

## ‘Have a little less, feel a lot better’ – Drinkaware campaign evidence pack

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This document presents the research evidence supporting claims presented as part of the campaign launched in May 2016. The following key areas of health impacts from alcohol are addressed:

Drinking less generates health and wellbeing benefits .....	2
Liver .....	3
Heart .....	5
Weight gain and central obesity.....	7
Erectile Dysfunction.....	8
Mental Health .....	10
Risk from alcohol.....	12
Population comparison data .....	12

## Drinking less generates health and wellbeing benefits

### Claim

Have a little less, feel a lot better

### Evidence

As the detailed evidence in following sections of this document shows, even small reductions in drinking can have positive results on:

- High blood pressure
- The amount of fat and scarring on the liver
- Mental wellbeing
- Weight gain and belly fat

Overall, reducing drinking can lead to much better health outcomes as the following study illustrates:

“In a continuing screening and intervention programme in Malmo, elevated serum-yglutamyltransferase (GGT) values were used for selection of heavy drinkers. The study population consisted of 585 individuals born 1926-1933 with two consecutive GGT values in the upper decile of the GGT distribution, randomly allocated either to an intervention group or to a control group. The subjects in the intervention group were further investigated and 75% of them were judged to have elevated GGT values caused by alcohol consumption.

These individuals were repeatedly encouraged to lower their overall alcohol consumption and GGT measurements were used as biofeedback method in the treatment program. The controls were informed by letter to be restrictive with their alcohol consumption and that they should receive new invitations for measurements of their liver enzymes after 2, 4, and 6 years. The intervention and control groups were well matched and followed over a 2-6-year period. Two and 4 years after the screening investigation, the GGT values in both groups were significantly decreased.

There were differences, however, between the two groups with regard to sick absenteeism, hospitalization, and mortality. **A significant reduction was found in sick absence during 4 years by 80%, in hospital days during 5 years by 60%, and in mortality during 6 years by 50% in the intervention group compared with the control group.** Thus, the intervention program was effective in preventing medico-social consequences of heavy drinking.”

**Reference:** Kristenson, H., Öhlin, H., Hultén-Nosslin, M.B., Trelle, E. and Hood, B. (1983) Identification and intervention of heavy drinking in middle-aged men: Results and follow-up of 24–60 months of long-term study with randomized controls. *Alcoholism: clinical and experimental research*, 7(2): 203-209. [Accessed on 09.05.2016] <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-0277.1983.tb05441.x/abstract>

## Liver

### Claim

#### Video

M.V.O: It doesn't look like much... but it's the body's chemical breakdown factory.

M.V.O: When it tries to break down something that's hard to process like alcohol –

M.V.O: it struggles to do its job and can become fatty and scarred.

M.V.O: It's this damage that has led to around 7,000 deaths in the UK every year in the last decade.

M.V.O: And, regularly having more than just two beers or two glasses of wine can put the liver at risk.

M.V.O: The good news is,

M.V.O: having a little less...

M.V.O: ... can help the liver recover.

#### Radio

Cutting out just a few of those drinks could even help your liver recover

#### Poster

Cutting out just one or two every time you drink could improve your health and even help your liver recover.

### Evidence

- ONS Alcohol-related mortality figures for 2014 show 7235 alcohol-related deaths that are specifically attributable to liver disease. The average over the past three years was 7070.
- A study of the effects of increasing amounts of alcohol on the liver showed that consumption over 40g per day on average (5 units or about 2 pints) increased the risk of fatty liver and alcoholic hepatitis. Drinking more than 80g/day on average (10 units or about 4 pints) and liver cirrhosis increased the risk of fibrosis and cirrhosis of the liver.
- An intervention study showed that a reduction of 8.1 units/week (roughly 3.5 pints or medium glasses of wine per week) significantly improved the health of the liver.

"No significant increase in the incidence of features of ALD [Alcoholic Liver Disease] could be related to all-year daily intake of ethanol below 40 g (40 g equals 1.1 litre of beer, 0.44 litre of wine, and 0.11 litre of spirits). However, daily intake between 40-80 g increased relative liver weight on average 3.1 g/kg of body weight ( $p < 0.02$ ), the frequency of fatty liver from 11.7 to 47.2% [relative risk (RR) = 4.41, and the frequency of mainly slight alcoholic hepatitis up to 16.7% (RR = 7.5). The incidence of both bridging fibrosis and liver cirrhosis increased significantly (RR = 8.8) only when daily intake exceeded 80 g."

**Reference:** Savolainen, V. T., Liesto, K., Männikkö, A., Penttilä, A. and Karhunen, P. J. (1993), Alcohol Consumption and Alcoholic Liver Disease: Evidence of a Threshold Level of Effects of Ethanol.

*Alcoholism: Clinical and Experimental Research*, 17: 1112–1117. doi: 10.1111/j.1530-

0277.1993.tb05673.x. [Accessed on 09.05.2016] <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-0277.1993.tb05673.x/abstract>

“At one year a mean reduction in consumption of alcohol of 18.2 (SE 1.5) U/week had occurred in treated men compared with a reduction of 8.1 (1.6) U/week in controls ( $p < 0.001$ ). The proportion of men with excessive consumption at interview had dropped by 43.7% in the treatment group compared with 25.5% in controls ( $p < 0.001$ ). A mean reduction in weekly consumption of 11.5 (1.6) U occurred in treated women compared with 6.3 (2.0) U in controls ( $p < 0.05$ ), with proportionate reductions of excessive drinkers in treatment and control groups of 47.7% and 29.2% respectively. Reduction in consumption increased significantly with number of general practitioner interventions. At one year the mean value for  $\gamma$ -glutamyltransferase activity had dropped significantly more in treated men (-2.4 (0.9) IU/l) than in controls (+1.1 (1.0) IU/l;  $t = 2.7$ ,  $p < 0.01$ ). Reduction in  $\gamma$ -glutamyltransferase activity tended to increase with number of intervention sessions in men.

**Reference:** Wallace, P., Cutler, S. and Haines, A. (1988) Randomised controlled trial of general practitioner intervention in patients with excessive alcohol consumption. *BMJ*, 297(6649): 663-668. [Accessed on 09.05.2016] <http://www.bmj.com/content/297/6649/663?variant=abstract>

## Heart

### Claim

#### Video

M.V.O: Yup, regularly having just a couple of pints of lager can weaken your heart and shrink your arteries,

M.V.O: This makes it harder for blood to be pumped and pass through, which increases your blood pressure.

M.V.O: And that same pressure can lead to blood clots – which cause strokes and brain damage.

M.V.O: But it's not all bad.

M.V.O: Because having a little less can help lower your blood pressure and reduce the risks.

M.V.O: Have a little less, feel a lot better.

### Radio

Cutting out just a few of those drinks could improve your health, even lowering your blood pressure

### Poster

Cutting out just one or two every time you drink could improve your health and even lower your blood pressure.

### Evidence

A meta-analysis of randomized controlled trials showed that:

- Reducing alcohol intake was associated with a drop in blood pressure.
- The greater the reduction in alcohol, the greater the drop in blood pressure.
- This effect was stronger among those with high blood pressure.

“Overall, alcohol reduction was associated with a significant reduction in mean (95% confidence interval) systolic and diastolic blood pressures of  $-3.31$  mm Hg ( $-2.52$  to  $-4.10$  mm Hg) and  $-2.04$  mm Hg ( $-1.49$  to  $-2.58$  mm Hg), respectively. A dose-response relationship was observed between mean percentage of alcohol reduction and mean blood pressure reduction. Effects of intervention were enhanced in those with higher baseline blood pressure. Our study suggests that alcohol reduction should be recommended as an important component of lifestyle modification for the prevention and treatment of hypertension among heavy drinkers.”

**Reference:** Xin, X., He, J., Frontini, M.G., Ogden, L.G., Motsamai, O.I. and Whelton, P.K. (2001) Effects of alcohol reduction on blood pressure: A meta-analysis of randomized controlled trials.

*Hypertension*, 38(5): 1112-1117. [Accessed on 09.05.2016]

<http://hyper.ahajournals.org/content/38/5/1112.short>

## Claim

### Radio

Cutting out just a few of those drinks could reduce the strain on your heart

### Evidence

A study and meta-analysis of the links between atrial fibrillation and alcohol consumption showed that:

- Increasing consumption of alcohol was linked to increasing risk of atrial fibrillation.
- This analysis held true for non-binge drinkers.

“Over 859,420 person-years of follow-up (1998 to 2009), 7,245 incident AF cases were identified in our own cohort study. The association between alcohol consumption and AF did not differ by sex ( $p$  for interaction = 0.74). Compared with current drinkers of <1 drink/week (12 g alcohol/drink), the multivariable RRs [relative risks] of AF were 1.01 (95% confidence interval [CI]: 0.94 to 1.09) for 1 to 6 drinks/week, 1.07 (95% CI: 0.98 to 1.17) for 7 to 14 drinks/week, 1.14 (95% CI: 1.01 to 1.28) for 15 to 21 drinks/week, and 1.39 (95% CI: 1.22 to 1.58) for >21 drinks/week. Results were similar after excluding binge drinkers. In a meta-analysis of 7 prospective studies, including 12,554 AF cases, the RRs were 1.08 (95% CI: 1.06 to 1.10) for 1 drink/day, 1.17 (95% CI: 1.13 to 1.21) for 2 drinks/day, 1.26 (95% CI: 1.19 to 1.33) for 3 drinks/day, 1.36 (95% CI: 1.27 to 1.46) for 4 drinks/day, and 1.47 (95% CI: 1.34 to 1.61) for 5 drinks/day, compared with nondrinkers.”

**Reference:** Larsson, S.C., Drca, N. and Wolk, A. (2014) Alcohol consumption and risk of atrial fibrillation: a prospective study and dose-response meta-analysis. *Journal of the American College of Cardiology*, 64(3): 281-289. [Accessed on 09.05.2016]

<http://content.onlinejacc.org/article.aspx?articleid=1889060#tab1>

## Weight gain and central obesity

### Claim

#### Video

M.V.O: And, on men, fat tends to go to the belly.

M.V.O: Belly fat is more dangerous than other fats. Not only can it squeeze your organs, it can also release harmful chemicals into your blood.

M.V.O: And this can lead to cardio-vascular disease, diabetes...even dementia.

M.V.O: There's good news though.

M.V.O: Simply having a little less could keep that belly fat in check.

M.V.O: Have a little less, feel a lot better.

#### Radio

Cutting out just a few of those drinks could help you keep that belly fat in check

#### Poster

Cutting out just one or two every time you drink could improve your health and help keep your belly fat in check.

#### Evidence

A review of the role of ectopic fat in cardiovascular disease stated that:

- Men typically lay down fat in the belly;
- Visceral tissue releases fats and by-products directly in to the liver.

“The most important determinant of fat distribution is sex, with males being typified by central and females by peripheral fat distribution.”

“One potential reason for the particularly deleterious effects of visceral obesity may simply relate to its anatomical site and pattern of venous drainage. Visceral adipose tissue drains via the portal venous system, and thus the liver will be exposed to the full and undiluted repertoire of metabolites and secretory products produced by these fat depots.”

**Reference:** Montani, J.P., Carroll, J.F., Dwyer, T.M., Antic, V., Yang, Z. and Dulloo, A.G. (2004) Ectopic fat storage in heart, blood vessels and kidneys in the pathogenesis of cardiovascular diseases. *International Journal of Obesity*, 28: S58-S65. [Accessed on 09.05.2016]  
<http://www.ncbi.nlm.nih.gov/pubmed/15592488>

## Erectile dysfunction

### Claim

#### Video

MVO: Alcohol slows and prevents the release of sex hormones, affecting blood flow to the penis.

MVO: ...and that can make it harder to get and sustain an erection. Worse, alcohol can damage the testes over time.

MVO: This can also lower your testosterone, which inhibits sexual function, making it a big worry in a lot of ways.

MVO: But having a little less to drink help prevent erectile dysfunction and reduce risk of further long-term damage.

### Evidence

- An analysis of sexual behaviour surveys showed that male heavy drinkers were more likely than non-heavy drinkers to report sexual function problems.
- A review of the mechanisms behind the link between alcohol and erectile dysfunction stated that:
  - Long term use of alcohol reduces the release of sex hormones from the pituitary gland;
  - Alcohol inhibits the release of testosterone in humans;
  - Alcohol damages the testicles;
  - Alcohol reduces the level of nitrous oxide which dilates the blood vessels to the penis.

“A larger proportion of male heavy drinkers reported sexual function problem(s) lasting at least 1 month in the past year: 42.3% versus 33.4%; an association that remained after adjustment: AOR: 1.35. Furthermore, male heavy drinkers were more likely to report problems achieving and/or maintaining erections (OR: 1.49, 95% CI: 1.02–2.16, not shown in Table 3), although this was of borderline significance after adjustment (AOR: 1.43, 95% CI: 0.96–2.12,  $P = 0.077$ ).”

**Reference:** Aicken, Nardone and Mercer (2011) Alcohol misuse, sexual risk behaviour and adverse sexual health outcomes: evidence from Britain's national probability sexual behaviour surveys, *J Public Health*, 33(2): 262-271. doi: 10.1093/pubmed/fdq056 [Accessed on 09.05.2016]  
<http://jpubhealth.oxfordjournals.org/content/33/2/262.abstract>

“Studies on endocrine and other biological effects of alcohol report that long-term use of alcohol leads to inhibition of hypothalamic-pituitary-adrenal axis and reduces the release of gonadotropins from the pituitary. Chronic alcohol abuse has been recorded to cause testicular atrophy, inhibition of testosterone production, and inhibition of spermatogenesis, apart from its direct oxidative toxicity.”

“Human studies have shown lower levels of hypothalamic LH-releasing hormone and pituitary LH in adults and inhibition of testosterone secretion by the testes by alcohol.”

“Another mechanism postulated for alcohol's harmful effect on testosterone production is the reduced level of nitric oxide (NO) that acts as a local vasodilator. Oxidation of alcohol, part of alcohol

metabolism, generates oxidants that can contribute to cell damage and play a role in alcohol-induced tissue damage in the testes.”

**Reference:** Grover, S., Mattoo, S.K., Pendharkar, S. and Kandappan, V., 2014. Sexual dysfunction in patients with alcohol and opioid dependence. *Indian journal of psychological medicine*, 36(4): 355-365. [Accessed on 09.05.2016] <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4201785/>

## Mental health

### Claim

#### Video

M.V.O: It's not just a headache you can get from alcohol; it can negatively affect your mental health too.

M.V.O: But, as you drink more, alcohol can change your brain's ability to stay balanced and run smoothly.

M.V.O: The more you drink, the more of your brain is affected, making you nervous and low...

M.V.O: That may stop you sleeping properly, leaving you sluggish and irritable....

M.V.O: Yet, having a little less could really improve your mental health.

#### Radio

Cutting out just a few of those drinks could help improve your mood

#### Poster

Cutting out just one or two every time you drink could improve your health and even help improve your mood.

### Evidence

#### Alcohol's effect on mental health

A meta-review of epidemiological data showed that:

- The link between Alcohol Use Disorder (AUD) and Major Depression (MD) was not solely due to common factors;
- The link appeared to be causal;
- The most plausible association is that AUD increases the risk of MD rather than the other way round;
- Potentially, this link is due to the effects of alcohol on the brain and metabolism.

“Epidemiological data suggest that the linkages between the disorders [AUD and MD] cannot be accounted for fully by common factors that influence both AUD and MD, and that the disorders appear to be linked in a causal manner. Further evidence suggests that the most plausible causal association between AUD and MD is one in which AUD increases the risk of MD, rather than vice versa. Potential mechanisms underlying these causal linkages include neurophysiological and metabolic changes resulting from exposure to alcohol.”

**Reference:** Boden, J. M. and Fergusson, D. M. (2011), Alcohol and depression. *Addiction*, 106: 906–914. [Accessed on 09.05.2016] <http://onlinelibrary.wiley.com/doi/10.1111/j.1360-0443.2010.03351.x/abstract>

Analyses of a World Health Organisation study show the link between alcohol and depression:

- Light to moderate drinking was associated with a lower prevalence of depression and anxiety;
- Excessive alcohol consumption was associated with a higher prevalence of depression;
- This association held after potential confounding variables such as chronic disease were accounted for;
- This association held across different drinking cultures.

“Light to moderate alcohol consumption was associated with a lower prevalence of depression and generalized anxiety disorder compared to abstinence while excessive alcohol consumption was associated with a higher prevalence of depression. This non-linear association was not substantially affected after adjustment for a range of possible confounding variables, including the presence of chronic disease and the current physical status of participants and was evident in different drinking cultures.”

**Reference:** Bellos, S. *et al.* (2013) ‘Cross-cultural patterns of the association between varying levels of alcohol consumption and the common mental disorders of depression and anxiety: Secondary analysis of the WHO Collaborative Study on Psychological Problems in General Health Care’, *Drug and Alcohol Dependence*, 133: 825-831. [Accessed on 09.05.2016]

[http://www.drugandalcoholdependence.com/article/S0376-8716\(13\)00364-5/abstract](http://www.drugandalcoholdependence.com/article/S0376-8716(13)00364-5/abstract)

## Alcohol’s effect on sleep

A meta-review of studies on the effect of alcohol on sleep showed that:

- Alcohol delayed the onset of sleep;
- Alcohol disrupted sleep in the second half of the night;
- Alcohol delayed the onset of rapid eye movement sleep;
- Alcohol reduced the total amount of rapid eye movement (REM) sleep.

“The impact of a single dose of alcohol on nocturnal sleep parameters in healthy volunteers and control samples is to reduce SOL [Sleep Onset Latency], provide a more consolidated sleep in the first part of the night with more disruption in the second half of the night. SWS [Slow Wave Sleep] is increased in the first half of the night at all dosages and the increase in total night SWS is consistently found at higher doses. The reduction in total night REM [Rapid Eye Movement] sleep percentage and the delay in ROL [REM Onset Latency] appear to be the most significant and consistent effects of alcohol on REM sleep”

**Reference:** Ebrahim, I.O. *et al.* (2013) Alcohol and Sleep I: Effects on Normal Sleep, *Alcohol Clin Exp Res*, 37(4):539-49. doi: 10.1111/acer.12006. [Accessed on 09.05.2016]

<http://www.ncbi.nlm.nih.gov/pubmed/23347102>

## Risk from alcohol

### Claim

Risk of alcohol-related mortality at current drinking

Risk of alcohol-related mortality at lower drinking

### Evidence

These data were taken from the review of alcohol-related risks in the UK which underpins the 2016 CMO guidelines. This study, conducted by the School of Health and Related Research (ScHARR) at Sheffield University, reviewed evidence from published meta-analyses of the risks of 43 different alcohol-related conditions. The study applied the findings of these studies to alcohol consumption statistics and also alcohol-related hospitalisation and mortality data to establish the risk level associated with a given level of drinking for both men and women.

All mortality risk figures are taken from the data behind Sheffield Report underpinning the 2016 CMO guidelines on alcohol consumption.

**Reference:** Holmes, J. *et al.* (2016) 'Mortality and morbidity risks from alcohol consumption in the UK: Analyses using the Sheffield Alcohol Policy Model (v.2.7) to inform the UK Chief Medical Officers' review of the UK lower risk drinking guidelines', ScHARR, University of Sheffield. [Accessed on 09.05.2016]

[https://www.shef.ac.uk/polopoly\\_fs/1.538671!/file/Drinking\\_Guidelines\\_Final\\_Report\\_Published.pdf](https://www.shef.ac.uk/polopoly_fs/1.538671!/file/Drinking_Guidelines_Final_Report_Published.pdf)

## Population comparison data

### Claim

N% of men/women drink less than this amount.

### Evidence

The percentage of the population (male or female) who drink less than a given amount is calculated based on data on self-reported drinking data obtained in November/December from a nationally representative sample of adults in the UK.

Drinkaware commissioned Ipsos MORI to conduct a survey of 2,303 UK adults aged 18-75, using an online panel who were asked about their drinking habits, including a detailed examination of their weekly drinking. Quotas were set and the final data were weighted to reflect the known population of UK adults aged 18-75.

**Reference:** Further information on the study can be found in the Drinkaware Monitor 2015 report:

[https://www.drinkaware.co.uk/media/1553/drinkaware\\_monitor-2015-reportv2.pdf](https://www.drinkaware.co.uk/media/1553/drinkaware_monitor-2015-reportv2.pdf)