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Alcohol's harms to others in Wales, United Kingdom: Nature, magnitude and associations with mental well-being

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ABSTRACT

Aim: To explore the nature and magnitude of alcohol's harms to others (AHTOs), and associations with mental well-being.

Methods: Cross-sectional survey implemented amongst 891 randomly selected Welsh residents (aged 18+ years), via computer assisted telephone interviews. Questions established past 12-month experience of nine direct harms resulting from another person's alcohol consumption (e.g. violence) and five linked outcomes (e.g. concern for a child). The source (e.g. partner/stranger) and frequency of the AHTO were collected, and respondents' socio-demographics, drinking behaviours and mental well-being status.

Results: During the past 12 months, 43.5% of respondents had experienced at least one direct harm (45.5% at least one direct harm/linked outcome). In demographically adjusted analyses, the odds of experiencing any direct harm decreased sequentially as age group increased (Adjusted Odds Ratio [AORs]: 1.9 [age 65–74 years] - 4.2 [age 18–34 years]), and was higher amongst binge drinkers (AOR, 1.5, $p < 0.05$). Associations between age group and suffering the direct harms anxiety, disrupted sleep, feeling threatened, property damage and emotional neglect were found. Experience of feeling threatened was lower amongst females (AOR 0.6, $p < 0.05$). In demographically adjusted analyses, low mental well-being was higher amongst those who had suffered alcohol-related financial issues (AOR 2.2, $p < 0.001$), emotional neglect (AOR 2.3, $p < 0.01$) and property damage (AOR 2.2, $p < 0.05$).

Conclusion: AHTOs place a large, although unequal burden on adults in Wales. Individuals' drinking patterns are associated with experience of AHTOs. Critically, experience of some harms is associated with low mental well-being.

1. Introduction

Globally, alcohol consumption is estimated to result in approximately 3.3 million deaths each year, which arise from over 200 health conditions attributable to alcohol (World Health Organization [WHO], 2014). However, the impacts of alcohol consumption can go beyond the drinker and be placed on those around them. Often referred to as alcohol's harms to others (AHTOs), such harms can include alcohol-related road traffic incidents (Waller, Hill, Maio, & Blow, 2003), violence and aggression (Bellis, Hughes, & Hughes, 2006), as well as abuse and neglect of children (Laslett et al., 2017) and impacts on the foetus from maternal drinking (Riley, Infante, & Warren, 2011). The WHO's global strategy to reduce the harmful use of alcohol highlights the need to focus attention on reducing harm to people other than the drinker (WHO, 2009). Over the past decade, studies focusing on AHTOs have started to emerge, including in Australia, Canada, New Zealand and the United States (Casswell, Harding, You, & Huckle, 2011; Greenfield, Karriker-Jaffe, Kerr, Ye, & Kaplan, 2016; Laslett et al., 2011; Lewis-Laietmark et al., 2017). Collectively, these studies provide insights into the breadth, impact and costs of AHTOs, and consequently highlight the importance of considering such harms when measuring alcohol's impact on society, and developing policy and prevention activity.

Despite differences in methodology (e.g. number/type of harms considered), studies consistently demonstrate a high prevalence of AHTOs across various populations. The 2015 Global Drug Survey (an online survey targeted towards drug users) found that 60% of respondents reported one or more of seven negative harms caused by another's drinking in the past 12 months; 40% suffered at least one

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aggressive harm (physical, verbal or sexual assault) (Bellis et al., 2015). In Australia and New Zealand, studies have estimated that 70% of adults have experienced harms from a stranger's drinking in the past year (Casswell, Harding, et al., 2011; Laslett et al., 2011). Further, a study carried out in the USA indicated that 53% of adults had experienced one or more of six types of AHTOs over their life course (Greenfield et al., 2014). Across Europe, adult prevalence rates (past 12 months) of AHTOs have been estimated as: 79% in North West England (including 20 harms; Gell, Ally, Buykx, Hope, & Meier, 2015); 51% in Scotland (16 harms; Hope, Curran, Bell, & Platts, 2013); 40% in Norway (seven harms; Rossow & Hauge, 2004); and 28% in Ireland (five harms; Hope, 2014). In England and Wales in 2016/17, an estimated 40% of all violence was perpetrated by someone under the influence of alcohol (Office for National Statistics, 2018).

A number of studies have found associations between experiencing AHTOs and individual characteristics. Younger age groups are often identified as suffering more harm because of others' drinking compared to older age groups (Bellis et al., 2015; Hope, 2014; Laslett et al., 2011). Relationships with gender have also been found, including variations in experience of specific harms. For instance, studies have found that males are more likely to experience alcohol-related violence and aggression than females (Greenfield, Harford, & Tam, 2009; Laslett et al., 2011). Others have shown that females are more likely to experience family and financial problems (Greenfield et al., 2009), feeling unsafe in public (Casswell, Harding, et al., 2011; Laslett et al., 2011) and unwanted sexual attention (Casswell, Harding, et al., 2011). Personal alcohol consumption (Bellis et al., 2015; Rossow & Hauge, 2004) and community level factors (e.g. deprivation, alcohol outlet density; Karriker-Jaffe & Greenfield, 2014; Livingston, 2011) have been associated with increased risks of AHTOs.

Evidence indicates that the impacts of AHTOs are substantive. Within the European Union, an estimated 5564 men and 2146 women (aged 15–64 years) died as a result of other people's drinking in 2004 (WHO, 2013). Yet for every death many more will suffer other negative effects, including hospitalisation (Laslett et al., 2010), and broader effects on health and well-being (e.g. lower mental well-being; Casswell, You, & Huckle, 2011; Ferris, Laslett, Livingston, Room, & Wilkinson, 2011; Lewis-Laietmark et al., 2017), placing large financial impacts on society (Laslett et al., 2010). In the United Kingdom (UK) the negative consequences of alcohol are estimated to cost society £21 billion annually (HM Government, 2012). Whilst this estimate includes various costs related to healthcare, crime and the workplace, relatively little information on broader AHTOs, including tangible and intangible impacts, is available for the UK, resulting in a likely underestimation of the economic burden of alcohol. Equally, developing understanding of the differential impacts of AHTOs is warranted to provide more comprehensive assessments of their impact. For instance, whilst emerging studies suggest that experience of AHTOs is associated with lower mental well-being, they also suggest that the type of harm experienced, by whom and at what frequency may be mediating factors (Ferris et al., 2011; Karriker-Jaffe, Greenfield, & Kaplan, 2017; Lewis-Laietmark et al., 2017).

In the UK, there is a need to increase understanding of the breadth and impact of AHTOs, including direct harms to individuals (e.g. alcohol-related violence) and other linked outcomes such as subsequent harms to children, broader relationships with health and well-being, and impacts on public services (e.g. police) (Gell et al., 2015; Hope, 2014; Hope et al., 2013). This is critical to inform the development, targeting and evaluation of existing and future prevention activity and policy changes, including for example the introduction of a minimum price for the sale alcohol in Wales (to be introduced; National Assembly for Wales, 2018/19), and a more comprehensive assessment of the costs of alcohol to society. Our study aimed to develop understanding of AHTOs in Wales (prior to this major policy change), through:

1. Exploring the nature and magnitude of AHTOs in Wales, including direct harms and linked outcomes, and distributions across socio-demographic characteristics;
2. Estimating the strength of association between experience of AHTOs, socio-demographic factors (e.g. age, gender) and personal alcohol consumption; and,
3. Estimating the strength of association between low mental well-being and experience of AHTOs, controlling for demographic factors and personal alcohol consumption.

2. Materials and methods

2.1. Study design

A cross sectional survey of adults (aged 18+ years) resident in Wales was implemented from June to September 2015, via computer assisted telephone interviews. Sampling used a random probability method where Welsh landline telephone numbers (n = 22,000) were randomly selected (from a commercial provider). Random digit dialling was then used, with phone numbers called over different days/times (Monday-Friday, 09.30–20.00) to increase the likelihood of making contact. Call centre researchers completed an initial screening, which involved introducing themselves to the respondent and asking if they were aged 18+ years and resided in the household. If they were, the respondent was invited to participate in the survey. If not, they were asked whether there was anyone else available in the household who was a resident aged 18+ years who may wish to take part, and if so, the script was repeated with the next available respondent. If the respondent did not wish to take part in the survey, or there was no-one in the household within the age range, they were advised that their number would be removed from the system and they would not be called again. Interviews could be conducted in English or Welsh: no participants opted to conduct the survey in Welsh. All researchers received training and were supervised throughout data collection, with a selection of calls monitored. No answers/call back requests/answer machines were called until a respondent provided either a yes (n = 1080) or no (n = 5307) answer to survey participation, or the study end was reached. Nine respondents were excluded as they provided no information on harms, leaving a final sample of 1071 (response rate, 16.8%). For this study, data were limited to 891 individuals who provided full demographic data (i.e. gender, age and area of residence). Half (54.3%) of respondents were aged 55+ years, 61.5% were female and 58.9% lived in an area of low deprivation (Table 1). Ethical approval was obtained from Liverpool John Moores University and NHS research permissions were obtained from the Public Health Wales Research and Development Office.

2.2. Measures

2.2.1. Alcohol's harms to others

Respondents were asked if they had experienced a range of harms in the past 12 months because of someone else's drinking (Table S1). Two dichotomized variables were produced indicating experience of: any direct harm; and any direct harm or linked outcome. For each AHTO the respondent had experienced, they were asked whom this happened with covering three sources: a partner (i.e. someone you were in a relationship with who you lived/did not live with); another known person (i.e. family member you lived/did not live with; someone else you lived with; a friend; a work colleague; someone else you know); and a stranger (respondents could choose more than one response). To measure exposure to harms, respondents were asked how often each harm had happened in the past 12 months. Response options included: daily/almost daily; weekly; monthly; and less than monthly. A dichotomized variable was produced to indicate monthly exposure to harm (yes: daily/almost daily, weekly, monthly; no: less than monthly).

Table 1
Alcohol's harms to others and low mental well-being by sample characteristics.

	All	Age group								Gender				Deprivation				
	Sample	18–34	35–44	45–54	55–64	65–74	75+	X^2_{trend}	P	F	M	X^2	P	High	Mid	Low	X^2_{trend}	P
n	891	124	130	153	188	177	119			548	343			106	260	525		
Direct harms (%)																		
Threatened	11.3	23.4	18.5	12.4	5.9	7.3	4.2	34.447	< 0.001	10.0	13.4	2.388	0.122	14.2	13.1	9.9	2.523	0.112
Emotional neglect	11.6	16.9	17.7	13.7	9.0	9.6	3.4	16.533	< 0.001	13.5	8.5	5.252	< 0.05	16.0	14.6	9.1	6.845	< 0.01
Violent harm	3.1	8.1	4.6	3.3	1.1	2.3	0.8	12.373	< 0.001	2.9	3.5	0.232	0.630	6.6	4.2	1.9	7.817	< 0.01
Unintentional injury	3.3	8.9	6.9	3.3	0.5	1.1	0.8	22.133	< 0.001	3.1	3.5	0.102	0.749	5.7	3.5	2.7	2.372	0.124
Property damage	5.8	12.1	7.7	6.5	5.9	2.3	1.7	16.299	< 0.001	4.9	7.3	2.171	0.141	10.4	6.9	4.4	6.521	< 0.05
Financial issue	6.2	8.9	9.2	8.5	4.8	4.0	2.5	8.731	< 0.05	6.2	6.1	0.001	0.969	4.7	8.1	5.5	0.142	0.706
Anxious	23.4	33.1	33.1	30.7	17.0	16.4	13.6	28.534	< 0.001	23.2	23.7	0.030	0.861	28.3	25.5	21.3	3.261	0.071
Disrupted sleep	25.3	32.3	34.6	27.5	23.9	22.2	11.9	19.018	< 0.001	25.9	24.3	0.275	0.600	36.8	27.5	21.9	11.004	< 0.01
Any direct harm[a] (%)	43.5	58.9	61.5	51.5	34.6	36.2	22.7	56.814	< 0.001	43.2	44.0	0.052	0.820	54.7	47.3	39.4	10.483	< 0.01
Linked outcomes (%)																		
Child harm	5.2	5.6	6.9	7.2	4.3	3.4	4.2	1.949	0.163	6.0	3.8	2.116	0.146	5.7	5.8	4.8	0.331	0.565
Drink to cope	3.0	4.0	7.7	2.0	2.7	1.1	1.7	6.383	< 0.05	2.9	3.2	0.057	0.811	3.8	4.2	2.3	1.716	0.190
Police contact	7.8	10.5	8.5	10.5	6.4	6.2	5.0	3.964	< 0.05	6.8	9.3	1.938	0.164	8.5	9.7	6.7	1.354	0.245
Caring	3.8	3.2	4.6	5.2	3.2	3.4	3.4	0.171	0.679	3.8	3.8	0.001	0.981	4.7	5.0	3.0	1.571	0.210
Any direct harm[a]/linked outcome[b] (%)	45.5	59.7	63.1	54.2	36.7	37.9	25.2	53.192	< 0.001	45.3	45.8	0.023	0.880	54.7	48.8	41.9	7.517	< 0.01
Low mental well-being (%)	12.7	17.7	14.6	16.3	11.7	6.8	10.9	11.218	< 0.05	14.2	10.2	2.740	0.079	24.5	13.1	10.1	16.642	< 0.001

[a] Including sexual, experienced by 0.9% of the sample; no further analyses conducted due to low numbers.
[b] Including forced to move, experienced by 1.7% of the sample; no further analyses conducted due to low numbers.

2.2.2. Socio-demographic variables

Socio-demographic variables included age, gender and postcode of residence (converted into Lower Super Output Areas [LSOA] - geographical areas with a population mean of 1500). Each respondent was assigned a measure of deprivation (Welsh Index of Multiple Deprivation [IMD]; Welsh Government, 2014) based on nationally published IMDs for each LSOA.

2.2.3. Alcohol use

Respondents were asked if they had ever drank alcohol. If yes, they were asked how often they had had six or more drinks containing alcohol on one occasion in the past 12 months. Response options included: daily/almost daily; weekly; monthly; less than monthly; and never. A dichotomized variable was produced to indicate monthly binge drinking (yes: daily/almost daily, weekly, monthly; no: less than monthly, never).

2.2.4. Mental well-being

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was used to measure mental well-being over the past two weeks. WEMWBS includes 14 statements about an individual's thoughts and feelings, with each statement scored one (none of the time) to five (all of the time) and a total mental well-being score calculated (potential range: 14–70). Low mental well-being was defined as more than one standard deviation (10) below the mean (54) and consequently set at < 45.

2.3. Analyses

Data were collected in a Microsoft Access database and transferred to the Statistical Package for Social Science (SPSS) v21 for data cleaning, coding and analyses. X^2 tests and logistic regression (enter method) were used to examine unadjusted and adjusted associations between: direct harms, linked outcomes and low mental well-being, and; age, gender, deprivation, and personal alcohol consumption; and for low mental well-being, experience of any direct harm.

3. Results

3.1. Experience of AHTOs

Two-fifths (43.5%) of respondents reported experiencing at least one of the nine direct harms (i.e. any direct harm) in the past 12 months (45.5% experienced any direct harm/linked outcome). Due to someone else's drinking: over a fifth had been kept awake due to noise or disruption (25.3%) or felt anxious at a social occasion (23.4%); one in ten had felt emotionally neglected (11.6%) or threatened (11.3%); with lower percentages reporting experiencing other direct harms or linked outcomes (Table 1). In bivariate analyses, experience of any direct harm or any direct harm/linked outcome was significantly associated with age group and deprivation. Significant differences in experience of all direct harms, and the linked outcomes drink to cope and police contact were found across age groups (Table 1). Experience of emotional neglect, violent harm, property damage and disrupted sleep was significantly associated with deprivation (Table 1). Significant differences in experience of emotional neglect were found between genders. Levels of monthly binge drinking were higher amongst those experiencing any direct harm and any direct harm/linked outcome. Monthly binge drinking was also higher amongst those reporting the harms threatened, unintentional injury, financial issue, and the linked outcome drink to cope.

In adjusted analyses (Tables 2/S2), the odds of experiencing any direct harm were around 2–4 times higher amongst all age groups between 18 and 74 years, compared to those aged 75+ years. The odds of experiencing any direct harm decreased sequentially as age group increased (Adjusted Odds Ratio [AORs] range: 1.9 [age 65–74 years] - 4.2 [age 18–34 years]). The odds of experiencing any direct harm were 1.5 times higher amongst binge drinkers. Experience of the harms threatened, emotional neglect, and anxious were significantly higher amongst those aged 18–54 years, and unintentional injury and property damage was higher amongst those aged 18–34 years, compared to those aged 75+ years (Table S2). Females were less likely to report feeling threatened than males (AOR, 0.6). Those living in mid-affluent areas were more likely to report feeling emotionally neglected, compared to those in the most affluent areas (AOR, 1.7).

More than half of respondents experiencing financial issues reported

Table 2
Adjusted odds ratios[a] for any direct harm (past 12 months), and low mental well-being (past two weeks).

		Any direct harm[b]		Low mental well-being	
	Category	AOR (95%CIs)	P	AOR (95%CIs)	P
Age group (years)	18–34	4.2 (2.4–7.6)	< 0.001	1.2 (0.6–2.7)	0.589
	35–44	4.9 (2.8–8.7)	< 0.001	1.0 (0.5–2.2)	0.996
	45–54	3.5 (2.0–6.1)	< 0.001	1.3 (0.6–2.8)	0.464
	55–64	1.8 (1.0–3.0)	< 0.05	0.9 (0.4–2.0)	0.873
	65–74	1.9 (1.1–3.2)	< 0.05	0.5 (0.2–1.1)	0.090
	(Ref) 75 +		0.00		0.159
Deprivation	Poor	1.5 (0.9–2.3)	0.085	2.9 (1.7–5.1)	< 0.001
	Mid	1.4 (1.0–1.9)	0.062	1.3 (0.8–2.1)	0.251
	(Ref) Rich		0.08		0.001
Sex	Female	0.9 (0.6–1.2)	0.315	1.4 (0.9–2.2)	0.121
Alcohol	Binge monthly	1.5 (1.0–2.3)	< 0.05	1.4 (0.8–2.4)	0.197
Harm	Any direct harm	NA	NA	1.3 (0.9–2.0)	0.212

[a] Logistic regression using the enter method.
[b] Including nine direct harms.

Table 3
Alcohol's harms to others by source of harm and frequency of exposure (past 12 months).

	Source of harm							
	Any		By partner		By other known		By stranger	
		Monthly or more	Of all in category	Monthly or more	Of all in category	Monthly or more	Of all in category	Monthly or more
	n (*)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Direct harms								
Threatened	101 (3)	30.7	13.9	50.0	35.6	36.1	53.5	24.1
Emotional neglect	103 (4)	35.3	27.2	57.1	70.9	28.8	4.9	20.0
Violent harm	28 (1)	28.6	32.1	55.6	50.0	14.3	21.4	33.3
Unintentional injury	29 (2)	13.8	27.6	25.0	41.4	8.3	37.9	9.1
Property damage	52 (2)	11.5	30.8	6.3	50.0	15.4	23.1	16.7
Financial issue	55 (2)	57.4	38.2	76.2	63.6	48.6	0.0	na
Anxious	208 (12)	14.6	13.0	19.2	64.3	15.9	25.6	13.2
Disrupted sleep	225 (16)	36.6	10.2	47.8	46.2	37.9	48.4	36.7
Linked outcomes								
Child harms	46 (2)	26.7	8.7	75.0	73.9	33.3	19.6	11.1
Drink to cope	27 (5)	69.2	42.3	70.0	69.2	72.2	0.0	na
Police contact	69 (5)	10.4	10.1	28.6	58.0	13.2	37.7	7.7
Caring	34 (1)	64.7	20.6	71.4	79.4	63.0	2.9	100.0

(*) Participants could select more than one source of harm. (*) denotes the number of individuals experiencing each harm/outcome who specified more than one main source of harm.

experiencing them frequently (i.e. monthly or more), as did around three in ten of those reporting disrupted sleep, feeling threatened or experiencing emotional neglect or violent harm. Over two thirds of respondents experiencing the linked outcomes drink to cope and caring experienced them frequently. Across all harms and linked outcomes, the source of harm with the highest proportion was 'other known'; with the exception of feeling threatened and disrupted sleep, where stranger was more prevalent. Frequency of experiencing all direct harms and linked outcomes was elevated when the source of harm was a partner, except for property damage and drink to cope (Table 3).

3.2. Mental well-being

Just over one in ten (12.7%) participants reported low mental well-being. In bivariate analyses, associations were found between low mental well-being and experiencing at least one direct harm, and all direct harms individually excluding unintentional injury (Table S3). In adjusted analyses, low mental well-being was higher amongst those who had experienced alcohol-related financial issues (adjusted odds ratio [AOR] 2.2, $p < 0.001$), emotional neglect (AOR 2.3, $p < 0.01$) and property damage (AOR 2.2, $p < 0.05$) (Fig. 1). Experiencing any direct harm was not significantly associated with low mental well-being in adjusted analyses (Table 2).

4. Discussion

Identifying the nature, extent and impact of AHTOs is vital for providing a better understanding of the collateral damage alcohol places on society, and for driving and measuring the impact of alcohol policy and prevention activity (Greenfield et al., 2014; Karriker-Jaffe, Room, Giesbrecht, & Greenfield, 2018). Few studies have explored AHTOs in the UK (Gell et al., 2015; Hope, 2014; Hope et al., 2013) and this study is the first to explore a broad range of AHTOs across the Welsh population. Findings indicate that AHTOs place a large although unequal burden on adults in Wales. Experience of AHTOs varied by socio-demographics, the type of harm experienced and the source of the harm, and was associated with personal alcohol consumption. Whilst our study found no association between any direct AHTOs and low mental well-being, associations were found for some AHTOs, specifically experience of alcohol-related financial issues, emotional neglect and property damage.

More than two-fifths (43.5%) of respondents reported experiencing at least one of the nine direct harms (45.5% experienced any direct harm/linked outcome). The most commonly reported were being kept

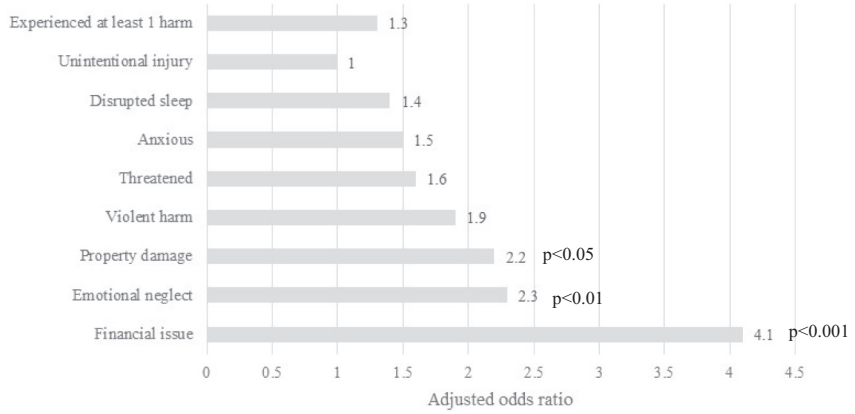

Fig. 1. Adjusted odds ratios for low mental well-being; any direct harm and individual harms.

awake due to noise or disruption and feeling anxious at a social occasion. As found elsewhere, harms that are often perceived as more severe, such as violence, unintentional injury and property damage were reported less often (Casswell, Harding, et al., 2011; Rossow & Hauge, 2004). Our study corroborates other research indicating that AHTOs are experienced more by younger people and heavy drinkers (Karriker-Jaffe & Greenfield, 2014; Laslett et al., 2011; Laslett, Ferris, Dietze, & Room, 2012). Despite levels of alcohol consumption amongst young people declining in the UK (ONS, 2017), greater exposure to environments where AHTOs may be more likely to occur (e.g. nightlife) and increased risky alcohol consumption amongst sub-groups, may place young people at greater risk of AHTOs (Marmet & Gmel, 2017; Rossow & Hauge, 2004). However, our study also suggests that younger people are more likely to experience harms that are not necessarily associated with risky drinking environments (e.g. emotional neglect), which warrants further investigation. Consistent with studies suggesting much higher levels of involvement in alcohol-related violence in men (Greenfield et al., 2009; Laslett et al., 2011), we found that females were less likely to experience feeling physically threatened than males.

Whilst our study did not find an association between any direct harm and low mental well-being in adjusted analyses, similar to other studies we found associations between individual harms and low mental well-being (Bellis et al., 2018; Greenfield et al., 2016; Karriker-Jaffe et al., 2017; Lewis-Laietmark et al., 2017). Participants experiencing alcohol-related financial issues, emotional neglect and property damage were twice as likely to report low mental well-being than individuals who had not experienced these harms. Some studies suggest that specific harms may have a greater impact on health and well-being (Greenfield et al., 2016; Karriker-Jaffe et al., 2017). However, it is also likely that both the frequency and source of harm can mediate impacts on health (Ferris et al., 2011; Karriker-Jaffe et al., 2017; Laslett et al., 2012). For example, in our study, all perpetrators of financial harm were someone known to the victim, and over half of those experiencing this harm reported experiencing it monthly or more. Further, for most harms, the frequency of experiencing the harm was elevated when the source of harm was a partner. Whilst our study cannot establish a direct link between the exposure to harm and mental well-being, it is plausible that repeated exposure to harm from a known other results in greater negative impacts on mental well-being (Rossow & Ramstedt, 2016).

The context in which AHTOs are experienced, including harm type, source and length of exposure, and its relationship to both immediate and long-term health and well-being, requires further consideration. Studies have suggested that experience of AHTOs can last many years (Laslett et al., 2015, 2017), and impacts may be seen across both an individual's life-course and future generations. For instance, our study suggests that 5% of adults in Wales have been concerned that their or another's child may be harmed because of someone else's drinking. Alcohol problems in the home environment are associated with increased risks of physical and verbal abuse of children, exposure to domestic violence and child neglect as well as the breakdown of marriages and mental health issues in parents (Casswell, You, & Huckle, 2011). Such factors are part of a suite of adverse childhood experiences (ACEs) that not only have immediate detrimental impacts on a child's health but are also linked with poorer school performance, substance use and violence and, in the longer term, the premature development of chronic diseases (e.g. cancers) and early death (Anda et al., 2002). In England, from 2011 to 2014, over a third of child deaths or serious injuries through neglect were linked to parental alcohol misuse (Sidebotham et al., 2016). Such impacts are substantive for individuals, families, communities and society as a whole, including public and voluntary services. The broad impact of AHTOs is illustrated in our study, which suggests that just under one in ten adults had contacted the police due to another's drinking in the past 12 months.

Our study has some limitations, similar to other studies of this nature (Rossow & Hauge, 2004). Young people are often missed from household surveys, a group identified as at-risk of AHTOs. Thus, our final two weeks of data collection were limited to those aged 18–34 years to boost this sample cohort. Findings represent an association only and do not imply causation. Thus, lower mental health and/or personal alcohol consumption may be a predictor and/or consequence of AHTOs. However, our results are consistent with findings elsewhere that show similar associations (Ferris et al., 2011; Karriker-Jaffe et al., 2017; Lewis-Laietmark et al., 2017) and suggest exposure to AHTOs may increase the likelihood of poor mental well-being (Ferris et al., 2011). Participants self-identified AHTOs; we were unable to verify if the harms reported occurred as a direct result of another's drinking, or if the harm would have occurred if alcohol had not been consumed (Rossow & Ramstedt, 2016). Further, one event may have led to more than one AHTOs recorded in our study; future studies should explore this further. Similar to other studies, we did not ask children about their experience of harm, but rather adult's perceptions of child harm. Recall bias may have affected the study; however, we aimed to mitigate this by asking about past 12 months, rather than lifetime, exposure. Further, whilst we have been able to adjust for socio-demographic variables there may be unmeasured confounders that have not been accounted for.

5. Conclusion

Across many countries, alcohol consumption is a normalised behaviour, which places substantial harm on the population's health. Reducing access to alcohol has the potential to reduce alcohol consumption levels, especially in the heaviest drinkers, and subsequently alcohol's impact on society, including through AHTOs (Karriker-Jaffe et al., 2018). Our study provides a baseline for measuring such impacts following national commitment to implement a minimum unit price of

alcohol across Wales (National Assembly for Wales, 2018). Ensuring the safety of the public is a key responsibility of national government. Critically, our study highlights the extent that a person's alcohol consumption affects others, and shifts the focus of responsibility for harm prevention from an individual to a governmental perspective. The right to promote and sell alcohol, and consume it in ways that damages individuals' own health needs to be carefully weighed against the harms caused by those not drinking or consuming at low levels. An increased understanding of AHTO in adults and children is a critical part of providing the right balance.

Conflict of interest

None declared.

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Appendix A. Supplementary data

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References

Anda, R. F., Whitfield, C. L., Felitti, V. J., Chapman, D., Edwards, V. J., Dube, S. R., & Williamson, D. F. (2002). Adverse childhood experiences, alcoholic parents, and later risk of alcoholism and depression. *Psychiatric Services, 53*(8), 1001–1009. https://doi.org/10.1176/appi.ps.53.8.1001.

Bellis, M. A., Hughes, K., Ford, K., Hardcastle, K. A., Sharp, C. A., Wood, S., & Davies, A. (2018). Adverse childhood experiences and sources of childhood resilience: A retrospective study of their combined relationships with child health and educational attendance. *BMC Public Health, 18*(1), 792. https://doi.org/10.1186/s12889-018-5699-8.

Bellis, M. A., Hughes, K., & Hughes, S. (2006). *WHO policy briefing: Interpersonal violence and alcohol.* Liverpool: Centre for Public Health, Liverpool John Moores University.

Bellis, M. A., Quigg, Z., Hughes, K., Ashton, K., Ferris, J., & Winstock, A. (2015). Harms from other people's drinking: An international survey of their occurrence, impacts on feeling safe and legislation relating to their control. *BMJ Open, 5*(12), e010112. https://doi.org/10.1136/bmjopen-2015-010112.

Casswell, S., Harding, J. F., You, R. Q., & Huckle, T. (2011). Alcohol's harm to others: Self-reports from a representative sample of new Zealanders. NZ. *Medizinhistorisches Journal, 124*(1336), 75–84. https://www.nzma.org.nz/journal/read-the-journal/all-issues/2010-2019/2011/vol-124-no-1336/article-casswell.

Casswell, S., You, R. Q., & Huckle, T. (2011). Alcohol's harm to others: Reduced wellbeing and health status for those with heavy drinkers in their lives. *Addiction, 106*(6), 1087–1094. https://doi.org/10.1111/j.1360-0443.2011.03361.x.

Ferris, J., Laslett, A.-M., Livingston, M., Room, R., & Wilkinson, C. (2011). The impacts of others' drinking on mental health. *Medical Journal of Australia, 195*(3), S22–S26.

Gell, L., Ally, A., Buykx, P., Hope, A., & Meier, P. (2015). *Alcohol's harm to others.* Sheffield: University of Sheffield School of Health and Related Research.

Greenfield, T. K., Harford, T. C., & Tam, T. W. (2009). Modeling cognitive influences on drinking and alcohol problems. *Journal of Studies on Alcohol and Drugs, 70*(1), 78–86. https://doi.org/10.15288/jsad.2009.70.78.

Greenfield, T. K., Karriker-Jaffe, K. J., Giesbrecht, N., Kerr, W. C., Ye, Y., & Bond, J. (2014). Second-hand drinking may increase support for alcohol policies: New results from the 2010 National Alcohol Survey. *Drug and Alcohol Review, 33*(3), 259–267. https://doi.org/10.1111/dar.12131.

Greenfield, T. K., Karriker-Jaffe, K. J., Kerr, W. C., Ye, Y., & Kaplan, L. M. (2016). Those harmed by others' drinking in the US population are more depressed and distressed. *Drug and Alcohol Review, 35*(1), 22–29. https://doi.org/10.1111/dar.12324.

HM Government (2012). *The government's alcohol strategy.* London: The Stationery Office.

Hope, A. (2014). *Alcohol's harm to others in Ireland.* Health Service Executive.

Hope, A., Curran, J., Bell, G., & Platts, A. (2013). *Unrecognised and under-reported: The impact of alcohol on people other than the drinker in Scotland.* Glasgow: Alcohol Focus Scotland.

Karriker-Jaffe, K. J., & Greenfield, T. K. (2014). Gender differences in associations of neighbourhood disadvantage with alcohol's harms to others: A cross-sectional study from the USA. *Drug and Alcohol Review, 33*(3), 296–303. https://doi.org/10.1111/dar.12119.

Karriker-Jaffe, K. J., Greenfield, T. K., & Kaplan, L. M. (2017). Distress and alcohol-related harms from intimates, friends, and strangers. *Journal of Substance Use, 22*(4), 434–441. https://doi.org/10.1080/14659891.2016.1232761.

Karriker-Jaffe, K. J., Room, R., Giesbrecht, N., & Greenfield, T. K. (2018). Alcohol's harm to others: Opportunities and challenges in a public health framework. *Journal of Studies on Alcohol and Drugs, 79*(2), 239–243. https://doi.org/10.15288/jsad.2018.79.239.

Laslett, A. M., Callinan, S., Mugavin, J., Jiang, H., Livingston, M., & Room, R. (2015). *Beyond the drinker: Longitudinal patterns in alcohol's harm to others.* Canberra, Australia: Centre for Alcohol Policy Research, Turning Point Alcohol and Drug Centre.

Laslett, A. M., Catalano, P., Chikritzhs, T., Dale, C., Doran, C., Ferris, J., & Room, R. (2010). *The range and magnitude of alcohol's harm to others.* Victoria: The Centre for Alcohol Policy Research, Turning Point Alcohol and Drug Centre, Eastern Health.

Laslett, A. M., Ferris, J., Dietze, P., & Room, R. (2012). Social demography of alcohol-related harm to children in Australia. *Addiction, 107*(6), 1082–1089. https://doi.org/10.1111/j.1360-0443.2012.03789.x.

Laslett, A. M., Rankin, G., Waleewong, O., Callinan, S., Hoang, H. T., Florenzano, R., & Hope, A. (2017). A multi-country study of harms to children because of others' drinking. *Journal of Studies on Alcohol and Drugs, 78*(2), 195–202. https://doi.org/10.15288/jsad.2017.78.195.

Laslett, A. M., Room, R., Ferris, J., Wilkinson, C., Livingston, M., & Mugavin, J. (2011). Surveying the range and magnitude of alcohol's harm to others in Australia. *Addiction, 106*(9), 1603–1611. https://doi.org/10.1111/j.1360-0443.2011.03445.x.

Lewis-Laietmark, C., Wettlaufer, A., Shield, K. D., Giesbrecht, N., April, N., Asbridge, M., & Stockwell, T. (2017). The effects of alcohol-related harms to others on self-perceived mental well-being in a Canadian sample. *International Journal of Public Health, 62*(6), 669–678. https://doi.org/10.1007/s00038-016-0924-7.

Livingston, M. (2011). Alcohol outlet density and harm: Comparing the impacts on violence and chronic harms. *Drug and Alcohol Review, 30*(5), 515–523. https://doi.org/10.1111/j.1465-3362.2010.00251.x.

Marmet, S., & Gmel, G. (2017). Alcohol's harm to others in Switzerland in the year 2011/2012. *Journal of Substance Use, 22*(4), 403–411. https://doi.org/10.1080/14659891.2016.1232757.

National Assembly for Wales (2018). *The public health (minimum price for alcohol) (Wales) Bill.* Cardiff: National Assembly for Wales.

Office for National Statistics (2017). Adult drinking habits in Great Britain: 2005 to 2016. Online. Accessed 16/8/18. Available at https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/bulletins/opinionsandlifestylesurveyadultdrinkinghabitsingreatbritain/2017.

Office for National Statistics (2018). The nature of violent crime in England and Wales: year ending March 2017. Online. Accessed 16/8/18. Available at https://www.ons.gov.uk/releases/thenatureofviolentcrimeinenglandandwalesyearendingmarch2017.

Riley, E. P., Infante, M. A., & Warren, K. R. (2011). Fetal alcohol spectrum disorders: An overview. *Neuropsychology Review, 21*(2), 73. https://doi.org/10.1007/s11065-011-9166-x.

Rossow, I., & Hauge, R. (2004). Who pays for the drinking? Characteristics of the extent and distribution of social harms from others' drinking. *Addiction, 99*(9), 1094–1102.

Rossow, I., & Ramstedt, M. (2016). Challenges in estimating population impacts of alcohol's harm to others. *Nordic Studies on Alcohol and Drugs, 33*(5–6), 503–513. https://doi.org/10.1111/j.1360-0443.2004.00788.x.

Sidebotham, P., Brandon, M., Bailey, S., Belderson, P., Dodsworth, J., Garstang, J., & Sorensen, P. (2016). *Pathways to harm, pathways to protection: A triennial analysis of serious case reviews 2011 to 2014.* London: Department for Education.

Waller, P. F., Hill, E. M., Maio, R. F., & Blow, F. C. (2003). Alcohol effects on motor vehicle crash injury. *Alcoholism: Clinical and Experimental Research, 27*(4), 695–703. https://doi.org/10.1097/01.ALC.0000062758.18918.7C.

Welsh Government (2014). *Welsh Index of Multiple Deprivation (WIMD) 2014.* Cardiff: Statistical Publication Unit.

World Health Organization (2009). *Global strategy to reduce harmful use of alcohol: Report on the WHO regional technical consultation, 24–26 February 2009, Nonthaburi, Thailand (No. SEA-Ment-161).* WHO Regional Office for South-East Asia.

World Health Organization (2013). *Status report on alcohol and health in 35 European countries 2013.* Copenhagen, Denmark: World Health Organization.

World Health Organization, & World Health Organization. Management of Substance Abuse Unit (2014). *Global status report on alcohol and health, 2014.* World Health Organization.