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## **UK ALCOHOL INDUSTRY'S 'BILLION UNITS PLEDGE': INTERIM EVALUATION FLAWED**

*John Holmes, Colin Angus, Petra S Meier*

*Sheffield Alcohol Research Group, School of Health and Related Research, University of Sheffield, 30 Regent Street, Sheffield, S1 4DA, UK. John Holmes Senior Research Fellow, Colin Angus Research Associate, Petra Meier, Professor of Public Health.*

**Correspondence to:** Colin Angus: [c.r.angus@sheffield.ac.uk](mailto:c.r.angus@sheffield.ac.uk)

**Standfirst:** *Flaws in the Department of Health's interim evaluation of an alcohol industry pledge to remove one billion alcohol units from the market mean the report should be withdrawn, the evaluation approach reviewed and revised targets set for the pledge argue John Holmes and colleagues.*

The UK Government's 2012 Alcohol Strategy contained a number of evidence-based policy proposals, including minimum unit pricing.<sup>1</sup> However, few of these policies have been implemented. Instead, the Government has increasingly pointed to an alcohol industry pledge to remove one billion units from the alcohol market as a demonstration of what can be achieved via voluntary deals with industry.<sup>2</sup> For example, the Billion Unit pledge was the only alcohol intervention mentioned in the Department of Health (DoH) report *Living Well for Longer* in July 2014.<sup>3</sup>

The pledge by 33 alcohol producers, retailers and trade organisations began in 2012 and was announced as part of the Public Health Responsibility Deal; the UK Government's flagship public health policy.<sup>4</sup> Under the Responsibility Deal, industry partners make individual or collective pledges to undertake activities ostensibly addressing public health problems. Such voluntary agreements are argued by the Government to be preferable to costly and cumbersome regulatory approaches. The Billion Unit pledge committed signatories to "remove one billion units of alcohol sold annually from the market by December 2015, principally through improving consumer choice of lower alcohol products".<sup>5</sup>

In practice, this means that the alcoholic strength of some beverages will be reduced and new beverages branded as low or no alcohol will be developed and promoted by industry. However, the evidence base for achieving public health gains by promoting reduced strength alcohol is limited.<sup>6</sup> In theory, if consumers simply replace higher strength products with lower strength alternatives, overall alcohol consumption and associated harm will fall. However there is little evidence to support this hypothesis. Consumers may also ignore the new products or drink them in addition to pre-existing consumption.

This potential for higher consumption prompts legitimate questions regarding industry motives for focusing on making lower strength drinks available to consumers. It has been reported that consumer tastes have shifted away from high-strength products and that brewers are keen to attract women, who are perceived to prefer lower ABV drinks.<sup>7;8</sup> These trends were acknowledged in the press release announcing the deal<sup>9</sup> and invite the question of whether new low strength products are primarily designed to reduce alcohol consumption, simply reflect what consumers want, or seek to increase consumption in new drinkers. Is manufacturer motivation driven by public health concern or commerce?

#### **2014 DoH evaluation of progress towards the pledge**

The Responsibility Deal website says that for the Billion Unit pledge to be judged a success the annual number of units of alcohol sold across the UK must be reduced by at least one billion (equivalent to a 2% reduction from 2011 levels). It also says that the reduction must be shown to result from the pledge.<sup>10</sup> This second aspect is the more challenging to demonstrate.

In December 2014, the DoH produced their second interim report on progress towards meeting the Billion Unit pledge and concluded that its target had been exceeded two years early as 1.3 billion units had been removed from the market as a result of the pledge between 2011 and 2013.<sup>11</sup> However, whilst the headline finding is appealing, a closer look at the analyses and data which underpin it raises questions. We believe the data used in the analysis may not be fit for purpose rendering the headline estimate inaccurate. We also believe that the report makes simplistic assumptions about consumer responses to the pledge and takes insufficient notice of confounding factors, which means that it is unclear whether any change in alcohol consumption is truly attributable to the pledge. In this article and the accompanying online technical appendix we explain why. We conclude that the DoH should give urgent consideration to withdrawing the report, revising its evaluation approach and modifying the targets associated with the pledge.

### **Problems with the DoH interim report**

#### The data may be unfit for purpose

DoH's interim evaluation draws on two data sources. HMRC excise duty (alcohol tax) data on alcoholic drinks measure how much alcohol is sold in the UK in any given year.<sup>12</sup> Beer and spirits are taxed relative to their alcohol content making this a reasonable source of information for quantifying sales of these drinks. However, wine and ciders are taxed by volume of product irrespective of strength.<sup>13</sup> This means tax data do not provide information on the number of alcohol units in the market for wine and cider.

Therefore, additional market research data on alcohol retail sales in Great Britain were also used to estimate quantities of wine and cider sold.<sup>14</sup> But the estimated volume of alcoholic drink sold in these data is 9% lower in 2011 than the equivalent estimate from HMRC and 14% lower in 2013; for example due to limited information on discount retailers and the exclusion of Northern Ireland.<sup>11;14</sup> This increase in the discrepancy over time is important as it is larger than the claimed effect of the pledge – a 1.3 billion (or 2.6%) reduction in units sold. We show in the technical appendix that a proportion of this effect could be due to the discrepancy between data sources.

In the appendix we also present a case that that 870 million of the 1.3 billion units removed from the market are accounted for by a change in 2011 to the way HMRC recorded beer data, rather than the pledge. As DoH do not take steps to address these data problems, we conclude that the estimated impact of the pledge may be invalid irrespective of our other concerns.

#### Only one consumer response is considered

The DoH analysis assumes that people will respond to lower strength drinks by consuming the same amount of beer or wine but at a lower strength (a lower percentage alcohol by volume or %ABV). However this may not be the case and we believe that this simplistic approach is flawed.

Three outcome measures are used in the DoH report drawn from a mixture of the HMRC and market research data: (1) the total annual volume of a beverage sold; (2) the percentage of that volume

which is pure alcohol (%ABV) and (3) the number of alcohol units sold (1 unit = 10ml or 8g of pure alcohol). These outcomes are obtained for five categories of beverage (beer, cider, wine, spirits and alcopops) and fed into a before and after analysis comparing 2011 with 2013. Table 1 shows how the data sources are combined to give the outcome for each beverage type. The before and after analysis is shown in Table 2 and is based on the equation below.

*Change in units sold = (2013 %ABV x 2011 volume of beverage) – (2011 %ABV x 2011 volume of beverage)*

Using this equation, the online technical appendix provides worked examples of consumer response scenarios different to the one assumed by the evaluation. These demonstrate that DoH's analysis can produce results suggesting that the policy led to reduced consumption even when consumption actually increased.

#### A change in the analysis plan

The analytical approach was altered following the resignation of public health stakeholders from the Responsibility Deal Alcohol Monitoring and Evaluation Group. The change meant that the headline measure of the pledge's success was based on analysing all beverages separately then adding up the results, rather than analysing all beverages together (Personal Communication: Professor Mark Bellis, 2014). DoH do not acknowledge this change in the report but explain the use of a beverage-specific analysis by arguing that this controls for underlying trends and confounding in the market share of each beverage type:

“Some of the change in the total volume of pure alcohol that occurs from year to year is due to changes in the category shares. For example, as the average abv of beer is lower than the average abv of wine, a shift in market share from beer to wine would (other things being equal) result in an increase in the total volume of pure alcohol and an increase in the overall average abv. By holding constant the volume of products the change in the number of units driven solely by changes in abv can be calculated.”<sup>11</sup> p.10-11

This methodological change makes a difference. In the first interim report produced by the DoH they found 253 million units had been removed from the market; however, had the original method been used, it would have concluded that the pledge led to 359 million units being *added* to the market. In the second report analysis by beverage type made little difference.

#### Confounders are inadequately considered

The only consideration given in the report to potential sources of confounding is to the market share of each beverage type. However, there are others important sources of confounding that DoH does not control for.

The following three confounders are likely to affect the number of units sold over time. Robustly separating the impact of the pledge from these factors requires a careful and detailed statistical analysis which the report does not provide.

First, increased taxes on high-strength beer and reduced taxes on low-strength beer were introduced in 2011. Lower taxes for low-strength beer mean these products can be sold more cheaply or more profit can be made if they are sold at the same price as other beers. Given this incentive to producers and consumers, sales of these products are likely to have increased irrespective of whether the pledge was made or not.

Second, the estimated annual number of units of alcohol sold in the UK fell by 18% between 2004/05 and 2012/13.<sup>15</sup> This trend has not been uniform across the population or across types of alcoholic beverage. For example, there have been long-term shifts in consumption from beer to wine, and from drinking by younger people to drinking by older people. These shifts affect the volume of each beverage type sold over time and the total amount of alcohol sold.<sup>16;17</sup>

Finally, the average strength of products has not been stable over time; the average alcohol content of beer sold fell from 4.57% in 2000 to 4.48% in 2010.<sup>16</sup>

### **A better approach**

The above critique does not imply the Billion Unit pledge is necessarily bad for public health, simply that it may be too challenging to evaluate whether the target has been met. The DoH evaluation plan stipulated that any reduction in alcohol sales must be shown to result from the pledge. Until these problems of data, plausible consumer responses and confounding (summarised in Table 3) have been addressed we question the validity of the conclusion that 1.3 billion units have been removed from the market as a result of the pledge alone.

It is not clear whether a robust quantitative evaluation of the Billion Unit pledge can be conducted based on the data that are currently available. Individual-level longitudinal data on alcohol consumption with sufficient detail to allow analysis of changes in the products consumers purchase and whether new lower strength products substitute for or add to existing consumption, would be ideal. To our knowledge, such data are unavailable and are not being collected by DoH.

In the absence of these data what are the alternatives? We believe that greater onus should instead be placed on process evaluations which assess whether producers' behaviour and products have changed in a way and to a scale likely to facilitate healthier drinking habits. This may include, for example, reporting on what specific products have been introduced or altered in strength with accompanying %ABVs, and supplying sales data for these products. Currently provision of such data is voluntary and many signatories make more generalised claims. For example, Barcardi Brown-Forman Brands (who make Bacardi rum, Jack Daniel's whiskey and Southern Comfort liqueur) state in their progress report: "The ABV on some products has been reduced and new products at a lower ABV than the parents' brands have been introduced."<sup>18</sup>

Again, although it is unlikely to quantify progress towards the pledge, independent market research could also be used to understand how consumers are responding to new and revised products, in particular detailing who is buying these products and whether they are substituting for and adding to existing drinking.

We recommend the billion unit target is abandoned in favour of measurable alternatives. We also recommend that DoH withdraw the 2014 interim report, request stakeholders no longer cite its conclusions and conduct a review and revision of the evaluation approach.

#### **KEY MESSAGES BOX:**

- The responsibility deal includes a pledge from the alcohol industry to remove one billion units from the market and is the UK's central alcohol policy
- The Department of Health's interim evaluation of its success makes questionable assumptions and ignores key confounding factors.
- We call for the report to be withdrawn
- A robust quantitative evaluation may not be possible
- The billion unit target should be dropped in favour of measurable alternatives

#### **CONTRIBUTORS AND SOURCES**

JH, CA and PM are public health researchers at the University of Sheffield specialised in quantitative appraisal of alcohol policy options. All authors contributed to drafting of the manuscript. Additionally, JH conceived and lead-authored the manuscript and is guarantor of the article, CA and JH developed the critique of the interim report and PM oversaw the work. The analyses in this paper are based on a report produced by the Department of Health.<sup>7</sup>

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#### **CONFLICTS OF INTEREST**

We have read and understood the BMJ Group policy on declaration of interests and declare the following interests: PM is a member of the Scientific Advisory Board of the Institute for Alcohol Studies, a non-profit organisation advocating for the use of scientific evidence in policy-making to reduce alcohol-related harm. The views expressed are the authors' own and do not necessarily reflect those of their employers or funders.

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Table 1: Data sources for DoH interim report by alcoholic beverage type

Beverage	Volume sold	Average ABV	Units of alcohol sold
Beer	HMRC	Calculated <sup>2</sup>	HMRC
Cider	HMRC	Nielsen/CGA	Calculated <sup>2</sup>
Wine	HMRC	Nielsen/CGA	Calculated <sup>2</sup>
Spirits and RTDs <sup>1</sup>	Calculated <sup>2</sup>	Nielsen/CGA	HMRC

<sup>1</sup>RTDs are ready-to-drink pre-mixed spirits – also known as alcopops.

<sup>2</sup>Data calculated from two of volume sold, ABV and units of alcohol sold.

Table 2: Results from Department of Health Billion Units pledge Interim Report

	Beer	Cider	Wine	Spirits	RTDs	Total
<b>2011</b>						
Volume of product (hectolitres)	42.5m	9.3m	13.3m	2.9m	1.5m	69.6m
Average ABV	4.4%	5.0%	12.9%	36.8%	4.5%	7.5%
Volume of pure alcohol (units sold) <sup>1</sup>	18.7bn	4.6bn	17.2bn	10.8bn	0.7bn	52.2bn
<b>2013</b>						
Volume of product (hectolitres)	42.4m	8.6m	13.2m	2.9m	1.9m	69.0m
Average ABV	4.1%	4.8%	12.9%	36.9%	4.4%	7.3%
Volume of pure alcohol (units sold) <sup>1</sup>	17.4bn	4.1bn	17.0bn	10.6bn	0.8bn	50.4bn
<b>2013 ABVs applied to 2011 product volume</b>						
Volume of pure alcohol (units) <sup>1</sup>	17.4bn	4.5bn	17.2bn	10.9bn	0.7bn	50.6bn
<b>Estimated change in units resulting from ABV decrease<sup>2</sup></b>	<b>-1.2bn</b>	<b>-0.1bn</b>	<b>-0.0bn</b>	<b>+0.0bn</b>	<b>-0.0bn</b>	<b>-1.3bn</b>

<sup>1</sup>2011 and 2013 data are not provided by Department of Health and are calculated here using average ABV and volume of product data.

<sup>2</sup>ABV estimates are given by Department of Health to one decimal place; however, estimated changes in units are highly sensitive to precision of ABVs (e.g. a 0.01% increase in 2011 average beer ABV would increase the estimated reduction in beer units by approximately 40 million). Consequently, the results obtained by the Department of Health cannot be reproduced exactly using the data provided in the report which is replicated here

Table 3: Summary of factors affecting the DoH's interim evaluation of the Billion Units pledge

Factors affecting the estimate of how many units have been removed from the market	Accounted for by DoH	Direction of effect on estimate of units removed from the market
Change in HMRC recording practises for beer	No	Increase
Multiple possible consumer responses to lower strength products	No	Unknown
Changes in the accuracy of %ABVs for most beverage types	No	Unknown
Factors affecting whether the estimate of units removed from the market is attributable to the Billion Unit pledge.	Accounted for by DoH	Direction of effect on estimate of units removed from the market
Reduction in lower strength beer taxes	No	Increase
Long-term downward trend in %ABV of beer	No	Increase



Long-term downward trend in consumption	No	Unknown
Changing market share of beverage types	Yes	Unknown

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