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Harms from other people's drinking: an international survey of their occurrence, impacts on feeling safe and legislation relating to their control

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3 **Harms from other people's drinking: an international survey of their**
4 **occurrence, impacts on feeling safe and legislation relating to their control**
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ABSTRACT

Objective- To examine factors associated with suffering harm from another person's alcohol consumption and explore how suffering such harms relates to feelings of safety in nightlife.

Design- Cross-sectional opportunistic survey (Global Drug Survey) using an online anonymous questionnaire in eleven languages promoted through newspapers, magazines and social media.

Subjects- Individuals (participating November 2014-January 2015) aged 18-34 years, reporting alcohol consumption in the last 12 months and resident in a country providing ≥ 250 respondents (n=21 countries; 63,725 respondents).

Main outcome measures- Harms suffered due to others' drinking in the last 12 months, feelings of safety on nights out (on the way out, in bars/pubs, in nightclubs and when travelling home) and knowledge of over-serving laws and their implementation.

Results- In the last 12 months >40% of respondents suffered at least one aggressive (physical, verbal or sexual assault) harm and 59.5% any harm caused by someone drunk. Suffering each category of harm was higher in younger individuals and those with more harmful alcohol consumption patterns. Males were more likely than females to have suffered physical assault (9.2% vs. 4.7; $p < 0.001$) with females much more likely to suffer sexual assault or harassment (15.3% vs. 2.5%; $p < 0.001$).

Females were more likely to feel unsafe in all nightlife settings with 40.8% typically feeling unsafe on the way home. In all settings feeling unsafe increased with experiencing more categories of aggressive harm by a drunk person. Only 25.7% of individuals resident in countries with restrictions on selling to drunks knew about such laws and 75.8% believed that drunks usually get served alcohol.

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3 **Conclusions-** Harms from others' drinking are a threat to people's health and well-
4 being. Public health bodies must ensure that such harms are reflected in measures of
5 the societal costs of alcohol and advocate for the enforcement of legislation designed
6 to reduce such harms.
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STRENGTHS AND LIMITATIONS OF THIS STUDY

- The Global Drug Survey is an established survey that allows the collection of comparative data on alcohol and drug-related issues from a large international sample of individuals.
- The sample includes a high proportion of younger individuals who can be difficult to capture in telephone or face-to-face surveys.
- The survey tool measures a unique combination of harms from others' drinking, their relationships with feelings of safety in nightlife situations and respondents' knowledge and observations on aspects of alcohol legislation.
- While the sample size is large, participation is self-selected and therefore the sample should not be considered representative of any specific population.
- In studies of this design, reliability of responses cannot be confirmed; although previous audits of the survey suggest deliberate sabotage (i.e. individuals submitting multiple completions) is not an issue.

INTRODUCTION

Globally, alcohol is estimated to result in 3.3 million deaths each year. Such deaths arise from over 200 disease and injury related conditions, wholly or partly caused by alcohol.[1, 2] Research continues to add more conditions to this total with studies identifying and quantifying additional harms caused by alcohol not just to the drinker themselves, but also to individuals affected by the drinking of others.[1, 3, 4] Such harms include alcohol-related violence (e.g. nightlife and domestic violence, elder and child abuse and neglect,[5]) unintentional injury of others (e.g. road traffic and work place incidents,[6]) property damage,[7] and the toxic effects of alcohol transferring to others (i.e. foetal harms through maternal alcohol consumption).[8] Importantly, in addition to physical and toxic assault, drinkers can impose harms on others' mental health and well-being through, for example, fear of assault, concern for other people's safety, neglect or exploitation resulting from drinking by carers and even disturbance to sleep.[9] A survey on harms to others found that increased exposure to heavy drinkers was associated with lower levels of both well-being and health status. Moreover, the prevalence of such harms was higher (18%) than harms from individuals' own drinking (12%), especially among young people and women.[10, 11]

A variety of studies have established that harms caused by others' drinking are common events. In a survey of Australian adults, 70% had been adversely affected by a stranger's drinking in the last year with 30% affected by the drinking of someone they knew.[12] A study in the USA indicated that 53% of individuals had experienced one or more harms from others' drinking over their life course.[13] Other studies in Canada, Scotland, Norway and Ireland,[3, 14-16] all identify high levels of harms from others' drinking and while such studies are not directly comparable (i.e. each

measures different harms), together they demonstrate this is an international phenomenon. The impact of such harms is also substantive. Estimates for the European Union suggest that 5,564 men and 2,147 women (aged 15-64 years) died as a result of other people's drinking in a single year.[17] Such deaths represent only the tip of an iceberg; in Australia (2005) while 367 people died due to others' drinking, 14,000 individuals were hospitalised and an estimated 10.5 million suffered some negative effects.[18] Although all demographic groups appear affected by harms from others' drinking, studies suggest that males are especially at risk,[3] along with younger individuals.[15]

While increasing numbers of countries are starting to administer local and national surveys of harms from others' drinking, both descriptive epidemiology and understanding of effective prevention measures require substantive development. Even where policy level interventions have been established for decades (e.g. legislation preventing the service of alcohol to inebriated individuals) research suggests implementation is limited.[19, 20] Consequently, the World Health Organization has identified research on harms to others from drinking as a key component in their Research Initiative on Alcohol, Health and Development.[1]

The Global Drug Survey (GDS) is a large, international, annual survey covering both alcohol and drug use which is self-completed largely by younger individuals on a self-nominating and anonymous basis. The 2015 iteration included a module of questions on harms resulting from other people's alcohol consumption. Using results from this module this study examines harms individuals have suffered in the last 12 months as a result of others' drinking and how these relate to individuals' own alcohol

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3 consumption. Focusing specifically on a subset of aggressive harms (physical, sexual
4 and verbal assault), analyses explore how experiencing such harms from others'
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7 drinking relates to personal feelings of safety when going out to socialise. Finally, we
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10 explore whether individuals are aware of over-serving legislation developed to reduce
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12 harms associated with inebriation and whether such legislation is enforced in their
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14 social environments.

15 16 17 18 **METHODS** 19

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21 The GDS is an anonymous, online survey widely promoted in partnership with a
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23 range of media including national newspapers, magazines, web sites and social media
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25 outlets.[21] The first iteration of the GDS collected data in 2011 and subsequently has
26
27 been used to identify and explore emerging trends in drug and alcohol related harm.
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29 [22] The most recent survey (GDS 2015) collected data during November 2014-
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31 January 2015 and was available in eleven languages (English, German, Greek, Polish,
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33 French, Italian, Spanish, Portuguese, Flemish, Hungarian and Danish). The sample
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35 was opportunistic and not intended to be representative of any specific population, but
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37 as it was a self-selected sample, those with social interests in alcohol and/or drugs are
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39 likely to be over-represented. Other publications provide further detail on the utility,
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41 design and limitations of the GDS.[21, 23, 24] At the point of analysis for this study,
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43 89,509 completions of GDS 2015 were available for inclusion. However, in order to
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45 utilise a more defined dataset, analyses were limited to those aged 18-34 years,
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47 reporting gender (male or female), who had consumed alcohol in the last 12 months
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49 and were resident in a country contributing at least 250 responses to the survey (see
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51 Supplementary table A, n=21 countries). The final sample size was therefore
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56 n=63,725 (71.2% of all available completions).
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5 The GDS includes extensive substance use screening questions measuring the types
6 and quantities of licit and illicit drugs consumed.[21] However, analyses within this
7 study focus on measures of alcohol use and a range of questions on harms from
8 others' drinking, feeling of safety on nights out and both knowledge and
9 implementation of laws to prevent drunkenness in countries of residence (here sales to
10 inebriated individuals). For alcohol, individuals completed the AUDIT (Alcohol Use
11 Disorders Identification Test) questionnaire that collects measures of drinking levels,
12 dependence and harms.[25] Individuals were rated in score categories of 0–7, 8–15,
13 16–19 and 20+ hereon referred to as lower risk, increasing risk, higher risk and
14 possible dependence. Harms due to others' drinking are measured through the
15 questions 'In the last 12 months have you been negatively affected by someone else's
16 drink in any of the following ways: 1) physically assaulted by someone who was
17 drunk; 2) sexually harassed or assaulted by someone who was drunk, 3) called names
18 or insulted by someone who was drunk; 4) injured accidentally by someone who was
19 drunk; 5) had property damaged by someone who was drunk; 6) involved in a traffic
20 accident caused by a drunk driver or pedestrian; and 7) kept awake by drunken noise.
21 A combined aggressive harms category for anyone experiencing physical (1), sexual
22 (2) or verbal (3) harms from others' drinking was created to examine how
23 experiencing such aggressive actions may impact feelings of safety when on a night
24 out. Feelings of safety on a night out were measured using separate Likert scales
25 (1=very unsafe to 5=very safe) for: on the way out; in bars/pubs; in nightclubs; and
26 travelling home after a night out. In order to specifically examine impressions of low
27 safety, individuals were categorised as feeling very unsafe/unsafe (score 1 or 2) or
28 safer (score 3-5). Finally, individuals were asked if it was illegal for servers to sell
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3 alcohol to drunk people in their country and whether they thought someone who was
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5 obviously drunk would usually be served alcohol.
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10 Demographics included in analyses were age (categorised as 18-24, 25-29, 30-34
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12 years), sex, country of residence and basic educational attainment (whether
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14 individuals had at least a high school/secondary school education; here used as a
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16 socio-economic proxy).[26] Preliminary data exploration examined potential
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18 duplicate responses. Across demographics combined with key variables used in
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20 analyses here, 0.7% (n=467) of respondents had a response set identical to at least one
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22 other individual. Whether these were duplicate responses or different individuals
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24 could not be established. However these levels were considered low enough to not
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26 substantively affect findings and consequently such cases were retained in the data.
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28 Analyses were undertaken in SPSS (v21) and used chi squared and logistic regression
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30 modeling. Ethical approval for the GDS 2015 was granted by the Psychiatry, Nursing
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32 and Midwives Ethics sub committee at Kings College London.
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38 RESULTS

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40 In both genders, prevalence of all types of harms from others' drinking is highest in
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42 the 18-24 year age category and reduces with age (Table 1). Being verbally insulted
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44 was the most frequent harm for both males and females. Males were nearly twice as
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46 likely as females to report being physically assaulted by someone drunk in the last 12
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48 months, with over 1 in 10 males aged 18-24 having suffered such an assault. In
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50 contrast females were over six times more likely than males to have been sexually
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52 assaulted or harassed by someone drunk (Table 1). Over 1 in 6 females aged 18-24
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54 years had suffered such sexual harassment in the last 12 months. A combined
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Table 1. Overall prevalence of harms suffered as a result of others' drinking in last 12 months stratified by age and sex

		Aggressive harms from others' drinking				Other harms from others' drinking					All harms [§]	
		Physically assaulted	Sexually harassed or assaulted	Verbally insulted	Any aggressive harm [†]	Unintended injury	Traffic incident	Kept awake	Property damaged	Any other harm [‡]		
n												
All		63725	7.40	7.71	39.40	43.71	7.73	0.93	29.29	12.01	38.27	59.54
Female												
Age	18-24	15461	5.67	17.73	40.70	48.63	11.84	0.94	36.45	13.41	46.68	66.75
	25-29	7128	3.72	13.20	34.22	40.31	6.10	0.74	33.53	8.00	39.28	58.85
	30-34	3532	2.35	8.75	27.66	31.91	3.14	0.54	31.74	7.11	35.31	50.96
	All	26121	4.69	15.28	37.17	44.10	9.10	0.84	35.02	11.08	43.12	62.46
	X²		91.724	212.131	245.670	383.406	369.300	6.719	37.624	210.441	210.581	359.960
	P		***	***	***	***	***	***	***	***	***	***
Male												
Age	18-24	20581	11.88	2.76	45.72	48.74	9.08	1.17	26.07	15.30	38.03	62.43
	25-29	10593	7.06	2.26	38.45	40.35	4.62	0.90	25.68	10.35	33.03	55.00
	30-34	6430	4.67	1.74	29.83	31.60	3.00	0.65	22.22	7.96	27.96	45.89
	All	37604	9.21	2.45	40.95	43.45	6.78	0.93	25.30	12.65	34.90	57.51
	X²		388.955	23.715	549.649	643.196	395.358	14.649	39.487	309.567	241.243	585.957
	P		***	***	***	***	***	***	***	***	***	***
Male vs Female	X²		457.136	3570.041	92.912	2.678	115.810	4.702	702.440	36.011	441.058	156.912
	P[¶]		***	***	***	ns	***	ns	***	***	***	***

[†]Any aggressive harm includes any individual answering yes to physical assault, sexual harassment or assault or verbally insulted. [‡]Other harms includes unintentional injury, traffic incident, being kept awake and having property damaged. [§]All harms includes any individual reporting one or more of the seven harm categories. [¶]For males and females P values compare differences in overall prevalence between males and females. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant

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3 aggressive harms category including any physical, sexual or verbal assault in the last
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5 12 months (Table 1) identified that over 40% of individuals had suffered at least one
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7 such assault; although overall prevalence did not differ between sexes (Table 1). For
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9 other harms females were substantively more likely to suffer unintended injury and
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11 being kept awake, and males were marginally more likely to report property damage
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13 (Table 1). The least frequently reported harm was from a traffic incident where only
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15 males age 18-24 years exceeded one percent in the last 12 months. Nearly 6 in 10
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17 individuals reported at least one negative impact of others' drinking in the last 12
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19 months (Table 1).
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25 Individuals' alcohol consumption (AUDIT score) was strongly related to their risk of
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27 suffering harms from others' drinking (Table 2). Each individual category of harm
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29 increased with increasing AUDIT score category. Thus, risks of physical assault by
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31 someone drunk were over five times higher in possible dependence versus lower risk
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33 drinking categories (Table 2). Individuals with lower educational attainment were
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35 more likely to report suffering physical assault, unintended injury and traffic incidents
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37 as a result of others' drinking, but less likely to report sexual assault/harassment or
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39 being kept awake (Table 2). Using logistic regression modelling to control for
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41 demographic confounders (Table 3; Supplementary Table B), younger age remained
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43 strongly associated with higher risks of all harms from others' drinking along with
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45 higher AUDIT categories. Males were significantly more likely to experience
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47 physical assault, verbal insult, traffic incident and property damage due to someone
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49 else's drinking in the last 12 months, with females at higher risk from sexual
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51 assault/harassment, unintentional injury and being kept awake (Table 3). Having a
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53 high school education reduced the odds of experiencing physical assault,
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Table 2. Relationship between harms suffered as a result of others drinking in last 12 months and Alcohol Use Disorders Identification Test (AUDIT) score and educational achievement†

	n	Aggressive harms from others' drinking				Other harms from others' drinking					All harms
		Physically assaulted	Sexually harassed or assaulted	Verbally insulted	Any aggressive harm	Unintended injury	Traffic incident	Kept awake	Property damaged	Any other harm	
AUDIT (score)											
Lower risk (0-7)	28048	3.80	6.33	31.12	34.61	4.47	0.55	27.15	7.83	32.74	51.077
Increasing risk (8-15)	25622	8.39	8.27	43.47	48.33	8.47	0.89	30.54	13.14	40.63	64.437
Higher risk (16-19)	4582	14.03	9.95	54.45	59.78	14.49	1.88	33.57	21.54	50.11	74.531
Dependence (20+)	3177	20.68	12.34	60.12	65.66	21.03	3.12	36.07	26.53	54.64	77.432
χ^2		1690.268	214.862	1987.737	2268.329	1516.174	254.624	190.337	1520.194	1052.194	1940.784
P		***	***	***	***	***	***	***	***	***	***
Educational attainment											
No high school education	6530	10.05	6.23	39.63	43.89	8.50	1.32	22.53	12.48	33.23	56.769
High school or higher	56337	7.07	7.86	39.46	43.74	7.64	0.88	30.09	11.96	38.89	59.904
χ^2		76.146	21.734	0.074	0.051	6.035	12.401	161.729	1.48	79.27	23.882
P		***	***	ns	ns	ns	***	***	ns	***	***

†Some individuals (3.6%) did not answer all AUDIT questions and therefore an AUDIT score could not be calculated. For educational attainment 1.4% of individuals did not provide data. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant

Table 3. Logistic regression model for Alcohol Use Disorders Identification Test (AUDIT) score and demographic relationships with harms suffered as a result of others' drinking in last 12 months

	Aggressive harms from others' drinking								Other harm from others' drinking								All harms			
	Physically assaulted		Sexually harassed or assaulted		Verbally insulted		Any aggressive harm		Unintended injury		Traffic incident		Kept awake		Property damaged		Any other harm		All harms	
	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P		
Age[†]	25-29		0.64 *** (0.59-0.69)	0.79 *** (0.73-0.85)	0.77 *** (0.74-0.80)	0.74 *** (0.71-0.77)	0.54 *** (0.50-0.58)	0.89 ns (0.73-1.09)	1.04 ns (1.00-1.09)	0.67 *** (0.63-0.71)	0.86 *** (0.82-0.89)	0.78 *** (0.75-0.81)								
	30-34		0.42 *** (0.38-0.47)	0.53 *** (0.47-0.59)	0.56 *** (0.53-0.59)	0.53 *** (0.50-0.55)	0.32 *** (0.28-0.36)	0.63 ** (0.47-0.84)	0.88 *** (0.84-0.93)	0.55 *** (0.51-0.60)	0.70 *** (0.66-0.73)	0.56 *** (0.54-0.59)								
Sex[‡]	Male		1.94 *** (1.80-2.08)	0.13 *** (0.12-0.14)	1.13 *** (1.09-1.17)	0.92 *** (0.89-0.95)	0.68 *** (0.64-0.72)	1.10 ns (0.92-1.32)	0.66 *** (0.64-0.68)	1.16 *** (1.10-1.22)	0.71 *** (0.69-0.74)	0.78 *** (0.75-0.81)								
High school[§]	Yes		0.72 *** (0.65-0.79)	1.07 ns (0.95-1.20)	0.95 ns (0.90-1.01)	0.95 ns (0.90-1.01)	0.78 *** (0.70-0.86)	0.63 *** (0.49-0.81)	1.29 *** (1.21-1.38)	0.91 * (0.83-0.99)	1.13 *** (1.06-1.20)	1.04 ns (0.98-1.10)								
AUDIT score	Increasing risk		2.08 *** (1.92-2.25)	1.63 *** (1.52-1.75)	1.65 *** (1.59-1.71)	1.74 *** (1.68-1.81)	1.89 *** (1.75-2.03)	1.51 *** (1.23-1.87)	1.13 *** (1.09-1.18)	1.65 *** (1.55-1.75)	1.35 *** (1.30-1.40)	1.69 *** (1.63-1.75)								
	Higher risk		3.60 *** (3.23-4.00)	2.17 *** (1.92-2.44)	2.56 *** (2.40-2.74)	2.78 *** (2.60-2.97)	3.33 *** (3.00-3.70)	3.10 *** (2.35-4.07)	1.25 *** (1.16-1.34)	2.90 *** (2.66-3.16)	1.92 *** (1.80-2.06)	2.71 *** (2.52-2.92)								
	Dependence		5.80 *** (5.20-6.48)	2.90 *** (2.55-3.30)	3.26 *** (3.02-3.52)	3.62 *** (3.34-3.92)	5.17 *** (4.64-5.75)	5.27 *** (4.05-6.85)	1.31 *** (1.21-1.42)	3.74 *** (3.41-4.11)	2.22 *** (2.05-2.40)	3.13 ** (2.87-3.43) *								

Reference categories: [†]18-24 years; [‡]female; [§]did not attend high school; ^{||}lower risk. Country of residence was also included in the logistic regression model and AORs (Adjusted Odds Ratios) for countries are included in Supplementary Table B. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

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3 unintentional injury, traffic incident and property damage but increased the odds of
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5 being kept awake.
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10 Overall, the proportion of respondents feeling unsafe/very unsafe on a night out in
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12 their country of residence increases from 4.9% while in bars, to 28.6% on the way
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14 home (Table 4). Using logistic regression modelling to control for demographic
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16 confounders (Table 5; Supplementary Table C) feeling unsafe was more frequently
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18 reported in all settings by females, those without a high school education and younger
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20 age groups (apart from in bars). For alcohol consumption, individuals with the lowest
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22 AUDIT scores were most likely to feel unsafe in bars and nightclubs but both lowest
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24 and highest AUDIT categories felt more unsafe on the way out and way home (Table
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26
27 5). Experiencing more categories of harms from others' drinking in the past 12
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29 months was associated with feeling unsafe in all settings (Tables 4 and 5). Thus,
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31 feeling unsafe on the way home rises from 25.8% of those experiencing no harms to
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33 46.5% of those experiencing harms in all three aggressive categories (physically
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35 assaulted, sexually harassed/assaulted, verbally insulted) in the last 12 months (Table
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38 4).
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43 Finally, knowledge of laws to prevent extreme drunkenness and its consequences
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45 through prohibiting sales of alcohol to already inebriated individuals were examined.
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47 Based on data from the Global Status Report on Alcohol and Health,[1] sales to
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49 inebriated individuals are prohibited in 19 of the 21 countries included here
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51 (Supplementary Table A). However, only a quarter of respondents (25.7%) from these
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53 19 countries knew about such restrictions (Supplementary Table A; vs. 8.8% of
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55 individuals from the two countries without legislation believing restrictions were in
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Table 4. Variations by socio-demographics and AUDIT category in proportions of individuals feeling unsafe/very unsafe at different points of a night out

		Feel unsafe or very unsafe [†]			
		On way out	In bars	In nightclubs	On way home
	n	62851	62610	61010	62321
	All	6.83	4.90	14.41	28.59
Age	18-24	7.51	5.03	15.24	32.20
	25-29	6.00	4.61	13.75	25.13
	30-34	5.84	4.95	12.56	21.75
	χ^2	59.653	4.559	51.526	549.68
	P	***	ns	***	***
Gender	Female	9.15	5.98	17.10	40.80
	Male	5.21	4.15	12.55	20.16
	χ^2	369.738	109.193	247.676	3144.88
	P	***	***	***	***
Education	No high school	7.82	7.39	17.58	27.58
	High school or higher	6.73	4.60	14.00	28.68
	χ^2	10.729	95.152	57.091	3.398
	P	***	***	***	ns
AUDIT (score)	Lower risk (0-7)	7.09	5.96	16.58	28.90
	Increasing risk (8-15)	6.27	3.77	12.36	27.15
	Higher risk (16-19)	6.87	3.60	12.32	28.91
	Dependence (20+)	7.62	4.84	14.55	35.34
	χ^2	18.181	153.236	202.818	96.71
P	***	***	***	***	
Aggressive harms from others' drinking count[‡]	0	6.49	4.76	13.09	25.75
	1	7.09	4.71	14.96	30.64
	2	7.57	5.88	19.13	36.59
	3	10.30	10.33	26.75	46.52
	χ^2	26.92	58.664	235.704	458.033
	P	***	***	***	***

AUDIT=Alcohol Use Disorders Identification Test. [†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with individuals categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). [‡]Harms from others' drinking count is the total number of harms categories reported from physically assaulted, sexually harassed or assaulted and verbally insulted. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

Table 5. Logistic regression analysis of factors associated with feeling unsafe/very unsafe[†] at different times during a night out

		On way out			In bars			In nightclubs			On way home						
		AOR	95%CI _s	P	AOR	95%CI _s	P	AOR	95%CI _s	P	AOR	95%CI _s	P				
Age[‡]	25-29	0.84	0.78	0.91	***	0.93	0.85	1.02	ns	0.92	0.87	0.97	**	0.74	0.71	0.78	***
	30-34	0.84	0.76	0.93	***	1.04	0.93	1.16	ns	0.82	0.77	0.88	***	0.64	0.61	0.68	***
Sex[§]	Male	0.55	0.51	0.58	***	0.73	0.68	0.79	***	0.75	0.71	0.79	***	0.35	0.33	0.36	***
High school[¶]	Yes	0.62	0.55	0.69	***	0.49	0.44	0.55	***	0.64	0.60	0.70	***	0.75	0.70	0.80	***
AUDIT (score)[¶]	Increasing risk	0.84	0.78	0.91	***	0.62	0.56	0.67	***	0.68	0.65	0.72	***	0.87	0.84	0.91	***
	Higher risk	0.87	0.76	0.99	*	0.56	0.47	0.66	***	0.65	0.59	0.72	***	0.89	0.82	0.96	**
	Dependence	0.86	0.74	1.00	ns	0.65	0.54	0.78	***	0.71	0.63	0.79	***	1.10	1.01	1.20	*
Aggressive harms from others' drinking count^{¶¶}	1	1.25	1.16	1.34	***	1.15	1.06	1.26	**	1.28	1.21	1.35	***	1.36	1.30	1.41	***
	2	1.44	1.28	1.63	***	1.58	1.38	1.81	***	1.77	1.63	1.92	***	1.77	1.66	1.90	***
	3	2.00	1.54	2.61	***	2.97	2.28	3.86	***	2.60	2.17	3.11	***	2.30	1.95	2.72	***

[†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with individuals categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). See methods for more details. Reference categories: [‡]18-24 years; [§]female; [¶]did not attend high school; ^{¶¶}0. Country of residence was also included in the logistic regression model and AORs (Adjusted Odds Ratios) for countries are included in Supplementary Table C. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant. Aggressive harms from others' drinking count is the total number of harms categories reported from; physically assaulted, sexually harassed or assaulted and verbally insulted.

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3 place, $X^2=620.181$, $P<0.001$). Across all 19 countries with restrictions more than three
4
5 quarters of individuals (75.8%) believed that drunks usually get served alcohol;
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7 marginally more than in countries with no such restriction (71.3%; $X^2=44.040$,
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9 $P<0.001$). At a country level, there is a strong correlation between proportions in a
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11 country thinking it is illegal to be served alcohol when drunk and the proportion
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13 identifying that drunks are not usually served ($R^2=0.326$, $P=0.004$).
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18 DISCUSSION

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20 The 2030 Agenda for Sustainable Development commits all countries in the United
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22 Nations to Sustainable Development Goals that include: making cities safe; halving
23
24 deaths and injuries from road traffic accidents; and reducing all forms of violence
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26 with particular emphasis on violence against women and girls.[27] Critically, global
27
28 definitions of violence and sexual violence include both threat and use of physical
29
30 force, as well as their impacts on physical or psychological harm.[28] Our study
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32 found that harms caused by others' drinking routinely impacts on the safety, well-
33
34 being (Table 2) and feelings of security (Table 4) of substantive numbers of young
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36 respondents. In total, 9.2% of men and 4.7% of women surveyed reported being
37
38 physically assaulted by someone who was drunk and over one in seven women had
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40 been sexually assaulted or harassed by a drunk person in the past 12 months (Table
41
42 1). While the severity of such events was not recorded here, results elsewhere identify
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44 alcohol is a major component in the perpetration of sexual violence including
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46 rape.[29] Moreover, as with other surveys, other harms that may be considered
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48 relatively minor were substantively more common (e.g. 29.3% kept awake by
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50 drunken noise).[9, 10] Evidence indicates that such harms, even on an occasional
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52 basis, may impact health and quality of life.[30]
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5 While suffering harms from others' drinking varied with age, sex and educational
6 status, individuals' own alcohol consumption patterns also affected risk (Table 2 and
7 3). Higher risk drinkers had odds of being physically assaulted by an intoxicated
8 individual 5.8 times higher than those in the lower risk category. Unintended injury
9 by a drunk, and harms from a traffic incident caused by someone else's drinking were
10 also more than five times more likely in higher risk drinkers (vs. lower risk drinkers).
11 These findings are consistent with those elsewhere suggesting risks of suffering harm
12 from others' drinking increase in those who drink more themselves.[31] While the
13 GDS study could not identify causality, a number of factors link heavy alcohol
14 consumption and increased harms from others' drinking. Thus, heavy drinkers: have a
15 reduced ability to recognise warning signs of, and so avoid, potentially violent or
16 dangerous situations; may visit settings patronised by heavy drinkers more often; or
17 may themselves drink heavily to cope with harms they already suffer from a drunk
18 (e.g. living with an abusive or neglectful drinker).[32-34] Raising people's awareness
19 of how their own heavy drinking may make them more vulnerable to harms from
20 other drinkers could encourage behavioural change but is poorly explored as a public
21 health interventions.
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45 Attempts to better control alcohol misuse often focus on the harms drinkers cause to
46 themselves with harms to others being neglected.[12] Consequently, accusations of
47 'nanny states' are raised by the alcohol industry insinuating that governments
48 interfere with choices individuals should make about their own health.[35] However,
49 this ignores the legitimate role governments have in ensuring individuals are protected
50 from harms caused by others' drinking and how poorly controlled alcohol promotion,
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3 pricing and access undermines this role.[36, 37] Here in an international sample, over
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5 40% of women felt unsafe or very unsafe on the way home after a night out (Table 4).
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7 The vast majority of individuals were from high-income countries where legislation,
8
9 problem orientated policing and environmental adaptations such as lighting,
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11 pedestrianisation and reliable public transport should provide safety and security even
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13 in the early hours of the morning. However, respondents' fears are largely justified. In
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15 England and Wales for instance, 53% of the 1.3 million violent incidents occurring in
16
17 the year 2013/14 were alcohol-related, increasing to 64% of those when the assailant
18
19 was a stranger and 84% of those between midnight and 6am.[38]
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25 Feeling unsafe or very unsafe on the way out, in bars and nightclubs, and on the way
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27 home all increased substantively with the number of aggressive harms individuals had
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29 suffered through others' drinking (limited to physically assaulted, sexually
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31 harassed/assaulted, verbally insulted; Table 4 and 5). How much such feelings
32
33 actually impact on individuals' choices to go out at all, or only visit selected
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35 destinations was not measured here. However, feelings of safety have been identified
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37 as a key issue in choice of both tourism destinations,[39] and nights out in
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39 individuals' country of residence, with for example a survey of around 30,000
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41 individuals in England finding nearly half avoided their local town or city centre at
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43 night because of the drunken behaviour of others.[40] Consequently, while some
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45 licensed venues in nightlife settings may thrive on unrestricted sales to individuals
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47 regardless of their drunken state,[41] other businesses including restaurants and better
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49 regulated bars and clubs are likely to be losing potential customers.
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3 Links between inebriation and increased risks of disturbance including committing
4 violence have been documented since at least ancient Egyptian times,[42] and
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7 legislation aimed at protecting the peace though preventing alcohol sales to those
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10 already drunk can date back centuries.[43] However, despite 19 of the 21 countries
11
12 included in these analyses having laws restricting sales to drunks, only 25.7% of
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14 individuals in these countries knew about the laws (Supplementary Table A). Further,
15
16 over three quarters of individuals from these countries thought that inebriated
17
18 individuals would usually be served alcohol. Legislation relating to serving drunks
19
20 can play an important role in reducing harms in nightlife with promotion of its use
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22 already reported as both effective and cost-effective in the reduction of anti-social
23
24 behaviour.[19, 44] Some countries are now using such legislation on a regular basis
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26 (e.g. Finland and Sweden,[45, 46]). However, results here suggest internationally
27
28 there is an urgent need to increase both public and hospitality industry awareness and
29
30 critically enforcement of over-serving legislation.
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36 The study has a number of important limitations. Respondents were from an
37
38 opportunistic sample and should not be considered representative of any country or
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40 region. Consequently, analyses have focused on predictors of harms from others'
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42 drinking and feelings of safety at an individual level rather than establishing measures
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44 of population prevalence in any country. Our analyses provided only one general
45
46 measure of social-economic status (here high school educational attainment).
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49 However, while it suggested a protective impact of higher socio-economic status on
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51 experiencing some harms (e.g. physical assault; Table 3) and increased feeling of
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53 safety when out (Table 5), it can only be considered a rough socio-economic proxy.
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56 Questions were also limited to whether individuals had experienced harms at all and
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3 therefore levels of severity were not available for analysis. Moreover, we cannot rule
4
5 out the impact of recall bias or deliberate misreporting on results. Finally, as on online
6
7 questionnaire it is possible that the same individual completed the form multiple
8
9 times. However, less than 1% of the sample provided identical response sets across
10
11 demographics and key variables used in these analyses. This is consistent with
12
13 previous audits of the GDS.[47]
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16 17 18 **CONCLUSIONS** 19

20 This study adds further international evidence to a growing body of studies
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22 identifying high levels of harms suffered as a result of other people's drinking.
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24 Despite such evidence, harms from, for instance, violence committed by drunks are
25
26 frequently omitted from estimates of alcohol-attributable burdens of disease.[1] They
27
28 are however a critical part of establishing the right balance between individuals'
29
30 rights to consume alcohol and the responsibilities of governments to protect
31
32 individuals from the harms drinkers may cause others. The 2030 Agenda for
33
34 Sustainable Development connects violence and insecurity with poor governance and
35
36 calls for nations to strengthen the prevention and treatment of the harmful use of
37
38 alcohol.[27] Results here suggest that harms from others' drinking are a common
39
40 threat to people's health and well-being, that large proportions of individuals
41
42 (especially women) feel unsafe returning from a night out even in developed countries
43
44 and that legislation developed in part to tackle such issues is typically ignored. Public
45
46 health bodies must ensure that harms caused by others' drinking are fully reflected in
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48 measures of the societal costs of alcohol, and through partnership with other public
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50 sector bodies that legislation is effectively communicated and enforced.
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DATA SHARING STATEMENT

The Global Drug Survey will consider all applications for access to original study data on a case by case basis.

CONTRIBUTORS

AW is the founder of the Global Drug Survey and AW and JF developed and directed it. MAB, KH, AW conceived and designed the survey questions on violence and alcohol. JF coordinated data collection and cleaning. MAB performed the statistical analyses and drafted the manuscript. ZQ, KH and KA contributed to the literature review and all authors drafted, edited and approved the final manuscript.

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Supplementary Table A. Respondent understanding of legislative restrictions on serving to drunks and levels of enforcement in their country of residence

Country	Is it illegal to serve drunks?						Are drunks usually served?		
	n (all)	Law [†]	n	Legal	Illegal	Don't know	n	Usually served	Usually refused
Germany	22095	Yes	21926	46.76	8.02	45.22	21834	75.88	24.12
Sweden	420	Yes	412	16.02	48.54	35.44	412	60.68	39.32
Denmark	335	Yes	331	68.58	6.04	25.38	330	86.67	13.33
Poland	310	Yes	306	8.50	76.80	14.71	305	88.85	11.15
UK	4645	Yes	4602	20.14	41.13	38.72	4590	75.62	24.38
Ireland	1856	Yes	1838	36.83	19.31	43.85	1835	82.29	17.71
Netherlands	4404	Yes	4370	19.34	29.02	51.65	4357	74.85	25.15
Belgium	1291	Yes	1280	19.22	35.94	44.84	1274	84.85	15.15
France	6220	Yes	6166	17.01	40.48	42.51	6143	76.54	23.46
Switzerland	3444	No	3410	39.82	9.94	50.23	3402	67.11	32.89
Austria	1296	Yes	1284	34.89	25.86	39.25	1274	84.62	15.38
Hungary	3277	Yes	3254	42.69	23.17	34.14	3242	87.11	12.89
Spain	610	No	607	54.86	4.61	40.53	600	84.17	15.83
Portugal	741	Yes	735	15.65	66.26	18.10	732	83.47	16.53
Italy	256	Yes	254	37.40	22.44	40.16	254	82.28	17.72
Greece	282	No	282	52.13	3.19	44.68	280	94.64	5.36
Australia	1798	Yes	1779	2.87	90.61	6.52	1777	53.35	46.65
New Zealand	1511	Yes	1505	1.40	93.89	4.72	1501	46.57	53.43
Canada	921	Yes	912	16.56	42.65	40.79	910	63.19	36.81
USA	4118	Yes [‡]	4065	17.86	32.77	49.37	4043	63.52	36.48
Brazil	3895	Yes	3863	76.34	1.29	22.37	3858	92.53	7.47
χ^2						20228.391			2922.834
P						<0.001			<0.001
All illegal [§]	59389	Yes	58882	34.41	25.66	39.93	58671	75.82	24.18
All legal [§]	4336	No	4299	42.75	8.75	48.50	4282	71.30	28.70
χ^2						620.181			44.040
P						<0.001			<0.001
Total	63725		63181	34.98	24.51	40.51	62953	75.51	24.49

[†]Whether it is against the law to serve to inebriated individuals is taken from Global Status Report on Alcohol and Health (WHO 2014) [‡]Only Florida and Nevada have no such laws at the State level (Laws Prohibiting Alcohol Sales to Intoxicated Persons, 2009). [§]Sum of all individuals from countries where there are legal restrictions on selling to drunk individuals and all individuals where there are no restrictions.

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Supplementary Table B. Adjusted Odds Ratios (AORs) at country of residence level for different harms suffered as a result of others' drinking in last 12 months†

Country	Aggressive harms from others' drinking								Other harm from others' drinking								All harms			
	Physically assaulted		Sexually harassed or assaulted		Verbally insulted		Any aggressive harm		Unintended injury		Traffic incident		Kept awake		Property damaged				Any other harm	
	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P		
Sweden	1.27 (0.90-1.81)	ns	1.19 (0.78-1.79)	ns	0.77 (0.62-0.96)	*	0.84 (0.68-1.04)	ns	1.04 (0.69-1.57)	ns	0.70 (0.17-2.84)	ns	1.35 (1.07-1.70)	*	1.31 (0.97-1.76)	ns	1.20 (0.97-1.49)	ns	0.93 (0.75-1.15)	ns
Denmark	0.86 (0.57-1.30)	ns	1.53 (1.02-2.29)	*	0.47 (0.36-0.60)	***	0.57 (0.45-0.72)	***	0.91 (0.58-1.42)	ns	1.14 (0.36-3.61)	ns	2.30 (1.82-2.91)	***	1.13 (0.81-1.58)	ns	1.75 (1.39-2.21)	***	1.00 (0.79-1.27)	ns
Poland	0.93 (0.62-1.40)	ns	0.78 (0.48-1.29)	ns	0.66 (0.52-0.84)	**	0.67 (0.52-0.85)	**	1.18 (0.79-1.76)	ns	NC	NC	1.72 (1.34-2.02)	***	1.38 (1.00-1.88)	*	1.55 (1.22-1.96)	***	0.99 (0.77-1.26)	ns
UK	0.93 (0.83-1.05)	ns	1.48 (1.32-1.65)	***	0.90 (0.84-0.96)	**	0.96 (0.90-1.03)	ns	1.29 (1.15-1.44)	***	0.87 (0.59-1.28)	ns	3.30 (3.08-3.53)	***	1.24 (1.13-1.63)	***	2.42 (2.26-2.59)	***	1.55 (1.44-1.67)	***
Ireland	1.13 (0.97-1.33)	ns	0.95 (0.81-1.12)	ns	0.97 (0.87-1.07)	ns	1.02 (0.92-1.13)	ns	1.68 (1.46-1.94)	***	0.71 (0.40-1.27)	ns	2.81 (2.54-3.11)	***	1.43 (1.26-1.62)	***	2.19 (1.98-2.42)	***	1.47 (1.31-1.65)	***
Netherlands	0.84 (0.74-0.93)	**	1.12 (1.00-1.26)	ns	0.66 (0.62-0.71)	***	0.72 (0.67-0.78)	***	0.98 (0.87-1.11)	ns	1.43 (1.03-1.98)	*	1.63 (1.52-1.76)	***	1.02 (0.92-1.13)	ns	1.38 (1.29-1.48)	***	0.95 (0.88-1.02)	ns
Belgium	1.17 (0.96-1.43)	ns	0.96 (0.76-1.20)	ns	0.64 (0.56-0.72)	***	0.70 (0.62-0.79)	***	0.89 (0.71-1.12)	ns	1.92 (1.18-3.11)	**	1.57 (1.39-1.78)	***	1.28 (1.08-1.15)	**	1.47 (1.31-1.66)	***	0.99 (0.88-1.11)	ns
France	1.02 (0.92-1.13)	ns	0.32 (0.28-0.38)	***	0.99 (0.93-1.05)	ns	0.91 (0.86-0.97)	**	0.84 (0.75-0.95)	**	1.81 (1.37-2.38)	***	1.01 (0.94-1.08)	ns	1.20 (1.10-1.31)	***	1.07 (1.01-1.14)	*	1.04 (0.98-1.10)	ns
Switzerland	0.89 (0.76-1.03)	ns	0.55 (0.46-0.66)	***	0.77 (0.71-0.83)	***	0.76 (0.70-0.82)	***	0.54 (0.44-0.65)	***	1.08 (0.70-1.66)	ns	0.60 (0.54-0.66)	***	0.64 (0.55-0.74)	***	0.62 (0.57-0.68)	***	0.70 (0.65-0.75)	***
Austria	1.31 (1.07-1.61)	*	1.42 (1.17-1.73)	***	0.99 (0.88-1.12)	ns	1.09 (0.97-1.22)	ns	0.82 (0.64-1.06)	ns	0.24 (0.06-0.97)	*	0.84 (0.73-0.97)	*	0.86 (0.71-1.05)	ns	0.80 (0.70-0.91)	**	1.04 (0.93-1.18)	ns
Hungary	0.45 (0.37-0.54)	***	0.31 (0.24-0.39)	***	0.46 (0.42-0.50)	***	0.45 (0.41-0.49)	***	1.14 (0.99-1.32)	ns	1.10 (0.72-1.68)	ns	1.10 (1.01-1.20)	*	0.55 (0.48-0.64)	***	1.01 (0.93-1.09)	ns	0.65 (0.60-0.70)	***
Spain	0.87 (0.62-1.21)	ns	0.92 (0.65-1.29)	ns	0.46 (0.38-0.56)	***	0.51 (0.43-0.62)	***	0.95 (0.68-1.34)	ns	1.73 (0.80-3.72)	ns	1.28 (1.06-1.55)	*	0.71 (0.52-0.96)	*	1.14 (0.95-1.35)	ns	0.69 (0.58-0.82)	***
Portugal	0.44 (0.28-0.69)	***	0.17 (0.09-0.32)	***	0.45 (0.38-0.54)	***	0.43 (0.36-0.51)	***	0.67 (0.45-0.99)	*	0.71 (0.23-2.24)	ns	0.70 (0.57-0.85)	***	0.48 (0.34-0.68)	***	0.62 (0.52-0.74)	***	0.47 (0.40-0.55)	***

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Italy	1.01 (0.62-1.65)	ns	1.38 (0.88-2.17)	ns	0.76 (0.58-0.99)	*	0.83 (0.64-1.08)	ns	0.73 (0.40-1.32)	ns	1.16 (0.29-4.74)	ns	0.95 (0.70-1.29)	ns	0.60 (0.37-0.99)	*	0.87 (0.66-1.15)	ns	0.91 (0.70-1.18)	ns
Greece	0.24 (0.10-0.59)	**	0.32 (0.13-0.79)	*	0.28 (0.20-0.39)	***	0.27 (0.20-0.37)	***	0.57 (0.29-1.11)	ns	3.66 (1.60-8.39)	**	0.46 (0.31-0.68)	***	0.26 (0.13-0.53)	***	0.49 (0.36-0.67)	***	0.34 (0.26-0.45)	***
Australia	0.97 (0.80-1.16)	ns	1.35 (1.14-1.60)	**	0.86 (0.78-0.95)	**	0.88 (0.80-0.98)	*	1.45 (1.23-1.72)	***	0.88 (0.49-1.60)	ns	2.77 (2.50-3.06)	***	1.24 (1.08-1.44)	**	2.14 (1.93-2.36)	***	1.34 (1.21-1.49)	***
New Zealand	0.92 (0.74-1.14)	ns	0.85 (0.70-1.04)	ns	0.97 (0.87-1.09)	ns	0.93 (0.84-1.04)	ns	1.50 (1.25-1.79)	***	1.26 (0.73-2.20)	ns	4.64 (4.16-5.18)	***	2.60 (2.28-2.96)	***	3.66 (3.27-4.10)	***	2.07 (1.83-2.35)	***
Canada	1.09 (0.84-1.41)	ns	1.03 (0.83-1.27)	ns	0.92 (0.80-1.06)	ns	0.90 (0.78-1.04)	ns	1.20 (0.96-1.51)	ns	0.90 (0.40-2.05)	ns	2.34 (2.03-2.69)	***	1.14 (0.93-1.40)	ns	1.79 (1.55-2.05)	***	1.27 (1.10-1.48)	**
USA	0.90 (0.78-1.04)	ns	1.19 (1.07-1.33)	**	0.85 (0.79-0.92)	***	0.88 (0.82-0.95)	**	1.21 (1.07-1.36)	**	1.38 (0.97-1.97)	ns	2.39 (2.22-2.57)	***	1.48 (1.34-1.63)	***	1.93 (1.80-2.08)	***	1.23 (1.14-1.32)	***
Brazil	0.46 (0.39-0.55)	***	0.25 (0.21-0.31)	***	0.57 (0.53-0.62)	***	0.52 (0.48-0.56)	***	0.97 (0.85-1.11)	ns	2.20 (1.62-2.98)	***	0.88 (0.81-0.96)	**	0.47 (0.41-0.54)	***	0.79 (0.73-0.76)	***	0.57 (0.53-0.61)	***

Age, sex, AUDIT score and educational attainment were also included in the logistic regression model and those Adjusted Odds Ratios (AORs) are shown in Table 3. Reference category=Germany. NC=Insufficient traffic incidents were reported from the Poland sample to calculate AORs for Poland. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

Supplementary Table C. Adjusted Odds Ratios (AORs) at country of residence level for feeling unsafe/very unsafe[†] at different times during a night out

Country	On way out		In bars		In clubs		On way home	
	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P
Sweden	0.97 (0.57-1.67)	ns	1.26 (0.79-2.02)	ns	0.97 (0.71-1.34)	ns	0.90 (0.68-1.19)	ns
Denmark	1.35 (0.80-2.28)	ns	1.43 (0.86-2.39)	ns	0.71 (0.47-1.06)	ns	0.50 (0.34-0.72)	***
Poland	3.21 (2.19-4.71)	***	2.32 (1.49-3.61)	***	2.53 (1.92-3.34)	***	2.05 (1.58-2.65)	***
UK	1.29 (1.11-1.51)	**	0.89 (0.74-1.07)	ns	1.17 (1.06-1.28)	**	1.69 (1.57-1.82)	***
Ireland	1.29 (1.03-1.60)	*	1.02 (0.79-1.33)	ns	0.81 (0.69-0.95)	*	1.60 (1.43-1.79)	***
Netherlands	0.98 (0.83-1.16)	ns	0.46 (0.36-0.58)	***	0.44 (0.38-0.50)	***	0.80 (0.73-0.87)	***
Belgium	1.19 (0.90-1.57)	ns	0.77 (0.55-1.08)	ns	1.12 (0.94-1.33)	ns	1.28 (1.12-1.48)	***
France	2.40 (2.13-2.69)	***	1.15 (0.99-1.34)	ns	1.37 (1.26-1.49)	***	2.33 (2.18-2.49)	***
Switzerland	1.12 (0.94-1.34)	ns	0.73 (0.60-0.89)	**	0.86 (0.76-0.97)	*	0.95 (0.86-1.04)	ns
Austria	0.83 (0.61-1.14)	ns	0.72 (0.51-1.01)	ns	0.75 (0.62-0.91)	**	0.65 (0.55-0.76)	***
Hungary	1.44 (1.21-1.72)	***	0.76 (0.61-0.96)	*	1.43 (1.28-1.59)	***	1.83 (1.68-2.00)	***
Spain	1.51 (1.05-2.18)	*	0.90 (0.57-1.42)	ns	1.21 (0.95-1.54)	ns	0.93 (0.75-1.17)	ns
Portugal	1.95 (1.45-2.63)	***	1.22 (0.85-1.74)	ns	1.07 (0.85-1.34)	ns	2.04 (1.72-2.41)	***
Italy	2.19 (1.36-3.52)	**	0.76 (0.36-1.62)	ns	1.24 (0.85-1.80)	ns	1.33 (0.98-1.81)	ns
Greece	4.50 (3.13-6.49)	***	2.01 (1.24-3.27)	**	1.57 (1.13-2.19)	**	2.67 (2.05-3.49)	***
Australia	1.58 (1.28-1.94)	***	1.49 (1.19-1.85)	***	1.79 (1.57-2.03)	***	1.80 (1.61-2.01)	***
New Zealand	1.36 (1.08-1.72)	**	1.34 (1.05-1.70)	*	1.10 (0.94-1.29)	ns	1.43 (1.26-1.62)	***
Canada	0.65 (0.45-0.96)	*	0.94 (0.67-1.32)	ns	1.05 (0.86-1.28)	ns	0.72 (0.61-0.85)	***
USA	1.24 (1.06-1.44)	**	1.56 (1.34-1.81)	***	1.79 (1.62-1.92)	***	1.20 (1.10-1.30)	***
Brazil	11.70 (10.58-12.95)	***	5.92 (5.29-6.62)	***	2.36 (2.16-2.58)	***	8.52 (7.86-9.24)	***

[†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with individuals categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). Age, sex, AUDIT score and educational attainment were also included in the logistic regression model and those Adjusted Odds Ratios (AORs) are shown in Table 5. Reference category=Germany. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

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STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of *cross-sectional studies*

Section/Topic	Item #	Recommendation	
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Yes
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Yes
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	Yes
Objectives	3	State specific objectives, including any prespecified hypotheses	Yes
Methods			
Study design	4	Present key elements of study design early in the paper	Yes
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Yes
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	Yes
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Yes
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Yes
Bias	9	Describe any efforts to address potential sources of bias	Yes
Study size	10	Explain how the study size was arrived at	Yes
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Yes
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	Yes
		(b) Describe any methods used to examine subgroups and interactions	Yes
		(c) Explain how missing data were addressed	Yes
		(d) If applicable, describe analytical methods taking account of sampling strategy	Yes
		(e) Describe any sensitivity analyses	na
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Yes
		(b) Give reasons for non-participation at each stage	na
		(c) Consider use of a flow diagram	na
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Yes
		(b) Indicate number of participants with missing data for each variable of interest	Yes
Outcome data	15*	Report numbers of outcome events or summary measures	Yes
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Yes
		(b) Report category boundaries when continuous variables were categorized	Yes
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	na
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	Yes
Discussion			
Key results	18	Summarise key results with reference to study objectives	Yes
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Yes
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Yes
Generalisability	21	Discuss the generalisability (external validity) of the study results	Yes
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Yes

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.

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BMJ Open

Harms from other people's drinking: an international survey of their occurrence, impacts on feeling safe and legislation relating to their control

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2015-010112.R1
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Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology
Keywords:	Alcohol, Violence, Safety, Over-serving, Nightlife

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3 **Harms from other people's drinking: an international survey of their**
4 **occurrence, impacts on feeling safe and legislation relating to their control**
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ABSTRACT

Objective- To examine factors associated with suffering harm from another person's alcohol consumption and explore how suffering such harms relates to feelings of safety in nightlife.

Design- Cross-sectional opportunistic survey (Global Drug Survey) using an online anonymous questionnaire in eleven languages promoted through newspapers, magazines and social media.

Subjects- Individuals (participating November 2014-January 2015) aged 18-34 years, reporting alcohol consumption in the last 12 months and resident in a country providing ≥ 250 respondents (n=21 countries; 63,725 respondents).

Main outcome measures- Harms suffered due to others' drinking in the last 12 months, feelings of safety on nights out (on the way out, in bars/pubs, in nightclubs and when travelling home) and knowledge of over-serving laws and their implementation.

Results- In the last 12 months >40% of respondents suffered at least one aggressive (physical, verbal or sexual assault) harm and 59.5% any harm caused by someone drunk. Suffering each category of harm was higher in younger respondents and those with more harmful alcohol consumption patterns. Males were more likely than females to have suffered physical assault (9.2% vs. 4.7; $p < 0.001$) with females much more likely to suffer sexual assault or harassment (15.3% vs. 2.5%; $p < 0.001$).

Females were more likely to feel unsafe in all nightlife settings with 40.8% typically feeling unsafe on the way home. In all settings feeling unsafe increased with experiencing more categories of aggressive harm by a drunk person. Only 25.7% of respondents resident in countries with restrictions on selling to drunks knew about such laws and 75.8% believed that drunks usually get served alcohol.

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3 **Conclusions-** Harms from others' drinking are a threat to people's health and well-
4 being. Public health bodies must ensure that such harms are reflected in measures of
5 the societal costs of alcohol and advocate for the enforcement of legislation designed
6 to reduce such harms.
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STRENGTHS AND LIMITATIONS OF THIS STUDY

- The Global Drug Survey is an established survey that allows the collection of comparative data on alcohol and drug-related issues from a large international sample of individuals.
- The sample includes a high proportion of younger respondents who can be difficult to capture in telephone or face-to-face surveys.
- The survey tool measures a unique combination of harms from others' drinking, their relationships with feelings of safety in nightlife situations and respondents' knowledge and observations on aspects of alcohol legislation.
- While the sample size is large, participation is self-selected and therefore the sample should not be considered representative of any specific population.
- In studies of this design, reliability of responses cannot be confirmed; although previous audits of the survey suggest deliberate sabotage (i.e. individuals submitting multiple completions) is not an issue.

INTRODUCTION

Globally, alcohol is estimated to result in 3.3 million deaths each year. Such deaths arise from over 200 disease and injury related conditions, wholly or partly caused by alcohol.[1, 2] Research continues to add more conditions to this total with studies identifying and quantifying additional harms caused by alcohol not just to the drinker themselves, but also to individuals affected by the drinking of others.[1, 3, 4] Such harms include alcohol-related violence (e.g. nightlife and domestic violence, elder and child abuse and neglect,[5]) unintentional injury of others (e.g. road traffic and work place incidents,[6]) property damage,[7] and the toxic effects of alcohol transferring to others (i.e. foetal harms through maternal alcohol consumption).[8] Importantly, in addition to physical and toxic assault, drinkers can impose harms on others' mental health and well-being through, for example, fear of assault, concern for other people's safety, neglect or exploitation resulting from drinking by carers and even disturbance to sleep.[9] A survey on harms to others found that increased exposure to heavy drinkers was associated with lower levels of both well-being and health status. Moreover, the prevalence of such harms was higher (18%) than harms from individuals' own drinking (12%), especially among young people and women.[10, 11]

A variety of studies have established that harms caused by others' drinking are common events. In a survey of Australian adults, 70% had been adversely affected by a stranger's drinking in the last year with 30% affected by the drinking of someone they knew.[12] A study in the USA indicated that 53% of individuals had experienced one or more harms from others' drinking over their life course.[13] Other studies in Canada, Scotland, Norway and Ireland,[3, 14-16] all identify high levels of harms from others' drinking and while such studies are not directly comparable (i.e. each

measures different harms), together they demonstrate this is an international phenomenon. The impact of such harms is also substantive. Estimates for the European Union suggest that 5,564 men and 2,147 women (aged 15-64 years) died as a result of other people's drinking in a single year.[17] Such deaths represent only the tip of an iceberg; in Australia (2005) while 367 people died due to others' drinking, 14,000 individuals were hospitalised and an estimated 10.5 million suffered some negative effects.[18] Although all demographic groups appear affected by harms from others' drinking, studies suggest such harms vary by both age and sex. Thus, females have been identified as suffering greater harms from others' drinking in private settings and through family-related (e.g. marital) problems [19, 20] with males at increased risk of physical assault. [3, 19] Further, multiple studies have identified younger individuals also suffer more harms as a result of others' drinking.[15, 20]

While increasing numbers of countries are starting to administer local and national surveys of harms from others' drinking, both descriptive epidemiology and understanding of effective prevention measures require substantive development. Even where policy level interventions have been established for decades (e.g. legislation preventing the service of alcohol to inebriated individuals) research suggests implementation is limited.[21, 22] Consequently, the World Health Organization has identified research on harms to others from drinking as a key component in their Research Initiative on Alcohol, Health and Development.[1]

The Global Drug Survey (GDS) is a large, international, annual survey covering both alcohol and drug use which is self-completed largely by younger individuals on a self-nominating and anonymous basis. The 2015 iteration included a module of questions

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3 on harms resulting from other people's alcohol consumption. Using results from this
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5 module this study examines harms respondents have suffered in the last 12 months as
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7 a result of others' drinking and how these relate to respondents' own alcohol
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9 consumption. Focusing specifically on a subset of aggressive harms (physical, sexual
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11 and verbal assault), analyses explore how experiencing such harms from others'
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13 drinking relates to personal feelings of safety when going out to socialise. Finally, we
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15 explore whether respondents are aware of over-serving legislation developed to
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17 reduce harms associated with inebriation and whether such legislation is enforced in
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19 their social environments.
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25 **METHODS**

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27 The GDS is an anonymous, online survey widely promoted in partnership with a
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29 range of media including national newspapers, magazines, web sites and social media
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31 outlets.[23] The first iteration of the GDS collected data in 2011 and subsequently has
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33 been used to identify and explore emerging trends in drug and alcohol related harm.
34
35 [24] The most recent survey (GDS 2015) collected data during November 2014-
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37 January 2015 and was available in eleven languages (English, German, Greek, Polish,
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39 French, Italian, Spanish, Portuguese, Flemish, Hungarian and Danish). The sample
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41 was opportunistic and not intended to be representative of any specific population, but
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43 as it was a self-selected sample, those with social interests in alcohol and/or drugs are
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45 likely to be over-represented. Other publications provide further detail on the utility,
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47 design and limitations of the GDS.[23, 25, 26] At the point of analysis for this study,
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49 89,509 completions of GDS 2015 were available for inclusion. However, in order to
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51 utilise a more defined dataset, analyses were limited to those aged 18-34 years,
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53 reporting gender (male or female), who had consumed alcohol in the last 12 months
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3 and were resident in a country contributing at least 250 responses to the survey (see
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5 Supplementary table A, n=21 countries). The final sample size was therefore
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7 n=63,725 (71.2% of all available completions).
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11 The GDS includes extensive substance use screening questions measuring the types
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13 and quantities of licit and illicit drugs consumed.[23] However, analyses within this
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15 study focus on measures of alcohol use and a range of questions on harms from
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17 others' drinking, feeling of safety on nights out and both knowledge and
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19 implementation of laws to prevent drunkenness in countries of residence (here sales to
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21 inebriated individuals). For alcohol, respondents completed the AUDIT (Alcohol Use
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23 Disorders Identification Test) questionnaire that collects measures of drinking levels,
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25 dependence and harms.[27] Respondents were rated in score categories of 0–7, 8–15,
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27 16–19 and 20+ hereon referred to as lower risk, increasing risk, higher risk and
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29 possible dependence. Harms due to others' drinking are measured through the
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31 questions 'In the last 12 months have you been negatively affected by someone else's
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33 drink in any of the following ways: 1) physically assaulted by someone who was
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35 drunk; 2) sexually harassed or assaulted by someone who was drunk, 3) called names
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37 or insulted by someone who was drunk; 4) injured accidentally by someone who was
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39 drunk; 5) had property damaged by someone who was drunk; 6) involved in a traffic
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41 accident caused by a drunk driver or pedestrian; and 7) kept awake by drunken noise.
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43 A combined aggressive harms category for anyone experiencing physical (1), sexual
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45 (2) or verbal (3) harms from others' drinking was created to examine how
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47 experiencing such aggressive actions may impact feelings of safety when on a night
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49 out. Feelings of safety on a night out were measured using separate Likert scales
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51 (1=very unsafe to 5=very safe) for: on the way out; in bars/pubs; in nightclubs; and
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3 travelling home after a night out. In order to specifically examine impressions of low
4 safety, respondents were categorised as feeling very unsafe/unsafe (score 1 or 2) or
5 safer (score 3-5). Finally, respondents were asked if it was illegal for servers to sell
6 alcohol to drunk people in their country and whether they thought someone who was
7 obviously drunk would usually be served alcohol.
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16 Demographics included in analyses were age (categorised as 18-24, 25-29, 30-34
17 years), sex, country of residence and basic educational attainment (whether
18 respondents had at least a high school/secondary school education; here used as a
19 socio-economic proxy).[28] Preliminary data exploration examined potential
20 duplicate responses. Across demographics combined with key variables used in
21 analyses here, 0.7% (n=467) of respondents had a response set identical to at least one
22 other respondent. Whether these were duplicate responses or different individuals
23 could not be established. However these levels were considered low enough to not
24 substantively affect findings and consequently such cases were retained in the data.
25
26 As the sample was opportunistic, analyses focused on exploring relationships between
27 demographics, harms from others' drinking and other variables of interest at the
28 individual respondent level. Thus, chi squared and logistic regression modelling were
29 used to identify and quantify the strength of associations between such variables. All
30 such analyses were undertaken in SPSS (v21). Ethical approval for the GDS 2015 was
31 granted by the Psychiatry, Nursing and Midwives Ethics sub committee at Kings
32 College London.
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51 52 53 54 **RESULTS**

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3 In both genders, prevalence of all types of harms from others' drinking is highest in
4 the 18-24 year age category and reduces with age (Table 1). Being verbally insulted
5 was the most frequent harm for both males and females. Males were nearly twice as
6 likely as females to report being physically assaulted by someone drunk in the last 12
7 months, with over 1 in 10 males aged 18-24 having suffered such an assault. In
8 contrast females were over six times more likely than males to have been sexually
9 assaulted or harassed by someone drunk (Table 1). Over 1 in 6 females aged 18-24
10 years had suffered such sexual harassment in the last 12 months. A combined
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Table 1. Overall prevalence of harms suffered as a result of others' drinking in last 12 months stratified by age and sex

		Aggressive harms from others' drinking				Other harms from others' drinking					All harms [§]	
		Physically assaulted	Sexually harassed or assaulted	Verbally insulted	Any aggressive harm [†]	Unintended injury	Traffic incident	Kept awake	Property damaged	Any other harm [‡]		
n												
All		63725	7.40	7.71	39.40	43.71	7.73	0.93	29.29	12.01	38.27	59.54
Female												
Age	18-24	15461	5.67	17.73	40.70	48.63	11.84	0.94	36.45	13.41	46.68	66.75
	25-29	7128	3.72	13.20	34.22	40.31	6.10	0.74	33.53	8.00	39.28	58.85
	30-34	3532	2.35	8.75	27.66	31.91	3.14	0.54	31.74	7.11	35.31	50.96
	All	26121	4.69	15.28	37.17	44.10	9.10	0.84	35.02	11.08	43.12	62.46
	X²		91.724	212.131	245.670	383.406	369.300	6.719	37.624	210.441	210.581	359.960
	P		***	***	***	***	***	***	***	***	***	***
Male												
Age	18-24	20581	11.88	2.76	45.72	48.74	9.08	1.17	26.07	15.30	38.03	62.43
	25-29	10593	7.06	2.26	38.45	40.35	4.62	0.90	25.68	10.35	33.03	55.00
	30-34	6430	4.67	1.74	29.83	31.60	3.00	0.65	22.22	7.96	27.96	45.89
	All	37604	9.21	2.45	40.95	43.45	6.78	0.93	25.30	12.65	34.90	57.51
	X²		388.955	23.715	549.649	643.196	395.358	14.649	39.487	309.567	241.243	585.957
	P		***	***	***	***	***	***	***	***	***	***
Male vs Female	X²		457.136	3570.041	92.912	2.678	115.810	4.702	702.440	36.011	441.058	156.912
	P[¶]		***	***	***	ns	***	ns	***	***	***	***

[†]Any aggressive harm includes any respondent answering yes to physical assault, sexual harassment or assault or verbally insulted. [‡]Other harms includes unintentional injury, traffic incident, being kept awake and having property damaged. [§]All harms includes any respondent reporting one or more of the seven harm categories. [¶]For males vs. females P values compare differences in overall prevalence between males and females. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant

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3 aggressive harms category including any physical, sexual or verbal assault in the last
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5 12 months (Table 1) identified that over 40% of respondents had suffered at least one
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7 such assault; although overall prevalence did not differ between sexes (Table 1). For
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9 other harms females were substantively more likely to suffer unintended injury and
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11 being kept awake, and males were marginally more likely to report property damage
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13 (Table 1). The least frequently reported harm was from a traffic incident where only
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15 males age 18-24 years exceeded one percent in the last 12 months. Nearly 6 in 10
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17 respondents reported at least one negative impact of others' drinking in the last 12
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19 months (Table 1).
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25 Respondents' alcohol consumption (AUDIT score) was strongly related to their risk
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27 of suffering harms from others' drinking (Table 2). Each individual category of harm
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29 increased with increasing AUDIT score category. Thus, risks of physical assault by
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31 someone drunk were over five times higher in possible dependence versus lower risk
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33 drinking categories (Table 2). Respondents with lower educational attainment were
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35 more likely to report suffering physical assault, unintended injury and traffic incidents
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37 as a result of others' drinking, but less likely to report sexual assault/harassment or
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39 being kept awake (Table 2). Using logistic regression modelling to control for
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41 demographic confounders (Table 3; Supplementary Table B), younger age remained
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43 strongly associated with higher risks of all harms from others' drinking along with
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45 higher AUDIT categories. Males were significantly more likely to experience
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47 physical assault, verbal insult, traffic incident and property damage due to someone
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49 else's drinking in the last 12 months, with females at higher risk from sexual
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51 assault/harassment, unintentional injury and being kept awake (Table 3). Having a
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53 high school education reduced the odds of experiencing physical assault,
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Table 2. Relationship between harms suffered as a result of others drinking in last 12 months and Alcohol Use Disorders Identification Test (AUDIT) score and educational achievement[†]

	n	Aggressive harms from others' drinking				Other harms from others' drinking					All harms
		Physically assaulted	Sexually harassed or assaulted	Verbally insulted	Any aggressive harm	Unintended injury	Traffic incident	Kept awake	Property damaged	Any other harm	
AUDIT (score)											
Lower risk (0-7)	28048	3.80	6.33	31.12	34.61	4.47	0.55	27.15	7.83	32.74	51.077
Increasing risk (8-15)	25622	8.39	8.27	43.47	48.33	8.47	0.89	30.54	13.14	40.63	64.437
Higher risk (16-19)	4582	14.03	9.95	54.45	59.78	14.49	1.88	33.57	21.54	50.11	74.531
Dependence (20+)	3177	20.68	12.34	60.12	65.66	21.03	3.12	36.07	26.53	54.64	77.432
χ^2		1690.268	214.862	1987.737	2268.329	1516.174	254.624	190.337	1520.194	1052.194	1940.784
P		***	***	***	***	***	***	***	***	***	***
Educational attainment											
No high school education	6530	10.05	6.23	39.63	43.89	8.50	1.32	22.53	12.48	33.23	56.769
High school or higher	56337	7.07	7.86	39.46	43.74	7.64	0.88	30.09	11.96	38.89	59.904
χ^2		76.146	21.734	0.074	0.051	6.035	12.401	161.729	1.48	79.27	23.882
P		***	***	ns	ns	ns	***	***	ns	***	***

[†]Some respondents (3.6%) did not answer all AUDIT questions and therefore an AUDIT score could not be calculated. For educational

attainment 1.4% of respondents did not provide data. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant

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Table 3. Logistic regression model for Alcohol Use Disorders Identification Test (AUDIT) score and demographic relationships with harms suffered as a result of others' drinking in last 12 months

	Aggressive harms from others' drinking								Other harm from others' drinking								All harms			
	Physically assaulted		Sexually harassed or assaulted		Verbally insulted		Any aggressive harm		Unintended injury		Traffic incident		Kept awake		Property damaged		Any other harm		All harms	
	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P	AOR (95%CIs)	P
Age[†]																				
25-29	0.64	***	0.79	***	0.77	***	0.74	***	0.54	***	0.89	ns	1.04	ns	0.67	***	0.86	***	0.78	***
	(0.59-0.69)		(0.73-0.85)		(0.74-0.80)		(0.71-0.77)		(0.50-0.58)		(0.73-1.09)		(1.00-1.09)		(0.63-0.71)		(0.82-0.89)		(0.75-0.81)	
30-34	0.42	***	0.53	***	0.56	***	0.53	***	0.32	***	0.63	**	0.88	***	0.55	***	0.70	***	0.56	***
	(0.38-0.47)		(0.47-0.59)		(0.53-0.59)		(0.50-0.55)		(0.28-0.36)		(0.47-0.84)		(0.84-0.93)		(0.51-0.60)		(0.66-0.73)		(0.54-0.59)	
Sex[‡]																				
Male	1.94	***	0.13	***	1.13	***	0.92	***	0.68	***	1.10	ns	0.66	***	1.16	***	0.71	***	0.78	***
	(1.80-2.08)		(0.12-0.14)		(1.09-1.17)		(0.89-0.95)		(0.64-0.72)		(0.92-1.32)		(0.64-0.68)		(1.10-1.22)		(0.69-0.74)		(0.75-0.81)	
High school[§]																				
Yes	0.72	***	1.07	ns	0.95	ns	0.95	ns	0.78	***	0.63	***	1.29	***	0.91	*	1.13	***	1.04	ns
	(0.65-0.79)		(0.95-1.20)		(0.90-1.01)		(0.90-1.01)		(0.70-0.86)		(0.49-0.81)		(1.21-1.38)		(0.83-0.99)		(1.06-1.20)		(0.98-1.10)	
AUDIT score																				
Increasing risk	2.08	***	1.63	***	1.65	***	1.74	***	1.89	***	1.51	***	1.13	***	1.65	***	1.35	***	1.69	***
	(1.92-2.25)		(1.52-1.75)		(1.59-1.71)		(1.68-1.81)		(1.75-2.03)		(1.23-1.87)		(1.09-1.18)		(1.55-1.75)		(1.30-1.40)		(1.63-1.75)	
Higher risk	3.60	***	2.17	***	2.56	***	2.78	***	3.33	***	3.10	***	1.25	***	2.90	***	1.92	***	2.71	***
	(3.23-4.00)		(1.92-2.44)		(2.40-2.74)		(2.60-2.97)		(3.00-3.70)		(2.35-4.07)		(1.16-1.34)		(2.66-3.16)		(1.80-2.06)		(2.52-2.92)	
Dependence	5.80	***	2.90	***	3.26	***	3.62	***	5.17	***	5.27	***	1.31	***	3.74	***	2.22	***	3.13	**
	(5.20-6.48)		(2.55-3.30)		(3.02-3.52)		(3.34-3.92)		(4.64-5.75)		(4.05-6.85)		(1.21-1.42)		(3.41-4.11)		(2.05-2.40)		(2.87-3.43)	*

Reference categories: [†]18-24 years; [‡]female; [§]did not attend high school; ^{||}lower risk. Country of residence was also included in the logistic regression model and AORs (Adjusted Odds Ratios) for countries are included in Supplementary Table B. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

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3 unintentional injury, traffic incident and property damage but increased the odds of
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5 being kept awake.
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10 Overall, the proportion of respondents feeling unsafe/very unsafe on a night out in
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12 their country of residence increases from 4.9% while in bars, to 28.6% on the way
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14 home (Table 4). Using logistic regression modelling to control for demographic
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16 confounders (Table 5; Supplementary Table C) feeling unsafe was more frequently
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18 reported in all settings by females, those without a high school education and younger
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20 age groups (apart from in bars). For alcohol consumption, respondents with the lowest
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22 AUDIT scores were most likely to feel unsafe in bars and nightclubs but both lowest
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24 and highest AUDIT categories felt more unsafe on the way out and way home (Table
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27 5). Experiencing more categories of harms from others' drinking in the past 12
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29 months was associated with feeling unsafe in all settings (Tables 4 and 5). Thus,
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31 feeling unsafe on the way home rises from 25.8% of those experiencing no harms to
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33 46.5% of those experiencing harms in all three aggressive categories (physically
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35 assaulted, sexually harassed/assaulted, verbally insulted) in the last 12 months (Table
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42 Finally, knowledge of laws to prevent extreme drunkenness and its consequences
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44 through prohibiting sales of alcohol to already inebriated individuals were examined.

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47 Based on data from the Global Status Report on Alcohol and Health,^[1] sales to
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49 inebriated individuals are prohibited in 19 of the 21 countries included here
50
51 (Supplementary Table A). However, only a quarter of respondents (25.7%) from these
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53 19 countries knew about such restrictions (Supplementary Table A; vs. 8.8% of
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55 respondents from the two countries without legislation believing restrictions were in
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Table 4. Variations by socio-demographics and AUDIT category in proportions of respondents feeling unsafe/very unsafe at different points of a night out

		Feel unsafe or very unsafe [†]			
		On way out	In bars	In nightclubs	On way home
n		62851	62610	61010	62321
All		6.83	4.90	14.41	28.59
Age	18-24	7.51	5.03	15.24	32.20
	25-29	6.00	4.61	13.75	25.13
	30-34	5.84	4.95	12.56	21.75
	χ^2	59.653	4.559	51.526	549.68
	P	***	ns	***	***
Gender	Female	9.15	5.98	17.10	40.80
	Male	5.21	4.15	12.55	20.16
	χ^2	369.738	109.193	247.676	3144.88
	P	***	***	***	***
Education	No high school	7.82	7.39	17.58	27.58
	High school or higher	6.73	4.60	14.00	28.68
	χ^2	10.729	95.152	57.091	3.398
	P	***	***	***	ns
AUDIT (score)	Lower risk (0-7)	7.09	5.96	16.58	28.90
	Increasing risk (8-15)	6.27	3.77	12.36	27.15
	Higher risk (16-19)	6.87	3.60	12.32	28.91
	Dependence (20+)	7.62	4.84	14.55	35.34
	χ^2	18.181	153.236	202.818	96.71
P	***	***	***	***	
Aggressive harms from others' drinking count[‡]	0	6.49	4.76	13.09	25.75
	1	7.09	4.71	14.96	30.64
	2	7.57	5.88	19.13	36.59
	3	10.30	10.33	26.75	46.52
	χ^2	26.92	58.664	235.704	458.033
	P	***	***	***	***

AUDIT=Alcohol Use Disorders Identification Test. [†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with respondents categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). [‡]Harms from others' drinking count is the total number of harms categories reported from physically assaulted, sexually harassed or assaulted and verbally insulted. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

Table 5. Logistic regression analysis of factors associated with feeling unsafe/very unsafe[†] at different times during a night out

		On way out			In bars			In nightclubs			On way home						
		AOR	95%CI _s	P	AOR	95%CI _s	P	AOR	95%CI _s	P	AOR	95%CI _s	P				
Age[‡]	25-29	0.84	0.78	0.91	***	0.93	0.85	1.02	ns	0.92	0.87	0.97	**	0.74	0.71	0.78	***
	30-34	0.84	0.76	0.93	***	1.04	0.93	1.16	ns	0.82	0.77	0.88	***	0.64	0.61	0.68	***
Sex[§]	Male	0.55	0.51	0.58	***	0.73	0.68	0.79	***	0.75	0.71	0.79	***	0.35	0.33	0.36	***
High school[¶]	Yes	0.62	0.55	0.69	***	0.49	0.44	0.55	***	0.64	0.60	0.70	***	0.75	0.70	0.80	***
AUDIT (score)[¶]	Increasing risk	0.84	0.78	0.91	***	0.62	0.56	0.67	***	0.68	0.65	0.72	***	0.87	0.84	0.91	***
	Higher risk	0.87	0.76	0.99	*	0.56	0.47	0.66	***	0.65	0.59	0.72	***	0.89	0.82	0.96	**
	Dependence	0.86	0.74	1.00	ns	0.65	0.54	0.78	***	0.71	0.63	0.79	***	1.10	1.01	1.20	*
Aggressive harms from others' drinking count^{**}	1	1.25	1.16	1.34	***	1.15	1.06	1.26	**	1.28	1.21	1.35	***	1.36	1.30	1.41	***
	2	1.44	1.28	1.63	***	1.58	1.38	1.81	***	1.77	1.63	1.92	***	1.77	1.66	1.90	***
	3	2.00	1.54	2.61	***	2.97	2.28	3.86	***	2.60	2.17	3.11	***	2.30	1.95	2.72	***

[†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with respondents categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). See methods for more details. Reference categories: [‡]18-24 years; [§]female; [¶]did not attend high school; [¶]lower risk; ^{**}0. Country of residence was also included in the logistic regression model and AORs (Adjusted Odds Ratios) for countries are included in Supplementary Table C. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant. Aggressive harms from others' drinking count is the total number of harms categories reported from; physically assaulted, sexually harassed or assaulted and verbally insulted.

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3 place, $X^2=620.181$, $P<0.001$). Across all 19 countries with restrictions more than three
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5 quarters of respondents (75.8%) believed that drunks usually get served alcohol;
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7 marginally more than in countries with no such restriction (71.3%; $X^2=44.040$,
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9 $P<0.001$). At a country level, there is a strong correlation between proportions in a
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11 country thinking it is illegal to be served alcohol when drunk and the proportion
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13 identifying that drunks are not usually served ($R^2=0.326$, $P=0.004$).
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18 DISCUSSION

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20 The 2030 Agenda for Sustainable Development commits all countries in the United
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22 Nations to Sustainable Development Goals that include: making cities safe; halving
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24 deaths and injuries from road traffic accidents; and reducing all forms of violence
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26 with particular emphasis on violence against women and girls.[29] Critically, global
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28 definitions of violence and sexual violence include both threat and use of physical
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30 force, as well as their impacts on physical or psychological harm.[30] Our study
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32 found that harms caused by others' drinking routinely impact on the safety, well-
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34 being (Table 2) and feelings of security (Table 4) of substantive numbers of young
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36 respondents. In total, 9.2% of men and 4.7% of women surveyed reported being
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38 physically assaulted by someone who was drunk and over one in seven women had
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40 been sexually assaulted or harassed by a drunk person in the past 12 months (Table
41
42 1). While the severity of such events was not recorded here, results elsewhere identify
43
44 alcohol as a major component in the perpetration of sexual violence including
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46 rape.[31] Moreover, as with other surveys, other harms that may be considered
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48 relatively minor were substantively more common (e.g. 29.3% kept awake by
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50 drunken noise).[9, 10] Evidence indicates that such harms, even on an occasional
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52 basis, may impact health and quality of life.[32]
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5 While suffering harms from others' drinking varied with age, sex and educational
6 status, respondents' own alcohol consumption patterns also affected risk (Table 2 and
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10 3). Higher risk drinkers had odds of being physically assaulted by an intoxicated
11 individual 5.8 times higher than those in the lower risk category. Unintended injury
12 by a drunk, and harms from a traffic incident caused by someone else's drinking were
13 also more than five times more likely in higher risk drinkers (vs. lower risk drinkers).
14
15 In part, those identifying heavy or problematic drinking in their own behaviour may
16 also be more likely to acknowledge that harms from others result from the drunken
17 state of such individuals. However, our findings are consistent with those elsewhere
18 suggesting risks of suffering harm from others' drinking increase in those who drink
19 more themselves.[3, 33] While the GDS study could not identify causality, a number
20 of factors link heavy alcohol consumption and increased harms from others' drinking.
21 Thus, heavy drinkers: have a reduced ability to recognise warning signs of, and so
22 avoid, potentially violent or dangerous situations; may visit settings patronised by
23 heavy drinkers more often; or may themselves drink heavily to cope with harms they
24 already suffer from a drunk (e.g. living with an abusive or neglectful drinker).[34-36]
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26 Raising people's awareness of how their own heavy drinking may make them more
27 vulnerable to harms from other drinkers could encourage behavioural change but is
28 poorly explored as a public health interventions.
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49 Attempts to better control alcohol misuse often focus on the harms drinkers cause to
50 themselves with harms to others being neglected.[12] Consequently, accusations of
51 'nanny states' are raised by the alcohol industry insinuating that governments
52 interfere with choices individuals should make about their own health.[37] However,
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3 this ignores the legitimate role governments have in ensuring individuals are protected
4 from harms caused by others' drinking and how poorly controlled alcohol promotion,
5 pricing and access undermine this role.[38, 39] Here in an international sample, over
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10 40% of female respondents felt unsafe or very unsafe on the way home after a night
11 out (Table 4). The vast majority of respondents were from high-income countries
12 where legislation, problem orientated policing and environmental adaptations such as
13 lighting, pedestrianisation and reliable public transport should provide safety and
14 security even in the early hours of the morning. However, respondents' fears are
15 largely justified. In England and Wales for instance, 53% of the 1.3 million violent
16 incidents occurring in the year 2013/14 were alcohol-related, increasing to 64% of
17 those when the assailant was a stranger and 84% of those between midnight and
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Feeling unsafe or very unsafe on the way out, in bars and nightclubs, and on the way home all increased substantively with the number of aggressive harms respondents had suffered through others' drinking (limited to physically assaulted, sexually harassed/assaulted, verbally insulted; Table 4 and 5). How much such feelings actually impact on individuals' choices to go out at all, or only visit selected destinations was not measured here. However, feelings of safety have been identified as a key issue in choice of both tourism destinations,[41] and nights out in individuals' country of residence, with for example a survey of around 30,000 individuals in England finding nearly half avoided their local town or city centre at night because of the drunken behaviour of others.[42] Consequently, while some licensed venues in nightlife settings may thrive on unrestricted sales to individuals

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3 regardless of their drunken state,[43] other businesses including restaurants and better
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5 regulated bars and clubs are likely to be losing potential customers.
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10 Links between inebriation and increased risks of disturbance including committing
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12 violence have been documented since at least ancient Egyptian times,[44] and
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14 legislation aimed at protecting the peace though preventing alcohol sales to those
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16 already drunk can date back centuries.[45] However, despite 19 of the 21 countries
17
18 included in these analyses having laws restricting sales to drunks, only 25.7% of
19
20 respondents in these countries knew about the laws (Supplementary Table A).
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23 Further, over three quarters of respondents from these countries thought that
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25 inebriated individuals would usually be served alcohol. Legislation relating to serving
26
27 drunks can play an important role in reducing harms in nightlife with promotion of its
28
29 use already reported as both effective and cost-effective in the reduction of anti-social
30
31 behaviour.[21, 46] Some countries are now using such legislation on a regular basis
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33 (e.g. Finland and Sweden,[47, 48]). However, results here suggest internationally
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35 there is an urgent need to increase both public and hospitality industry awareness and
36
37 critically enforcement of over-serving legislation.
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42 The study has a number of important limitations. Respondents were from an
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44 opportunistic sample and should not be considered representative of any country or
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46 region. Consequently, analyses have focused on predictors of harms from others'
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48 drinking and feelings of safety at an individual respondent level rather than
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50 establishing measures of population prevalence in any country. Further, the sample
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52 was also limited to those who had consumed alcohol in the previous 12 months.
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56 Therefore the impact of harms from others' drinking on abstainers, while an important
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3 consideration, was not captured in these analyses. Our data provided only one general
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5 measure of socio-economic status (here high school educational attainment).
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8 However, while it suggested a protective impact of higher socio-economic status on
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10 experiencing some harms (e.g. physical assault; Table 3) and increased feeling of
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12 safety when out (Table 5), it can only be considered a rough socio-economic proxy.
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14 Questions were also limited to whether respondents had experienced harms at all and
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16 therefore levels of severity were not available for analysis. Moreover, we cannot rule
17
18 out the impact of recall bias or deliberate misreporting on results. Finally, as on online
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20 questionnaire it is possible that the same individual completed the form multiple
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22 times. However, less than 1% of the sample provided identical response sets across
23
24 demographics and key variables used in these analyses. This is consistent with
25
26 previous audits of the GDS.[26]
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32 CONCLUSIONS

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34 This study adds further international evidence to a growing body of studies that both
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36 identify high levels of harms resulting from other people's drinking and provide the
37
38 necessary methodologies to quantify them.[49] Despite such evidence, harms from,
39
40 for instance, violence committed by drunk individuals are frequently omitted from
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42 estimates of alcohol-attributable burdens of disease.[1] They are however a critical
43
44 part of establishing the right balance between individuals' rights to consume alcohol
45
46 and the responsibilities of governments to protect individuals from the harms drinkers
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48 may cause others. The 2030 Agenda for Sustainable Development connects violence
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50 and insecurity with poor governance and calls for nations to strengthen the prevention
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52 and treatment of the harmful use of alcohol.[29] Results here suggest that harms from
53
54 others' drinking are a common threat to people's health and well-being, that large
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3 proportions of individuals (especially women) feel unsafe returning from a night out
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5 even in developed countries and that legislation developed in part to tackle such
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7 issues is typically ignored. Public health bodies must ensure that harms caused by
8
9 others' drinking are fully reflected in measures of the societal costs of alcohol, and
10
11 through partnership with other public sector bodies that legislation is effectively
12
13 communicated and enforced.
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16 17 18 **FUNDING STATEMENT** 19

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21
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23
24
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26 27 28 **COMPETING INTERESTS STATEMENT** 29

30 **Two authors have declared the following interests.**

31
32 AW is the founder and owner of Global Drug Survey. JF is part of the Global Drug
33
34 Survey Expertise Advisory Committee. All other authors have no competing interests.
35
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38 39 40 **DATA SHARING STATEMENT** 41

42 No additional data available.
43
44

45 46 47 **CONTRIBUTORS** 48

49 AW is the founder of the Global Drug Survey and AW and JF developed and directed
50
51 it. MAB, KH, AW conceived and designed the survey questions on violence and
52
53 alcohol. JF coordinated data collection and cleaning. MAB performed the statistical
54
55 analyses and drafted the manuscript. ZQ, KH and KA contributed to the literature
56
57 review and all authors drafted, edited and approved the final manuscript.
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19 [lications/other%20resources/RangeMagnitudeAlcoholsHarmtoOthers_TechReport.pd](http://www.turningpoint.org.au/site/DefaultSite/filesystem/documents/Centre%20Publications/other%20resources/RangeMagnitudeAlcoholsHarmtoOthers_TechReport.pdf)
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Supplementary Table A. Respondent understanding of legislative restrictions on serving to drunks and levels of enforcement in their country of residence

Country	Is it illegal to serve drunks?						Are drunks usually served?		
	n (all)	Law [†]	n	Legal	Illegal	Don't know	n	Usually served	Usually refused
Germany	22095	Yes	21926	46.76	8.02	45.22	21834	75.88	24.12
Sweden	420	Yes	412	16.02	48.54	35.44	412	60.68	39.32
Denmark	335	Yes	331	68.58	6.04	25.38	330	86.67	13.33
Poland	310	Yes	306	8.50	76.80	14.71	305	88.85	11.15
UK	4645	Yes	4602	20.14	41.13	38.72	4590	75.62	24.38
Ireland	1856	Yes	1838	36.83	19.31	43.85	1835	82.29	17.71
Netherlands	4404	Yes	4370	19.34	29.02	51.65	4357	74.85	25.15
Belgium	1291	Yes	1280	19.22	35.94	44.84	1274	84.85	15.15
France	6220	Yes	6166	17.01	40.48	42.51	6143	76.54	23.46
Switzerland	3444	No	3410	39.82	9.94	50.23	3402	67.11	32.89
Austria	1296	Yes	1284	34.89	25.86	39.25	1274	84.62	15.38
Hungary	3277	Yes	3254	42.69	23.17	34.14	3242	87.11	12.89
Spain	610	No	607	54.86	4.61	40.53	600	84.17	15.83
Portugal	741	Yes	735	15.65	66.26	18.10	732	83.47	16.53
Italy	256	Yes	254	37.40	22.44	40.16	254	82.28	17.72
Greece	282	No	282	52.13	3.19	44.68	280	94.64	5.36
Australia	1798	Yes	1779	2.87	90.61	6.52	1777	53.35	46.65
New Zealand	1511	Yes	1505	1.40	93.89	4.72	1501	46.57	53.43
Canada	921	Yes	912	16.56	42.65	40.79	910	63.19	36.81
USA	4118	Yes [‡]	4065	17.86	32.77	49.37	4043	63.52	36.48
Brazil	3895	Yes	3863	76.34	1.29	22.37	3858	92.53	7.47
X^2						20228.391			2922.834
P						<0.001			<0.001
All illegal [§]	59389	Yes	58882	34.41	25.66	39.93	58671	75.82	24.18
All legal [§]	4336	No	4299	42.75	8.75	48.50	4282	71.30	28.70
X^2						620.181			44.040
P						<0.001			<0.001
Total	63725		63181	34.98	24.51	40.51	62953	75.51	24.49

[†]Whether it is against the law to serve to inebriated individuals is taken from Global Status Report on Alcohol and Health (WHO 2014) [‡]Only Florida and Nevada have no such laws at the State level (Laws Prohibiting Alcohol Sales to Intoxicated Persons, 2009). [§]Sum of all individuals from countries where there are legal restrictions on selling to drunk individuals and all individuals where there are no restrictions.

5 **Supplementary Table B. Adjusted Odds Ratios (AORs) at country of residence level for different harms suffered as a result of others' drinking in last 12**
 6 **months[†]**

Country	Aggressive harms from others' drinking								Other harm from others' drinking								All harms			
	Physically assaulted	Sexually harassed or assaulted	Verbally insulted	Any aggressive harm				Unintended injury	Traffic incident	Kept awake	Property damaged	Any other harm		AOR	P					
	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P				
Sweden	1.27 (0.90-1.81)	ns	1.19 (0.78-1.79)	ns	0.77 (0.62-0.96)	*	0.84 (0.68-1.04)	ns	1.04 (0.69-1.57)	ns	0.70 (0.17-2.84)	ns	1.35 (1.07-1.70)	*	1.31 (0.97-1.76)	ns	1.20 (0.97-1.49)	ns	0.93 (0.75-1.15)	ns
Denmark	0.86 (0.57-1.30)	ns	1.53 (1.02-2.29)	*	0.47 (0.36-0.60)	***	0.57 (0.45-0.72)	***	0.91 (0.58-1.42)	ns	1.14 (0.36-3.61)	ns	2.30 (1.82-2.91)	***	1.13 (0.81-1.58)	ns	1.75 (1.39-2.21)	***	1.00 (0.79-1.27)	ns
Poland	0.93 (0.62-1.40)	ns	0.78 (0.48-1.29)	ns	0.66 (0.52-0.84)	**	0.67 (0.52-0.85)	**	1.18 (0.79-1.76)	ns	NC	NC	1.72 (1.34-2.02)	***	1.38 (1.00-1.88)	*	1.55 (1.22-1.96)	***	0.99 (0.77-1.26)	ns
UK	0.93 (0.83-1.05)	ns	1.48 (1.32-1.65)	***	0.90 (0.84-0.96)	**	0.96 (0.90-1.03)	ns	1.29 (1.15-1.44)	***	0.87 (0.59-1.28)	ns	3.30 (3.08-3.53)	***	1.24 (1.13-1.63)	***	2.42 (2.26-2.59)	***	1.55 (1.44-1.67)	***
Ireland	1.13 (0.97-1.33)	ns	0.95 (0.81-1.12)	ns	0.97 (0.87-1.07)	ns	1.02 (0.92-1.13)	ns	1.68 (1.46-1.94)	***	0.71 (0.40-1.27)	ns	2.81 (2.54-3.11)	***	1.43 (1.26-1.62)	***	2.19 (1.98-2.42)	***	1.47 (1.31-1.65)	***
Netherlands	0.84 (0.74-0.93)	**	1.12 (1.00-1.26)	ns	0.66 (0.62-0.71)	***	0.72 (0.67-0.78)	***	0.98 (0.87-1.11)	ns	1.43 (1.03-1.98)	*	1.63 (1.52-1.76)	***	1.02 (0.92-1.13)	ns	1.38 (1.29-1.48)	***	0.95 (0.88-1.02)	ns
Belgium	1.17 (0.96-1.43)	ns	0.96 (0.76-1.20)	ns	0.64 (0.56-0.72)	***	0.70 (0.62-0.79)	***	0.89 (0.71-1.12)	ns	1.92 (1.18-3.11)	**	1.57 (1.39-1.78)	***	1.28 (1.08-1.15)	**	1.47 (1.31-1.66)	***	0.99 (0.88-1.11)	ns
France	1.02 (0.92-1.13)	ns	0.32 (0.28-0.38)	***	0.99 (0.93-1.05)	ns	0.91 (0.86-0.97)	**	0.84 (0.75-0.95)	**	1.81 (1.37-2.38)	***	1.01 (0.94-1.08)	ns	1.20 (1.10-1.31)	***	1.07 (1.01-1.14)	*	1.04 (0.98-1.10)	ns
Switzerland	0.89 (0.76-1.03)	ns	0.55 (0.46-0.66)	***	0.77 (0.71-0.83)	***	0.76 (0.70-0.82)	***	0.54 (0.44-0.65)	***	1.08 (0.70-1.66)	ns	0.60 (0.54-0.66)	***	0.64 (0.55-0.74)	***	0.62 (0.57-0.68)	***	0.70 (0.65-0.75)	***
Austria	1.31 (1.07-1.61)	*	1.42 (1.17-1.73)	***	0.99 (0.88-1.12)	ns	1.09 (0.97-1.22)	ns	0.82 (0.64-1.06)	ns	0.24 (0.06-0.97)	*	0.84 (0.73-0.97)	*	0.86 (0.71-1.05)	ns	0.80 (0.70-0.91)	**	1.04 (0.93-1.18)	ns
Hungary	0.45 (0.37-0.54)	***	0.31 (0.24-0.39)	***	0.46 (0.42-0.50)	***	0.45 (0.41-0.49)	***	1.14 (0.99-1.32)	ns	1.10 (0.72-1.68)	ns	1.10 (1.01-1.20)	*	0.55 (0.48-0.64)	***	1.01 (0.93-1.09)	ns	0.65 (0.60-0.70)	***
Spain	0.87 (0.62-1.21)	ns	0.92 (0.65-1.29)	ns	0.46 (0.38-0.56)	***	0.51 (0.43-0.62)	***	0.95 (0.68-1.34)	ns	1.73 (0.80-3.72)	ns	1.28 (1.06-1.55)	*	0.71 (0.52-0.96)	*	1.14 (0.95-1.35)	ns	0.69 (0.58-0.82)	***
Portugal	0.44 (0.28-0.69)	***	0.17 (0.09-0.32)	***	0.45 (0.38-0.54)	***	0.43 (0.36-0.51)	***	0.67 (0.45-0.99)	*	0.71 (0.23-2.24)	ns	0.70 (0.57-0.85)	***	0.48 (0.34-0.68)	***	0.62 (0.52-0.74)	***	0.47 (0.40-0.55)	***

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Italy	1.01 (0.62-1.65)	ns	1.38 (0.88-2.17)	ns	0.76 (0.58-0.99)	*	0.83 (0.64-1.08)	ns	0.73 (0.40-1.32)	ns	1.16 (0.29-4.74)	ns	0.95 (0.70-1.29)	ns	0.60 (0.37-0.99)	*	0.87 (0.66-1.15)	ns	0.91 (0.70-1.18)	ns
Greece	0.24 (0.10-0.59)	**	0.32 (0.13-0.79)	*	0.28 (0.20-0.39)	***	0.27 (0.20-0.37)	***	0.57 (0.29-1.11)	ns	3.66 (1.60-8.39)	**	0.46 (0.31-0.68)	***	0.26 (0.13-0.53)	***	0.49 (0.36-0.67)	***	0.34 (0.26-0.45)	***
Australia	0.97 (0.80-1.16)	ns	1.35 (1.14-1.60)	**	0.86 (0.78-0.95)	**	0.88 (0.80-0.98)	*	1.45 (1.23-1.72)	***	0.88 (0.49-1.60)	ns	2.77 (2.50-3.06)	***	1.24 (0.08-1.44)	**	2.14 (1.93-2.36)	***	1.34 (1.21-1.49)	***
New Zealand	0.92 (0.74-1.14)	ns	0.85 (0.70-1.04)	ns	0.97 (0.87-1.09)	ns	0.93 (0.84-1.04)	ns	1.50 (1.25-1.79)	***	1.26 (0.73-2.20)	ns	4.64 (4.16-5.18)	***	2.60 (2.28-2.96)	***	3.66 (3.27-4.10)	***	2.07 (1.83-2.35)	***
Canada	1.09 (0.84-1.41)	ns	1.03 (0.83-1.27)	ns	0.92 (0.80-1.06)	ns	0.90 (0.78-1.04)	ns	1.20 (0.96-1.51)	ns	0.90 (0.40-2.05)	ns	2.34 (2.03-2.69)	***	1.14 (0.93-1.40)	ns	1.79 (1.55-2.05)	***	1.27 (1.10-1.48)	**
USA	0.90 (0.78-1.04)	ns	1.19 (1.07-1.33)	**	0.85 (0.79-0.92)	***	0.88 (0.82-0.95)	**	1.21 (1.07-1.36)	**	1.38 (0.97-1.97)	ns	2.39 (2.22-2.57)	***	1.48 (1.34-1.63)	***	1.93 (1.80-2.08)	***	1.23 (1.14-1.32)	***
Brazil	0.46 (0.39-0.55)	***	0.25 (0.21-0.31)	***	0.57 (0.53-0.62)	***	0.52 (0.48-0.56)	***	0.97 (0.85-1.11)	ns	2.20 (1.62-2.98)	***	0.88 (0.81-0.96)	**	0.47 (0.41-0.54)	***	0.79 (0.73-0.76)	***	0.57 (0.53-0.61)	***

Age, sex, AUDIT score and educational attainment were also included in the logistic regression model and those Adjusted Odds Ratios (AORs) are shown in Table 3. Reference category=Germany. NC=Insufficient traffic incidents were reported from the Poland sample to calculate AORs for Poland. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

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Supplementary Table C. Adjusted Odds Ratios (AORs) at country of residence level for feeling unsafe/very unsafe[†] at different times during a night out

Country	On way out		In bars		In clubs		On way home	
	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P	AOR (95% CIs)	P
Sweden	0.97 (0.57-1.67)	ns	1.26 (0.79-2.02)	ns	0.97 (0.71-1.34)	ns	0.90 (0.68-1.19)	ns
Denmark	1.35 (0.80-2.28)	ns	1.43 (0.86-2.39)	ns	0.71 (0.47-1.06)	ns	0.50 (0.34-0.72)	***
Poland	3.21 (2.19-4.71)	***	2.32 (1.49-3.61)	***	2.53 (1.92-3.34)	***	2.05 (1.58-2.65)	***
UK	1.29 (1.11-1.51)	**	0.89 (0.74-1.07)	ns	1.17 (1.06-1.28)	**	1.69 (1.57-1.82)	***
Ireland	1.29 (1.03-1.60)	*	1.02 (0.79-1.33)	ns	0.81 (0.69-0.95)	*	1.60 (1.43-1.79)	***
Netherlands	0.98 (0.83-1.16)	ns	0.46 (0.36-0.58)	***	0.44 (0.38-0.50)	***	0.80 (0.73-0.87)	***
Belgium	1.19 (0.90-1.57)	ns	0.77 (0.55-1.08)	ns	1.12 (0.94-1.33)	ns	1.28 (1.12-1.48)	***
France	2.40 (2.13-2.69)	***	1.15 (0.99-1.34)	ns	1.37 (1.26-1.49)	***	2.33 (2.18-2.49)	***
Switzerland	1.12 (0.94-1.34)	ns	0.73 (0.60-0.89)	**	0.86 (0.76-0.97)	*	0.95 (0.86-1.04)	ns
Austria	0.83 (0.61-1.14)	ns	0.72 (0.51-1.01)	ns	0.75 (0.62-0.91)	**	0.65 (0.55-0.76)	***
Hungary	1.44 (1.21-1.72)	***	0.76 (0.61-0.96)	*	1.43 (1.28-1.59)	***	1.83 (1.68-2.00)	***
Spain	1.51 (1.05-2.18)	*	0.90 (0.57-1.42)	ns	1.21 (0.95-1.54)	ns	0.93 (0.75-1.17)	ns
Portugal	1.95 (1.45-2.63)	***	1.22 (0.85-1.74)	ns	1.07 (0.85-1.34)	ns	2.04 (1.72-2.41)	***
Italy	2.19 (1.36-3.52)	**	0.76 (0.36-1.62)	ns	1.24 (0.85-1.80)	ns	1.33 (0.98-1.81)	ns
Greece	4.50 (3.13-6.49)	***	2.01 (1.24-3.27)	**	1.57 (1.13-2.19)	**	2.67 (2.05-3.49)	***
Australia	1.58 (1.28-1.94)	***	1.49 (1.19-1.85)	***	1.79 (1.57-2.03)	***	1.80 (1.61-2.01)	***
New Zealand	1.36 (1.08-1.72)	**	1.34 (1.05-1.70)	*	1.10 (0.94-1.29)	ns	1.43 (1.26-1.62)	***
Canada	0.65 (0.45-0.96)	*	0.94 (0.67-1.32)	ns	1.05 (0.86-1.28)	ns	0.72 (0.61-0.85)	***
USA	1.24 (1.06-1.44)	**	1.56 (1.34-1.81)	***	1.79 (1.62-1.92)	***	1.20 (1.10-1.30)	***
Brazil	11.70 (10.58-12.95)	***	5.92 (5.29-6.62)	***	2.36 (2.16-2.58)	***	8.52 (7.86-9.24)	***

[†]Feelings of safety were measured on a 1 (very unsafe) to 5 (very safe) Likert scale with individuals categorised as feeling unsafe/very unsafe (score 1 or 2) or safer (score 3-5). Age, sex, AUDIT score and educational attainment were also included in the logistic regression model and those Adjusted Odds Ratios (AORs) are shown in Table 5. Reference category=Germany. For P values, ***P<0.001, **P<0.01, *P<0.05, ns = not significant.

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For peer review only

STROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cross-sectional studies

Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study’s design with a commonly used term in the title or the abstract	1,2
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5-7
Objectives	3	State specific objectives, including any prespecified hypotheses	6-7
Methods			
Study design	4	Present key elements of study design early in the paper	7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8,9
Bias	9	Describe any efforts to address potential sources of bias	9
Study size	10	Explain how the study size was arrived at	7,8
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	9
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	9
		(b) Describe any methods used to examine subgroups and interactions	9
		(c) Explain how missing data were addressed	Table 2
		(d) If applicable, describe analytical methods taking account of sampling strategy	9
		(e) Describe any sensitivity analyses	-
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7,8
		(b) Give reasons for non-participation at each stage	7
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	11
		(b) Indicate number of participants with missing data for each variable of interest	Tables
Outcome data	15*	Report numbers of outcome events or summary measures	Tables
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Tables
		(b) Report category boundaries when continuous variables were categorized	Tables
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-
Discussion			
Key results	18	Summarise key results with reference to study objectives	10-18
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	21-22
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	18-21
Generalisability	21	Discuss the generalisability (external validity) of the study results	22-23
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	23

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at <http://www.plosmedicine.org/>, Annals of Internal Medicine at <http://www.annals.org/>, and Epidemiology at <http://www.epidem.com/>). Information on the STROBE Initiative is available at www.strobe-statement.org.