

Supplementary File 2: Summary of cross-sectional research reviewed into digital alcohol marketing

| Author | Sample | Digital marketing measure | Outcome measure | Summary of findings |
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| Carrotte et al. (2016) | n = 1,001 15-29 year olds Australia | Liked or followed alcohol marketing on social media for beer, cider, spirit, wine, and retailer (<i>Yes/No</i>). | AUDIT-C (<i>low risk, medium risk, high risk</i>) Drinking initiation (<i>by age</i>) | A quarter liked or followed at least one type of alcohol marketing on social media. Underage participants were just as likely as those who could legally purchase to view pages. Exposure was associated with male gender, ever used of illegal drugs, and early age of drinking onset. Exposure to alcohol marketing on social media use associated with higher risk scoring on the AUDIT-C. |
| Collins et al. (2016) | n = 589 11-14 year olds USA | Overall digital marketing (<i>13 day ecological momentary assessment using hand-held device – i.e. record every time alcohol marketing noticed</i>) | Not measured. | Over the 13 days, participants recorded 877 online alcohol advertisements (particular marketing for beer). This represented 0.115 per person per day. When compared to the eight other marketing channels digital marketing, digital represented 4% of total ads recorded, behind outdoor (39%), television (26%), point of sale (8%), print (7%), and radio (6%). |
| de Bruijn (2013) and de Bruijn et al. (2016b) | n = 9,038 Mean: 14.05 years old Europe (Poland, Italy, Holland, Germany) | Exposure to: e-mails, display advertisements, websites, screensavers, and social media (<i>Never – Very often</i>) | Previous 30 day binge drinking (>5 drinks on single occasion) and Drinking Initiation (<i>both Yes/No</i>) | Reported exposure to all digital channels, ranging from 18% (screensavers) to 66% (display adverts). Adjusting for confounders, higher exposure to online marketing was related to drinking initiation and binge drinking. This effect was consistent in all four countries. Active engagement with online marketing was found to interact more strongly with drinking than passive exposure. |
| Fox et al. (2015) | n = 686 13-17 year olds Republic of Ireland | Exposure to: advert or pop-up, online quiz, invited to like a brand, invited to event sponsored by an alcohol brand; invited to go to event sponsored by alcohol brand (<i>Yes/No</i>) | Ever drunk alcohol, binge drinking in last 30 days, drunkenness in last 30 days, been really drunk, and drinking in the next year (<i>Yes/No/Don't know</i>) | 72% had seen online adverts or pop ups; 15% had seen online quiz about alcohol or marketing; 35% had been invited to like an alcohol brand; 30% invited to like event sponsored by alcohol brand and 21% invited to go to event sponsored by alcohol brand. Exposure greater in females than males. Exposure to online marketing significantly associated with future drinking intentions. |

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| Gallopel-Morvan et al. (2016) | <i>n</i> = 6,642 Mean: 17.3 years old France | Advertising for alcohol on the internet (<i>Never – Almost every day</i>) | Not measured. | Over half (54.1%) of the sample recalled exposure to alcohol marketing on the internet in the last 12 months, with 18.4% reporting exposure weekly and 11.6% reporting exposure almost every day. Exposure to all marketing (including traditional) linked to beverage name recall, beverage type, feeling an incentive to drink and finding the advert attractive. |
| Gordon et al. (2011) And Harris et al. (2015) | <i>n</i> = 920 12-14 year olds United Kingdom, Scotland | Awareness of and involvement with: e-mails; websites, downloads; social networking sites (<i>Yes/No/Don't Know</i>). | Drinking status, and future drinking intentions (<i>both Yes/No</i>). | Awareness of digital marketing ranged from 5-24% whilst involvement ranged from 4-12%. Awareness and involvement greater in drinkers, compared to non-drinkers. Awareness, including digital marketing, increased the odds of being a drinker by 137%, whilst involvement with digital marketing increased the odds by 300%. Similar associations were also observed for intentions to drink. |
| Hoffman et al. (2014) | <i>n</i> = 637 Mean 21.4 years old United States | Exposure to updates on social media, competitions, downloads, videos, display adverts, discounts from social media, chat rooms or forums, and giveaways on social media (<i>0 times – 10+ times in last 3 months</i>). | Problem drinking scale (<i>Each time 0 – 10+ times</i>) Days alcohol consumed on in last thirty (<i>0 - 30 days</i>) Typical consumption in usual session (<i>I don't drink – Until I get really drunk</i>). | Participants exposed to the digital marketing channels ranged from 6-50%. Use of social media related to alcohol marketing predicted increased reporting in alcohol related problems, consumption days in the last thirty, and quantity consumed in a typical drinking session. |
| Jernigan and Padon (2011) and Jernigan et al. (2017) | <i>n</i> = 2,316 13-20 year olds (<i>n</i> = 1,192) and adults aged 21+ (<i>n</i> = 1,124) United States | Awareness of and involvement with: display advertisements, pictures of celebrities using alcohol, and pictures of celebrities with alcohol-branded items. | N/A | Compared to adults, nearly twice as many as many youth (30%) reported seeing alcohol advertisements on the internet (17%). Youth were more likely to have seen advertisements, pictures of celebrities using alcohol, and pictures of celebrities with alcohol-branded items and were more likely to have shared these. Youth were also more likely to have liked pictures of celebrities using alcohol and pictures of celebrities with alcohol branded items. |

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| Jones and Magee (2011) | <i>n</i> = 1,113 12-17 year olds Australia | Overall exposure to internet marketing (<i>Yes/No/Don't know</i>). | Drinking status (<i>Never - ≥ 10 drinks</i>) Regular consumption (<i>Less than/More than monthly</i>) Recent consumption in last four weeks (<i>Yes/No</i>). | Overall 55% had seen alcohol adverts online, with exposure higher in 16-17 than 12-15 year olds. Exposure to internet advertising increased odds of having consumed alcohol by 47% and odds of recent consumption by 52%. The effect was strongest for males aged 12-15 years old and weakest for males aged 17-16. |
| Jones et al. (2015) | <i>n</i> = 283 16-24 year olds Australia | Recalled frequency of exposure to marketing on social media, and context (e.g. to enter competition). Recalled frequency of involvement with alcohol marketing on social media (e.g. posted on page). | Alcohol Use Disorders Identification Test (AUDIT) | Sixteen per cent saw marketing in a typical week, with 88% aware of between one and four pieces in the past month. Twenty percent had visited a marketing page, with the most doing so to enter competitions (12%). Involvement ranged from 3% (branded app on Facebook) to 30% (uploaded or tagged a photo with alcohol product). Significant associations between interaction with marketing and consumption, and between engagement with alcohol brands on Facebook and problematic drinking. |
| Kenny (2014) | <i>n</i> = 1,071 18-25 year olds Ireland | Involvement with: e-mails, websites, screensaver; apps, games; videos, social media, Twitter updates, and followed venue on Twitter (<i>Yes/No</i>). | Frequency consumption and drinking to get drunk (<i>1 = Never - 7 = Everyday</i>) Social norms of alcohol consumption. | Participation with digital marketing was associated with increased frequency of consumption and increased frequency of drinking to get drunk. The association between exposure to digital marketing and consumption was mediated through an initial association with social norms to consume. |
| Lin et al. (2012) | <i>n</i> = 2,538 12-13 year olds New Zealand | Awareness of and involvement with: e-mails, websites, downloadable content and social networking sites (<i>Yes/No/Don't Know</i>). | Drinking status (<i>Yes/No</i>) Drinking intent (<i>Yes/No</i>) Frequency of consumption (<i>Number of drinking days in past year</i>). | The proportion aware of digital marketing ranged between 5-17% in non-drinkers and 9-37% in drinkers. The proportion involved in digital marketing ranged between 2-5% in non-drinkers and 6-10% in drinkers. Awareness of marketing, including digital, increased the odds of being a drinker by 8%. Involvement with only digital marketing increased the odds by 98%. Involvement with all marketing, including digital, increased the odds of drinking frequency of consumption by 34%. |

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| McClure et al. (2013) | <i>n</i> = 3,342 15-23 year olds (2,012 under 21) United States | Exposure to: Seeing alcohol advertising on the internet, visiting websites, recognising five 'home pages', and being an online 'fan' of an alcohol brand. | Drinking initiation (Yes/No) Binge drinking (≥ 6 drinks in a single session) (Yes/No). | 57% of drinkers had seen display advertisements, 12% had visited an alcohol brand website, 5% were an online fan and 18.5% could recall at least 1 or more of the alcohol brand web page images. Although exposure to internet advertising was not associated with drinking status, it was associated with binge drinking among binge drinkers. |
| Weaver et al. (2016) | <i>n</i> = 172 16-29 year olds Australia | Content from Australian Facebook pages of six popular alcohol brands popular on social media (e.g. Smirnoff, Strongbow, Rekorderlig). | Main message of ad (<i>Characteristics, context, emotion, association with success, real-world tie in, encouragement to drink, person-specific appeal</i>) Violations on seven items of ABAC marketing code, such as 'improving mood' (<i>Agree/Disagree</i>) Perceived target audience (<i>Much older than me; Older than me; My age; Younger than me; Much younger than me</i>) | The most frequently reported main messages focused on success (e.g. sporting, social or sexual). When prompted, the most frequent violations of the ABAC code were suggestions of relaxation (67%), improving mood (65%), being more social and outgoing (57%) and confident about oneself (49%). These themes were suggested most by the youngest age group. Most participants aged 16-17 (83%) and 18-24 (80%) years old thought that the advertising was targeting those older than them, while 25-29 years old thought the marketing was aimed at people their age. |