RESEARCH REPORT

What underlies the high alcohol related mortality of the disadvantaged: high morbidity or poor survival?

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Study objective: To investigate whether the large socioeconomic differences in alcohol related mortality can be explained by differences in morbidity or differences in survival.**Design:** Register linkage study. A nationwide hospital discharge register was linked to population censuses for socioeconomic data and to the cause of death register for mortality follow up.**Setting:** Finland.**Participants:** Men and women aged 15 years and older discharged from hospitals with an alcohol related diagnosis in 1991–1996.**Measurements:** Mortality hazard up to the end of 1997 by socioeconomic category was estimated with Cox's regression model.**Main results:** Socioeconomic differences in alcohol related hospitalisation rates were almost as large as those that have been observed for alcohol related mortality. For example, the rate ratio among male unskilled workers for any alcohol related hospitalisations was 3.6 as compared with upper white collar workers; among women the rate ratio was 2.7. Depending on gender, age, hospitalisation diagnosis, and cause of death, survival after discharge either showed no socioeconomic differences or it was worse among better off groups.**Conclusions:** The study suggests that differences in survival after hospitalisation do not cause the high socioeconomic differences in alcohol related mortality.

There is a strong, negative socioeconomic gradient in alcohol related mortality in many countries.^{1–3} This has been shown for both mortality related to long term heavy drinking and that caused by acute intoxication. The difference in Finland has been in the order of 3.5-fold to 4.5-fold between the lowest and the highest socioeconomic group among men; among women the difference has been twofold to threefold.¹

Alcohol consumption habits, as reported by different socioeconomic groups in Finnish drinking habits surveys,^{4,5} offer only a partial explanation for the large socioeconomic differences in mortality¹: there are no systematic socioeconomic differences in the level of reported alcohol consumption, and the differences observed for the proportion of heavy drinkers, risk drinkers, and the frequency of drinking large amounts of alcohol at a time are either non-existent or so small that they do not suffice to explain the large differences in mortality.

The reason for this discrepancy between drinking and its adverse consequences in socioeconomic groups remains a puzzle. Because alcohol related mortality is a major cause of premature death, particularly among men and in lower socioeconomic groups, and because the prevention of socioeconomic differences in mortality has a high priority,⁶ it would be important to find out more about the process through which people in lower socioeconomic groups end up with more alcohol related deaths even though their reported alcohol consumption is close to average.

One postulated explanation for the discrepancy is that there are socioeconomic differences in survival among people with alcohol related problems and diseases. For instance, members of lower socioeconomic groups may receive treatment of poorer quality for their alcohol related problems or alternatively they may not be able to benefit optimally from their treatment. This might apply to treatment for alcohol

dependence and social alcohol problems as well as to treatment for somatic diseases.

Some previous studies have followed up a sample of clinically treated alcoholics. In the UK⁷ and in Sweden⁸ small or non-existent socioeconomic differences in mortality were found, while in Norway⁹ and in Canada¹⁰ a slightly higher mortality was reported for those in higher socioeconomic positions. Rossow and Amundsen showed additionally that the rate of treatment was much lower in better off groups.⁹ The authors concluded that heavy drinkers in higher socioeconomic positions are less likely to seek treatment for alcohol problems—that is, they have, when entering treatment, more severe alcohol problems. It is hard to know to what extent this selection effect biases the results.

In this study, we use a nationwide administrative hospital register with a follow up for mortality to examine the role of differential survival as a cause of socioeconomic differences in alcohol related mortality. These data allow us to examine socioeconomic survival differences in patients hospitalised for somatic alcohol related diseases and alcohol intoxication in addition to survival differences in patients hospitalised for alcohol dependence. It is likely that socioeconomic differences in the propensity of seeking treatment—and hence the bias in results on survival—are smaller for somatic alcohol related diseases and intoxication than for alcohol dependence.

Thus, the research questions are (1) Are there socioeconomic differences in rates of hospitalisation with alcohol related diagnoses and (2) are there socioeconomic differences in survival among those who are hospitalised with different alcohol related diagnoses.

METHODS

Data on hospital utilisation attributable to alcohol related diagnoses came from the 1991–1996 Finnish Hospital

Table 1 Number of patients in the hospital discharge register in 1991–1996 with an alcohol related primary diagnosis, median length of hospital stay (LOS) in days, deaths during the follow up from discharge to the end of 1997, and their proportion of the patients by type of diagnosis*

Diagnosis	Men	Women	All	Median LOS (days)	Deaths	%
	Number	Number	Number			
Alcohol psychoses	12955	2571	15526	5	2165	14
Alcohol dependence syndrome	19951	4095	24046	4	4001	17
Alcohol intoxication	12833	3151	15984	3	2456	15
Alcoholic diseases of the liver	3679	1169	4848	10	2371	49
Alcoholic diseases of the pancreas	5951	1010	6961	6	997	14
Other alcohol related	2390	366	2756	4	554	20
Any alcohol related diagnosis	43132	9842	52974	5	9735	18

*Different categories of diagnoses may include same persons, and hence their sum is larger than the total. Only first admissions in the study period are included in the table.

Discharge Register. Hospital records of the patients aged 15 and over who were discharged from any Finnish public or private hospital were individually linked to sociodemographic data in the population censuses carried out in 1990, 1985, 1980, 1975, and 1970 to obtain reliable information on socioeconomic variables. The patients who were hospitalised because of alcohol related primary diagnoses were followed up for mortality in the 1991–1997 Cause of Death Register maintained by Statistics Finland, for 3.8 years on average. The linkages were carried out using personal identity codes; the proportion of cases that could not be linked was minimal.

According to hospital type, the hospitalisations were grouped into admissions to: (1) university, (2) central, (3) district, (4) mental, (5) private, and (6) other hospitals, and (7) health centre wards. Of these hospital types, district hospitals in Finland provide specialised care in two to three main specialties, while health centre wards are mainly run by general practitioners.

In 1991–1995, the hospital diagnoses and causes of death were coded according to the Finnish version of the 9th

revision of the International Classification of Diseases (ICD9), while in 1996–1997 the Finnish version of the ICD10 was used. We classified the causes of hospitalisation according to the primary diagnosis into six groups: (1) alcohol psychoses, (2) alcohol dependence syndrome, (3) alcohol intoxication, (4) alcoholic diseases of the liver, (5) alcoholic diseases of the pancreas, and (6) other alcoholic diagnoses (alcoholic gastritis, alcoholic polyneuropathy, alcoholic cardiomyopathy, alcohol dependence in pregnancy, and alcoholic beriberi disease). The term “alcohol related diseases” refers to all these groups except group 3.

Causes of death were assigned into four categories: (1) all causes, (2) causes directly attributable to alcohol—that is, deaths that have an alcohol related underlying cause (same list of causes as above for hospitalisations)—, (3) all alcohol related causes—that is, deaths that have an alcohol related underlying or contributory cause—, and (4) causes that are not alcohol related. Most common causes in category 2 were alcoholic diseases of the liver, accidental alcohol poisoning, alcoholic cardiomyopathy, alcohol dependence syndrome,

Table 2 Number of patients in the hospital discharge register in 1991–1996 with an alcohol related primary diagnosis, median length of hospital stay (LOS) in days, the ratio of alcohol related disease diagnoses to intoxication diagnoses, the number of deaths among the hospitalised during follow up from discharge to the end of 1997, and their proportion of the patients by socioeconomic status and sex

Socioeconomic status	Number of patients	Median LOS (days)	Alcohol related disease dg/ intoxication dg	Deaths	%
Men					
Upper white collar worker	2759	5.0	3.4	559	20
Lower white collar worker	4889	5.0	3.2	919	19
Specialised manual worker	14803	5.0	2.9	2700	18
Unspecialised manual worker	10496	4.0	2.7	1949	19
Farmer	2355	4.0	2.4	514	22
Other	7830	4.0	2.6	1641	21
All	43132	5.0	2.8	8282	19
Women					
Upper white collar worker	634	5.5	2.8	103	16
Lower white collar worker	3000	5.0	2.8	398	13
Specialised manual worker	1751	5.0	2.5	261	15
Unspecialised manual worker	2388	5.0	2.5	319	13
Farmer	365	4.0	2.0	69	19
Other	1704	4.0	2.1	303	18
All	9842	5.0	2.5	1453	15
All	52974	5.0	2.8	9735	18

and alcoholic diseases of the pancreas. The alcohol related contributory causes in category 3 included alcohol intoxication and alcohol related diseases. In Finland, death certificates record alcohol intoxication as a contributory cause of death more frequently and accurately than in many other countries.¹¹

We used the socioeconomic classification of Statistics Finland. It was based on the patients' occupation in the 1990 census for the economically active and on their earlier occupation in the previous censuses for the retired and unemployed. The occupation of the head of the household was used for those with no such information available. Manual workers were divided into two on the basis of Pensola *et al* (<http://www.valt.helsinki.fi/sosio/pru/ses.htm>).

Family type was classified as follows: no family; a couple without children; a couple with children; mother or father with children; institutionalised or unknown. Language was divided into Finnish, Swedish, and other.

Hospitalisations attributable to alcohol related conditions in 1991–1996 were related to the person years of the population at risk in the 1990 census. Hospitalisation rates were adjusted for age using direct age standardisation with five year age categories and the 1990 census population as the standard.

We analysed the survival of the patients hospitalised because of alcohol related conditions by Cox's proportional hazards models (SAS Phreg). For mortality follow up, we separately identified the patients' first (index) hospitalisations in the study period 1991–1996 due to each alcohol related diagnostic category. The patient's follow up for a diagnostic category started from the end of the diagnosis specific index hospitalisation and ended at the date of the patient's death or on 31 December 1997. Hence, a person hospitalised for, for example, alcoholic liver cirrhosis at one time and for alcohol dependence at another time is included in the analyses for both of the two causes. Mortality during hospital stay was analysed separately.

RESULTS

In Finland in 1991–1996 there were nearly 53 000 first hospitalisations attributable to an alcohol related primary diagnosis, 81% of which were among men (table 1). Alcohol dependence syndrome was the most common diagnosis, followed by alcoholic psychoses and alcohol intoxication. Eighteen per cent of the patients died during the follow up. Almost half of the patients hospitalised for alcoholic liver diseases died during follow up. Also the median length of hospital stay for liver cirrhosis was double the average (10 compared with 5 days).

A larger proportion of hospitalisations was due to alcohol related diseases, as opposed to intoxication, in the higher socioeconomic categories than in lower ones (table 2).

About one half of all hospitalisations with alcohol related diagnoses occurred in health centre wards. University, central, district, and mental hospitals each covered about equivalent shares of the alcohol related hospitalisations, while private hospitals only accounted for 1.7% of them.

There was a clear negative socioeconomic gradient in the rate of alcohol related hospitalisations (table 3). For alcohol related diagnoses in general, unspecialised manual workers had a 3.6-fold rate as compared with upper white collar workers, among men, and a 2.7-fold rate among women. The socioeconomic differences were marked for each alcohol related diagnosis, but they were smaller than average especially for alcoholic diseases of the liver, alcoholic diseases of the pancreas, and, among women, alcohol psychoses.

In analysing the survival of the discharged patients, we divided the patients into three groups on the basis of their

main diagnosis: (1) alcoholic diseases of liver or pancreas, (2) alcohol dependence, alcohol psychoses and "other", and (3) intoxication. Among both genders, there were no statistically significant differences in survival between socioeconomic groups in any of these diagnosis groups (table 4). The data were further divided into three age categories (15–44, 45–59, 60+). In the second hospitalisation category (alcohol dependence, etc), there was a statistically significant interaction between age group and socioeconomic status among men ($p = 0.024$): in the youngest age group the male upper white collar workers had an increased mortality rate, while in the oldest age group the gradient was in the opposite direction.

No direct measure of the severity of disease was available in the hospital records. As proxies in the models shown in table 4 we used the cause for hospitalisation, hospital type (cause specific survival was worse than average in university hospitals and district hospitals and better than average in private hospitals), and the length of hospital stay (the longer the stay, the worse the survival). The treatment of upper socioeconomic groups was longer than average in duration and took place more often than average in university and private hospitals. This suggests that, besides the severity of disease, the inclusion of length of stay and hospital type into the model may control for quality of treatment, which we would not like to control for, because it is a potential mediating factor between socioeconomic status and mortality. Therefore, the models in table 4 were refitted without these two variables. The results were almost identical with those in table 4.

Two further sets of models were run to check the validity of the results in table 4. Firstly, in the follow up shown in table 4, large differences between the socioeconomic groups may exist in health status at the beginning of the study period in 1991 and in the number of alcohol related hospitalisations before the beginning of the period. To make sure that these factors do not confound the results, all those who were hospitalised with an alcohol related diagnosis in 1991 or 1992 were excluded from the analysis. This did not substantially modify the results (for example, rate ratios among male unspecialised manual workers were 1.19, 1.05, and 0.97).

Secondly, the follow up in table 4 started from the moment when the patient was discharged from hospital. Analysis of mortality during the hospitalisation period was only possible among men because of the small numbers among women. The results were not substantially different from those in table 4: there were no statistically significant differences between socioeconomic groups.

Table 5 shows cause specific survival by type of hospital diagnosis. In the first cause of death category the underlying cause is directly attributable to alcohol, while the second includes additionally those deaths where a contributory cause is alcohol related. The third category consists of deaths not related to alcohol. For all three cause of death categories, there were few statistically significant differences between the socioeconomic groups. When the hospitalisation diagnosis was alcohol dependence or alcohol psychosis, among women it was the upper white collar workers who had an increased risk to die from alcohol related causes.

DISCUSSION

We set out to examine whether the high socioeconomic differences in alcohol related mortality observed in previous studies could be attributed to either differences in rates of hospitalisation or differences in survival during or after hospitalisation. Our follow up ranged from one to seven years, averaging 3.8 years. Hence, our study design excluded alcohol related deaths that occurred either after a long time after

Table 3 Rate ratios of index hospitalisations (age adjusted) by socioeconomic status (SES), type of diagnosis, and sex. Rate ratios with 95% confidence intervals that do not include 1.0 are marked in bold

SES	Diagnosis						
Men	Alcohol psychoses	Alcohol dependence syndrome	Alcoholic intoxication	Alcoholic diseases of the liver	Alcohol diseases of pancreas	Other alcohol related	Any alcohol related
Upper white collar	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lower white collar	1.6	1.6	1.5	1.2	1.6	1.6	1.5
Specialised manual	2.9	3.0	2.8	1.6	2.5	3.4	2.7
Unspecialised manual	3.7	4.1	3.9	1.8	2.7	4.3	3.6
Farmer	1.6	1.8	1.9	0.9	1.0	1.6	1.6
Other	3.1	3.5	3.1	1.7	2.1	3.7	3.0
Women							
Upper white collar	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lower white collar	1.1	1.3	1.2	1.2	1.1	1.8	1.2
Specialised manual	2.2	2.7	2.7	1.9	2.4	4.1	2.5
Unspecialised manual	2.3	3.1	3.1	1.7	2.2	3.9	2.7
Farmer	0.9	1.2	1.6	0.7	0.4	0.8	1.1
Other	1.8	2.7	2.5	2.1	1.5	4.0	2.3

hospitalisation or without any hospitalisation. In principle it is possible that the results would be different with a longer follow up, but we see no evident reasons for this.

We found large socioeconomic differences in rates of alcohol related hospitalisations for all alcohol related diagnosis groups, although less so for alcoholic liver diseases. In contrast, there were practically no differences in survival after hospitalisation for alcoholic diseases of liver or pancreas or for intoxication. After hospitalisation for alcohol dependence or alcohol psychosis, young men's mortality from all causes and women's mortality from alcohol related causes was highest in upper white collar workers.

The finding of the non-existent or even reversed socioeconomic differences in survival after hospitalisation due to alcohol related conditions is in contrast with results obtained for other causes: a negative socioeconomic gradient is observed in survival for several diseases in Finland and elsewhere.¹²⁻¹⁵

The results on the reversed socioeconomic gradient among women for alcohol related deaths and among young men for deaths from all causes after hospitalisation for alcohol dependence and alcohol psychoses are similar to the findings

previously reported on the overall survival of alcoholics in treatment.^{9,10} It is not plausible that the quality of treatment would explain this difference. Rather, it is probable that, even if we tried to control for the severity of disease by controlling for the length of hospital stay, type of diagnosis, and type of hospital, and used a wash out period of two years, members of higher socioeconomic groups obtain the diagnosis of alcohol dependence/alcohol psychosis in more severe cases than members of lower socioeconomic groups.

One potential reason for the differences in the severity of disease could be that in higher socioeconomic groups people try to avoid and postpone the hospitalisation for an alcohol related condition more than in lower socioeconomic groups. This would be more easily done in the case of alcohol dependence than in the case of, for example, liver cirrhosis. Alternatively, doctors could be less prone to give the diagnosis of alcohol dependence/alcohol psychosis to members of upper socioeconomic groups except in severe cases. The diagnoses of alcoholic diseases of liver and pancreas may be less dependent on medical discretion, which would explain why a reversed socioeconomic gradient was not observed for them.

Table 4 Hazard ratios for all cause mortality among patients discharged from a hospital for an alcohol related diagnosis, by type of diagnosis and socioeconomic group*

SES	Discharge diagnosis		
	Alcoholic disease of liver or pancreas	Alcohol dependence or alcohol psychoses	Intoxication
Men			
Number of deaths	2738	5917	2111
Upper white collar	1.00	1.00	1.00
Lower white collar	1.09 (0.93 to 1.28)	0.98 (0.86 to 1.12)	1.00 (0.80 to 1.26)
Specialised manual	1.09 (0.94 to 1.26)	0.96 (0.85 to 1.08)	0.97 (0.80 to 1.18)
Unspecialised manual	1.09 (0.93 to 1.27)	1.00 (0.89 to 1.13)	1.00 (0.82 to 1.22)
Farmer	1.21 (0.99 to 1.48)	0.95 (0.82 to 1.10)	0.90 (0.70 to 1.15)
Other	1.19 (1.01 to 1.39)	1.03 (0.91 to 1.16)	0.98 (0.80 to 1.21)
(p for trend when <0.1)†	—	—	—
Women			
Number of deaths	630	803	345
Upper white collar	1.00	1.00	1.00
Lower white collar	0.97 (0.71 to 1.33)	0.82 (0.62 to 1.09)	1.14 (0.70 to 1.88)
Specialised manual	0.90 (0.64 to 1.27)	0.95 (0.71 to 1.28)	1.57 (0.95 to 2.60)
Unspecialised manual	0.95 (0.68 to 1.33)	0.76 (0.56 to 1.01)	1.07 (0.64 to 1.77)
Farmer	1.27 (0.80 to 2.02)	1.03 (0.68 to 1.56)	1.24 (0.63 to 2.45)
Other	1.16 (0.83 to 1.63)	0.99 (0.74 to 1.33)	1.41 (0.85 to 2.34)
(p for trend when <0.1)†	—	—	—

*In the model, age, language, marital status, family type, hospital type, length of stay, and a dummy variable for the type of diagnosis have been adjusted for, all as categorical variables. †Calculated for the first four categories of SES.

Table 5 Hazard ratios and confidence intervals for mortality from causes directly attributable to alcohol, from all causes related to alcohol, and from causes not related to alcohol among patients discharged from a hospital for an alcohol related diagnosis, by type of diagnosis and socioeconomic group*

	Men						Women					
	Discharge diagnosis:											
	Alcoholic disease of liver or pancreas											
	Cause of death:											
	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related
Number of deaths	1768	2192	546	448	513	117						
SES												
Upper white collar	1.00	1.00	1.00	1.00	1.00	1.00						
Lower white collar	1.08	(0.89 to 1.32)	1.10	(0.75 to 1.55)	0.91	(0.63 to 1.28)	1.00	(0.65 to 1.28)	1.41	(0.65 to 1.28)	1.00	(0.61 to 3.24)
Specialised manual	1.11	(0.93 to 1.33)	1.11	(0.70 to 1.35)	0.84	(0.56 to 1.23)	0.83	(0.58 to 1.23)	1.32	(0.58 to 1.23)	1.32	(0.54 to 3.25)
Unspecialised manual	1.01	(0.84 to 1.23)	1.11	(0.69 to 1.39)	0.87	(0.59 to 1.27)	0.87	(0.63 to 1.30)	1.28	(0.63 to 1.30)	1.28	(0.52 to 3.14)
Farmer	1.15	(0.89 to 1.48)	1.21	(0.74 to 1.76)	1.08	(0.62 to 1.88)	1.07	(0.63 to 1.83)	2.42	(0.63 to 1.83)	2.42	(0.85 to 6.93)
Other	1.14	(0.94 to 1.39)	1.19	(0.83 to 1.67)	1.00	(0.67 to 1.48)	1.05	(0.72 to 1.52)	1.90	(0.72 to 1.52)	1.90	(0.80 to 4.51)
(p for trend when <0.1)†	—	—	—	—	—	—	—	—	—	—	—	—
Alcohol dependence or alcohol psychoses												
Cause of death:												
	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related
Number of deaths	1872	3643	2274	272	491	312						
SES												
Upper white collar	1.00	1.00	1.00	1.00	1.00	1.00						
Lower white collar	0.83	(0.66 to 1.03)	0.96	(0.77 to 1.20)	0.67	(0.49 to 1.22)	0.78	(0.48 to 0.94)	1.21	(0.48 to 0.94)	1.21	(0.73 to 1.99)
Specialised manual	0.83	(0.69 to 1.01)	0.99	(0.82 to 1.20)	0.88	(0.52 to 1.36)	0.84	(0.61 to 1.25)	1.06	(0.61 to 1.25)	1.06	(0.62 to 1.83)
Unspecialised manual	0.83	(0.68 to 1.01)	1.06	(0.87 to 1.29)	0.59	(0.24 to 0.68)	0.41	(0.41 to 0.84)	1.17	(0.41 to 0.84)	1.17	(0.70 to 1.95)
Farmer	0.93	(0.72 to 1.20)	0.94	(0.74 to 1.20)	0.82	(0.41 to 1.73)	0.84	(0.47 to 1.43)	1.47	(0.47 to 1.43)	1.47	(0.77 to 2.83)
Other	0.84	(0.69 to 1.03)	1.09	(0.90 to 1.33)	0.82	(0.52 to 1.39)	0.85	(0.57 to 1.18)	1.40	(0.57 to 1.18)	1.40	(0.84 to 2.32)
(p for trend when <0.1)†	—	—	—	—	<0.001	—	—	0.05	—	—	—	—
Intoxication												
Cause of death:												
	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related	Directly alcohol attributable	All alcohol related	Not alcohol related
Number of deaths	595	1176	935	81	171	174						
SES												
Upper white collar	1.00	1.00	1.00	1.00	1.00	1.00						
Lower white collar	0.81	(0.55 to 1.20)	1.03	(0.72 to 1.47)	0.76	(0.37 to 2.29)	0.92	(0.41 to 1.42)	1.95	(0.41 to 1.42)	1.95	(0.82 to 4.64)
Specialised manual	0.77	(0.55 to 1.08)	1.15	(0.84 to 1.56)	0.97	(0.42 to 2.82)	1.09	(0.51 to 1.84)	2.90	(0.51 to 1.84)	2.90	(1.22 to 6.89)
Unspecialised manual	0.80	(0.60 to 1.20)	1.04	(0.76 to 1.44)	0.72	(0.27 to 1.85)	0.71	(0.38 to 1.36)	1.79	(0.38 to 1.36)	1.79	(0.75 to 4.30)
Farmer	0.02	(0.65 to 1.60)	0.83	(0.57 to 1.21)	0.67	(0.36 to 4.84)	1.32	(0.23 to 1.89)	2.39	(0.23 to 1.89)	2.39	(0.86 to 6.63)
Other	0.90	(0.63 to 1.28)	0.99	(0.72 to 1.36)	0.92	(0.36 to 2.58)	0.96	(0.47 to 1.77)	2.47	(0.47 to 1.77)	2.47	(1.04 to 5.87)
(p for trend when <0.1)†	—	—	—	—	—	—	—	—	—	—	—	—

*In the model, age, language, marital status, family type, hospital type, length of hospitalisation and a dummy variable for the type of diagnosis have been adjusted for, all as categorical variables. †Calculated for the first four categories of SES.

Key points

- Eighteen per cent of all patients hospitalised because of an alcohol related diagnosis, and almost half of those hospitalised for alcoholic liver diseases, died during the average follow up of 3.8 years.
- A socioeconomic gradient existed for the incidence of hospitalisations attributable to each alcohol related diagnosis group, but it was less marked for alcoholic liver disease.
- Hospitalisations because of alcohol related diagnoses, and because of intoxication in particular, were much less frequent in white collar workers than in other socioeconomic groups.
- There were no systematic statistically significant differences in all cause mortality between socioeconomic groups after or during hospitalisations attributable to alcohol related somatic diseases or intoxication.
- Upper white collar workers hospitalised because of alcohol dependence or psychosis had, among women, an increased risk to die from alcohol related causes and, among young men, from all causes.

In conclusion, the strong socioeconomic gradient in mortality from alcohol related causes in Finland cannot be attributed to socioeconomic differentials in the quality of hospital treatment or other factors operating through survival after hospitalisation. The reasons for the mortality differences have to be located causally earlier, in higher incidence of alcohol related health problems in the lower socioeconomic groups. Hence, further preventive measures should be targeted to drinking habits and to early prevention of alcohol problems. This conclusion is in contrast with the results of surveys on drinking habits,^{4,5} which do not show significant variation in alcohol consumption by socioeconomic position. It is possible that surveys on drinking habits provide a distorted picture of socioeconomic variations in alcohol consumption, due to socioeconomic differences in alcohol consumption among the non-respondents and in the accuracy of reported alcohol consumption among the respondents. Moreover, it is possible that other environmental or behavioural factors augment the harmful effects of alcohol in lower socioeconomic groups.¹

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Policy implications

- The study underlines the importance of early prevention of alcohol problems as a preventive measure to reduce high socioeconomic inequalities in alcohol related mortality.

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