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# Tobacco, e-cigarette and alcohol content in popular UK soap operas: a content analysis to explore changes in social norms and scene location

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## ABSTRACT

**Background:** Exposure to tobacco and alcohol on-screen promotes use and despite regulations and policies to limit impact, these behaviours remain common. We report a longitudinal analysis of tobacco, e-cigarette and alcohol content in three popular UK television soap operas, to examine changing social norms between 2002 and 2022.

**Methods:** We used one-minute interval coding to measure content in programmes in two one-week periods in three years (2002, 2012 and 2022). Change in the probability of actual and implied use of tobacco, e-cigarette and alcohol over time was examined using logistic regression.

**Results:** We coded 2505 intervals from 78 episodes. Tobacco content occurred in 22% of episodes and significantly decreased from 2002 to 2022 (OR 0.15 95% CI 0.06–0.40). Tobacco use changed over time with decreasing use indoors and increasing use outdoors. No e-cigarette use was identified. Alcohol content was found in 88% of episodes and while it also significantly decreased over time (OR 0.78 95% CI 0.61–0.99) it featured in 20% of broadcast minutes in 2022. Alcohol use in homes increased over time.

**Conclusion:** While tobacco imagery is increasingly rare in these three UK soap operas, alcohol content has remained common. Tightening the UK Ofcom regulations would help to reduce young people's exposure to these harmful behaviours and their potential influence on social norms now and in the future.

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## Introduction

Reducing tobacco and alcohol use are public health priorities with both behaviours increasing the risk of developing serious health conditions including cancer and stroke (NHS, 2022; Public Health Scotland, 2021). E-cigarettes are becoming increasingly popular creating widespread concerns over their attractiveness and potential normalisation of these products among young people (Hoek et al., 2022). Media depictions represent an important source of learning about substance use, especially for young people (Jackson et al., 2018). Strong evidence exists that exposure to tobacco and alcohol on-screen promotes the use of these products, particularly among young people (Barker, Smith, et al., 2019; Barker et al., 2021; Gabrielli et al., 2022; Hassanein et al., 2022; Hessari et al., 2019; Jernigan et al., 2017; Khan, 2022; Smith & Foxcroft, 2009). Young people observe and may imitate the actions of others, for example television characters, highlighting how on-screen behaviours can influence what is perceived as socially acceptable and normal behaviour (Barker et al., 2021; Elmore et al., 2017; Sheldon, 2006). This modelling behaviour

refers to the social learning theory which suggests that individuals learn about behaviour consequences by watching others (Elmore et al., 2017). It has been widely recognised that these social norms affect young people's decision-making regarding substance use (Elmore et al., 2017). For those experiencing dependence, the presence of tobacco or alcohol can have an immediate effect of cue reactivity and craving (Brett et al., 2023; Witteman et al., 2015).

The location of consumption is important and may play a role in the types of alcohol-related consequences an individual might experience. Different drinking contexts including when, with whom and under what circumstances may also affect experiences (Friesthler et al., 2014). Prior to COVID-19, the majority of alcohol consumed in Australia was drunk in people's homes (Callinan et al., 2016). Bars/pubs have long been regarded as the main British drinking-place, however the proportion of drinking taking place in the home has risen (MacLean et al., 2022). Home drinking can contribute considerably to alcohol-related harms with higher consumption, uncontrolled portion control and lone drinking (MacLean

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et al., 2022; Nicholls & Conroy, 2021). Changes in tobacco policies, including the implementation of the smoke-free public spaces in the UK which aimed to protect people from tobacco harms as well as influence smoking behaviour and norms, may have impacted on the location of tobacco consumption (Bauld, 2011). Public health information campaigns such as 'Take It Right Outside' have also sought to denormalise smoking in the home (Turner et al., 2020).

Several studies over the last two decades have analysed tobacco and/or alcohol portrayal on television and found that despite regulations and policies to limit impact, tobacco and/or alcohol depictions were common (Barker, Whittamore, Britton, & Cranwell, 2019; Barker, Whittamore, Britton, Murray et al., 2019; Coyne & Ahmed, 2009; Lyons et al., 2014a; Lyons et al., 2014b). Studies have also suggested that high levels of exposure may increase electronic cigarette (e-cigarette) uptake, highlighting similar findings regarding behavioural influence on-screen (Jackson et al., 2018; Hassanein et al., 2022). UK Television broadcasting content has been regulated by the Office of Communications (Ofcom) since 2003 when specific rules to protect young people under the age of 18 were introduced (Office of Communications, 2007; Office of Communications, 2021). These prohibit the inclusion of tobacco and alcohol use in programmes made primarily for children and recommend that these activities are not condoned, encouraged, or glamorised in programmes likely to be seen by people under 18 (Office of Communications, 2021). Since 2004, advertising on television has been regulated by the Advertising Standards Authority who state that alcohol advertisements should not be likely to appeal to people under 18 and should not feature in or be adjacent to programmes directed or likely to interest those under 18 (Hessari et al., 2019). Tobacco advertising has been prohibited in the UK since 1965 however tobacco imagery for artistic or editorial purposes is permitted (Action on Smoking and Health [ASH] 2019; Lyons et al., 2014b). In 2016, Ofcom made changes to the broadcasting code to include a ban on e-cigarette product placement in all programmes (Office of Communications, 2016).

Soap operas have been a core feature of UK television for many years and are regularly watched by young people (Aswasulasikin et al., 2019; Barker et al., 2021; Sheldon, 2006). While viewership is declining, soap operas remain as some of the most commonly watched shows on UK television with an average of five million viewers for Eastenders and Coronation Street episodes in December 2022 (Barb, n.d.). Taking cognisance of the popularity of television soap operas, tobacco and alcohol content in six UK soap operas was analysed in a study in 2018/19, the most recent study to our knowledge. While tobacco imagery was rare, alcohol imagery featured in nearly every episode, resulting in significant exposure for viewers including young people (Barker et al., 2021). To build on existing evidence, in this study we have explored if the frequency of tobacco and alcohol content has changed over time by examining programme content including advertisements from 2002, 2012 and 2022. For the first time e-cigarettes have been included in the analysis due to recent increases in e-cigarette use among adults and young people, and

increasing policy attention (ASH 2023a; ASH 2023b; DHSC 2024). We have selected these years as they span a 20-year period covering significant changes in public health policies and legislation around the harmful impacts of tobacco and alcohol use. We have taken a novel approach and analysed the scene locations where tobacco, e-cigarette, and alcohol are featured, which has not been investigated thus far.

## Methods

### Study design and sample

Three popular UK soap operas (Coronation Street, Eastenders and Hollyoaks) were identified; originally broadcast on national UK free-to-air channels (ITV1, BBC1 and Channel 4) and accessed through the British Universities Film and Video Council (BUFVC) Television and Radio Index for Learning and Teaching (TRILT) service (Learning on Screen, n.d.a). These soap operas tend to have different target audiences which may provide a variety of content for investigation. Coronation Street is the world's longest-running soap opera so may have long-standing viewers over many decades. Eastenders began in 1985 and has frequently been one of the UK's top-rated programmes. Hollyoaks began in 1995, initially targeting a young adult audience (BBC America, 2021). Programme content including the advertisements during any commercial break within the show at the time of the first broadcast was identified from two one-week periods (Monday to Sunday) in July and December from three years in different decades (2002, 2012 and 2022). This provided a snapshot of each year, and two different months were used to provide a reasonable sample size that would likely reflect some degree of seasonality. Advertisements were included from two soap operas (Coronation Street and Hollyoaks) that were broadcast on commercial television stations (ITV and Channel 4). Twelve of the 90 episodes were unavailable through the TRILT service. Replacements for missing episodes from 2012 ( $n=9$ ) were sought from the same day of the week within seven days before or after, or alternatively the next available episode where this was not possible. Missing episodes from 2002 ( $n=3$ ) are archive recordings and no alternatives were available (Learning on Screen, n.d.b). No omnibus episodes were included in the sample, further details of which can be found in the [supplementary material](#).

### Coding and analysis

To measure tobacco, e-cigarette, and alcohol content we used one-minute interval coding, a method used extensively in previous related studies (Barker, Smith, et al., 2019; Barker, Whittamore, Britton, & Cranwell, 2019; Barker, Whittamore, Britton, Murray et al., 2019; Barker et al., 2021; Lyons et al., 2014a; Lyons et al., 2014b). This included coding each one-minute interval for the presence of tobacco, e-cigarette, and alcohol content in the following categories, which were used in the previous related studies (Barker, Smith, et al., 2019; Barker, Whittamore, Britton, & Cranwell, 2019; Barker, Whittamore, Britton, Murray et al., 2019; Barker et al., 2021; Lyons et al., 2014a; Lyons et al., 2014b).

### Actual use

Use of tobacco, e-cigarettes, or alcohol on-screen by any character.

### Implied use

Any inferred use of tobacco, e-cigarettes, or alcohol, without any actual use on-screen, for example a character holding a cigarette without seeing them smoke it.

### Paraphernalia

The presence of tobacco, e-cigarettes, or alcohol related materials on-screen, for example beer cans.

In addition, scene location was included to specifically identify content that has not been explored previously and this was agreed between one researcher [NS] and the project supervisor [SS]:

### Scene location

Where the use of tobacco, e-cigarettes, or alcohol takes place. This included at home, in a bar/nightclub, outside, and 'other' which allowed for additional venues to be recorded.

Further details of the coding variables can be found in the [supplementary material](#). Tobacco, e-cigarette, or alcohol content were recorded as present if they appeared on-screen in the one-minute interval, and coded as 1 for present or 0 for not present. If actual use and implied use of the same behaviour occurred in a one-minute interval, only actual use was recorded. More than one of these behaviours could be coded in a single interval, for example tobacco and alcohol use. Multiple instances of the same category in a one-minute interval were recorded as a single occurrence. If the same event overlaps two intervals, this was coded as two separate events. For each episode, one-minute interval coding was completed from the opening credits through to the end credits, including any advertisements that were broadcasted during this. Coding was completed by one researcher [NS] and a randomly selected 10% of episodes were coded separately by the project supervisor [SS] for quality assurance. Inter-rater reliability was determined by the percentage agreement on the number of intervals coded for the various coding variables. There was a very high level of agreement (98%) indicating that the coding was considered accurate and reliable. Data coding was completed in Microsoft Excel and exported to IBM SPSS Statistics 28 for statistical analysis. Change over time was examined using logistic regression and results are presented as the odds ratio and 95% confidence interval.

## Results

In total, 78 episodes and 69 advertisements were included in the study with 2505 one-minute intervals analysed. The number of broadcasted minutes varied in each of the years analysed from 613min in 2002, 903min in 2012, and 989min in 2022. We coded from the beginning of the opening shot of each episode continuously to the completion of the end credits.

### Tobacco

Actual and/or implied tobacco use (referred to as 'tobacco use' from hereon in) occurred in 17 episodes (22% of all episodes) and 38 intervals (1.5% of all intervals) across all years sampled, with actual use occurring in 24 intervals (1.0% of all intervals). Tobacco use was present in 3.3% of all minutes broadcast in 2002, 1.4% of all minutes in 2012, and 0.5% of all minutes in 2022. There was a significant decline in tobacco use from 2002 to 2022 (OR 0.15 95% CI 0.06–0.40,  $p < .001$ ) (Table 1). No tobacco use appeared in Hollyoaks. There was no e-cigarette use identified in any of the three soap operas in this study.

In terms of scene location, tobacco use significantly changed over time with decreasing use indoors (in a bar/nightclub and in the home) and increasing use outdoors ( $p = .019$ ) (Table 2). There was a noticeable shift in the scene location from 2002 to 2012. One interval featured implied tobacco use in a prison which was part of an advert shown during the end credits, and this was recorded as 'other'.

Tobacco paraphernalia was seen in 99 intervals (4.0% of all broadcasted minutes) and mostly involved ash trays and cigarette packets. This declined from 12.4% of broadcasted minutes in 2002, to 1.88% of minutes in 2012, and to 0.61% of minutes in 2022, which is a statistically significant decline between 2002 and 2022 (OR 0.04 95% CI 0.02–0.10,  $p < .001$ ) (Table 1). No advertisements featured tobacco paraphernalia. Actual tobacco use occurred in one advert for another programme, and implied tobacco use was seen in one advert for the national campaign *Keep Britain Tidy* which focused on reducing cigarette littering. No smoking signs were seen in 95 intervals (3.8% of all intervals). There was a substantial increase from 2002 (0.2% of all intervals) to 2012 (1.9% of all intervals), and this remained similar in 2022 (1.7% of all intervals).

### Alcohol

Actual and/or implied alcohol use (referred to as 'alcohol use' from hereon in) occurred in 69 episodes (88% of all episodes) and 574 intervals (23% of all intervals) with actual use occurring in 317 intervals (12% of all intervals). Alcohol use accounted for 24% of minutes broadcasted in 2002, 25% of minutes in 2012, and 20% of minutes in 2022. There was a significant difference from 2002 to 2022 with alcohol use decreasing during this twenty-year period (OR 0.78 95% CI 0.61–0.99,  $p = .043$ ) (Table 1).

In terms of scene location, alcohol use mostly occurred in a bar/nightclub in every year analysed, with 18.8% of all minutes broadcast in 2002, 15.2% of all minutes in 2012, and 11.4% of all minutes in 2022. Alcohol use in the home was the next most common scene location, with a clear increase over time with 3.9% of all minutes broadcast in 2002, 5.0% of all minutes in 2012, and 5.5% of all minutes in 2022. Four intervals contained both alcohol and tobacco use depictions and these occurred in a bar/nightclub ( $n = 2$ ) and home ( $n = 3$ ). Alcohol use also occurred outside, in a restaurant, and 'other' scene locations including a theme park and a workplace (Table 3).

**Table 1.** Tobacco and alcohol use over time in episodes of three popular UK soap operas, 2002, 2012 and 2022.

Behaviour	2002		2012		OR (95% CI) 2012 v 2002	2022		OR (95% CI) 2022 v 2002
	Number of one-minute intervals	% of broadcasted minutes	Number of one-minute intervals	% of broadcasted minutes		Number of one-minute intervals	% of broadcasted minutes	
Tobacco (any)	20	3.26	13	1.44	<b>0.43 (0.21–0.88)</b>	5	0.51	<b>0.15 (0.06–0.40)</b>
Alcohol (any)	149	24.3	226	25.0	1.05 (0.82–1.33)	198	20.0	<b>0.78 (0.61–0.99)</b>
Actual tobacco use	10	1.63	11	1.22	0.74 (0.31–1.76)	3	0.30	<b>0.18 (0.05–0.67)</b>
Actual alcohol use	91	14.9	118	13.1	0.86 (0.64–1.16)	108	10.9	<b>0.70 (0.52–0.95)</b>
Implied tobacco use	10	1.63	3	0.33	<b>0.20 (0.06–0.73)</b>	2	0.20	<b>0.12 (0.03–0.56)</b>
Implied alcohol use	58	9.46	108	12.0	1.30 (0.93–1.82)	90	9.10	0.96 (0.68–1.36)
Tobacco paraphernalia	76	12.4	17	1.88	<b>0.14 (0.08–0.23)</b>	6	0.61	<b>0.04 (0.02–0.10)</b>
Alcohol paraphernalia	201	32.8	249	27.6	<b>0.79 (0.62–0.98)</b>	242	24.5	<b>0.66 (0.53–0.83)</b>

Bold  $p < .05$ .

**Table 2.** Scene location of tobacco use over time in episodes of three popular UK soap operas, 2002, 2012 and 2022.

Location	2002		2012		2022	
	Number of one-minute intervals	% of broadcasted minutes	Number of one-minute intervals	% of broadcasted minutes	Number of one-minute intervals	% of broadcasted minutes
bar/ nightclub	7	1.14	1	0.11	0	0
home	10	1.63	4	0.44	0	0
outside	4	0.65	8	0.89	4	0.40
other	0	0	0	0	1	0.1

**Table 3.** Scene location of alcohol use over time in episodes of three popular UK soap operas, 2002, 2012 and 2022.

Location	2002		2012		2022	
	Number of one-minute intervals	% of broadcasted minutes	Number of one-minute intervals	% of broadcasted minutes	Number of one-minute intervals	% of broadcasted minutes
bar/ nightclub	115	18.76	137	15.17	113	11.43
home	24	3.92	45	4.98	54	5.46
outside	2	0.33	28	3.10	5	0.51
restaurant	0	0	4	0.44	22	2.22
other	11	1.79	13	1.44	13	1.31

Alcohol paraphernalia was seen in 692 intervals (28% of all broadcasted minutes) and mostly involved beer pumps/taps and bottles. There was a significant difference over time with alcohol paraphernalia decreasing from 2002 to 2022 (OR 0.66 95% CI (0.53–0.83)). Alcohol paraphernalia was observed in 38% of all advertisements, including adverts for alcohol brands, kitchens, supermarkets and a high street hearing care establishment. One interval featured the national campaign *Don't drink and drive*, portraying the negative consequences from alcohol use. Actual alcohol use occurred in 5.8% of all advertisements ( $n=4$ ) which included a beer advert and a holiday advert. Implied alcohol use occurred in 29% of all advertisements ( $n=20$ ) which included holiday adverts, food products, and a high street establishment.

## Discussion

This study is the first to our knowledge to look at longitudinal changes in depictions of alcohol and tobacco use in three popular UK soap operas. It demonstrates that both tobacco and alcohol imagery has significantly decreased between 2002 and 2022. Tobacco imagery is now rare: appearing in approximately 1 in every 200min of broadcast content by 2022. However, alcohol use remains common: appearing in 1 of every 5min of broadcast content in 2022 and occurring in 88% of all episodes examined. Alcohol paraphernalia was also observed in 38% of all advertisements and this is an area where broadcasting regulations could be tightened to remove

this content during TV soap opera intervals. It is possible that the frequent depictions of alcohol use during soap operas is contributing to maintaining social norms around alcohol use in UK society. These findings concur with previous research which found that tobacco content lessened over time and alcohol content maintained a regular presence (Barker, Whittamore, Britton, & Cranwell, 2019; Barker, Whittamore, Britton, Murray et al., 2019; Barker et al., 2021; Coyne & Ahmed, 2009; Lyons et al., 2014a; Lyons et al., 2014b). Although no e-cigarette use was identified, it is anticipated that depictions of use are likely in future if storylines and characterisation reflect the increasing prevalence of these devices (ASH 2023a; ASH 2023b). The lack of e-cigarette use is in contrast to recent findings of video-on-demand shows (Allem et al., 2022).

The scene location of tobacco use changed over time with decreasing use indoors and increasing use outdoors, particularly from 2002 to 2012, which would reflect UK smoke-free legislation that came into force between 2006 and 2007 prohibiting smoking in nearly all enclosed public places (ASH 2020). No smoking signs featured more in 2012 and 2022, also as a likely consequence of this legislation. No tobacco use featured in any Hollyoaks episodes, confirming previous research findings (Barker et al., 2021). The most common scene location for alcohol use remained in a bar/nightclub. Many UK soap operas are centred round a bar/pub so frequent scenes with alcohol are very likely, increasing the social acceptability and normalisation of alcohol consumption as a regular social activity. Alcohol use

in the home increased from 2002 to 2022 which may be reflective of the rising cost of living and the COVID-19 pandemic when restrictions were in place to keep people home-based (Organisation for Economic Co-operation and Development, 2021). This could also be due to increasing social norms around pre-drinking which involves drinking alcohol before going out and may result in higher consumption of alcohol (Labhart et al., 2017). This study was the first to our knowledge to identify that the scene location of tobacco use changed over time with decreasing use indoors and increasing use outdoors, while the majority of alcohol use remained in a bar/nightclub. As alcohol use in the home was found to increase from 2002 to 2022, future research should monitor if this trend continues and influences social norms around drinking at home. We note that the process is likely to be bi-directional: not only will media portrayals influence society but similarly, changes in the location of use of tobacco, alcohol and e-cigarettes within wider society will be reflected by story-writers and directors in how they portray 'real-life' in these soap operas.

All episodes in this study were broadcasted before the 9pm watershed so were likely seen by young people, and therefore subject to the UK Ofcom regulations (Office of Communications n.d.). Our findings suggest that the UK legislation prohibiting product placement appears to be effective, with decreasing tobacco imagery over time, which concurs with previous research findings (Barker et al., 2021). While alcohol brand appearances are also restricted, alcohol-related content featured in the majority of episodes. These depictions may increase the social acceptability of alcohol consumption: young people are particularly influenced by viewing these social norms (Elmore et al., 2017).

Tightening the UK Ofcom regulations, for example by restricting programmes with tobacco and/or alcohol imagery to broadcast after the 9pm watershed, would help reduce young people's exposure to these behaviours (Barker et al., 2021; Khan, 2022). Working with soap opera producers and writers to inform them about the harmful effects of tobacco and alcohol, and the potential influence these on-screen behaviours can have on social norms should be considered as a potential public health intervention. Hollyoaks did not feature any tobacco use and remains popular, so this would be a prime example to showcase how removing tobacco consumption could be achieved without detriment to storylines and viewing figures. Restricting alcohol use may be more challenging given that soap operas have traditionally been based around a bar/pub and this most likely provides the editorial justification required under the Ofcom regulations. To balance this, producers should consider the portrayal of stories that illustrate the short and long-term harms of alcohol use. Implementing legislation to prohibit alcohol advertising prior to the 9pm watershed is another potential measure to reduce young people's exposure. This would align with the World Health Organization SAFER initiative which supports governments to reduce harmful alcohol use and consequences, and has five strategic actions, one of which is to enforce comprehensive restrictions or bans on alcohol advertising (World Health Organization, 2018).

## Limitations

While we explored three long-running UK soap operas, there are others that we did not include. We focused on soap operas and did not include other programme types, such as dramas, or changes in the media landscape such as video-on-demand services which are becoming increasingly popular (Barker, Smith, et al., 2019). While we utilised the TRILT service and coded the broadcasted content in its entirety at the time of first airing, we acknowledge that advertising content would likely differ depending on the viewer's location or if watching on a streaming or 'catch-up' service. Our sample covered two one-week periods in three different years so we are unable to pinpoint the exact timing of behaviour changes. It is likely that tobacco and alcohol occurrences would have been higher if actual use and implied use of the same behaviour were both coded. Further research could assess the impact of these behaviours on viewers, and also analyse the impact of exposure from how tobacco and alcohol are portrayed. We used one-minute interval coding which can result in both underestimation and overestimation if lots of occurrences take place in short periods of time or if short occurrences extend over two intervals. Frequency analysis would have been an alternative approach where all visual appearances are counted, irrespective of duration, and this has been used in alcohol studies (Purves & Critchlow, 2021). We also did not analyse the change over time of the frequency or duration of total advert content during the two soap operas we studied where adverts were included. This means that we do not have a denominator to calculate changes in the ratio over time for advert content. However, given the rigid format of these television shows we think this is unlikely to have altered substantially between 2002 and 2022.

## Conclusion

Our findings demonstrate that tobacco and alcohol imagery in three popular UK soap operas has significantly decreased between 2002 and 2022, and while tobacco imagery is increasingly rare on television, alcohol content has remained common and it is possible that this is contributing to maintaining social norms around alcohol use in the UK. Tightening the UK Ofcom regulations would help to reduce young people's exposure to these harmful behaviours and their potential influence on social norms now and in the future. Soap opera producers should consider the impact of on-screen depictions of tobacco and alcohol and opportunities to change social norms and reduce future generations' use of these harmful substances.

## Ethical approval

Ethical approval was granted by the University of Stirling Ethics Committee (reference: 12087).

## Disclosure statement

Between 2017 and 2022, Nathan Critchlow was on the board of directors at Alcohol Focus Scotland. The authors declare no other competing interests.

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