

URBANIZATION, MIGRATION AND ALCOHOL USE IN A POPULATION OF GREENLAND INUIT

Marie Henriette Madsen ^{1,2}, Morten Grønbaek ¹, Peter Bjerregaard ²,
Ulrik Becker ³, *The Greenland Population Study* ⁴

¹ National Institute of Public Health, Centre for Alcohol Research, Copenhagen, Denmark

² National Institute of Public Health, Centre for Health Research in Greenland, Copenhagen, Denmark

³ Alcohol Unit, Copenhagen University Hospital, Hvidovre, Denmark

⁴ Steering Group: Stig Andersen, Vibeke Backer, Ulrik Becker, Peter Bjerregaard, Knut Borch-Johnsen, Gert Mulvad
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ABSTRACT

Objective. To analyse the effects of migration and urbanisation on alcohol intake among a population of Greenland Inuit.

Study design. Population-based cross-sectional study of 4,139 Inuit randomly selected from Denmark and four areas of western Greenland. Data collection was based on interviews and self-administered questionnaires.

Methods. The association between different aspects of alcohol intake (quantity of intake, occasional heavy drinking, and the modified CAGE questionnaire) and place of living were analysed using a chi-square test and logistic regression analysis.

Results. The population living in Denmark had a higher mean alcohol intake than those living in Greenland. Drinking above the sensible drinking limits (21 drinks per week for men and 14 drinks per week for women; where one drink contains 12 g alcohol) was also more prevalent in the population living in Denmark, whereas a higher proportion of those living in Greenland was abstaining. In contrast to the higher alcohol intake in the population living in Denmark, a higher proportion of individuals with episodes of heavy drinking (binge drinking), was observed in both large and small communities in Greenland. A higher proportion of positive results on the modified CAGE test, measuring alcohol dependence, were also seen in large communities in Greenland. We found no statistically significant differences in alcohol intake between Inuit living in large and small communities in Greenland. When comparing Inuit living in Denmark according to length of stay in Denmark, we found a significantly increase in prevalence of binge drinking with length of stay, while no significant variation with length of stay was found for other alcohol parameters.

Conclusion. Our findings suggest that the alcohol intake among Inuit, living in Denmark and in Greenland respectively, differs in relation to total intake, drinking patterns and a measure of alcohol dependence. Whether this may be attributed to urbanization, or to migration, is not clear. (*Int J Circumpolar Health* 2005; 64(3):234-245.)

Keywords: Greenland, urbanization, migration, alcohol intake

INTRODUCTION

Previous studies have found that cultural changes, such as migration and urbanization, may influence the use of alcohol and other drugs. A study from Finland has shown that alcohol use is more frequent in larger towns than in rural areas (1), and in a study from the United States it was found that the use of alcohol by immigrants differed from the alcohol intake among the population of both the host country and the country of birth. Immigrants had a lower use of alcohol and other drugs than native-born citizens, but the pattern of drug use approached that of the native-born population after some years of residing in the United States (2).

In Greenland, there is a considerable variation in living conditions, ranging from a more western European way of living in the towns (which, in Greenland, refers to towns with a population of 1,000-13,000), to the more traditional Inuit style of living in the villages (3), and differences in the use of alcohol may also occur within Greenland. Previous studies in Greenland have indicated that alcohol-related deaths, including accidents, were most frequently seen outside the towns (4-6). It is unlikely that these findings reflect solely the distribution of alcohol intake within Greenland, but there are indications of a drinking pattern in Greenland characterized by occasional and sometimes excessive use, which differs from that in many other western societies (7). Whether urbanization and migration influence such drinking pattern, has never been examined in a population of Greenland Inuit, and there is also a lack of knowledge of the potential diversity in the effects of alcohol intake, for instance in terms of alcohol depen-

dence, as a function of differences in intake and drinking pattern. The objective of this study was therefore to describe aspects of alcohol intake among a population of Greenland Inuit and, thereby, to examine how urbanization and migration influence the use of alcohol among Inuit living in Denmark and in western Greenland.

MATERIAL AND METHODS

This study was part of a large, population-based, cross-sectional study (The Greenland Population Study, 1999). Inuit were selected from Denmark and from four areas of western Greenland, with the aim of studying health-related issues in Inuit living under different socio-economic conditions. The study has been described in detail elsewhere (3).

In short, the following locations in Greenland were chosen - Nuuk, Sisimiut, Qasigiannuguit, and four villages in the Uummannaq municipality (Ikerasak, Saattut, Qaarsut and Ukkussissat) (Figure 1). Nuuk, the capital of Greenland, has a population of approximately 13,000. The lifestyle is westernized, but traditional Inuit food represents a significant proportion of the diet, and hunting and fishing are important leisure-time activities. Sisimiut is the second largest town in Greenland, with a population of approximately 5,000. The lifestyle resembles that in Nuuk, but hunting and fishing play a greater role. Qasigiannuguit is a small town with less than 1,500 inhabitants. The main diet consists of locally caught fish, sea mammals and birds, but food items like fruit, vegetables, dairy products and meat are also available. Hunting and fishing are important trades. The four villages in Uummannaq

have a total population of approximately 1,000. The main occupation is hunting and fishing, and the diet is mainly traditional, consisting of sea mammals and fish.

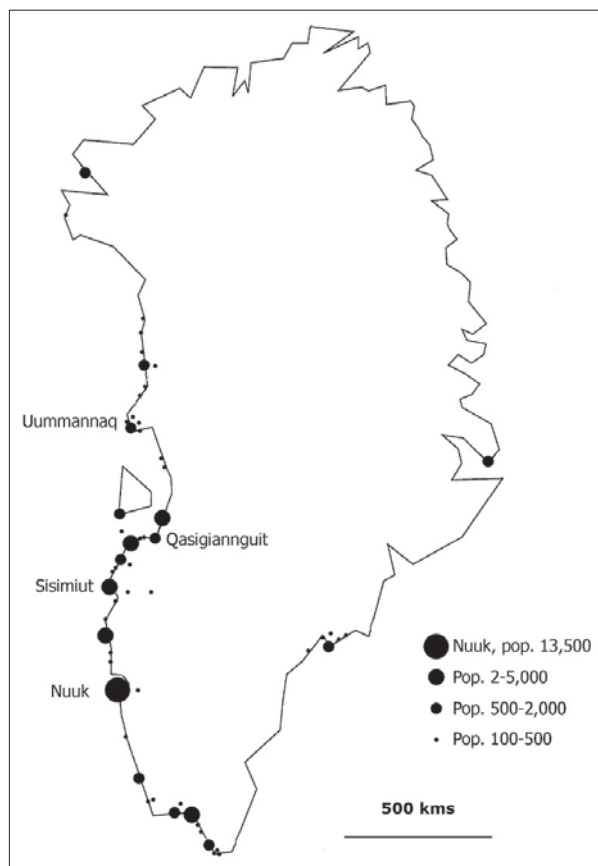


Figure 1. Map of Greenland with towns, villages and names of study areas.

The inclusion criteria for participants in the study was an age of 18 years, or older, and at least one Inuit parent, or grandparent. Subjects without knowledge of ancestry, but with Greenlandic, or mixed Greenland-Danish self-identity, were also included. In Denmark, subjects born in Greenland were identified from the Central Population Register, and a random sample was drawn from this group. From this, 3,513 were identified as Greenlanders according to the above-mentioned criteria. In Nuuk and Sisimiut, random samples of individuals born in Greenland were invited to participate. The sample consisted of those who had

been randomly selected for a Health Interview Survey in 1993, a random sample drawn from the population register, and subjects identified from a household sample ($n = 1,912$). In Qasigiannuit, all Inuit residents of the town were invited to participate in the study ($n = 842$), and the potential participants were identified from the population register, supplemented by hospital files. In Uummannaq, all residents present during the week-long stay of the investigation team were invited to participate. The eligible population was identified by systematic house-to-house visits ($n = 428$). All participants gave informed consent before entry into the study, and The Danish Data Protection Agency, The Regional Scientific Ethical Committee for Copenhagen, and the Commission for Scientific Research in Greenland (j.nr. 505-30) approved the study.

Data collection

Data collection was based on questionnaires, interviews and clinical examinations. In Denmark, questionnaires were mailed to the participating subjects, and completed questionnaires were received from 2,123 (60%). A random sample of these ($n = 1,358$) was invited to take part in clinical examinations, and a total of 736 (54%) participated. Only some of the questions concerning alcohol used in this study were present in the questionnaire mailed to subjects living in Denmark, but those who went through a clinical examination were asked additional questions on alcohol habits.

In Nuuk and Sisimiut, data collection was carried out by mailed questionnaires, or interviews by trained interviewers combined with self-administered questionnaires with questions on sensitive matters, such as the use of alcohol. A total of 1,135 (60%) completed the

interview, or the questionnaire. This part of the study population was asked all questions concerning alcohol.

In Qasigiannuguit and Uummannaq, the intension was that all participants should take part in the clinical examinations and an interview, and answer a self-administered questionnaire with questions on sensitive matters. In Qasigiannuguit 618 (73%) participated and, in the four villages in Uummannaq, a total of 263 (60%) subjects participated in the clinical examination. However, 64 participants in Uummannaq were accidentally not interviewed. Alcohol-related data was obtained for 199 (46%) participants in this study area.

Urbanization and migration

In order to ensure statistical power in the analysis of the effect of urbanization and migration, we regrouped the four geographical areas in Greenland into two. We defined Nuuk and Sisimiut as large communities, and Qasigiannuguit and the four villages in Uummannaq as small communities. All participants living in Denmark were born in Greenland and, hence, were defined as migrants. In order to analyze the importance of the length of stay on alcohol intake (2), we classified the population living in Denmark into four groups, according to their length of stay (less than 5 years, 5 to <10 years, 10 to <15 years, and 15 years or more).

Alcohol intake and drinking patterns

The participants were asked how many drinks of beer, wine and spirits they had on average per week (one drink contains 12 gram alcohol, which represents one bottle of beer, one glass of wine, or 2 cl of spirits). From the mean weekly intake, the prevalence

of abstainers and of heavy drinkers (alcohol intake exceeding the sensible drinking limits defined by the Danish National Board of Health: 14 drinks per week for women and 21 drinks per week for men) was estimated and related to place of living. Similarly, the proportion of each beverage type of total alcohol intake was estimated.

No consensus exists regarding the definition of “*occasional heavy drinking*” (binge drinking), but an intake of five, or more, drinks for men and four, or more, drinks for women, at least once during the past two weeks, is widely used (8). The participants were asked two questions, which can accommodate the above definition: *When did you last have a beer, a glass of wine, or a glass of spirits? (Today/yesterday, Within the last week, Within the last month, More than a month ago)* and *How much did you drink on that occasion? (1 drink, 2-5 drinks, 6-10 drinks, or more than 10 drinks)*. These questions did not allow for assessing whether there had been an episode with an intake of five, or more, drinks within the last two weeks. Instead we defined occasional heavy drinking, for men as well as women, as the consumption of more than five drinks within the last week. In this way, we have minimized the possibility of overestimating the prevalence of occasional heavy drinkers according to the original definition.

The modified CAGE test

The CAGE test is a four-item questionnaire, developed to detect established harmful drinking (9;10). The original questions in the CAGE test are: “*Have you ever felt you should cut down on your drinking?*”, “*Have people annoyed you by criticizing your drinking?*”,

“Have you ever felt bad or guilty about your drinking?” and “Have you ever had a drink first thing in the morning to steady your nerves, or get rid of a hang-over?”. These questions, however, have not had the intended effect in a Danish population, and the questionnaire has therefore been modified and expanded to include the six questions shown in Figure 2 (Becker U *et al.* Personal communication). The modifications of the original test, where “ever” has been substituted by “within the last year”, were carried out due to the very high prevalence of alcohol users in Denmark, that would otherwise lead to a high number of false positive results in the original test. The addition of questions 5 and 6 (Figure 2) to the test, concerning the number of days per week with alcohol intake, and alcohol intake outside mealtimes, aimed to further improve the specificity and sensitivity of the test in a Danish population. The modified CAGE questionnaire was then validated in a population of Danish hospital patients and proved to be a suitable screening instrument in this setting. Neither the modified CAGE questionnaire, nor alternative questionnaires, have been validated in a Greenland population.

1. Have you, within the last year felt you should cut down on your drinking? (yes; no)
2. Have people, within the last year, annoyed you by criticizing your drinking? (yes; no)
3. Have you, within the last year, felt bad or guilty about your drinking? (yes; no)
4. Have you within the last year, had a drink first thing in the morning to steady your nerves or get rid of a hangover? (yes; no)
5. Do you drink outside mealtimes on weekdays? (yes; no)
6. How many days a week do you drink alcohol? (0-7 days)

Harmful drinking/alcoholism:

Two positive answers in question 1 to 5, or one positive answer in question 1 to 5 plus alcohol drinking more than 3 days per week (question 6), defines a positive test result.

Figure 2. Questions included in the modified CAGE test.

Statistical analyses

The statistical procedures for this study included chi-square tests and logistic regression analyses. Several models were tested in the logistic regression analyses. Firstly, the associations between place of living (Denmark, large or small communities in Greenland) and the various outcome measures (abstention, alcohol intake above the sensitive drinking limits, occasional heavy drinking, and the modified CAGE test) were examined in separate analyses. Secondly, the association between total alcohol intake and a positive result in the modified CAGE questionnaire was examined in a model stratified for place of living. Accordingly, each combination of level of alcohol intake and place of living was entered simultaneously. Finally, analyses of the associations between length of stay in Denmark and the four outcome measures were performed for the study population living in Denmark. In all analyses, sex and age were included as covariates and, in the analysis of the association between the modified CAGE test and place of living, or length of stay in Denmark, we also included total alcohol intake as a covariate. A p-value of less than 0.05 was considered statistically significant. Analyses were performed using SPSS, version 11.0.

RESULTS

The study population was comprised of fewer men than women and, especially in the group of subjects living in Denmark, there was a larger proportion of women ($p < 0.001$, Table I). The average age was 43 years, with a slightly higher age in larger communities in Greenland,

compared to the groups living in Denmark and in small communities in Greenland.

Table II shows that, on average, men consumed more alcohol (mean 9.3 drinks/week) than women (mean 4.7 drinks/week). For both men and women, the highest alcohol intake was seen in the group living in Denmark

and the lowest alcohol intake in those living in small communities in Greenland. For men, the differences between the mean alcohol intake among residents in larger and smaller communities in Greenland was not statistically significant, whereas the higher alcohol intake in Denmark was significantly different from the

Table I. Characteristics of the study population living in large and small communities in Greenland and in Denmark, according to sex, occupational status and age.

		Total (N = 4,139)	Denmark (N = 2,123)	Greenland Large communities (N = 1,135)	Greenland Small communities (N = 881)
Sex	Men, n (%)	1,506 (36)	610 (29) *	494 (44) **	402 (46)
Age	Mean age, years (CI 95%)	43 (42-43)	42 (41-42)	45 (44-45)	43 (42-43)
Occupation	Traditional	112 (3.2)	6 (0.3)	38 (4.3)	68 (9.5)
	White collar	1062 (29.9)	509 (26.2)	381 (42.7)	172 (23.9)
	Semiskilled	234 (6.6)	146 (7.5)	61 (6.8)	27 (3.8)
	Unskilled	768 (21.6)	318 (16.4)	222 (24.9)	228 (31.7)
	Other	175 (4.9)	109 (5.6)	36 (4.0)	30 (4.2)
	Not working	1202 (33.8)	853 (43.9)	155 (17.4)	194 (27.0)

* P-value less than 0.05 when comparing the population living in Denmark with the population living in Greenland, Chi-square test

** P-value less than 0.05 when comparing the population living in large communities in Greenland with the populations living in small communities in Greenland, Chi-square test

Table II. Mean alcohol intake and proportion of intake above sensible limits, abstainers, occasionally heavy drinkers, and positive results on the modified CAGE test in the study population living in large and small communities in Greenland, and in Denmark.

	Total	Denmark	Greenland Large communities	Greenland Small communities
Men				
Mean alcohol intake, drinks/week (CI 95%)	9.3 (8.5-10.2)	11.7 (10.1-13.4)	8.1 (6.9-9.2)	6.7 (5.7-7.8)
Intake above sensible drinking limits, n (%)	128 (10.6)	71 (13.7) *	33 (8.1)	24 (8.3)
Abstainers, n (%)	333 (27.5)	73 (14.1) *	146 (35.9)	114 (39.6)
Occasional heavy drinkers, n (%)	359 (30.6)	114 (21.1) *	147 (40.3)	98 (36.4)
Modified CAGE test, positive results, n (%)	267 (26.2)	39 (19.7) *	144 (30.8) **	84 (23.6)
Women				
Mean alcohol intake, drinks/week (CI 95%)	4.7 (4.2-5.2)	5.9 (5.1-6.8)	3.6 (3.1-4.1)	2.3 (1.8-2.9)
Intake above sensible drinking limits, n (%)	158 (7.9)	117 (10.1) *	28 (5.5)	13 (3.8)
Abstainers, n (%)	748 (37.3)	283 (24.5) *	248 (48.9) **	217 (63.3)
Occasional heavy drinkers, n (%)	325 (16.8)	134 (10.6) *	125 (30.1)	66 (25.8)
Modified CAGE test, positive results, n (%)	204 (13.0)	56 (10.4) *	102 (16.8) **	46 (10.7)

* P-value < than 0.05 when comparing the population living in Denmark with the population living in Greenland, Chi-square test

** P-value < than 0.05 when comparing the population living in large communities in Greenland with the population living in small communities in Greenland, Chi-square test

alcohol intake of subjects living in both areas in Greenland. Among women, the differences in alcohol intake differed significantly in all three geographical areas (Table II).

Beer was the most frequent beverage type in all three areas. As shown in Figure 3, the total alcohol intake consisted of a slightly higher part of beer in the study groups from both areas in Greenland than in the study group living in Denmark. Among Greenlanders living in Denmark, wine was also a considerable part of the alcohol intake, whereas spirits were a greater part of the total alcohol intake in the population living in small communities in Greenland, compared to the those living in Denmark and large communities in Greenland (Figure 3).

14% (n = 71) of men from the study group living in Denmark, and 8% of men from the study group living in both large (n = 33) and small (n = 24) communities in Greenland had an alcohol intake exceeding the sensible drinking limits. The same tendency was seen for women, although the proportion of subjects consuming more than the sensible drinking limits was lower in all three geographical areas (Table II). A logistic regression analysis, controlling for sex and age, showed that, with the study group living in Denmark as the reference, the odds-ratio for consumption of alcohol intake exceeding the sensible drinking limits was 0.5 in both large and small communities in Greenland (Table III).

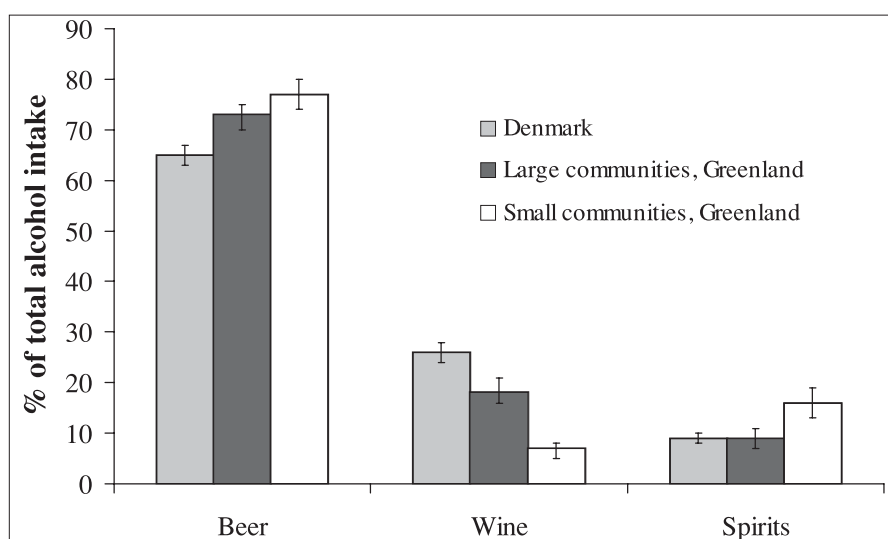


Figure 3. Proportion (95% confidence limits) of beer, wine and spirits of the total alcohol intake, according to place of living.

Table III. Odds-ratios (95% confidence limits) for intake above sensible drinking limits, abstinence, occasionally heavy drinking, and a positive result on the modified CAGE test, according to place of living.

	Denmark	Greenland Large communities	Greenland Small communities
Intake above sensitive drinking limits*	1 (ref.)	0.5 (0.4-0.7)	0.5 (0.3-0.7)
Abstainers*	1 (ref.)	3.1 (2.6-3.7)	4.7 (3.7-5.9)
Occasional heavy drinkers (binge drinkers) *	1 (ref.)	3.1 (2.6-3.8)	2.6 (2.0-3.2)
Modified CAGE test, positive results**	1 (ref.)	2.3 (1.7-3.1)	1.7 (1.2-2.4)

* Logistic regression analyses adjusted for sex and age. Analyses were made for men and women separately, but since these showed similar results, only the results from the analyses including both men and women are shown.

** Logistic regression analyses adjusted for sex, age and total alcohol. Analyses were made for men and women separately, but since these showed similar results, only the results from the analyses including both men and women are shown.

Abstinence was most prevalent among women. In the study group living in Denmark, 25% (n = 283) of the female study population were abstainers compared to 49% (n = 248) and 63% (n = 217) in the study groups living in larger and smaller communities in Greenland, respectively. For the men, the lowest proportion of abstainers was also seen in the group living in Denmark. Odds ratios were high and statistically significant among the groups living in Greenland compared to the group living in Denmark (Table III).

We found a higher proportion of binge drinkers among men (31%, n = 359) compared to women (17%, n = 325) (Table II). Since the frequency of alcohol intake was fairly similar for men and women, this difference was mainly assigned to the fact that a larger proportion of men had had more than five drinks on the latest drinking occasion (results not shown). For both men and women, a higher proportion of occasional heavy drinkers were seen in the groups living in Greenland than in the group living in Denmark (Table II). The odds-ratios for occasional heavy drinking were increased

approximately three times for the groups living in the two areas in Greenland compared to the group living in Denmark (Table III).

The proportion of positive results on the modified CAGE test was largest for men and for the population living in large communities in Greenland (Table II). A logistic regression analysis revealed that odds-ratios for a positive test result were twice as high among the groups living in both larger and smaller communities in Greenland compared to those living in Denmark, Table III.

When examining the association between total alcohol intake and the modified CAGE test, stratified by place of living, there was a tendency towards increasing odds-ratios with increasing numbers of alcoholic drinks per week in all three geographical areas (Figure 4). These results must, however, be interpreted with caution, taking the 95% confidence limits into consideration. Furthermore, at the same levels of alcohol intake from 1-14 drinks per week, higher odds-ratios for a positive result on the modified CAGE test were seen among those living in large communities

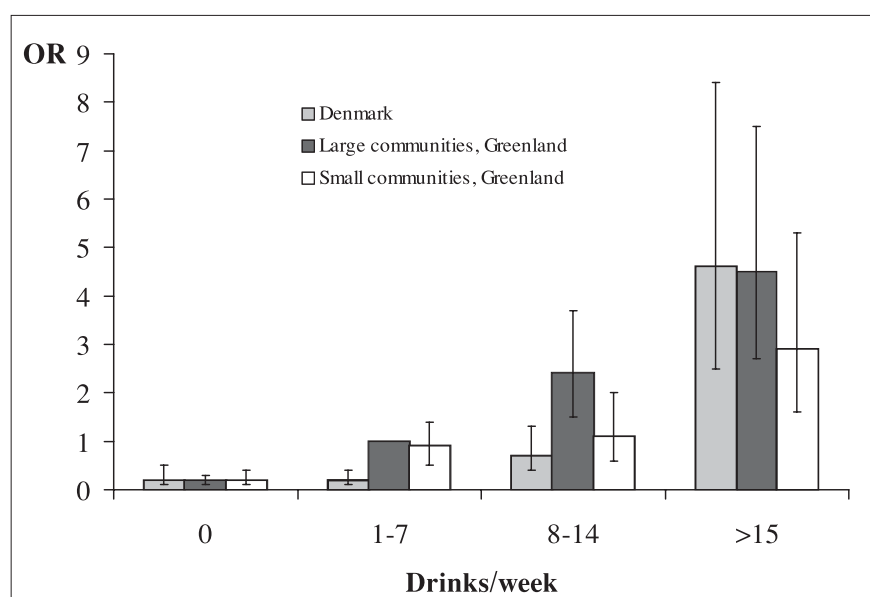


Figure 4. Odds-ratios and 95% confidence limits for a positive result in the modified CAGE test, according to total alcohol intake, in a model stratified for place of living.

in Greenland, than among the subjects living in Denmark.

When focussing on the population sample living in Denmark, a tendency towards increased mean alcohol intakes and prevalences of subjects consuming more than the sensible limits, and decreases in prevalence of abstainers, were observed with increased lengths of stay in Denmark (Table IV). The prevalence of binge drinkers decreased significantly with increasing lengths of stay, with the most remarkable decrease occurring from less than five years to 5-10 years of residence in Denmark, whereas the development in the proportion of positive results on the modified CAGE test did not follow any particular pattern (Table IV).

Logistic regression analyses revealed that only binge drinking differed significantly with length of stay in Denmark (Table V).

DISCUSSION

In this study, a larger proportion of Inuit living in Denmark consumed more alcohol than the alcohol limits recommended by the Danish National Board of Health, when compared to Inuit living in Greenland, whereas a higher proportion of Inuit living in Greenland were abstainers. In contrast to the higher alcohol intake among Inuit living in Denmark, there was a higher proportion of positive results in the modified CAGE test detecting harmful drinking, or alcoholism, in the group of Inuit living in Greenland, especially among residents in larger communities. Similarly, there was a relatively higher prevalence of occasional heavy drinkers amongst Inuit living in Greenland, compared to those living in Denmark, and the composition of beverage types also differed between subjects living

Table IV. Mean alcohol intake and proportion of intake above sensible limits, abstainers, occasionally heavy drinkers, and positive results on the modified CAGE test, according to duration of stay in Denmark*.

	Total	<5	Years in Denmark		
			5-<10	10-<15	15+
Mean alcohol intake, drinks/week (CI 95%)	7.7 (7.2-9.3)	6.3 (4.8-7.8)	6.7 (4.6-8.7)	6.8 (5.2-8.3)	8.2 (7.2-9.3)
Intake above sensible drinking limits, n (%)	182 (11.5)	11 (8.5)	12 (7.7)	17 (10.5)	142 (12.7)
Abstainers, n (%)	331 (16.9)	37 (49.8)	42 (20.9)	33 (17.7)	219 (16.0)
Occasional heavy drinkers, n (%)**	233 (13.6)	40 (50.4)	28 (16.1)	23 (13.9)	142 (11.9)
Modified CAGE test, positive results, n (%)	83 (14.2)	3 (31.1)	4 (7.7)	7 (1.9)	69 (15.8)

* Only Inuit living in Denmark are included

** P-value less than 0.05, Chi-square test

Table V. Odds-ratios (95% confidence limits) for intake above sensible drinking limits, abstention, occasionally heavy drinking, and a positive result on the modified CAGE test, according to duration of stay in Denmark*.

	<5	Years in Denmark		
		5-<10	10-<15	15+
Intake above sensitive drinking limits**	0.9 (0.5-1.8)	0.8 (0.4-1.5)	1.1 (0.6-1.9)	1 (ref.)
Abstainers**	1.3 (0.8-2.0)	1.4 (1.0-2.1)	1.0 (0.6-1.6)	1 (ref.)
Occasional heavy drinkers (binge drinkers) **	1.9 (1.2-2.9)	1.4 (0.9-2.2)	1.1 (0.7-1.8)	1 (ref.)
Modified CAGE test, positive results***	0.6 (0.1-2.5)	0.8 (0.3-2.7)	0.8 (0.3-2.1)	1 (ref.)

* Only Inuit living in Denmark are included

** Logistic regression analyses adjusted for sex and age

*** Logistic regression analyses adjusted for sex, age, and total alcohol

in Greenland and those living in Denmark. These results may indicate an effect of migration on the use of alcohol in this population of Greenland Inuit. Furthermore, the prevalence of occasional heavy drinkers decreased significantly with the length of stay in Denmark in the group of Inuit residing in Denmark. A tendency towards similar variation regarding the other alcohol variables with the length of stay was also observed, indicating an effect of time after migration on alcohol habits.

All data on alcohol intake were self-reported measures, which means that underestimation is a possibility, or even likely. Furthermore, it may, as in many other epidemiological studies, be assumed that the respondents were not representative of the entire population of Inuit. For instance, there might have been a low representation of heavy drinkers in the study population. In 1993-1994, a cross-sectional health study, similar to the above-described study, was conducted in Greenland with the aim of describing health status in the Greenland population. In this study, the average intake of alcohol was 7 drinks per week, with a slightly higher intake in the larger communities compared to smaller communities in Greenland (11). Including all of Greenland, the study from 1994 covered a larger geographical area than the present study. However, the results from these two studies indicate that from 1993-1999 there has been an achievement of a steady level, or even a slight reduction in alcohol intake to approximately 6 drinks per week on average, in the Greenland population. This tendency is in agreement with reports from Statistics Greenland based on import statistics for alcohol, showing that the yearly average import of alcohol decreased until 1993, after which it is observed to have levelled off at approximately

12-13 litres of pure alcohol per inhabitant above 14 years (12). In addition, since we are making comparisons between regions, any information bias should not affect the conclusions we make, unless differential underreporting has taken place.

Earlier studies have shown that alcohol intake varies with socio-economic status (13). In the view of pronounced socio-economic differences between the studied regions (11), this may explain our present findings. In the logistic regression analyses we chose not to adjust for socio-economic factors, such as occupation or income, because socio-economic changes could be an important part of urbanization and, by adjusting for socio-economic status, we would probably eliminate some of the effect of urbanization.

Our findings that urbanization has no, or little effect on alcohol intake contrast with other studies showing an increased alcohol intake with increasing levels of urbanization. However, in this study, it was not possible to study urbanization as a dynamic concept taking changes in living conditions into consideration. We had no data on lengths of stay in the four study areas in Greenland and, therefore, could not evaluate how the time elapsed since moving from a village to a larger town, for instance, affects the alcohol intake. Hence, our analysis was restricted to a comparison of geographical entities, which provides information on differences in alcohol intake under different living conditions.

The findings of a different alcohol intake among Inuit living in Denmark, compared to Inuit living in Greenland, are comparable with the results of other studies of migrants' use of alcohol and suggest an effect of different living conditions. In other countries, the

higher alcohol intake amongst migrants has been explained as the migrant's adaptation to a new alcohol culture, or as a coping strategy to manage the new environment (2). Data on mean intake, consumption above sensible drinking limits and abstention, may be compared to data from the Danish Health and Morbidity Survey 2000, which contains information on self-reported intake of alcohol among 20,000 randomly selected Danes (14). In that study, the mean alcohol intake was 8 drinks per week, the prevalence of subjects consuming more than the sensible drinking limits was 12%, and the prevalence of abstainers was 22%. Compared to the results from the present study, we see that the alcohol intake among Inuit living in Denmark corresponds fairly well to that of the general Danish population. Since we cannot compare all aspects of alcohol intake to Danish data, we must refrain from drawing conclusions on whether the Inuit living in Denmark have completely adapted to a Danish alcohol culture. Data on coping strategies was not available in this study, and conclusions on this aspect are also beyond the scope of this analysis. However, the finding that the time elapsed since migration to Denmark is of some importance to the alcohol habits suggests that the different alcohol intakes in the study population living in Denmark, compared the population living in Greenland, might be either an adaptation to the alcohol intake in the host country, or a coping strategy.

Our findings of a higher proportion of positive results in the modified CAGE test in Greenland, despite the lower alcohol intake, may suggest a greater impact of alcohol intake on Inuit living in Greenland than on those living in Denmark. However, the applicability of instruments used to assess dependence and harmful use, or abuse, for instance, is question-

able when comparing different cultural settings. Disorders relating to the use of alcohol, or of other drugs, are defined according to cultural norms, and the formulations used in diagnostic interviews ought to depend on these norms (15). Analysis of the modified CAGE test has shown a rather high sensitivity and specificity in a Danish population, but we have no certainty that this is found in a Greenland population. Questions 1-3 in the modified CAGE questionnaire may be answered in a positive way even if the respondents have had no, or only a few, drinks of alcohol. If cultural norms concerning alcohol intake are diverse in Greenland and in Denmark, the answers to the questions in the modified CAGE test might be answered differently, even at the same levels of alcohol intake. This might explain the significantly higher proportion of positive test results in the group of Inuit living in large communities in Greenland compared to those living in Denmark, even though they have a lower intake of alcohol.

In this study, we also wished to focus on drinking patterns, especially the occasional heavy drinking, because this was suspected to be more prevalent in Greenland than in Denmark. We chose to define occasional heavy drinking as an intake of more than five drinks within the last week, which might seem very strict, especially in populations with liberal attitudes towards alcohol. This definition is based on, but differs slightly from, an international classification which has demonstrated to be useful in population-based research. It may be used to make comparisons, and it has proven to be a good indicator of increased risk of experiencing alcohol-related problems (8). Immediate damages, such as accidents, violence and social consequences, are common consequences of this specific drinking pattern, and

is an area in need of further investigations (7). Similarly, the higher prevalence of positive test results in the modified CAGE test might be due to a higher social strain caused by occasional heavy drinking. Furthermore, earlier studies have found that a moderate and regular intake of alcohol has a positive effect on health when compared to more irregular patterns, at least for some diseases (16). This has not been investigated in a Greenlandic population, but taking into consideration the findings of an increased prevalence of occasional heavy drinkers in the population living in Greenland, this could be a relevant issue to address.

In conclusion, this study reveals the existence of diversities in what characterizes alcohol intake in a population of Greenland Inuit under different living conditions. Problems concerning alcohol use, and their possible social, or health-related consequences for Greenland Inuit, is a concern in both Greenland and Denmark. This study draws attention to the importance of addressing the issue of alcohol use with respect to the particular regional characteristics. This study highlights an area of future research, and also where to focus when addressing the populations' current alcohol use.

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Ulrik Becker
 Alcohol Unit 161
 Hvidovre Hospital
 Kettegård Allé 30
 DK - 2650 Hvidovre
 Email: becker@dadlnet.dk