Appendix 1: search terms used in literature search

Pregnancy/

pregnancy.tw.

Pregnant Women/

(pregnant adj (mother* or wom?n)).ti.

Maternal Exposure/

Maternal-Fetal Exchange/

Preconception Care/

Prenatal Care/

exp Pregnancy Trimesters/

or/1-9 (923011)

((low or moderate or light or reduced or zero or non or no or strength) adj (alcohol* or drink*)).tw.

de?alcoholi?ed.tw.

alcohol?free.tw.

low-moderate prenatal alcohol.tw.

prenatal alcohol exposure.tw.

small amount* of alcohol.tw.

healthy drink*.tw.

((light or moderate) adj social drink*).tw.

“low dose* of alcohol”.tw.

“low level* of alcohol”.tw.

“moderate dose* of alcohol”.tw.

“moderate level* of alcohol”.tw.

or/11-22

exp Alcohol Drinking/

(alcohol adj (consumption or drinking)).tw.

24 or 25

(low or moderate or light or reduced or zero or non or no or strength).tw.

26 and 27

23 or 28

Fetal Diseases/ci [Chemically Induced]

exp Fetal Death/ci [Chemically Induced]

exp Congenital Abnormalities/

exp Pregnancy Complications/

Pregnancy/ab [Abnormalities]

Prenatal Exposure Delayed Effects/

Pregnancy Outcome/

exp Fetal Development/

Fetal Alcohol Spectrum Disorders/

FASD.tw.

Abortion, Spontaneous/ci [Chemically Induced]

miscarriage.tw.

exp Infant, Low Birth Weight/

Sudden Infant Death/

cot death.tw.

((child or infant or offspring) adj mental health).tw.

or/30-45

10 and 29 and 46

limit 47 to (english language and yr="2014 -Current")

"low alcohol".tw.

"moderate drink*".tw.

"low dose* of alcohol".tw.

"low level* of alcohol".tw.

"moderate dose* of alcohol".tw.

"moderate level* of alcohol".tw.

"light alcohol".tw.

"reduced alcohol".tw.

"zero?alcohol".tw.

"non?alcohol*".tw.

“no alcohol”.tw.

“low strength alcohol”.tw.

de?alcoholi?ed.tw.

“alcohol?free”.tw.

“small amount* of alcohol”.tw.

“healthy drink*“.tw.

“light social drink*“.tw.

“low blood alcohol concentration*“.tw.

“social drink*“.tw.

((light or moderate) adj social drink*).tw.

or/49-68

((former or past or earlier or pre or ex) adj (drinker* or heavy drinker* or dependent or alcoholic* or problem or binge)).tw.

exp Alcoholics/

(former or past or earlier or pre or ex).tw.

71 and 72

70 or 73

69 and 74

limit 75 to (english language and yr=”2014 -Current”)

exp Driving Under the Influence/

exp Automobile Driving/

(drink* adj3 drive*).tw.

“drink-driv*“.tw.

“driving while under the influence”.tw.

“driving under the influence”.tw.

“driving impairment*“.tw.

or/77-83

69 and 84

limit 85 to (english language and yr=”2014 -Current”)

Appendix 2: search, screening, and selection process

Pregnancy search, screening, and selection

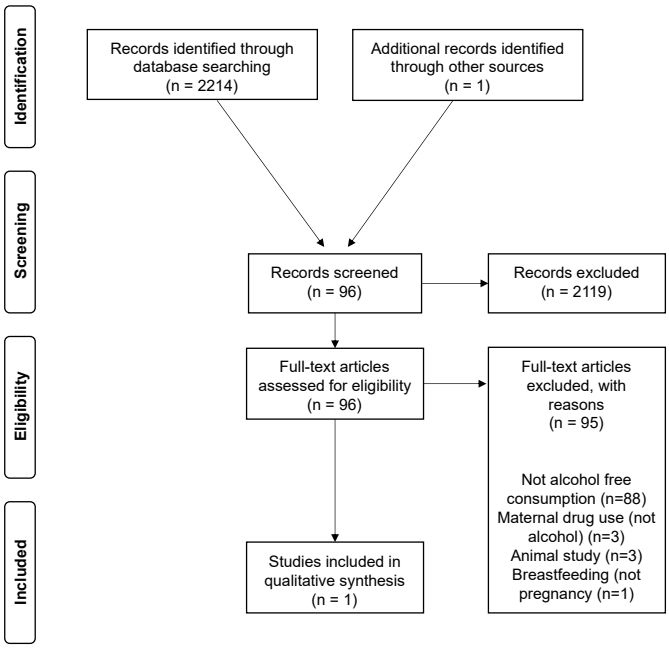
Figure 4 is a flow diagram showing the different stages of the rapid evidence review of the evidence published on known risks to pregnant women of having the alcohol free descriptor set at 0.5% ABV.

The database search identified 2,214 records, and one additional record was identified through other sources. After excluding 2,118 records through screening, we assessed the remaining 96 full-text articles for eligibility. We excluded 95 articles because they:

- did not focus specifically on the consumption of alcohol free products (defined here as < 1.0% ABV to account for higher international standards) (88 articles)
- were studies on maternal drug use (not alcohol) (3 articles)
- were animal studies (3 articles)
- were studies on breastfeeding (not pregnancy) (1 article)

We included the one remaining study in our qualitative synthesis.

Figure 4: flow diagram for pregnancy search



Driving search, screening, and selection

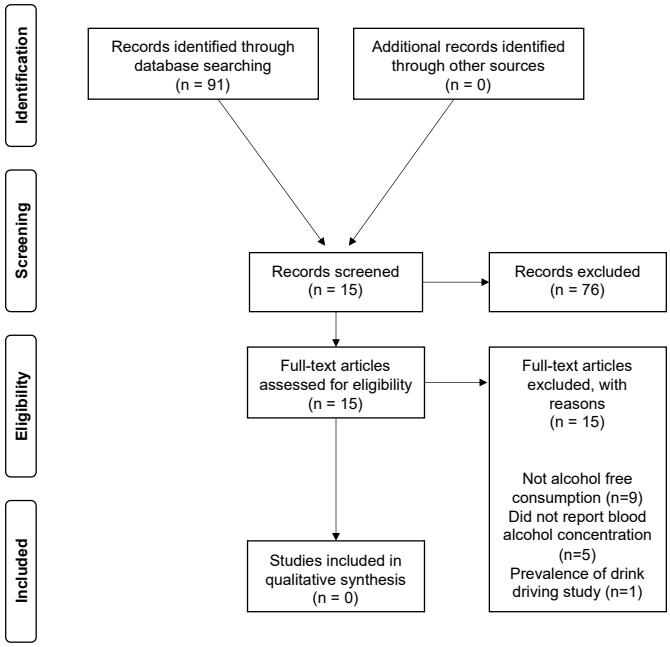
Figure 5 is a flow diagram showing the different stages of the rapid evidence review of the evidence published on known risks to people driving of having the alcohol free descriptor set at 0.5% ABV.

The database search identified 91 records, and no additional records were identified through other sources. After excluding 76 records through screening, we assessed the remaining 15 full-text articles for eligibility. We excluded all 15 articles because they:

- did not focus specifically on the consumption of alcohol free products (defined here as < 1.0% ABV to account for higher international standards) (9 articles)
- did not report blood alcohol concentration (5 articles)
- were a study on the prevalence of drink driving (1 article)

So, we did not include any studies in our qualitative synthesis.

Figure 5: flow diagram for driving search



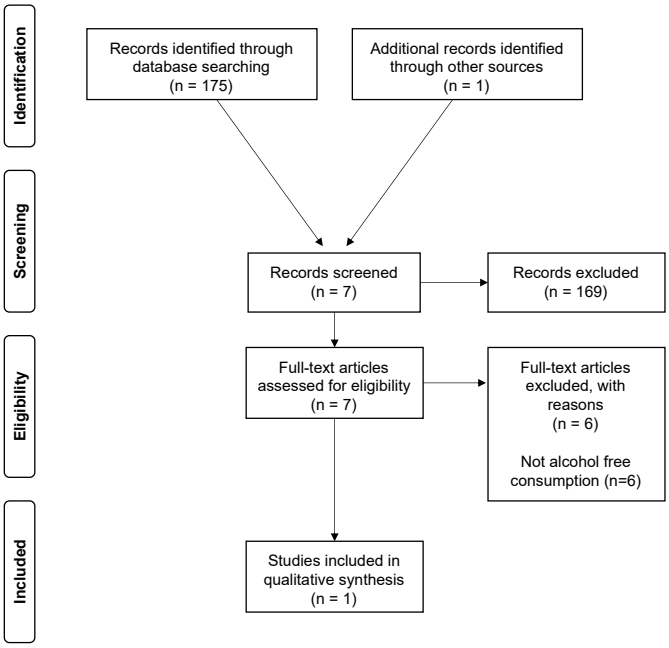
Alcohol dependence search, screening, and selection

Figure 6 is a flow diagram showing the different stages of the rapid evidence review of the evidence published on known risks to people in recovery from alcohol dependence of having the ‘alcohol free’ descriptor set at 0.5% ABV.

The database search identified 175 records, and one additional record was identified through other sources. After excluding 169 records through screening, we assessed the remaining 7 full-text articles for eligibility. We excluded 6 articles because they did not focus specifically on the consumption of alcohol free products (defined here as < 1.0% ABV to account for higher international standards).

We included the one remaining study in our qualitative synthesis.

Figure 6: flow diagram for search on alcohol dependence



Appendix 3: acknowledgements

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