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RESEARCH REPORT

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Domestication of drinking: a survey study of changes in types of drinking occasions during periods of increasing and decreasing alcohol consumption in the 2000s in Finland

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Abstract

Background and Aims: In Finland, per-capita alcohol consumption increased in the early 2000s and decreased after 2007. Our aim was to determine how these changes originated from changes in drinking practices.

Design: Repeated cross-sectional general-population surveys.

Setting: Finland in 2000, 2008 and 2016.

Participants: Finnish residents aged 15–69 years (n = 6703, response rate 59–78%).

Measurements: Event-level data on drinking occasions (n = 21 097). Types of drinking occasions (drinking practices) were identified with latent class analysis using occasion characteristics. The aggregated volume of consumption and intoxication occasions were decomposed into contributions from drinking practice classes and years.

Findings: Nine drinking occasion types were identified: three at home without company other than family (51% of occasions in 2016), three socializing occasions in different places and with different company (33%) and three party occasion types (16%). Both the frequency of drinking occasion types and the occasion type-specific amounts of alcohol consumed contributed to aggregate-level changes in alcohol use. Drinking at home without external company (with family only; for men, also alone) contributed most to the increase in alcohol use before 2008. Big parties in homes and bars became less common in the 2000s, contributing most to the decline in drinking after 2008.

Conclusions: The rise in per-capita alcohol consumption in Finland in the early 2000s appears to have been linked mainly to an increase in lighter drinking occasions at home without external company. The fall in per-capita drinking after 2007 was linked mainly to a decrease in big parties in homes and in licensed premises. Changes in drinking frequency and the amounts of alcohol consumed per occasion changed in the same direction as alcohol affordability.

KEYWORDS
Alcohol drinking habits, drinking patterns, drinking practices, event-level analysis, Finland, latent class analysis

INTRODUCTION

Alcohol consumption per capita has, on average, been stable in European countries in the 2000s [1, 2]. However, in many countries a decrease started in the 2000s, including Finland, Iceland, Norway, the United Kingdom, Russia and several other former Soviet Union countries; in others, a decreasing trend has strengthened [3]. In Finland, per-capita alcohol consumption first strongly increased until 2007 and then strongly decreased, with alcohol-related mortality following suit [4].

The changes observed in Finland were at least partly due to changing alcohol affordability: a large cut in alcohol taxes in 2004 combined with a good economic situation and eight smaller alcohol tax increases in 2008–21, combined with a poorer economy (ibid.). However, the tax increases may have boosted a 'taming of Finnish drinking': heavy episodic drinking has decreased [5], sales of non-alcoholic beer have seen large proportional increases and the popular media have increasingly presented stories of celebrities quitting drinking temporarily or permanently. The proportion of on-premise alcohol sales, which is connected to heavier drinking episodes [6], decreased from 25% in the mid-1990s to 14% in 2009, but thereafter the decrease in sales applied equally to on- and off-premise sales [7].

To more clearly understand the causes and consequences of trends in per-capita consumption, one must know the dynamics: was it the new groups of (non-)drinkers or the changing drinking patterns (in what parts of the population)? Dissecting these trends is common in alcohol research [8–10]. In Finland, the increase was due to an increase in drinking frequency among people aged 50+ and increasing amounts consumed per occasion among women. The key factors influencing post-2008 decreases were rising abstinence rates and reductions in drinking frequency throughout the population and decreasing amounts of alcohol consumed by men and younger age groups [5].

Interest has grown regarding alcohol research since the 2000s, with respect to the social situations where people drink, the characteristics of drinking occasions and their associations with amounts consumed and related harm [11, 12]. This provides an important complement to epidemiological information on frequencies and amounts of alcohol consumed [13] because people tend to drink to socialize with friends, relax after work or have a big night out [14], rather than drinking a certain amount of alcohol. Similarly, to identify windows for prevention, more information on these aspects is needed.

Some studies have examined the different aspects of drinking contexts holistically to capture the drinking practices involved. Mustonen *et al.* [15] and Mäkelä *et al.* [16] for Finland and Ally *et al.* [17] for the United Kingdom performed this using latent class analysis (LCA) to group drinking occasions into common types. However, no previous study, to our knowledge, has examined how population-level changes in alcohol use have been reflected on, or arisen from, changes in drinking practices, i.e. different types of drinking occasions. It is rare to have any general-population data on drinking practices, and data allowing temporal comparisons are even more scarce. For Finland, such data are available from the Finnish Drinking Habits (FDH) Survey for 2000, 2008 and 2016, which are perfect years for examining the interplay between the changing per-capita consumption and drinking practices.

The main goal of this study was to examine how different drinking practices contributed to the macro-level changes in Finnish drinking—to volumes consumed and prevalence of intoxication—first to their increase in 2000–08 and the subsequent decrease in 2008–16. Specifically, we ask: (1) how did the prevalence of various drinking practices change? (2) How did the amounts of alcohol consumed per occasion change in different drinking practice categories? (3) What is the contribution of each drinking practice to changes in (3a) the total number of litres consumed and (3b) the total number of intoxication occasions experienced in the population? For this purpose, a common operationalization of drinking practices throughout the whole period is needed. These are obtained as the classes from LCA. We examined change particularly in the whole population and also whether prevalence changes were similar across genders and age groups.

METHODS

Data

We use data from the general-population FDH surveys conducted in the autumn of 2000, 2008 and 2016. A random sample was drawn of Finns, excluding those institutionalized, with unknown residence (1.3% of the population) or living in the Åland Islands (0.5%). In 2016, young adults were oversampled. All were interviewed face-to-face by Statistics Finland [18]. There were 6703 respondents aged 15–69 years (1932, 2725 and 2046 by year). We use the subsample of those who had used alcohol during the previous 12 months (n = 6168), reported drinking occasions (see Measurements; n = 5811) and had no missing data for the variables included in the models (n = 5788, i.e. 23 or 0.4% of the individuals were dropped; n = 1707, 2358 and 1723, by year). They provided full data on 6244, 8675, 6178 or altogether 21 097 drinking occasions (203 or 0.95% of occasions were dropped). Response rates were high despite a falling trend: 78, 74 and 59%. Statistics Finland conducted the fieldwork.

The FDH survey was ethically evaluated and approved by the ethical committees of the Finnish Institute for Health and Welfare THL and Statistics Finland.

Measurement

Respondents who had consumed any alcohol during the previous 12 months were asked about all drinking occasions falling within a pre-defined time-period before the survey, the so-called 'survey period'. Its length depended upon the overall drinking frequency (reported with 11 response alternatives), ranging from 7 days (when the frequency was four or more times per week) to a year (when the frequency was three times per year or less), with seven categories.

This allowed the inclusion of infrequent drinkers' drinking occasions and yielded a comparable number of reported occasions for frequent and infrequent drinkers. In our analyses, aimed at a population-level description, differences in the survey period lengths were adjusted for by scaling (see below).

Characteristics of drinking occasions measured included the location, circumstance, drinking company, date, start and end times of drinking, the beverages and the amounts of alcohol consumed (Table 1).

The amounts consumed were converted to volumes of 100% alcohol consumed (aggregated to estimate respondents' annual drinking). Also, other factors affect the blood alcohol concentration (BAC), especially duration of drinking, gender and weight. Therefore, we used eBAC (estimated BAC) at the end of the drinking occasion [19]. A standard formula was used [20], with an updated estimate for the water content of blood, 0.8065 [21]:

$$\text{eBAC} = \frac{\text{amount of 100\% alcohol (grams)}}{\text{TBW}} \times 0.8065 - 0.17 \times \text{duration of drinking (hours)},$$

where TBW (total body water) was estimated as:

TABLE 1 Measures used to characterize drinking occasions. The variables were entered in the latent class analysis (LCA) model as 31 indicator variables

Characteristics of drinking occasion measured	Indicators used	To be noted
Location	Home surroundings (own or someone else's home or summer house)	When several were chosen, we used the respondent-identified main one
	On-premises	
	Other locations (e.g. outdoors)	
	Several locations	
	Abroad	
Circumstance	Home—no special occasion	In 2000, only the most important circumstance was asked; in 2008 and 2016, several could be chosen and we used the respondent-identified most important one
	Sauna	
	Partying	
	Meal	
	Visit	
	Celebration	
	Other occasion	
Drinking company	Alone	The first four company categories were mutually exclusive
	With own partner only (children could be present)	
	(Other) single gender company	
	(Other) mixed gender company	
	Children present	
	Relatives present	
	Colleagues present	
	Friends or acquaintances present	
	A large group (> 4 people including the respondent)	
Day of week	Monday–Thursday	The day when the occasion started
	Friday–Saturday	
	Sunday	
(Start and) end time of drinking	7 a.m. to 5 p.m.	Ending time and start time were asked as open-ended questions. We used end time, truncated to the lower full hour and categorized as shown
	6–11 p.m.	
	Midnight to 1 a.m.	
	2–6 a.m.	
Beverages and amounts of alcohol consumed	13 pre-defined beverage types; several units typical for each beverage type. Responses were transformed to volume of 100% alcohol and to eBAC, then categorized to three categories (see text)	Questions on beverages and amounts of alcohol consumed were open-ended. Interviewers were trained to code to available categories

eBAC = estimated blood alcohol concentration.

$$\text{TBW (men)} = 20.03 - (0.1183 \times \text{age}) + [0.3626 \times \text{weight (kg)}]$$

$$\text{TBW (women)} = 14.46 + [0.2549 \times \text{weight (kg)}].$$

We categorized eBAC as 0–0.049% (could still legally drive), 0.05–0.1% and > 0.1% ('intoxication occasion'). Respondents' weight was self-reported. For missing values (*c*. 1%), the age–sex-specific median was imputed.

Analysis

The analysis was not pre-registered and the results should therefore be considered exploratory.

Using data for the three periods combined, we applied latent class analysis (LCA) to identify classes (types) of drinking occasions, based on 31 dichotomous indicator variables characterizing drinking occasions. Two sets of parameters convey the underlying LCA class structure: the proportion of drinking occasions in each class (latent class prevalence) and the conditional probabilities of the indicator variables within each class, which depict the strength of the probabilistic connection between the indicators and the latent classes. They range from 0 (drinking occasions in the class are not characterized at all by that indicator) to 1 (all occasions in the class are characterized by the indicator).

We used SAS (version 9.4) PROC LCA (version 1.3.2) [22], accounting for the clustering of occasions within individuals. Conditional indicator probabilities by year were inspected to ensure a stable interpretation of classes (measurement invariance). Weights calculated by post-stratification for sex, age and geographical region were used in the analyses to accurately represent the population. To find the optimal number of classes, we estimated the LCA for 2–15 classes with 500 random starting values for each estimation. The criteria used for comparing the number of classes were subjective evaluations of meaningfulness, as a priority, and AIC (Akaike information criterion), CAIC (consistent AIC), BIC (Schwarz Bayesian information criterion), ABIC (adjusted BIC using Rissanen's sample size adjustment) and G^2 (likelihood-ratio G^2 deviance statistic) as an aid. Meaningful interpretation includes good separation of classes, sufficient membership probability in each class and a meaningful label to each class [23]. Entropy and average maximum posterior probabilities were examined for the discriminatory power of the models [24].

To examine the contribution of the classes to the change in Finnish drinking, we present 'post-analyses' by assigning drinking occasions to their most likely class. This was justified because the classes were well-delineated. The analyses consisted of a simple calculation of year-specific means and percentages with confidence intervals: frequency of the classes (by age and sex), extent of heavy drinking by class (mean eBAC and proportion of intoxication occasions) and the contribution of the classes to the population's total volume of alcohol consumed and total number of intoxication occasions. Because the survey period varied between respondents (frequent drinkers reported occasions in a short period), to acquire comparable population measures we needed to scale all the survey periods to the same metric (a year; e.g. multiply the number of occasions reported in a 7-day survey period by 52).

RESULTS

Finding the latent class solution

For deciding the number of classes, we compared the solutions estimating two to 15 classes. The model fit continued to improve significantly even when the additional classes were substantively meaningless (see Supporting information, Appendix, Figure S1, also for more information on the robustness of the solution). The seven-, nine- and 11-class solutions had meaningful interpretations, were supported by model fit statistics and had a good separation of classes. We selected the nine-class solution partly due to model parsimony and partly to avoid combining all 'big party' occasions into one class. Entropy and average class assignment probability were high: > 0.95 and 90–99%, respectively. The conditional indicator probabilities varied very little between years, i.e. interpretation of classes was the same across years.

Description of the drinking occasion types

A description of the identified latent classes (drinking occasion types) is given in Table 2. Figure 1 depicts the average amounts of alcohol consumed by class. (See Supporting information, Appendix, Table S1 for the corresponding point estimates with confidence intervals and Supporting information, Appendix, Figure S2 for a detailed mapping between classes and characteristics of drinking occasions.)

The nine classes are grouped into three (Table 2, Figure 1). The first three describe drinking practices occurring at home without external company—either alone (class 1) or with family either at weekends (class 2) or on weekdays (class 3) and cover 51% of occasions in 2016. These are, on average, relatively light-drinking occasions, and intoxication occasions are a small minority. The next three (altogether 33% of occasions in 2016) describe common, ordinary socializing situations, either at home in mixed-gender groups (class 4), when going out (class 5) or with friends of the same sex (class 6). Of these three, class 6 includes heavy drinking occasions most frequently. In the last three classes, 'party' is a common denominator (altogether 16% of occasions in 2016). They can take place at home (class 7), on licensed premises (class 8) or in other places (class 9). The latter is heterogeneous and most probably includes special occasions such as weddings and office parties. Classes 7 and 8 are the heaviest drinking occasions on average and are largely intoxication occasions.

Changes in the prevalence of drinking occasion types

To examine changes in the prevalence of drinking occasion types, Table 2 shows the proportion of all drinking occasions in a given year that fall into a given class and the mean number of occasions per

TABLE 2 Description of the latent classes (drinking occasion types) and their distribution and average number per respondent per year (95% confidence intervals)

Characteristics			% of all drinking occasions in the year				Average number of drinking occasions per year		
Name	**(Almost) always**	**Often**	**All**	**2000**	**2008**	**2016**	**2000**	**2008**	**2016**
(Home) alone	Alone, home (96%)	Light drinking in the evening	15.3	11.9	16.4	17.2	6.0 (4.8–7.3)	9.6 (8.1–11.1)	7.8 (6.4–9.3)
At home with family, weekends	Home, partner, weekend	No special occasion/sauna, evening, light drinking	19.1	16.6	19.2	21.9	8.4 (7.5–9.4)	11.2 (10.2–12.1)	10.0 (8.9–11.1)
At home with family, weekdays	Family only, home, weekday/ Sunday	No special occasion/sauna, evening, light drinking	14.3	13.8	15.9	12.2	7.0 (5.8–8.3)	9.3 (8.0–10.6)	5.6 (4.5–6.6)
Socializing at someone's home	Home, more people, mixed gender	Light drinking, weekend evening, relatives	14.8	17.1	13.7	14.1	8.7 (7.6–9.7)	8.0 (7.0–8.9)	6.4 (5.3–7.6)
Light drinking out	Not home	More people, dinner, abroad, weekday evening, light drinking	11.3	11.7	10.7	11.8	6.0 (4.9–7.1)	6.2 (5.2–7.2)	5.4 (4.6–6.2)
Get-together, single sex	Home, single gender	Friends, weekend (eBAC varies a lot)	6.4	6.7	5.9	7.1	3.4 (2.7–4.1)	3.4 (2.7–4.1)	3.2 (2.6–3.9)
Big party night, home	Home, mixed gender group	Friends, mixed group, weekend, late night, heavy drinking	7.8	7.9	8.4	6.5	4.0 (3.5–4.5)	4.9 (4.2–5.6)	3.0 (2.6–3.4)
Big party night, bar	Not home	Restaurant/bar, many places, friends, mixed gender group, big groups, weekend, late night, heavy drinking	7.0	9.7	6.4	5.0	4.9 (4.3–5.6)	3.7 (3.3–4.2)	2.3 (2.0–2.6)
Party, other place	(Big) mixed gender company	Other place, party/celebration, friends or colleagues, weekend (eBAC varies greatly)	4.0	4.6	3.4	4.2	2.3 (1.9–2.8)	2.0 (1.6–2.3)	1.9 (1.6–2.3)
All			100	100	100	100	51 (48–54)	58 (55–62)	46 (43–49)

eBAC = estimated blood alcohol concentration.

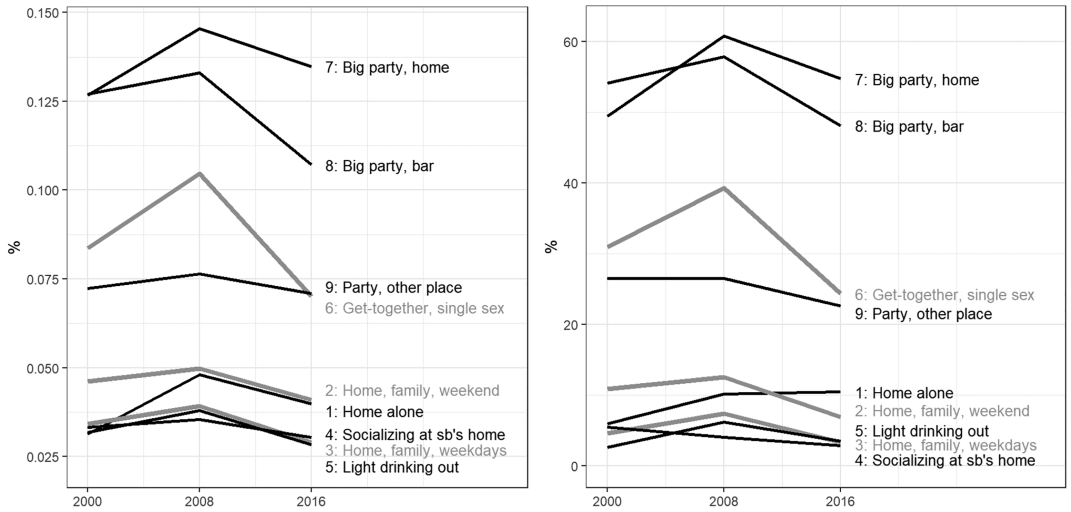


FIGURE 1 Mean estimated blood alcohol concentration (eBAC) (on left) and the proportion (%) of intoxication occasions (eBAC > 0.1%; on right) by drinking occasion type. For point estimates and confidence intervals, see Supporting information Appendix, Table S1

respondent per year. Both indicate that between 2000 and 2008, the three first drinking occasion types—drinking at home without external company—became more common. These occasions held their relative standing even after 2008: by year, the combined three categories covered 42, 52 and 51% of all drinking occasions. In contrast, parties and lighter social drinking occasion types did not become more frequent (even between 2000 and 2008, when per-capita consumption increased), and their share of all occasions decreased.

The decrease in per-capita consumption between 2008 and 2016 was due to a reduction in big parties and drinking occasions with the family at home on weekdays. Concurrently, the share of the lighter drinking social occasions—light drinking out and single-sex get-togethers—increased, possibly indicating a transfer from big parties to such occasions. The share of drinking occasions home alone or with family at weekends also increased.

We made two sensitivity analyses (Supporting information, Appendix, Table S2). Excluding occasions beyond the past 7 days (the 7-day period is available for all) yielded similar results, although drinking 'home alone' and with family on weekdays were then somewhat more common (in contrast, estimated temporal changes in these classes were less affected). In the second sensitivity analysis, it was found that without scaling to a year (i.e. frequent drinkers contributed much less than their true share), the results tilted the other way: home alone and with family on weekdays occasions were less frequent and special occasions were more frequent.

Changes in amounts consumed by drinking occasion type

When per-capita consumption increased between 2000 and 2008, so too did the mean eBAC in all drinking occasions combined (0.057 → 0.062) and the proportion of drinking occasions with an eBAC > 0.1% (16.9% → 18.5% – confidence intervals overlap slightly; Figure 1 and Supporting information, Appendix, Table S1). The change was in the same direction in all classes for the estimated means. With respect to the proportion of intoxication occasions, this trend occurred in seven of nine classes.

Between 2008 and 2016, when per-capita consumption decreased, the mean eBACs decreased from 0.062 to 0.049, and the proportion of intoxication occasions also decreased from 18.5 to 13.2%. For both, these appeared to be across-the-board changes across drinking occasion types. The increasing proportion of intoxication occasions during home alone occasions was the only exception.

Changes in each class's share of all alcohol used and intoxication occasions

Changes in the share of the population-level total volume of alcohol consumed and the total number of intoxication occasions that originate from a given drinking occasion type (Table 3) is a combination of changes in the two aspects examined above—prevalence and amounts consumed. The results highlight that during 2000–08, drinking occasions at home without external company contributed most to the increase in alcohol use and intoxication. In addition, big parties at homes gained a greater share of all alcohol consumed and intoxication occasions, while big parties in bars became less prominent. The combined contribution of the party categories decreased.

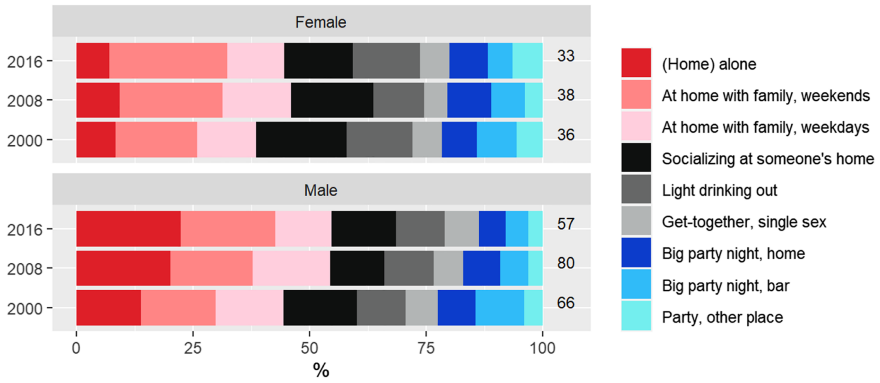
During 2008–16, (home) alone occasions continued to gain ground, especially in intoxication occasions, while weekday occasions with the family became less prominent for total volume and intoxication. The share of big parties at home or in bars continued to decline in both total volume and intoxication.

TABLE 3 The distribution across drinking occasion types of all litres of alcohol consumed and all intoxication occasions[a] by year (sum across all drinking occasion types = 100%)

	% of all litres of alcohol consumed			% of all intoxication occasions[a]		
	2000	2008	2016	2000	2008	2016
(Home) alone	6.7	13.2	13.9	4.2	9.1	13.6
At home with family, weekends	13.1	14.5	17.4	10.7	13.0	11.4
At home with family, weekdays	7.3	8.7	6.2	3.8	6.4	3.1
Socializing at someone's home	10.8	8.3	10.2	5.6	3.0	3.1
Light drinking out	7.2	7.6	8.7	1.9	3.6	3.2
Get-together, single sex	9.8	10.2	10.4	12.3	12.4	13.1
Big party night, home	17.1	19.2	15.5	23.1	27.7	26.9
Big party night, bar	21.5	13.4	11.1	31.2	20.1	18.3
Party, other place	6.6	4.9	6.7	7.2	4.9	7.3
All	100.0	100.0	100.0	100.0	100.0	100.0

[a]Estimated blood alcohol concentration (eBAC) exceeds 0.1%.

FIGURE 2 The proportion of the different drinking occasion types and the mean number of drinking occasions per year in 2000, 2008 and 2016 by gender



Changes in the prevalence of drinking occasion types by sex and age

As noted above, during 2000–08, drinking at home without external company became more common at the expense of parties and lighter social drinking occasions, and after 2008 the decrease was strongest for big party nights and weekday family drinking occasions. Figure 2 shows how these changes differ by gender. The marked share of (home) alone drinking occasions is especially a male phenomenon, and the difference between men and women has grown continuously. Also, the decrease in big party nights was especially strong among men. (This also applied to the number of occasions per year; Supporting information, Appendix, Figure S3).

The most common drinking occasions among the youngest and oldest age groups were very different (Figure 3 for the distribution and Supporting information, Appendix, Figure S3 for times per year). Older people more often drank at home without external company, while young people more often drank at parties. The direction of change, however, was largely similar in both groups. The middle-aged group were different in two respects. First, their mean number of annual drinking occasions was stable both during the periods of increasing and decreasing per-capita consumption. Secondly, after 2008, the share of drinking occasions at home without external company decreased only in this age group.

DISCUSSION

We identified nine drinking practices that characterized Finnish drinking in the 2000s. When grouped into three wider categories, the first group described drinking at home without external company and were most common among older respondents; the second group centred around socializing occasions in different places and with different company. The last group described drinking in party contexts and were most common among the younger respondents. When per-capita consumption first increased between 2000 and 2008 and then decreased between 2008 and 2016, the mean amounts consumed per occasion first increased and then decreased for almost all occasion types, but their frequencies changed differentially. The first group—drinking at home without external company—became more common and contributed most to the increasing population-level alcohol use between 2000 and 2008. Among men, drinking at home alone was a

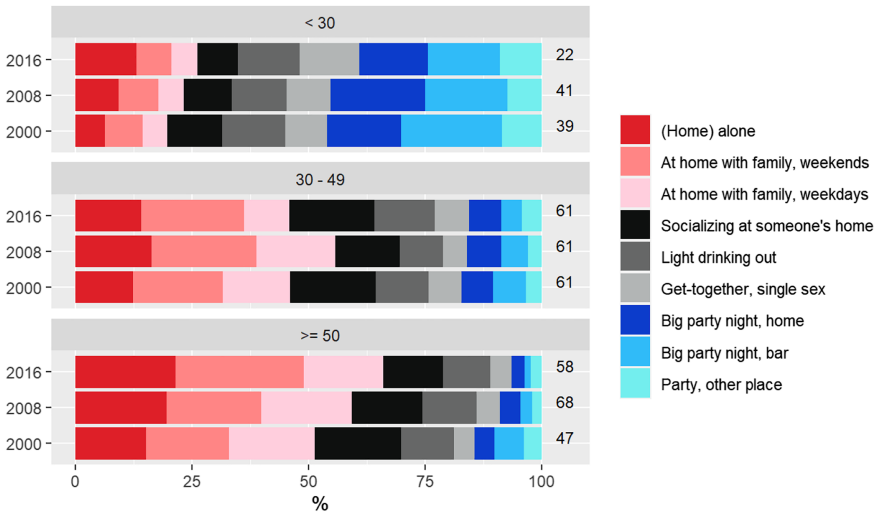


FIGURE 3 The proportion of the different drinking occasion types and the mean number of drinking occasions per year in 2000, 2008 and 2016 by age group (15–29, 30–49, 50+ years)

major contributor to this increase. The driving force in the declining per-capita consumption and intoxication occasions after 2008 was a decrease in big parties in homes and in licensed premises, which had already started in the first period. This change was also stronger among men.

Previously it has been shown that heavy episodic drinking has become less common in Finland after 2008 [5]. Our results shed more light on this change. Both before and after 2008, the more everyday type of drinking occasions, and especially those at home without external company, gained ground at the expense of big parties with heavy drinking. The mostly light drinking occasions at home without external company vary—drinking wine with a meal, having a drink or two while watching TV or (most often) refreshing oneself after a sauna [25]. These results could be interpreted as weak signals of a taming of the Finnish drinking culture. Further, after 2008, the heaviest party-drinking occasions decreased while the combined share of home drinking occasions with family at weekends and the three categories of social drinking occasions with lighter drinking increased. It seems that people have started to prefer meeting friends on lighter drinking occasions rather than on big party nights. An increasing share of sales in licensed premises comes from food [26], which could be a sign of the same development.

The previous analysis [5] also showed that the increase before 2008 was mainly due to increased drinking frequency among those aged 50+ years. Our results showed that the increase in this age group was due to a strong increase in drinking occasions at home without external company. Some of our findings by age could be cohort effects [27], but scrutinizing this is beyond the scope of this paper. Our results revealed no apparent explanation for women's increased heavy episodic drinking in 2000–08, as party drinking did not increase. The quantities per occasion could have increased for women within drinking occasion types.

Among men, drinking alone at home increased strongly. In principle, this could be beneficial for public health if these occasions replaced other, heavier (social) drinking occasions. However, an additive effect of this separate phenomenon is a more likely explanation, but this conjecture needs to be confirmed in longitudinal settings. Approximately 10% of all home alone occasions were intoxication occasions by 2016, and their share of all intoxication occasions increased from 4% in 2000 to 14% in 2016; even if most solitary drinking was light drinking, a part can be connected to heavy drinking, marginalization and health problems [28] or can reflect emerging symptoms of use disorder [29], and can (when frequent) contribute to chronically high alcohol exposure. Hence, these occasions contribute to alcohol problems and should be considered in prevention work.

Changes in alcohol affordability are an important determinant of changes in per-capita alcohol consumption in general [30, 31] and also in the Finnish changes during 2000–16 [4]. Our results show that changes in the amounts of alcohol consumed per occasion coincided with these economic changes, both when affordability increased and when it decreased. This suggests that the mechanism between the established connection between price and volumes of alcohol consumed may operate not only via drinking frequencies but also through amounts consumed per occasion. In contrast, it seems that economic conditions had less impact on drinking at home without external company (which increased constantly) or the continued decreasing of drinking in licensed premises. Instead, more general trends seem to be at play here, such as the rising number of single-person households [32], population ageing or a decrease in youth drinking [33].

The strengths of this study include the availability of rich data on drinking occasions in a general population sample. The limitations include inherent survey shortcomings, such as results being based on self-reports and the increasing non-response rates, although even the latest rate was excellent by international comparison [34]. Surveys on alcohol use never cover all the alcohol actually consumed due to non-response bias (heavy drinkers drop out more often), recall bias and other unintentional or intentional under-reporting (ibid.). A further reason is that our survey was designed to capture a typical period rather than special celebrations involving heavier drinking [35]. The precision of reports is likely to be lower for heavy drinkers, as

intoxication affects memory and they may lose track of the amounts consumed. Further, changes in the coverage may cause biases in results about change. We are not free of this problem, as the coverage of the FDH surveys slightly decreased across the years, which means that the data slightly underestimate the increase before 2008 and overestimate the decrease thereafter [5]. Additionally, Caluzzi *et al.* [36] found that drinking patterns are changing in ways that make it harder to capture them by the concept of a 'drinking occasion', as boundaries of occasions are blurred when drinking at home for extended periods. Also, the generalizability of the results to other countries is unknown. Many countries have experienced similar changes in per-capita consumption, but their determinants and relation to drinking practices could be different. Data on drinking occasions in other countries is needed to establish which results apply beyond Finland.

A key message for policy and prevention is that people drink increasingly at home for no special reason. Public health implications depend upon the extent to which this is substitution or addition. Any change towards moderation in the old Finnish intoxication-orientated drinking culture is welcome, but frequent drinking at home alone or with a partner can contribute to chronically high alcohol exposure, even if the quantities per occasion remain small. This question is timely, because some Finnish political parties support replacing the current government-owned alcohol monopoly stores with sales in grocery stores. In light of previous research [37, 38], however, this would increase wine consumption and total alcohol consumption and, hence, also harms [4, 39]. One argument presented for dismantling the monopoly is a wish to 'normalize' wine by selling it in grocery stores with food. However, it was the frequent drinkers who most often drank at home for no special reason and who have hence 'normalized' drinking. It is likely that increased availability and marketing of wine-drinking with meals would affect their drinking in particular, and this would probably increase their alcohol use disorders and mortality, even if those occasions were light drinking occasions.

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DECLARATION OF INTERESTS

None.

AUTHOR CONTRIBUTIONS

Pia Mäkelä: Conceptualization; data curation; funding acquisition; investigation; methodology; supervision; visualization. **Pekka Kumpulainen:** Data curation; formal analysis; methodology; software; visualization. **Janne Härkönen:** Conceptualization; data curation; funding acquisition; investigation; methodology; validation. **Tomi Lintonen:** Conceptualization; funding acquisition; investigation; methodology.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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