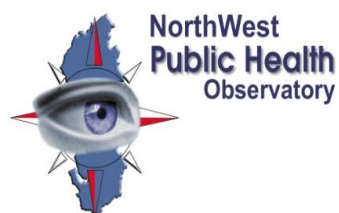




Changes in young people's alcohol consumption and related violence, sex and memory loss

2009 – 2011 North West of England

In partnership with:



Summary

Background and methodology

In 2009, the Chief Medical Officer (CMO) launched guidance to address alcohol-related harms in children and young people (those under 18 years of age). These recommended that an alcohol free childhood is the most desirable option. However, if this cannot be achieved, onset of drinking should be delayed for as long as possible (at least until 15 years of age). Further, that if 15-17 year olds do drink, they should do so only under the supervision of a parent/carer, should not drink more than once a week, and should not exceed the maximum daily units for adults (females: 2-3 units; males: 3-4 units). Since the CMO guidance was published, a number of initiatives and interventions have been launched to complement existing measures to tackle underage drinking and raise awareness of the harms caused by alcohol.

This report investigates whether any change has been observed in risky drinking behaviour since the guidance was implemented. It compares data from the 2009 and 2011 Trading Standards surveys of 15-16 year olds in the North West of England.

Eight measures assessed whether young people were abstaining or adhering to the drinking guidance. The percentages of individuals reporting drinking alcohol was the first such measure, followed by seven others which were analysed for drinkers only: frequent drinking (drinking more than weekly); heavy drinking (drinking five or more alcoholic drinks in one session at least monthly); unsupervised inside drinking (mostly drinking at home/in a friend's house when parents were out); unsupervised outside drinking (mostly drinking outside shops, in parks or on streets); buying own alcohol; taking alcohol from parents (without permission); and asking adults outside shops to buy alcohol (proxy purchase).

Findings

In 2011, 81.7% of young people surveyed reported drinking alcohol (82.8% in 2009). For six of the seven measures for drinkers, there was a significant decrease in risky drinking from 2009 to 2011. For example:

- Frequent drinking decreased from 22.3% of drinkers in 2009 to 17.4% in 2011 ($P<0.001$).
- Heavy drinking decreased from 54.7% of drinkers in 2009 to 48.7% in 2011 ($P<0.001$).
- Unsupervised outside drinking decreased from 29.7% of drinkers in 2009 to 20.3% in 2011 ($P<0.001$).

After accounting for demographic and other confounding factors, the odds of drinkers in 2009 drinking frequently were 1.4 times higher than in 2011, whilst their odds of heavy drinking were 1.2 times higher. In addition, the odds of a drinker in 2009 reporting unsupervised outside drinking were 1.8 higher than in 2011.

Data from both 2009 and 2011 were used to assess the characteristics of those more likely to drink above levels suggested in the guidance. These groups included:

- Drinkers aged 16 years were more at risk of frequent drinking, heavy drinking, unsupervised inside drinking, and buying their own alcohol. For example, 55.8% of 16-year-old drinkers reported drinking heavily compared with 48.1% of 15-year-old drinkers ($P<0.001$).
- Drinkers aged 15 were more likely to ask adults outside shops to buy alcohol than 16-year-old drinkers (11.5% vs 10.2%; $P<0.01$).
- Drinkers with higher expendable incomes were more at risk than those with lower incomes of frequent drinking, heavy drinking, unsupervised inside and outside drinking,

buying their own alcohol, taking alcohol from parents and proxy purchase. For example, 37.9% of those with £30 or more per week reported buying their own alcohol compared with 14.8% of those who had £10 or less per week.

- Those who drank due to boredom were more likely to drink frequently, drink heavily, drink unsupervised inside and outside, buy their own alcohol, take alcohol from parents and proxy purchase than those who did not drink for this reason. For example, 36.1% of those who reported drinking due to boredom were frequent drinkers compared with 15.2% of those who did not drink for this reason.

After accounting for demographic and other factors, those who drank due to boredom were particularly at risk of drinking outside the guidance across all of the indicators examined. In fact, they were over three times more likely to drink frequently, drink heavily, drink outside unsupervised and proxy purchase than those who did not drink for this reason.

The analysis also examined participants' experiences of alcohol-related harms (alcohol-related violence, regretted sex after drinking and forgetting things after drinking). This showed those who drank outside the guidance continued to be at greater risk of harm than those who drank within it. For example, 83.8% of frequent drinkers had experienced at least one harm compared with 45.7% of those who did not drink frequently. However, amongst **drinkers** from 2009 to 2011:

- There was a significant decrease in the proportion reporting involvement in alcohol-related violence (from 25% to 22%; $P < 0.001$).
- The proportion reporting regretted sex after drinking decreased significantly (from 10.6% to 9.6%; $P < 0.01$).

Conclusions

It is not possible to directly attribute the changes seen to the Chief Medical Officer's guidance or any subsequent interventions. However, whilst alcohol consumption continued to be the norm for 15-16 year olds surveyed in 2011, prevalence of risky drinking behaviours decreased between the two surveys. Further research is required to identify whether this decrease represents a downward trend. Nevertheless, appropriate and evidence-based interventions are urgently needed to engage with those who are most vulnerable to risky drinking and associated harms (such as those who drink due to boredom and those with higher expendable incomes). These include the provision of appropriate and affordable alternative activities. A minimum price per unit for alcohol would also reduce easy access to the cheapest products and make activities other than getting drunk more desirable.

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Introduction

Young people who drink alcohol are at risk of a range of harms including violence and regretted/unprotected sex,^[1-4] hospital admission^[5-7] and neurological damage.^[8] Those whose alcohol careers begin at a young age are at heightened risk of long term harm.^[9, 10] This is of particular concern given trends towards younger alcohol initiation.^[11]

In 2009, the Chief Medical Officer (CMO) published guidance to address alcohol-related harms in young people (those under 18 years of age).^[12] This guidance recommended that an alcohol-free childhood is the most desirable option. However, if this cannot be achieved, onset of drinking should be delayed for as long as possible (at least until 15 years of age). If 15-17 year olds do drink, they should do so only under the supervision or guidance of a parent/carer, should not drink more than once a week, and should not exceed the recommended maximum daily units for adults (females: 2-3 units; males: 3-4 units). Since the CMO guidance was published, initiatives and interventions aiming to reduce alcohol misuse have been continued and/or launched such as information for parents on children and alcohol,^[13] awareness raising campaigns,^[14, 15] as well as plans to tighten the legislation around persistently selling alcohol to children.^[16]

In 2010, the Centre for Public Health published an investigation into guidance adherence.^[1] This was based on a large-scale sub-national survey (led by Trading Standards North West) that collected data before the guidance was launched, providing a baseline against which change could be measured. The study showed that by the age of 15-16 years, alcohol consumption was an established norm (81.3% reported consumption). In addition, 54.7% of drinkers reported routine heavy drinking (five or more drinks per session at least monthly), and 57.4% reported mainly drinking unsupervised at home or at a friend's home when parents were

absent. Finally, the study found that alcohol-related violence, regretted sex and forgetting things were experienced by significantly fewer children drinking within the guidance (than outside of it).

This report uses the latest data from the Trading Standards surveys to investigate the level of guidance adherence and any change in risky behaviour. It does not try to establish cause and effect but to measure and describe any changes arising between the two time periods (2009 and 2011, before and after the guidance was launched).

Methods

An anonymous cross-sectional self-completed school survey has been conducted biennially since 2005 to examine drinking patterns among young people (aged 14-17 years) resident in the North West of England.^[1, 17-19] This report focuses on the 2009 and 2011 surveys:

- 2009: The survey was delivered in 133 schools based in 21 of 22 North West upper tier local authority areas. In total, 13,902 students completed the questionnaire.
- 2011: The survey was delivered in 94 schools based in 21 North West upper tier local authority areas. In total, 13,051 students completed the questionnaire.
- 19 upper tier local authorities and 58 schools were involved across both years of data collection.

The questionnaire consisted of closed, self-completed questions that addressed young people's current drinking behaviour. Students were informed that participation was voluntary and anonymous and that data were collected solely for aggregated analyses.

Staff delivered questionnaires to students in Years 10 and 11 (ages 14 - 17 years) in normal school hours. Analyses were restricted to those aged 15-16 (2009: n=11,642; 2011: n=10,293). In order to calculate level of deprivation, participants' postcode of main residence was mapped to lower super output area (LSOA - small geographical areas with an average population of approximately 1,500), which were in turn mapped to resident deprivation quintile. Where an individual's postcode was unavailable, school postcode was used as a proxy. Sample demographics by survey year are shown in Table 1.

Eight measures assess whether respondents' behaviour fell within the CMO guidance (Box 1). The percentages of individuals reporting drinking alcohol, followed by seven others that were analysed in the context of drinkers only. These were: frequent drinking, heavy drinking, unsupervised inside drinking, unsupervised outside drinking, buying own alcohol, taking alcohol from parents, and proxy purchase (Box 1).

Results

Change over time

In 2011, 81.7% of 15-16 year olds in the survey reported drinking alcohol. This was a slight but significant decrease from 2009 (82.8%; $P=0.044$; Figure 1). Of those who drank, the proportion of individuals reporting frequent consumption and heavy consumption also decreased significantly

between the survey years (frequent drinking: 22.3% to 17.4%, $P<0.001$; heavy drinking: 54.7% to 48.7%, $P<0.001$). These significant differences between survey years remained even after accounting for demographic (such as age, gender, deprivation and income) and other factors relating to pupils' alcohol consumption patterns (at least weekly participation in a hobby, parental provision of alcohol, peer pressure and boredom; Appendix 1). After correcting for potentially confounding factors, the odds of drinking alcohol were 1.2 times higher in 2009 than 2011. For drinkers, the odds of being frequent consumers of alcohol in 2009 were 1.4 times higher than 2011 and 1.2 times higher for heavy consumption.

Box 1: Survey measures

Alcohol consumption: Ever drink alcohol.

Frequent drinking: Drinking more than once per week.

Heavy drinking: Drinking five or more alcoholic drinks in one session at least once a month.

Unsupervised inside drinking: Mostly drink* at home or in a friend's house when parents are out.

Unsupervised outside drinking: Mostly drink* outside shops, in parks or on streets.

Buying own alcohol.

Take alcohol from parents (without permission).

Proxy purchase: Ask adults outside shops to buy alcohol for them.

* Respondents could tick multiple answers.

Table 1: Comparison of sample demographics

Demographic group		2009 (n=11,642)	2011 (n=10,293)	P value
Age	15	50.1%	54.0%	<0.001
	16	49.9%	46.0%	
Sex	Female	50.2%	49.5%	Not significant
	Male	49.8%	50.5%	
Deprivation ^IMD quintile	1 (wealthiest)	23.1%	20.3%	$P<0.001$
	2	23.5%	23.3%	
	3	13.8%	9.9%	
	4	12.1%	8.5%	
	5 (poorest)	27.6%	38.0%	

Percentages may not sum to 100% due to rounding. ^IMD quintile score is based on Index of Multiple Deprivation for England 2010.

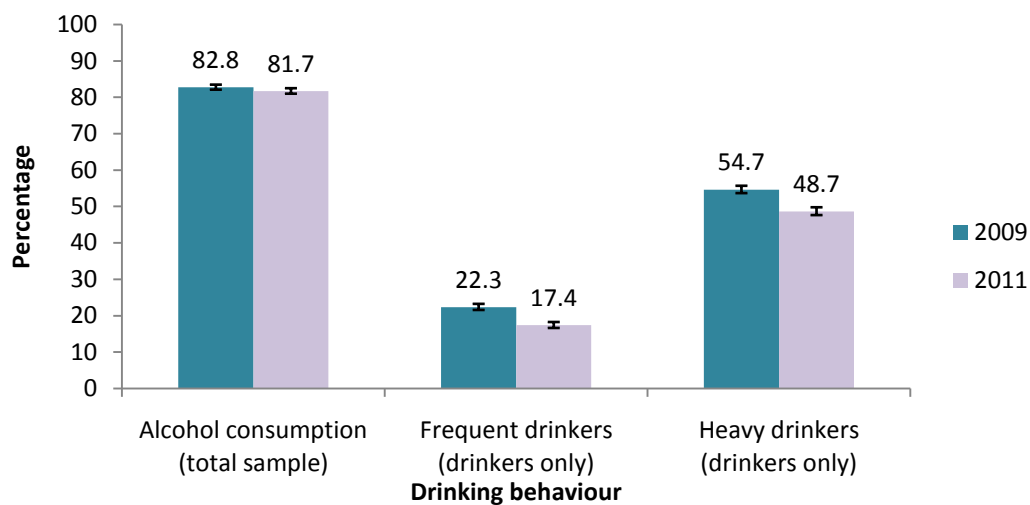
In general, prevalence of unsupervised consumption decreased between surveys and reductions were observed across all three methods of access to alcohol. Statistically significant reductions from 2009 to 2011 can be seen in:

- Unsupervised outside drinking (from 29.7% to 20.3%; $P<0.001$).
- Buying alcohol themselves (from 25.6% to 18.9%; $P<0.001$).

- Taking alcohol from parents (from 8.5% to 7.1%; $P<0.001$).
- Proxy purchase (11.7% to 9.9%; $P<0.001$; Figure 2).

Only for unsupervised inside drinking was no change identified. These patterns were also observed after accounting for other factors (Appendix 2). For example in 2009, the odds of drinkers reporting unsupervised outside drinking were 1.8 times higher (compared with 2011).

Figure 1: Prevalence of alcohol consumption, frequent drinking and heavy drinking by survey year



Corresponding P values: alcohol consumption $P=0.044$; frequent drinkers and heavy drinkers $P<0.001$. Error bars represent 95% confidence intervals.

Figure 2: Prevalence of unsupervised consumption and access (drinkers only)



Corresponding P values: unsupervised inside drinking $P=0.192$; unsupervised outside drinking, self-purchase, take from parents and proxy purchase $P<0.001$. Error bars represent 95% confidence intervals.

Demographic characteristics of those at risk

Data analysis conducted across both surveys highlighted the groups that were most at risk of not adhering to the guidance (Tables 2 and 3). These groups included:

- Those aged 16 years, who were more likely to drink alcohol, drink frequently and to drink heavily than 15 year olds. For example, 26.4% of 16-year-old drinkers reported buying their own alcohol compared with 18.5% of 15-year-old drinkers ($P<0.001$). They were also more likely to drink alcohol unsupervised inside, buy their own alcohol and proxy purchase.
- Males, who were more likely to drink frequently and heavily than females (drink frequently: 23.0% vs 17.3%, $P<0.001$; drink heavily: 52.8% vs 51.0%, $P<0.05$). They were also more likely to drink unsupervised outside and to proxy purchase. In comparison, females were more likely to drink alcohol and to drink alcohol unsupervised inside.
- Those with higher expendable incomes, who were more likely to drink alcohol, drink frequently and to drink heavily than those with lower incomes. For example, 65.0% of those with £30 or more per week reported heavy drinking compared with 42.6% of those with £10 a week or less ($P<0.001$). These groups (i.e. those with more money) were also more likely to drink unsupervised (inside and outside), self-purchase, take alcohol from parents and proxy purchase.

Table 2: Predictors of ever drinking, frequent drinking and heavy drinking

		All		Drinkers only			
		Drink alcohol		Frequent drinking		Heavy drinking	
Year	2009	82.8	*	22.3	***	54.7	***
	2011	81.7		17.4		48.7	
Age	15	80.7	***	18.3	***	48.1	***
	16	84.1		21.8		55.8	
Sex	Female	85.4	***	17.3	***	51.0	*
	Male	79.2		23.0		52.8	
Deprivation	1 (wealthiest)	84.5	***	19.2	***	49.8	***
	2	84.3		18.4		50.1	
	3	82.0		22.0		51.8	
	4	80.2		20.1		55.3	
	5 (poorest)	80.1		21.2		53.5	
Income	>=£10	78.6	***	14.6	***	42.6	***
	£11-20	84.4		20.6		55.6	
	£21-30	87.7		23.2		58.6	
	>£30	89.4		29.7		65.0	
Hobby / Sport ^a	No	81.7	ns	22.9	***	56.2	***
	Yes	82.6		20.0		49.2	
Parents provide ^b	No	Not applicable		23.4	***	59.4	***
	Yes			17.1		45.5	
Peer pressure ^c	No	Not applicable		19.8	ns	50.2	***
	Yes			20.9		57.3	
Boredom ^d	No	Not applicable		15.2	***	45.4	***
	Yes			36.1		74.2	

Accompanying P values are shown through the use of asterisks: * $P<0.05$; ** $P<0.01$; *** $P<0.001$. ^a Participates in a hobby outside school. ^b Parent provides alcohol. ^c Drinks because friends do. ^d Drinks because there is nothing else to do. The accompanying logistic regression analysis is available in Appendix 1. Deprivation score is based on Index of Multiple Deprivation for England 2010.

- Affluent groups, who were more likely to drink alcohol compared with the most deprived groups, whilst the latter were more likely to proxy purchase.

These relationships remained significant even when accounting for other factors (such as gender or age; Appendix 1).

Other characteristics of those at risk

The analysis investigated non-demographic characteristics of those most at risk of not adhering to the guidance (Tables 2 and 3). This included whether the participant had a hobby

outside school, whether their parents provided alcohol, whether they drank because their friends did and whether they drank due to boredom.

Across both survey years (2009 and 2011), the groups that were most at risk included:

- Those not involved in hobbies or sports outside school, who were more likely to drink heavily or frequently compared with those who were involved in hobbies (heavy drinking: 56.2% vs 49.2%, $P<0.001$; frequent drinking: 22.9% vs 20.0%, $P<0.001$). They were also more likely to drink alcohol outside unsupervised and proxy purchase.

Table 3: Predictors of unsupervised consumption and access (drinkers only)

		Unsupervised inside drinking		Unsupervised outside drinking		Buying own alcohol		Take alcohol from parents		Proxy purchase	
Year	2009	57.3	ns	29.7	***	25.6	***	8.5	***	11.7	***
	2011	56.1		20.3		18.9		7.1		9.9	
Age	15	54.7	***	25.6	ns	18.5	***	8.1	ns	11.5	**
	16	58.9		25.1		26.4		7.7		10.2	
Sex	Female	60.2	***	23.7	***	22.1	ns	8.2	ns	9.5	***
	Male	53.1		27.1		22.7		7.5		12.3	
Deprivation	1 (wealthiest)	58.8	*	24.1	*	20.8	**	9.6	***	8.1	***
	2	56.4		24.3		21.8		7.3		9.4	
	3	57.4		25.4		22.4		8.0		11.2	
	4	55.0		26.6		24.7		5.9		11.6	
	5 (poorest)	55.9		26.7		23.3		7.6		13.5	
Income	>=£10	51.6	***	21.9	***	14.8	***	7.2	***	9.3	***
	£11-20	61.8		27.2		21.2		7.6		11.5	
	£21-30	61.5		26.2		28.8		8.3		11.2	
	>£30	62.6		30.7		37.9		9.5		13.3	
Hobby / Sport ^a	No	58.4	**	29.2	***	22.8	ns	7.8	ns	13.1	***
	Yes	55.9		23.1		22.2		7.9		9.6	
Parents provide ^b	No	58.2	**	34.4	***	29.0	***	7.7	ns	16.6	***
	Yes	55.9		17.2		16.4		8.1		5.6	
Peer pressure ^c	No	54.1	***	23.1	***	21.9	**	7.0	***	9.6	***
	Yes	66.1		32.1		24.1		10.5		14.2	
Boredom ^d	No	54.7	***	18.1	***	19.3	***	6.6	**	6.9	***
	Yes	65.7		49.9		32.6		12.2		23.6	

Accompanying P values are shown through the use of asterisks: * $P<0.05$; ** $P<0.01$; *** $P<0.001$. ^a Participates in a hobby outside school. ^b Parent provides alcohol. ^c Drinks because friends do. ^d Drinks because there is nothing else to do. The accompanying logistic regression analysis is available in Appendix 2. Deprivation score is based on Index of Multiple Deprivation for England 2010.

- Those whose parents did not provide them with alcohol were more likely to drink frequently or heavily, drink outside unsupervised, self-purchase or proxy purchase compared with those whose parents did provide them with alcohol.
- Those who drank because their friends did, who were more likely to drink alcohol in an unsupervised manner (i.e. drink unsupervised inside and outside, take alcohol from parents and proxy purchasing).
- Those who drank due to boredom, who were more likely to drink frequently and heavily than those who did not. They were also more likely to drink alcohol and access alcohol in an unsupervised manner than those who did not (i.e. drink unsupervised inside and outside, take alcohol from parents and proxy purchasing).

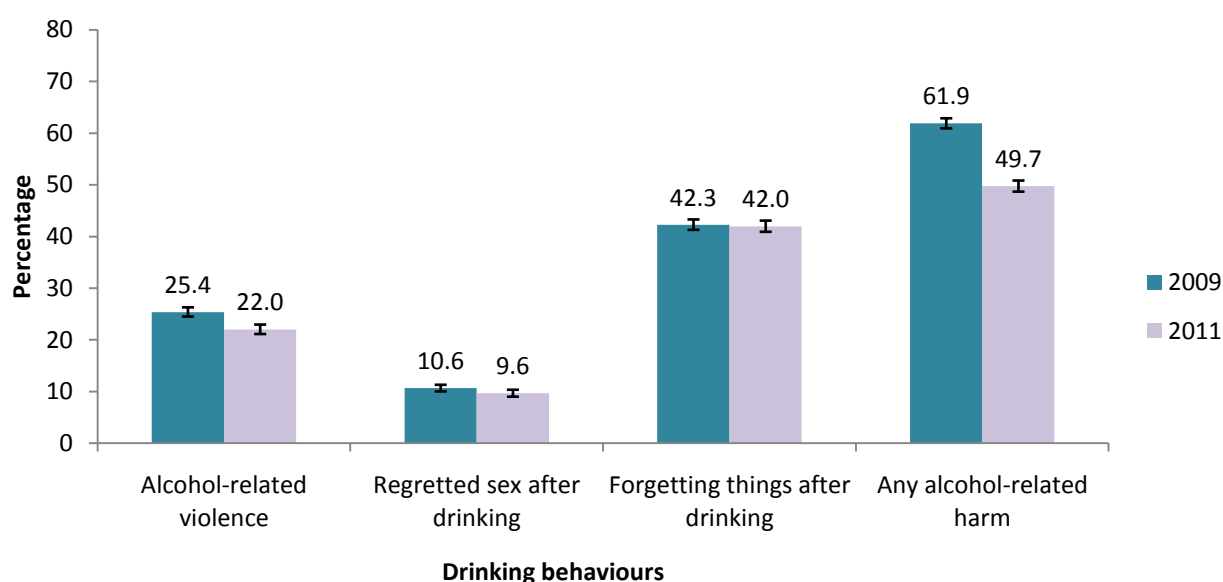
These relationships remained significant even when accounting for other factors (such as gender,

local authority of residence and so on; logistic regression analyses). Further details can be found in Appendix 2. For example, the odds of drinking frequently, drinking heavily, drinking unsupervised outside and proxy purchasing for those who drank due to boredom were over three times higher than those who did not drink for this reason. In fact, after all the other factors had been taken into account, the group who drank due to boredom experienced one of the highest levels of risk for acting outside the guidance.

Harms encountered

Experience of any alcohol-related harm (alcohol-related violence, regretted sex and forgetting things after drinking) decreased significantly between the 2009 and 2011 surveys (Figure 3). When harms were examined individually, significant decreases could be seen between the surveys for both alcohol-related violence and regretted sex after drinking. Prevalence of forgetting things after drinking remained constant.

Figure 3: Experience of harms by survey year (drinkers only)



Any alcohol-related harms equates to experience of alcohol-related violence, regretted sex after drinking and/or forgetting things after drinking. Corresponding P values: alcohol-related violence $P < 0.001$; regretted sex after drinking $P = 0.034$; forgetting things after drinking $P = 0.689$; any alcohol-related harm $P = 0.002$. Error bars represent 95% confidence intervals.

However, despite these decreases, those who drank above levels recommended in the guidance continued to be significantly more likely to experience any alcohol-related harm than those who drank within them (Figure 4).

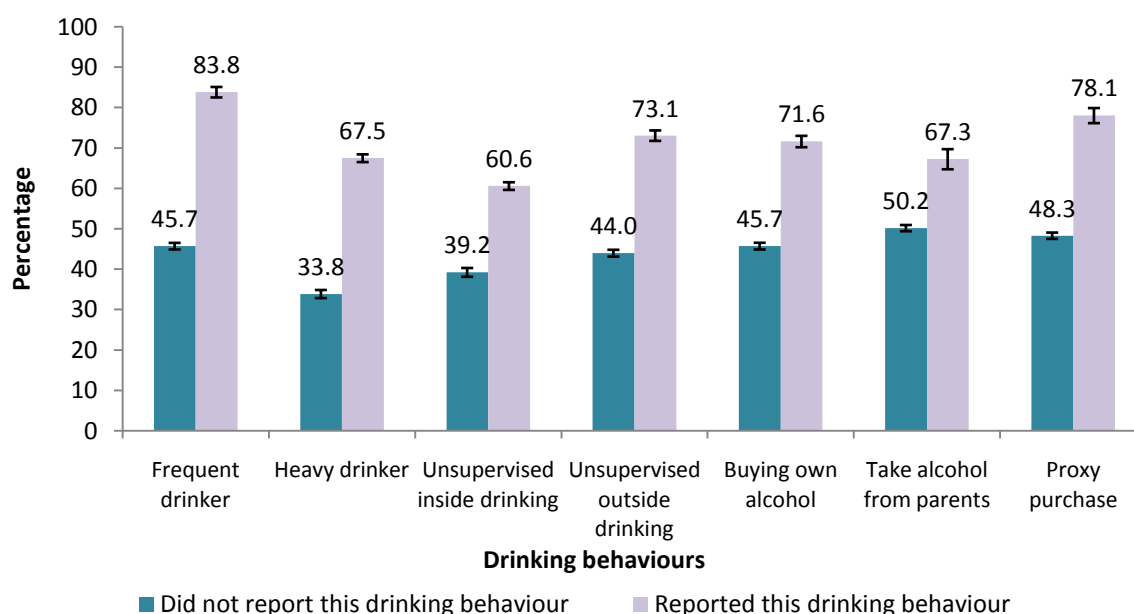
Discussion

This report investigates whether any change has been observed in risky drinking behaviour since the Chief Medical Officer's guidance was published. It compares data from the 2009 and 2011 Trading Standards surveys of 15-16 year olds in the North West of England. Overall, alcohol consumption continued to be the norm in the group sampled. A marginal (although significant) decrease was seen in the proportions reporting drinking alcohol from 82.8% in 2009 to 81.7% in 2011. For six of the seven measures for drinkers, there was a significant decrease in risky drinking from 2009. Thus, the odds of drinkers in 2009 reporting frequent consumption were 1.4 times higher than for the 2011 sample, and the odds of them reporting heavy consumption were 1.2 times higher. Those who do drink are more likely

to do so within the recommended limits set out in the guidance.

National studies have also suggested decreases in alcohol consumption by young people (in terms of the proportions who drink and prevalence of last week consumption).^[20] Some reductions in general consumption rates have also been shown overall (for all ages and across the total population rather than just drinkers),^[21] but this has yet to be evidenced by prevalence of health harms (such as alcohol-related hospital admissions), which continue to increase.^[5] For example, the number of alcohol-related admissions for 16-24 year olds increased by 5% between 2007/08 and 2009/10).^[22, 23] Nevertheless, in this study experience of harms to children did decrease between the survey years, although those who drank above limits set out in the guidance continued to be at risk of forgetting things. In fact, half of drinkers in 2011 reported that they had experienced at least one of these harms.

Figure 4: Experience of any alcohol-related harm by drinking behaviour in 2011 (drinkers only)



Any alcohol-related harms equates to experience of alcohol-related violence, regretted sex and/or forgetting things after drinking. P values for all drinking behaviour comparisons: $P < 0.001$. Error bars represent 95% confidence intervals.

In order to maximise the impact of harm reduction investment, those who are at risk of harm should be targeted with appropriate interventions. So, for example, those most at risk of drinking outside the guidance included those who drink due to boredom.^[1] Here, activities that are affordable, accessible and attractive to this age group are essential to alleviate such boredom. It is particularly important to identify sustainable ways of doing this within the current economic climate, where youth services are experiencing significant budgetary cuts.^[24]

Alcohol affordability is also an important factor in the prevalence of risky drinking. Those with higher expendable incomes (such as over £30 per week) were more likely to drink frequently and/or heavily than those with lower incomes (£10 or less per week). These groups were also more likely to drink unsupervised, buy their own alcohol, take alcohol from parents and proxy purchase. Although parental efforts to better understand children's expenditure or to reduce their income may improve guidance compliance, a minimum price per unit of alcohol would reduce access to the most affordable alcohol products and should be a public health priority.^[18, 25]

It is not possible to directly attribute the changes seen to the Chief Medical Officer's guidance^[12] or any subsequent interventions. The survey has not tracked changes in school policy and/or other prevention initiatives that may have occurred or changed since the launch of the guidance. Further, it is not known to what extent the decreases seen represent the beginning of a downwards trend. Further monitoring is required to assess this. It was not possible to examine data from previous years^[17, 18] for evidence of a continued trend because of changes in study design. Additional limitations to the study are that surveys often under-report alcohol consumption,^[26] that not all of the schools and/or local authorities recruited to the study were involved in both surveys, and that it was not possible to longitudinally monitor participants (but rather we have used a cross-

sectional methodology where results can be influenced by inclusion of different individuals in different years).

In conclusion, alcohol consumption continues to be the norm amongst 15-16 year olds in the North West. The results are consistent with a reduction in risky drinking behaviours between the 2009 and 2011 surveys. Further research is required to identify whether this decrease represents a downward trend. However, substantial proportions of teenagers continue to suffer harms as a result of alcohol consumption. Thus, whether or not this trend continues, appropriate and evidence-based interventions are urgently needed in order to engage with both those young people who are most vulnerable to risky drinking and associated harms and their parents.

This study aimed to describe changes in alcohol consumption and associated risks in 15 and 16 year olds between the 2009 and 2011 surveys. While it did not specifically examine future intervention and policy options a few recommendations directly arise from the results. These are outlined below.

Recommendations

- To continue to monitor young people's alcohol consumption and drinking behaviours in order to assess trend direction and individuals and groups most at risk of harm. Tools such as the Trading Standards North West survey represent an established mechanism for doing this.
- To investigate methods of engaging with young people at risk of harm and providing effective and sustainable interventions that target factors such as boredom.
- To continue to address underage access to alcohol particularly for those people with higher expendable incomes (who are at higher risk of alcohol misuse). This could include, for example, increased parental monitoring and minimum pricing.

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Appendices

Appendix 1: Logistic regression analysis of predictors of ever drinking, frequent drinking and heavy drinking

		All Drink alcohol AOR (95%CI)	Drinkers only Frequent drinking AOR (95%CI)	Heavy drinking AOR (95%CI)
Year	2009	1.15 (1.06-1.25)	1.37 (1.25-1.49)	1.23 (1.15-1.32)
	2011	Reference***	Reference***	Reference***
Age	15	Reference***	Reference***	Reference***
	16	1.23 (0.14-1.33)	1.19 (1.09-1.29)	1.34 (1.25-1.43)
Sex	Female	Reference***	Reference***	Reference***
	Male	0.63 (0.58-0.68)	1.65 (1.51-1.80)	1.15 (1.08-1.24)
Deprivation	1 (wealthiest)	Reference***	Reference*	Not significant
	2	0.97 (0.86-1.1)	0.95 (0.84-1.08)	
	3	0.82 (0.71-0.94)	1.14 (0.98-1.32)	
	4	0.74 (0.64-0.57)	0.93 (0.79-1.10)	
	5 (poorest)	0.77 (0.67-0.86)	1.10 (0.97-1.23)	
Income	>=£10	Reference***	Reference***	Reference***
	£11-20	1.49 (1.36-1.64)	1.38 (1.25-1.54)	1.61 (1.49-1.75)
	£21-30	1.94 (1.69-2.21)	1.62 (1.43-1.85)	1.81 (1.63-2.01)
	>£30	2.37 (2.10-2.68)	2.20 (1.97-2.45)	2.31 (2.10-2.54)
Hobby / Sport ^a	No	Reference*	Reference***	Reference***
	Yes	1.10 (1.01-1.19)	0.71 (0.65-0.77)	0.76 (0.71-0.82)
Parents provide ^b	No	Not applicable	Reference*	Reference***
	Yes		0.88 (0.81-0.95)	0.65 (0.61-0.70)
Peer pressure ^c	No	Not applicable	Reference***	Not significant
	Yes		0.78 (0.71-0.86)	
Boredom ^d	No	Not applicable	Reference***	Reference***
	Yes		3.05 (2.79-3.34)	3.14 (2.88-3.42)

Accompanying P values are shown through the use of asterisks: * P<0.05; ** P<0.01; *** P<0.001. Logistic regression also controlled for local authority of school (which was significant in all cases); this has not been shown due to space restrictions. ^a Participates in a hobby outside school. ^b Parent provides alcohol. ^c Drinks because friends do. ^d Drinks because there is nothing else to do. Deprivation score is based on Index of Multiple Deprivation for England 2010.

Appendix 2: Logistic regression analysis of predictors of unsupervised consumption and access (drinkers only)

		Unsupervised inside drinking AOR (95%CI)	Unsupervised outside drinking AOR (95%CI)	Buying own alcohol AOR (95%CI)	Take alcohol from parents AOR (95%CI)	Proxy purchase AOR (95%CI)
Year	2009		1.81 (1.66-1.97)	1.34 (1.23-1.45)	1.14 (1.01-1.29)	1.14 (1.03-1.29)
	2011	Not significant	Reference***	Reference***	Reference*	Reference*
Age	15	Reference***		Reference***		Reference**
	16	1.13 (1.06-1.21)	Not significant	1.52 (1.40-1.64)	Not significant	0.87 (0.78-0.96)
Sex	Female	Reference***	Reference***		Reference**	Reference***
	Male	0.71 (0.67-0.76)	1.32 (1.21-1.43)	Not significant	0.84 (0.75-0.95)	1.45 (1.29-1.62)
Deprivation	1 (wealthiest)		Reference*		Reference***	Reference***
	2		0.97 (0.86-1.10)		0.82 (0.69-0.98)	1.12 (0.94-1.34)
	3	Not significant	0.98 (0.85-1.14)	Not significant	0.90 (0.73-1.11)	1.29 (1.05-1.58)
	4		1.04 (0.90-1.22)		0.58 (0.45-0.74)	1.26 (1.02-1.57)
	5 (poorest)		1.16 (1.03-1.30)		0.90 (0.76-1.06)	1.58 (1.34-1.86)
Income	>=£10	Reference***	Reference***	Reference***	Reference**	Reference**
	£11-20	1.49 (1.37-1.61)	1.19 (1.08-1.31)	1.47 (1.32-1.63)	1.04 (0.90-1.21)	1.14 (1.00-1.31)
	£21-30	1.44 (1.30-1.60)	1.12 (1.00-1.27)	2.22 (1.97-2.51)	1.12 (0.93-1.34)	1.14 (0.97-1.36)
	>£30	1.53 (1.40-1.68)	1.40 (1.26-1.56)	3.29 (2.96-3.65)	1.35 (1.16-1.58)	1.34 (1.16-1.54)
Hobby / Sport ^a	No		Reference***			Reference***
	Yes	Not significant	0.75 (0.69-0.82)	Not significant	Not significant	0.78 (0.69-0.87)
Parents provide ^b	No		Reference***	Reference***	Reference**	Reference***
	Yes	Not significant	0.48 (0.45-0.52)	0.54 (0.50-0.59)	1.19 (1.05-1.34)	0.38 (0.34-0.43)
Peer pressure ^c	No	Reference***	Reference***		Reference***	Reference*
	Yes	1.58 (1.46-1.71)	1.18 (1.08-1.29)	Not significant	1.38 (1.21-1.56)	1.14 (1.02-1.29)
Boredom ^d	No	Reference***	Reference***	Reference***	Reference***	Reference***
	Yes	1.49 (1.37-1.61)	3.74 (3.43-4.07)	1.82 (1.67-1.99)	1.93 (1.69-2.19)	3.24 (2.90-3.62)

Accompanying P values are shown through the use of asterisks: * P<0.05; ** P<0.01; *** P<0.001. Logistic regression also controlled for local authority of school (which was significant in all cases); this has not been shown here due to space restrictions. ^a Participates in a hobby outside school. ^b Parent provides alcohol. ^c Drinks because friends do. ^d Drinks because there is nothing else to do. Deprivation score is based on Index of Multiple Deprivation for England 2010.



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