

**Original citation:**

Petticrew , M., Shemilt , I., Lorenc , T., Marteau , T. M., Melendez-Torres, G. J., O'Mara-Eves, A., Stautz , K. and Thomas, J.. (2017) Alcohol advertising and public health : systems perspectives versus narrow perspectives. *Journal of Epidemiology and Community Health*, 71 . pp. 308-312.

**Permanent WRAP URL:**

<http://wrap.warwick.ac.uk/83257>

**Copyright and reuse:**

The Warwick Research Archive Portal (WRAP) makes this work by researchers of the University of Warwick available open access under the following conditions. Copyright © and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable the material made available in WRAP has been checked for eligibility before being made available.

Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

**Publisher's statement:**

This article has been accepted for publication in *Journal of Epidemiology and Community Health* following peer review. The definitive copyedited, typeset version Petticrew , M., Shemilt , I., Lorenc , T., Marteau , T. M., Melendez-Torres, G. J., O'Mara-Eves, A., Stautz , K. and Thomas, J.. (2017) Alcohol advertising and public health : systems perspectives versus narrow perspectives. *Journal of Epidemiology and Community Health*, 71 . pp. 308-312. is available online <http://dx.doi.org/10.1136/jech-2016-207644>

© 2017 BMJ

**A note on versions:**

The version presented here may differ from the published version or, version of record, if you wish to cite this item you are advised to consult the publisher's version. Please see the 'permanent WRAP URL' above for details on accessing the published version and note that access may require a subscription.

For more information, please contact the WRAP Team at: [wrap@warwick.ac.uk](mailto:wrap@warwick.ac.uk)

## **Alcohol advertising and public health: systems perspectives versus narrow perspectives**

**Petticrew M,<sup>1</sup> Shemilt I,<sup>2</sup> Lorenc T,<sup>3</sup> Marteau TM,<sup>4</sup> Melendez-Torres GJ,<sup>5</sup> O'Mara-Eves A,<sup>2</sup> Stautz K,<sup>4</sup> Thomas J.<sup>2</sup>**

1. Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, UK WC1H 9SH

2. EPPI-Centre, Social Science Research Unit, Institute of Education, University College London, 18 Woburn Square, London, WC1H 0NR

3. Centre for Reviews and Dissemination, University of York YO10 5DD

4. Behaviour and Health Policy Research Unit, Institute of Public Health, Forvie Site, Robinson Way, Cambridge CB2 0SR

5. Warwick Medical School, Population Evidence and Technologies, University of Warwick, Coventry CV4 7AL

**Corresponding author:** Mark Petticrew, Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, 15-17 Tavistock Place, London, UK WC1H 9SH

**Email:** [mark.petticrew@lshtm.ac.uk](mailto:mark.petticrew@lshtm.ac.uk) **Telephone:** 0207 9272009

**Word count:** 2920 words

## **ABSTRACT**

**Background:** Alcohol consumption is influenced by a complex causal system of interconnected psychological, behavioral, social, economic, legal and environmental factors. These factors are shaped by governments (e.g. licensing laws and taxation), by consumers (e.g. patterns of alcohol consumption drive demand) and by alcohol industry practices, such as advertising. The marketing and advertising of alcoholic products contributes to an “alcoogenic environment” and is a modifiable influence on alcohol consumption and harm. The public health perspective is that there is sufficient evidence that alcohol advertising influences consumption. The alcohol industry disputes this, asserting that advertising only aims to help consumers choose between brands.

**Methods:** We review the evidence from recent systematic reviews, including their theoretical and methodological assumptions, to help understand what conclusions can be drawn about the relationships between alcohol advertising, advertising restrictions, and alcohol consumption.

**Conclusions:** A wide evidence base needs to be drawn upon to provide a system-level overview of the relationship between alcohol advertising, advertising restrictions, and consumption. Advertising aims to influence not just consumption, but also to influence awareness, attitudes, and social norms; this is because advertising is a system-level intervention with multiple objectives. Given this, assessments of the effects of advertising restrictions which focus only on sales or consumption are insufficient and may be misleading. For this reason, previous systematic reviews, such as the 2014 Cochrane review on advertising restrictions (Siegfried et al. 2014) contribute important, but incomplete representations of “the evidence” needed to inform the public health case for policy decisions on alcohol advertising. We conclude that an unintended consequence of narrow, linear framings of complex system-level issues is that they can produce misleading answers. Systems problems require systems perspectives.

[276 words]

*Advertising is the rattling of the stick in the swill bucket*

George Orwell [1]

## **INTRODUCTION**

Alcohol has been called ‘No ordinary commodity’, and reducing its consumption is an important global public health goal.[2 3] Alcohol contributes to around 4% of the global burden of disease, with about 9% of UK men and 4% of UK women showing signs of alcohol dependence, and the UK Government estimates the annual cost to the economy of alcohol-related harm at £21 billion per year.[4] [5]

Alcohol consumption is influenced by a complex causal system of interconnected psychological, behavioral, social, economic, legal and physical environmental factors. These factors interoperate at individual-, community- and population-levels and are shaped by the actions of local and national governments (e.g. licensing laws, and taxation), by consumers (e.g. patterns of alcohol consumption drive demand) and by alcohol industry practices. The latter includes advertising, which has been identified as a modifiable influence on alcohol consumption and harm.[6] Because of this complexity it is important to understand the alcohol system into which any new interventions, including policy measures, are introduced, and the effects of such interventions on this complex system. Such interventions may interact positively or negatively with the system itself; for example the effectiveness of individual-level interventions to reduce harmful alcohol consumption may be moderated by concurrent influences such as alcohol availability and pricing. Failure to take account of this wider “alco-genic environment” [7] may lead to the recommendation of ineffective or even harmful interventions, and/or a failure to recommend effective interventions.

This paper develops this argument in relation to alcohol advertising, making the case that the lack of a system perspective on the effects of alcohol advertising can lead to narrow and misleading conclusions. We focus on alcohol advertising because it has been the subject of a number of systematic reviews [8] [9] [6 10] that include different forms of evidence, and also because it is an area in which inferential claims based on the evidence are contended, notably between the alcohol industry, which argues that there is no evidence that advertising significantly influences alcohol consumption, and that advertising restrictions would be

ineffective, and public health advocates who argue that there is clear evidence that advertising importantly influences alcohol consumption, particularly among children and young people [3].

The aim of this paper is to challenge over-reliance on narrow forms of evidence and approaches to investigating causality to inform decision making. This is done through a critique of existing alcohol advertising systematic reviews. In the process, we call for a new framework for alcohol research that takes a broader systems perspective.

### **The outcomes of alcohol advertising: whose perspective?**

The alcohol industry frequently asserts that advertising does not stimulate consumption or create new consumers, but only aims to help consumers choose between brands. For example, a briefing paper produced by the European representative body for spirits producers “spirits.eu” states:

*“Contrary to the general belief, alcohol advertising does not create the desire to consume, therefore banning advertising will not significantly reduce overall consumption, and alcohol-related harm will not automatically decline”.*[11]

Such claims are rejected by critics who counter that, if it were true, the industry would not spend more than £800 million per year on advertising in the UK alone.[12] The House of Commons Select Committee in 2012 also noted the inherent implausibility of the claim:

*“Those speaking on behalf of the alcohol industry often appear to argue that advertising messages have no effect on public attitudes to alcohol or on consumption. We believe this argument is implausible.... Messages contained in alcohol advertisements play an important part in forming social attitudes about alcohol consumption... If this were not the case it is not clear why shareholders should be content for their companies’ resources to be spent in this way”.* [13]

It is clear that the potential outcomes of alcohol advertising are different, if viewed from different perspectives. This is important when considering what outcomes should be examined when assessing evidence for the effects of restrictions on alcohol advertising.

### **What is the evidence for the effects of alcohol advertising restrictions?**

Arguments about the potential effectiveness of restricting advertising typically draw on two categories of evidence. First, they draw on indirect evidence that exposure to advertising increases consumption, to infer that reducing exposure will reduce consumption. Second, they draw on direct evidence of the effect of reducing exposure on consumption (for example, evidence from studies of advertising restrictions).

*Indirect evidence: the link between exposure to advertising and alcohol consumption*

In the first category, the results of longitudinal studies have been synthesized in systematic reviews, which have found that exposure to media and commercial communications on alcohol is associated with adolescents starting to drink alcohol [6] [10 14]. The authors of one of these reviews noted – based on the strength of the association, the consistency of findings, the temporality of exposure and drinking behaviours, and the existence of dose-response relationships, as well as on the theoretical plausibility of the relationship – that “*alcohol advertising and promotion increases the likelihood that adolescents will start to use alcohol, and will drink more if they are already using alcohol*”. [6]

Another recent systematic review synthesized evidence from seven randomized experimental studies and found that viewing alcohol advertisements increased immediate alcohol consumption by amounts equivalent to between 0.39 and 2.85 units for men, and between 0.25 and 1.81 units for women [15]. Whilst this finding points towards a cause-effect relationship between alcohol advertising on television and immediate consumption, confidence in both the finding and its wider applicability were limited because it was based largely on data from studies at unclear risk of bias, conducted among small numbers of undergraduate students, under controlled research conditions, in the United States or the Netherlands. The same review did not find evidence that exposure to alcohol advertisements influenced explicit or implicit alcohol-related cognitions.

*Direct evidence: studies of the effects of advertising restrictions*

The bodies of evidence described above are just part of the jigsaw. They address the relationship between alcohol advertising and consumption, but do not include direct evidence from studies of the effects of population-based advertising restrictions or bans that aim to reduce exposure. A Cochrane review published in 2014 sought to fill the gap by appraising and synthesizing this body of evidence. [8] The review aimed to include randomized and non-randomized controlled trials (RCTs), prospective and retrospective cohort studies, controlled

before-and-after studies, and interrupted time series (ITS) studies that evaluated the restriction or banning of alcohol advertising, delivered via any marketing channel, including the press, television, radio, or internet, billboards, social media or product placement in films (Box 1). However, in practice the review process identified one small RCT (with 80 male student participants, conducted in the Netherlands from 2009) and three ITS studies (general population studies conducted in Canadian provinces during the 1970s and 80s). Based on the results of synthesizing this body of evidence, the review authors concluded that: “...*there is a lack of robust evidence for or against recommending the implementation of alcohol advertising restrictions.*” Elsewhere they state: “[The evidence in this review] *does not say that bans do not work; we do not know*”. [16]

**Box 1: Inclusion criteria for the Cochrane review on advertising restrictions (Siegfried et al., 2014)**

**Populations, and types of studies**

Both general population-level studies (where aggregate data from regions are collated before and after a reduction of or ban on advertising) and individual-level studies (where participants may be randomised to different levels of advertising and their subsequent consumption measured).

**General population level**

i) Randomised controlled trials (RCTs); ii) Controlled clinical trials (CCTs); iii) Prospective cohort studies iv) Retrospective cohort studies if baseline exposure data were collected at time of baseline of study; v) Controlled before and after (CBA) studies, including econometric studies; vi) Interrupted time series (ITS) studies.

**Individual level**

i) RCTs; ii) CCTs; iii) Prospective cohort studies; iv) Retrospective cohort studies if baseline data were collected at time of baseline of study; v) CBA cross-sectional studies; vi) ITS studies

**Intervention (i.e. advertising restrictions)**

Restriction or banning of alcohol advertising, via any format including advertising in the press, on the television, radio, or internet, via billboards, social media or product placement in films.

**Outcomes: Primary outcomes:** Reduction in alcohol consumption. In population-based studies, this may be measured via econometric data (e.g. annual sales of alcohol per capita) and in individual based studies this may be measured by rate of drinks (number during a specified time). **Secondary outcomes:** 1. Delayed age of initiation of alcohol use; 2. Reduction in rate of reported risk behaviour; 3. Reduction in alcohol-related injuries or accidents; 4. Reduction in individual spending on alcohol. **Adverse effects:** 1. Loss of revenue from alcohol industry; 2. Loss of advertising revenue; 3. Reduction in GDP attributable to alcohol sales; 4. Loss of employment from alcohol industry; 5. Reduction in taxes generated

This conclusion is underpinned by the view that the paucity of evaluative evidence on the impacts of advertising restrictions on population-level consumption means that the question

remains open and unanswered. The implication is that such population-level evaluations of marketing restrictions constitute not just the best evidence to inform policy decisions, but the *only* admissible evidence. In the absence of other evidence, the decision maker is left in a state of agnosticism as to the potential health effects of a ban: “*Our review disagrees with [Smart’s 1988] conclusion that advertising bans do not affect overall alcohol consumption as the data included in our review indicates that there is uncertainty as to whether this effect is beneficial, neutral or harmful*”. However this ignores the large body of relevant indirect evidence, described above, which consistently shows a link between alcohol advertising exposure and alcohol consumption.

It should also be noted that the Cochrane review was originally designed to capture evidence for other proposed causal pathways in the ‘alcohol system’, including the impacts of restrictions or bans on age of initiation of alcohol use; rates of alcohol-related injuries; individual spending on alcohol; revenue from the alcohol industry; advertising revenue; GDP attributable to alcohol sales; and employment within the alcohol industry. However, the included studies did not measure these outcomes, so no evidence for these wider impacts in the alcohol system was available to be considered in the review.

In sum, despite both direct and indirect research on the effects of alcohol advertising restrictions, these complementary sources of evidence have not been considered in conjunction. Other decisions about the eligibility of studies in the reviews considered here have further narrowed the scope, such that many of the potential moderators, mediators, and outcomes of advertising interventions have not been explored at the evidence synthesis level.

### **Alcohol advertising: do narrow perspectives lead to narrow conclusions?**

There are two ways in which we believe that the perspective on ‘the evidence’ taken in the Cochrane review [8] (which is not atypical of other systematic reviews of intervention effects), can result in narrow conclusions. First, it involves a restricted view of the wider evidence: as noted above there are few evaluative studies, and they consider only a narrow subset of potential outcomes. However Babor (2010) has noted that conclusions about the effects of alcohol marketing interventions can also be based on theoretical understandings and on empirical evidence about how marketing works and its effects, and can be informed by the larger body of evidence on tobacco advertising.[3] The Cochrane review excludes this

larger body of evidence, as well as the evidence from longitudinal and experimental studies of the distal and immediate effects of exposure to alcohol marketing.

Moreover advertising is rarely aimed at whole populations, but is targeted via ‘market segmentation’ to specific subpopulations (such as women, [17] and young people [18]) in order to increase sales of specific products. For example, in the 1990’s alcoholic soft-drink “alcopops” were developed for young drinkers, especially women [19]. The current trend towards marketing fruit-flavoured beers, ciders and spirits appears to be similarly aimed at developing the female market [20] (Box 2). (This contradicts the alcohol industry position that “*alcohol advertising for beverage alcohol responds to trends in consumption, rather than leading them*”.[21]) Thus, population-based evaluations might mask the differential effects of targeted advertising.

Second, the Cochrane review tests a simple hypothesis about the causal relationship between advertising restrictions and consumption. This is consistent with current systematic review practice, in which review eligibility criteria generally map narrowly onto a discrete pathway within the wider causal system of interest. However, this narrow framing – which is compounded by the even narrower evidence base which the review identified and synthesized – ignores the evidence that changing consumption is an important (contested) outcome of advertising, but it is not the only outcome. Alcohol advertising, like the advertising of any product or service, aims to increase sales. To achieve this end, it aims to influence a wide range of intermediate outcomes, such as public attitudes, knowledge and awareness about alcohol, as well as social norms around consumption[22] [17]. It also affects (and, conversely, its content is influenced by) the patterning, timing and contexts of drinking.[18] [17] These outcomes also need to be considered in reviews of the evidence.

Advertising experts themselves highlight that advertising has multiple interconnecting objectives, not just increases in sales and consumption. For example advertising messages delivered over long periods aim to maintain awareness and familiarity, and to prepare potential consumers for purchase.[23 24] The advertising literature also notes that advertising can have multiple social objectives, including developing connections between brands, individuals and social groups, and shaping social norms, with the ultimate aim of increasing saleability.[23] Alcohol advertising is thus an integral part of the wider alcohol system.

Advertising experts themselves often apply a systems perspective to their practice, and have done so since at least the 1960s[25 26] [27]

Narrow perspectives may therefore lead to narrow conclusions in this case if they do not include the full range of meaningful outcomes, and/or do not appropriately represent the complex causal relationship between advertising and those outcomes.

**Box 2: LBD (Little Black Dress): Premium Spirit Drink (20% vol)**

“Apple and cranberry lbd, the fruity vodka-based blend for your mix of friends. If your girly get-togethers aren’t complete without refreshingly, fabulous fun, this duo of juicy flavours is definitely the one!

Just mix with lemonade, best mates and a splash of gossip.”

**What wider evidence should be brought to bear to increase our understanding of the alcohol system?**

There is a considerable body of work on advertising theory and a wider range of evidence that can be drawn on to help develop a more rounded public health perspective. This perspective would also need to consider potential feedback loops (in which initial changes in behaviour within the system may create the conditions for behaviour to change further) within the overall alcohol system. For example, advertising shapes the social norms/ expectations of social situations and psychology (implicit and explicit cognitions) that influence consumption, which in turn shape the content and targeting of advertising. By these means, advertising seeks to extend what can be drunk and by whom, and on what occasions. Damping effects (the ability of systems to absorb or counteract change) also exist: for example alcohol marketing communications act as an ever-present counterpoint to public health guidelines aiming to reduce alcohol harms.

Advertising also influences the regulators, who in turn make the laws and regulations that influence advertising. Regulators, after all, are also citizens, and so are also exposed to advertising and its effects. Direct lobbying by the alcohol industries, combined with knowledge of the economic benefits of alcohol advertising and consumption (e.g. the GDP

and tax revenue attributable to alcohol sales, employment and related revenues from income tax) can also influence regulators, who make the laws that influence advertising.[28] If and when advertising restrictions are implemented in a particular setting, the system is likely to adapt to this change, with advertising budgets being diverted into new or different marketing strategies. This has been shown with respect to tobacco advertising for example.[29] Analysis of the effects of advertising restrictions needs to take account of these, and other system-level effects. Holder (1999) gives other illustrations of alcohol subsystems at a community level.[30]

Given this complexity, simple before and after population studies of effects on consumption on their own are insufficient for assessing change in the alcohol system. The wider evidence that needs to be considered potentially includes basic science (e.g. eye-tracking studies, and experimental laboratory studies), cross-sectional studies (such as surveys of the association between advertising and branding, and consumption in young people), market research, modelling studies (including models of the relationship between advertising and demand in different markets) and analysis of alcohol industry documents (for example annual reports which frequently describe how the industry is building new markets in developing countries), sales data, and advertising campaigns. It may also draw on the considerable business and economics literature on theory and research in advertising and marketing, some of which is specific to alcohol.[31] [32] [24] Evidence on the more recent diversification of marketing strategies - for example social media integration and geo-targeted advertising – could also be integrated.[33] The evidence base that needs to be drawn upon to describe change in systems is complex and ever-evolving, and approaches to research evidence synthesis have not kept pace with these changes.

A better understanding of how alcohol advertising fits within the wider alcohol system could be fostered by the development of causal loop diagrams, similar to the obesity Foresight model.[34] Any new analysis would also need to consider the high risk of publication bias, given that there are many unpublished alcohol industry studies on the effects of advertising – in fact, such studies are part of the process of developing new advertising campaigns.[35] It would also need to consider the ecological fallacy, to which evaluations of advertising interventions are subject. Advertising is highly targeted in terms of brands and populations, so population-level evaluations may be particularly subject to Type II error because they overlook effects in targeted subgroups (e.g., women, and young people). In support of this

argument, brand-specific exposure has been found to be associated with brand-specific consumption in underage drinkers.[36]

## **CONCLUSION**

This critical analysis of existing alcohol advertising systematic reviews found that previous systematic reviews have synthesised specific bodies of evidence that are largely focused on investigating the effects of (restricting) exposure to alcohol advertising on total quantities of alcohol consumed. They therefore contribute important, but incomplete representations of “the evidence” needed to inform the public health case for policy decisions on alcohol advertising. They are incomplete because advertising aims to influence more than just consumption; advertising is a system-level intervention with multiple interconnecting objectives.

The analysis suggests that—at least in the domain of alcohol advertising—there is an overreliance on narrow forms of evidence and approaches to causality in evidence-based decision making. In this specific case, evaluations of the effectiveness of alcohol advertising should not focus only on sales or consumption as the only relevant outcomes of interest. More generally, the consequence of narrow, linear framings of complex system-level issues is that they can produce misleading answers, as is the case, we believe, with the 2014 Cochrane review.[8]

Syntheses of evidence for system-level interventions require system-level perspectives. One way to facilitate this is to develop a framework and a vocabulary for analysing and reporting ‘system-level risk’ (c.f. population risk) associated with policy decisions. This framework could incorporate an assessment of the effects of the intervention on the system and on relevant subsystems, as well as on individual risk. Such a framework could be transformative in moving forward the science of “prevention systems”, and could find wide application beyond alcohol. It may be of particular value in areas where system-level and individual-level effects, and the trade-offs between them, are a subject of debate, such as e-cigarettes, ‘sin taxes’, and other related public health issues.

### **What is already known on this subject**

Evidence suggests that alcohol advertising influences consumption, particularly among young people, leading to recommendations that it should be restricted or banned.

The alcohol industry disputes this evidence, stating that advertising only influences brand choice, not consumption, and that there is no evidence that such restrictions work.

A recent Cochrane review (Siegfried et al. 2014) concluded that “there is a lack of robust evidence for or against recommending the implementation of alcohol advertising restrictions.”

### **What this study adds**

We argue that assessing the evidence on alcohol advertising and advertising restrictions needs to extend beyond such evaluations of population-based advertising restrictions. Instead, we need a more complete, reliable and actionable representation of the current evidence for the (wider) effects of alcohol advertising, placed firmly in context of the causal system. This needs to take a broader ‘systems perspective’, and to draw on diverse bodies of evidence from wider research literatures than those covered in previously published systematic reviews.

More generally there is a need to develop a framework and a vocabulary for system-level evaluation. This could substantively move forward the science of the evaluation of prevention systems and would find wide application beyond alcohol.

**Acknowledgements:** Lambert Felix

**Contributorship:** MP wrote the first draft and is guarantor. MP and IS revised the next draft, incorporating revisions from other authors, and TL, TM, GJMT, AOM, KS, JT revised and contributed to writing subsequent drafts and the final version.

**Funding:** Medical Research Council (MRC) Methods Research Programme.

**Competing interests:** None declared.

### **References**

1. Orwell G. *Keep the aspidastra flying*. London: Gollancz, 1936.
2. Global strategy to reduce the harmful use of alcohol. World Health Organization, Geneva, 2010.
3. Babor T, Caetano R, Casswell S, et al. *No ordinary commodity*: Oxford University Press, 2010.

4. The Government's Alcohol Strategy. The Stationery Office, 2012. Available at: [www.official-documents.gov.uk](http://www.official-documents.gov.uk). Accessed February 12th 2016.
5. Statistics on Alcohol: England, 2011. The Health and Social Care Information Centre. Available at: <http://www.hscic.gov.uk/catalogue/PUB00144/alco-eng-2011-rep.pdf>. Accessed 2nd March 2016.
6. Anderson P, de Bruijn A, Angus K, et al. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol and alcoholism (Oxford, Oxfordshire)* 2009;**44**(3):229-43
7. Fone D, Dunstan F, White J, et al. Change in alcohol outlet density and alcohol-related harm to population health (CHALICE). *BMC Public Health* 2012;**12**: 428
8. Siegfried N, Pienaar D, Ataguba J, et al. Restricting or banning alcohol advertising to reduce alcohol consumption in adults and adolescents. *Cochrane Database of Systematic Reviews* 2014, Issue 11 Art No: CD010704 DOI: 10.1002/14651858CD010704pub2
9. Bryden A, Roberts B, McKee M, et al. A systematic review of the influence on alcohol use of community level availability and marketing of alcohol. *Health Place* 2012;**18**(2):349-57
10. Smith L, Foxcroft D. The effect of alcohol advertising, marketing and portrayal on drinking behaviour in young people: systematic review of prospective cohort studies. *BMC Public Health* 2009;**9**(51);doi: 10.1186/1471-2458-9-51)
11. Getting the facts right on alcohol advertising and consumption. European spirits industry representative body spirits.eu, November 2012. Available at: <http://spirits.eu/files/98/alcohol-advertising-and-consumption.pdf>. Accessed 2nd March 2016.
12. Institute of Alcohol Studies Factsheet on Marketing and Alcohol, May 2013.
13. Government Response to the House of Commons Health Select Committee Report of Session 2012-13: Government's Alcohol Strategy, September 2012
14. Booth A, Meier P, Stockwell T, et al. Independent review of the effects of alcohol pricing and promotion. Part A: Systematic reviews. Sheffield, UK: School of Health and Related Research, University of Sheffield, 2008.
15. Stautz K, Brown K, King S, et al. Immediate effects of alcohol marketing communications and media portrayals on consumption and cognition: A systematic review and meta-analysis of experimental studies. *BMC Public Health* 2016 **16**:465.
16. Parry C, Pienaar D, Ataguba J, et al. Implications of Cochrane Review on restricting or banning alcohol advertising in South Africa. *South African Medical Journal* 2015;**105**(2) 80-81.
17. Creating customers: finding new ways and places to sell alcohol and new people to buy it. Alcohol Concern Cymru, Cardiff, Wales, 2014.
18. Hastings G, Angus K. Under the influence: the damaging effect of alcohol marketing on young people. London: British Medical Association, 2009.
19. Freudenberg N. *Lethal but legal: corporations, consumption and protecting the public health*. Oxford University Press, Oxford, 2013.
20. Women-The new market: Trends in Alcohol Marketing: EUCAM: European Centre for Monitoring Alcohol Marketing, 2008.
21. Industry Views on Beverage Alcohol Advertising and Marketing, with Special Reference to Young People. Prepared for the World Health Organization by the International Center for Alcohol Policies on behalf of its sponsors. Available at:[http://www.icap.org/portals/0/download/all\\_pdfs/Other\\_Publications/WHO\\_paper\\_annexed.pdf](http://www.icap.org/portals/0/download/all_pdfs/Other_Publications/WHO_paper_annexed.pdf). Accessed 2nd March 2016.

22. Austin E, Chen M-J, Grube J. How does alcohol advertising influence underage drinking? The role of desirability, identification and skepticism. *J Adolesc Health* 2006;**38**(4):376–84
23. Feldwick P. *The anatomy of humbug: how to think differently about advertising*. Leicestershire: Matador, 2015.
24. Wells W. *Measuring advertising effectiveness*. New Jersey: Lawrence Erlbaum Associates, 1997.
25. Gittings J. Putting Systems Thinking into Communications Practice. BLINK 08: The systems thinkign issue. See: <http://www.mediacom.com/en/think/magazine/systems-thinking/>.
26. Verbeke W. Advertising, product quality, and complex evolving marketing systems. *Journal of Consumer Policy* 1992;**15**:143-58
27. Thompson T. Understanding complex systems in viral marketing. See: <http://www.bloomfieldknoble.com/complex/> Accessed 7th June 2016.
28. McCambridge J, Kypri K, Drummond C, et al. Alcohol harm reduction: corporate capture of a key concept. *PLoS Med* 2014;**11**(12): e1001767
29. WHO Report on the global tobacco epidemic, 2013: Enforcing bans on tobacco advertising, promotion and sponsorship, World Health Organisation, Geneva.
30. Holder H. *Alcohol and the Community: A Systems Approach to Prevention*. Cambridge: Cambridge University Press, 1999.
31. Ackoff R, Emshoff J. Advertising Research at Anheuser-Busch, Inc. (1963-68). *Sloan Management Review* 1973;Winter:1-5; available at: <http://uts.cc.utexas.edu/~tecas/syllabi2/adv382jfall2002/readings/ackoff.pdf>
32. Franzen G. *Advertising Effectiveness: Findings from Empirical Research*: NTC Publications, London, 1994.
33. Johnson L. With better targeting, alcohol brands bet big on digital Adweek, June 16th, 2015 Available at: <http://www.adweek.com/news/technology/better-targeting-alcohol-brands-bet-big-digital-165357> Accessed 2nd March 2016
34. Reducing obesity: future choices: Government Office for Science. Available at: <https://www.gov.uk/government/publications/reducing-obesity-future-choices>. Accessed 2nd March 2016, 2007.
35. Hackley C. *Advertising and Promotion*. London: Sage, Ltd, 2015.
36. Siegel M, Ross C, Albers A, et al. The relationship between exposure to brand-specific alcohol advertising and brand-specific consumption among underage drinkers – United States, 2011–2012. *American Journal of Drug and Alcohol Abuse* 2006;**42**(1):4-14

The Corresponding Author has the right to grant on behalf of all authors and does grant on behalf of all authors, an exclusive licence (or non exclusive for government employees) on a worldwide basis to the BMJ Publishing Group Ltd to permit this article (if accepted) to be published in JECH and any other BMJ PGL products and sublicences such use and exploit all subsidiary rights, as set out in its licence (<http://group.bmj.com/products/journals/instructions-for-authors/licence-forms>).

Competing interests: