

ALCOHOL HABITS IN SWEDISH WOMEN: OBSERVATIONS FROM THE POPULATION STUDY OF WOMEN IN GOTHENBURG, SWEDEN 1968–1993

C. BENGTSSON*, P. ALLEBECK¹, L. LISSNER, C. BJÖRKELUND, T. HÄLLSTRÖM² and J. A. SIGURDSSON³

Department of Primary Health Care, Göteborg University, ¹Department of Social Medicine, Göteborg University, Gothenburg, ²Department of Clinical Neuroscience and Family Medicine, Karolinska Institute, Stockholm, Sweden and ³Health Centre of Hafnarfjörður, University of Iceland, Iceland

(Received 24 February 1997; in revised form 6 April 1998; accepted 16 April 1998)

Abstract — In a prospective population study of women in Gothenburg, Sweden, three examinations were conducted with 12-year intervals between 1968–1969 and 1992–1993. There were 1462 participants aged 38–60 years in the baseline study in 1968–1969, with a participation rate of 90.1%. This paper describes longitudinal changes and secular trends with respect to women's alcohol habits. An alcohol frequency questionnaire was validated at baseline and was re-administered at all examinations. Between 1968–1969 and 1980–1981, the proportion of alcohol abstainers decreased significantly both in 38-year-old and 50-year-old women. Women reporting alcohol intake at least once per week had higher socio-economic status and higher education than other women. Serum γ -glutamyl transpepsidase concentration was higher in women with the heavier alcohol intake, while a number of potential cardiovascular risk indicators were higher in women with the lower intake.

Daily intake of wine and spirits was about as common at all three examinations, whereas moderate intake of wine and spirits was more common in 1980–1981 and 1992–1993 than in 1968–1969. There seemed to be an increase in overall consumption of alcohol, mainly due to the increase in moderate drinking, but there was no indication of a large increase in heavy consumption of alcohol.

INTRODUCTION

Whether moderate alcohol consumption has a net positive or negative impact on women's health has been the topic of much recent debate and controversy (Goddard, 1994; Klatsky, 1994; Fuchs *et al.*, 1995; Rimm *et al.*, 1996). The possible protective effects against cardiovascular disease have to be balanced against higher risk of cancer and injuries, especially at higher consumption levels. In order to formulate recommendations concerning alcohol intake, it is important to know not only the risks associated with different levels of consumption, but also the consumption patterns in the general population. Specifically, it is of great public health importance to describe changes in alcohol consumption over time (Wilsnack and Wilsnack, 1995), both in terms of secular trends

and longitudinally in individuals. The 'convergence theory' has received much attention in recent years. Neve *et al.* (1996) concluded in a recent review that there is still little evidence for a 'convergence' in drinking patterns between men and women, but that 'research should keep an eye on developments in the near future'.

Much previous research has focused on heavy alcohol consumption. This type of research has provided some evidence for increased prevalence of alcohol dependence or abuse among women in Sweden (Dahlgren and Myrhed, 1977; Dahlgren and Willander, 1989). However, such studies give no indication of whether the numbers of moderate drinkers are increasing, and can provide no information on the health or demographic profiles associated with moderate alcohol consumption in women.

Some other population-based data are available on recent trends in women's drinking habits. For example, Wilsnack and Wilsnack (1995) reported that the proportion of women abstaining from

*Author to whom correspondence should be addressed at: Department of Primary Health Care, Vasa Hospital, SE-411 33 Göteborg, Sweden.

Table 1. Age, number of participants, and participation rates in the population study of women in Gothenburg in 1968–1969, and at follow-up

Year of birth	1968–1969		1980–1981			1992–1993		
	Age	<i>n</i>	Age	<i>n</i>	%	Age	<i>n</i>	%
1954	—	—	26	85	66 ^a	38	61	72
1942	—	—	38	122	85 ^a	50	93	76
1930	38	372	50	308	83	62	249	67
1922	46	431	58	332	77	70	270	63
1918	50	398	62	325	82	74	213	54
1914	54	180	66	140	78	78	79	44
1908	60	81	72	49	60	84	19	23
Total	38–60	1462	26–72	1361	79 ^b	38–84	984	57 ^b

The participation rate (%) refers to those who participated in the initial study of 1968–1969. Women born during 1908–1930 were sampled in 1968, whereas those born during 1942–1954 were sampled in 1980–1981.

^a Of those sampled in 1980–1981, ^b in women born 1908–1930.

alcohol did not change between 1980 and 1991 in the United States, while the proportion of those who consumed alcohol at least once a month decreased. In a Nordic comparative survey (Järvinen and Olafsdottir, 1989), wine was found to be the most frequent alcoholic beverage consumed by women, and younger women reported the heaviest alcohol consumption. These latter authors concluded that there was a 'new female drinking pattern' in Sweden and Norway, with more frequent drinking (once or twice per month) and a somewhat larger quantity each time (two or three glasses of wine or two or three shots of spirits). Because this study was based on a cross-sectional sample, it is of interest to re-examine this in a study with repeated examinations.

The present study addresses some of these issues in a representative population sample of Swedish women. In this multidisciplinary project, information has been collected on drinking habits of women in Gothenburg since 1968. The participants have now been followed for 24 years. The main purpose of this paper is to describe changes in alcohol consumption patterns of women, both longitudinally (as the women became older) and as secular trends (changes over time for a given age-group). As a consequence of the intense discussion on the relationship between moderate alcohol consumption and different health indicators, this paper also describes selected socio-economic, behavioural, laboratory, and anthropometric characteristics of women reporting

different levels of alcohol consumption.

STUDY POPULATION AND METHODS

Gothenburg, the second largest city in Sweden with about 430 000 inhabitants in 1968 and about the same number in 1992, is situated on the south-western coast of Sweden. The initial study of the population sample described in this paper was carried out in 1968–1969 (Bengtsson *et al.*, 1973a), when altogether 1462 women in five age strata between 38 and 60 years participated (Table 1). The participation rate was 90.1%. Non-participants were interviewed by telephone or letter, and information was obtained in this way from 107 non-participating women (69% of the non-participants). The participants were re-examined after 6 years, in 1974–1975 (Bengtsson *et al.*, 1978), after 12 years, in 1980–1981 (Bengtsson *et al.*, 1989), and in 1992–1993, after 24 years (Bengtsson *et al.*, 1997). Number of participants and participation rates in the latter two studies are also shown in Table 1. The participation rate in the 24-year follow-up study was 70.2% among those who had participated in 1968–1969 and who were alive in 1992–1993.

In 1980–1981, two additional groups aged 26 years (85 participants) and 38 years (122 participants) took part (Table 1). These age groups were again invited into the study in 1992–1993. Furthermore, in 1980–1981, those women born in 1930 (50 years of age in 1980–1981) who had moved to the study area since the initial examina-

tion and who fulfilled the inclusion criteria with respect to date of birth, were invited (59 participants in this group in 1980–1981) in order to obtain a representative cross-sectional sample, and for the same reason, women born in 1922, who had moved to the study area since the initial examination in 1968–1969 and fulfilled the inclusion criteria with respect to date of birth, were invited in 1992–1993, and 32 women in this group participated (not included in Table 1). The presentation of results is confined to the studies in 1968–1969, 1980–1981, and 1992–1993, carried out at 12-year intervals.

Information about alcohol habits was obtained in a standardized structured interview by a physician. All participants were asked to report the frequency of intake of beer, wine, and spirits respectively. They were asked for each of these three types of beverages, whether they had ever used them and, if they had, whether they had used them during the last year, at least once per month, at least once per week, several times per week or every day. Beer was studied separately from wine and spirits, because beer with a low alcohol content is commonly used in Sweden.

Information about childhood residence, socio-economic status and education was obtained by means of a questionnaire completed in the initial study in 1968–1969. Socio-economic status was defined according to a five-point scale (Carlsson, 1956; Bengtsson *et al.*, 1973b). High socio-economic status as defined in the present paper refers to large-scale employers and officials of high or intermediate rank, intermediate socio-economic status to small-scale employers, officials of lower rank, and foremen, while low socio-economic status refers to skilled and unskilled workers. Women with no professional work outside the home were classified as a separate group. Higher education was defined as education beyond elementary school (elementary schooling is usually for 6 or 7 years). Information about marital status used for the statistical analyses in this paper was obtained from the revenue office of Gothenburg in 1968 and 1980.

Body weight was measured to the nearest 0.1 kg by a balance scale. The women wore only briefs when being weighed. Body height without shoes was measured to the nearest 0.5 cm. Body mass index (BMI) was calculated as weight/height^2 (kg/m^2). Waist circumference was measured to the

nearest 1 mm at the level midway between the lower rib margin and the iliac crest using a steel tape measure. Hip circumference was measured with the same steel tape measure to the nearest 1 mm at the widest point between the iliac crest and buttock. The circumferences were measured in a standing position. The waist to hip circumference ratio (WHR) was calculated as waist circumference divided by hip circumference. Blood samples were drawn in the fasting state. Chemical analyses were done at the Department of Clinical Chemistry at the Sahlgrenska University Hospital in Gothenburg using standard routine clinical laboratory procedures.

Statistical methods

The Spearman correlation coefficient was calculated in order to examine the relative validity of the questionnaire used for estimation of alcohol intake. Analysis of variance was used to test the hypothesis of no difference in age-standardized mean values between two groups. An extension of the χ^2 -test, the Mantel–Haenszel procedure with one degree of freedom (Mantel, 1963), by means of which age strata were included in the analysis, was used for testing the hypothesis of no differences between frequencies. The odds ratio and the confidence interval (CI) of odds ratio were also calculated according to the Mantel–Haenszel procedure. Differences were considered statistically significant for P -values <0.05 .

RESULTS

Validity of the questions about alcohol intake

The relative validity of the questions about alcohol was assessed by comparing the data recorded in 1968–1969 with alcohol intake as reported in a 24-h dietary recall interview (Arvidsson Lenner *et al.*, 1977) in 1968–1969. The Spearman correlation coefficient between the information about total alcohol intake according to the two methods was 0.44. This indicated that these questions successfully ranked the subjects.

Secular trends for different beverages based on observations in 1968–1969, 1980–1981, and 1992–1993

Information about use of different alcoholic beverages as reported with 12-year intervals for

Table 2. Secular trends, expressed as frequency (%) of consuming beer, wine, and spirits respectively in women aged 38 and 50 years — a comparison between the studies in 1968–1969, 1980–1981, and 1992–1993

	Aged 38 years			Aged 50 years		
	1968–1969	1980–1981	1992–1993	1968–1969	1980–1981	1992–1993
Beer						
Every day	8.3	5.7	1.4*	12.1	2.3***	5.1*
At least once per week	53.0	34.4***	37.7*	46.6	24.2***	35.7
Sometimes	73.1	77.9	82.6	64.5	69.0	71.4
Never	26.9	22.1	17.4	35.5	31.0	28.6
Wine						
Every day	0.5	0.0	0.0	0.3	0.3	1.0
At least once per week	16.4	32.8***	31.9**	21.2	23.1	41.8***
Sometimes	54.2	90.2***	91.3***	52.3	83.7***	88.8***
Never	45.8	9.8***	8.7***	47.7	16.3***	11.2***
Spirits						
Every day	0.5	0.0	0.0	0.0	0.0	0.0
At least once per week	3.2	9.8**	2.9	6.3	11.3*	9.2
Sometimes	25.4	81.1***	59.4***	28.8	76.3***	76.7***
Never	81.1	18.9***	40.6***	71.2	23.7***	23.5***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, statistically significant difference, compared with women of the same age in 1968–1969.

38-year-old and 50-year-old women is given in Table 2. The presentation of results with respect to secular trends is confined to these two ages, as these two age groups were examined on all three occasions. Intake of beer at least once per week was reported less often in 1980–1981 and 1992–1993 than in 1968–1969, whereas weekly intakes of wine and spirits were reported to be more common in the latter two examinations than in 1968–1969. As far as wine intake was concerned, the consumption in 38-year-old women was already increased at the time of the examination in 1980–1981, while in 50-year-old women the reported consumption did not increase until 1992–1993. Intake of spirits in 38-year-old women seemed to be lower in 1992–1993 than in 1980–1981.

In Table 3, the two cohorts of women born in 1930 and 1918 were followed throughout the study period. This meant that the same individuals were compared at three different examinations. When following the same groups of women during the years, it is obvious that they increased their alcohol intake of wine and spirits, mainly during the first 12-year period studied. This indicates that there was not only a secular trend effect, but also that the consumption increased within the different age cohorts. The small differences in percentages given in Tables 2 and 3 reflect the fact that only

participants at all three examinations were included in the longitudinal analysis.

Non-consumers

Table 2 also shows percentages of women who stated that they never consumed beer, wine or spirits. There were no obvious differences between women aged 38 and 50 years, but there were clear-cut secular trends during the first half of the follow-up period. The number of non-consumers decreased considerably for wine as well as for spirits. A similar observation was made when women of the same age were followed-up longitudinally (Table 3). If including beer, the non-consumers of alcohol, i.e. the abstainers, in 38-year-old and 50-year-old women respectively were in 1968–1969 20.4 and 26.4%, in 1980–1981 4.9 and 9.0%, and in 1992–1993 4.3 and 4.1%.

Characteristics of women in relation to alcohol consumption

Table 4 shows some characteristics of the women in relation to reported intake of alcohol in 1980–1981. There were no differences when comparing women of different marital status, except for a lower consumption of beer in divorced women compared with other women. Women drinking beer at least once a week had

Table 3. Frequency (%) of consuming beer, wine, and spirits respectively in women born in 1930 and 1918 as studied longitudinally in the same women — a comparison between the observations made in the studies in 1968–1969, 1980–1981, and 1992–1993

	Women born in 1930 (n = 239)			Women born in 1918 (n = 207)		
	1968–1969 (38 years)	1980–1981 (50 years)	1992–1993 (62 years)	1968–1969 (50 years)	1980–1981 (62 years)	1992–1993 (74 years)
Beer						
Every day	7.5	2.1**	6.3	9.7	5.3	5.4
At least once per week	53.6	27.2***	38.5***	43.0	33.3*	32.2*
Sometimes	74.1	73.3	69.9	63.8	75.8	65.9
Never	25.9	26.7	30.1	36.2	24.2**	34.1
Wine						
Every day	0.0	0.4	0.0	0.0	0.0	0.0
At least once per week	16.7	22.6	28.5**	19.9	16.4	14.6
Sometimes	57.7	86.2***	77.8***	53.9	84.1***	72.7***
Never	42.3	13.8***	22.2***	46.1	15.9***	27.3***
Spirits						
Every day	0.0	0.0	0.4	0.0	0.0	1.0
At least once per week	2.9	9.2**	7.9*	2.9	7.3*	7.4*
Sometimes	26.1	79.1***	59.0***	26.7	76.8***	49.8***
Never	73.9	20.9***	41.0***	73.3	23.2***	50.2***

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, statistically significant difference, compared with the observations made in 1968–1969.

more often grown up in a big city; this was not observed for weekly intake of wine or spirits. Women with education beyond elementary school and with a higher socio-economic status drank wine and spirits more often than those with elementary school education only or those with a low

socio-economic status. A similar observation was made for intake of beer as far as socio-economic status of husband and education of participant were concerned. Smoking was more common in women with intake of wine or spirits at least once per week than in other women (Table 4).

Table 4. Odds ratios and 95% confidence intervals (CI) for socio-demographic characteristics and smoking habits in women aged 50–72 years in 1980–1981 as consumers of wine, spirits or both at least once per week compared with other women and as consumers of beer at least once per week compared with other women

Socio-demographic characteristics	Intake of wine or spirits at least once per week		Intake of beer at least once per week	
	Odds ratio	95% CI	Odds ratio	95% CI
Grown up in a big city	1.05	0.79–1.40	1.40*	1.08–1.81
High socio-economic status of participant	1.58*	1.08–2.29	1.22	0.88–1.70
High socio-economic status of husband	2.96***	2.09–4.19	1.66***	1.24–2.23
Higher education	2.46***	1.85–3.28	1.82***	1.39–2.38
Never married	0.99	0.58–1.68	0.71	0.43–1.17
Divorced	0.71	0.40–1.27	0.44**	0.25–0.78
Widowed	1.03	0.50–2.14	0.64	0.32–1.29
Smoker	1.98***	1.48–2.64	0.95	0.73–1.24

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$, compared with women not drinking wine or spirits at least once per week, and compared with women not drinking beer at least once per week, respectively.

The results with respect to education and socio-economic status were also analysed in relation to alcohol habits in 1968–1969. The over-representation of alcohol consumers among women who had had higher education and belonged to a high socio-economic status was even more marked at that time. Thus odds ratios for drinking wine or spirits at least once per week for those with higher education were 3.59, compared with other women (95% CI 2.78–4.62, $P < 0.001$). For those with high socio-economic status according to own occupation, the odds ratio was 2.59 (95% CI 1.81–3.70, $P < 0.001$), and for those with high socio-economic status according to husband's occupation the odds ratio was 3.93 (95% CI 2.82–5.47, $P < 0.001$). The corresponding figures for drinking beer at least once per week in 1968–1969 were with respect to education 1.62 (1.25–2.11, $P < 0.001$), with respect to own socio-economic status 1.86 (1.44–2.39, $P < 0.001$), and with respect to husband's socio-economic status 1.45 (1.08–1.94, $P < 0.05$).

Selected laboratory variables in relation to intake of alcohol

Table 5 shows age-standardized comparisons of a number of laboratory variables, anthropometric data, blood pressure, and heart rate between

women drinking wine or spirits at least once a week and other participants in 1980–1981. There were differences of statistical significance concerning almost all the variables studied where statistically significant differences were observed. The serum concentration of γ -glutamyl transpeptidase (GGT) was higher in women with a heavy intake of alcohol compared with those with lower or no intake, whereas higher levels were observed in the group with the lower intake of alcohol for all the other variables.

DISCUSSION

This longitudinal population-based study of women in Gothenburg has been ongoing since 1968. Due to the method of selection (based on date of birth), high participation rates in the initial as well as in the follow-up studies, and non-participation analyses, the participants are known to be representative of women in Gothenburg for the ages studied.

As a whole, the proportion of women consuming alcohol every day was about the same during the total study period. The proportion of women drinking alcohol every week increased for wine and spirits during the same period, but decreased for beer. There was a decrease in the proportion of

Table 5. Comparison between women drinking wine, spirits or both at least once per week with the rest of the sample concerning a number of health indicators

Health indicator	Wine or spirits every week ($n = 300$)		Wine or spirits not every week ($n = 1026$)		Statistical significance
	Mean	SEM	Mean	SEM	
B-glucose (mmol/l)	4.14	0.04	4.35	0.07	$P < 0.01$
S-cholesterol (mmol/l)	6.75	0.08	6.99	0.04	$P < 0.01$
S-triglycerides (mmol/l)	1.17	0.04	1.39	0.02	$P < 0.001$
S-urate ($\mu\text{mol/l}$)	266	4	268	2	n.s.
S-ASAT (mkat/l)	0.39	0.008	0.37	0.004	n.s.
S-ALAT (mkat/l)	0.36	0.014	0.35	0.007	n.s.
S- γ GT (mU/l)	0.55	0.031	0.42	0.017	$P < 0.001$
BMI (kg/m^2)	23.7	0.24	25.2	0.13	$P < 0.001$
WHR (cm/cm)	0.80	0.004	0.81	0.002	$P < 0.01$
Systolic BP (mmHg)	138.3	1.4	143.5	0.7	$P < 0.001$
Diastolic BP (mmHg)	85.3	0.6	86.0	0.3	n.s.
Pulse rate (beats/min)	66.6	0.7	68.0	0.4	$P < 0.001$

Results are age-standardized from the study in 1980–1981. S-ASAT, serum aspartate aminotransferase; S-ALAT, serum alanine aminotransferase; S- γ GT, serum γ -glutamyl transpeptidase; BMI, body mass index; WHR, waist to hip circumference ratio; B, blood; BP, blood pressure; S, serum; SEM, standard error of the mean; n.s., no statistical significance. There were 4–41 observations missing for the different variables studied.

women never drinking spirits or wine. A common reason given for this change is the influence from the continental European 'wine belt' through immigration and increased travelling. The strong temperance movements in Sweden have also lost their influence during the past decades (Nyberg and Allebeck, 1995). The results are in agreement with reports on drinking habits from Denmark (Sælan *et al.*, 1992) and other European Community countries (Hupkens *et al.*, 1993). Our study also shows that significant secular trends have occurred with respect to the type of alcohol consumed by Swedish women. This is also consistent with anecdotal reports and what is generally stated in public debate. The general trend towards increased consumption of wine and liquor is consistent with the idea that the alcohol intake of men and women may be converging (Neve *et al.*, 1996).

One limitation with respect to the information about alcohol habits of the participants in the study may be the fact that the results are based on information about frequency and not volume. However, there is support for an association between frequency and volume in the observations of a correlation between the information obtained from the interview about frequency of alcohol intake and the information about volume from a dietary interview in our study as well as in a Danish study using a similar questionnaire (Grønbæk and Heitmann, 1996). This indicates that the relative validity of the questionnaire is satisfactory. Another indication of validity is the observation that the GGT serum concentration, which is considered to be related to alcohol intake, was increased in women with heavier alcohol intake, whereas the other variables shown in Table 5 were higher in those with lower alcohol intake. Finally, the good personal contact between investigators and participants over the 24-year period may favour the quality of data collected.

We have shown that women with different drinking habits have distinctly different socio-demographic profiles and different smoking practices. Intake of beer at least once per week was more common in women who grew up in urban areas, than in women who grew up in rural areas. High socio-economic status of husband and higher education of the women were the strongest predictors of a consumption of beer, wine and spirits at least weekly. The association between

higher education and alcohol intake is in agreement with previous results from different European countries (Hupkens *et al.*, 1993).

BMI and WHR were lower in women drinking wine or spirits every week compared with other women, an observation which is in agreement with previous results (Duncan *et al.*, 1995). We also compared a number of other potential cardiovascular risk factors, almost all of them being more impaired in those with lower alcohol intake compared with those with heavier intake. This was a very clear observation and is consistent with observations in women as well as in men showing a higher mortality, in particular from coronary heart disease, in subjects with no or low alcohol intake compared with those with moderate intake (Fuchs *et al.*, 1995; Rimm *et al.*, 1996).

Acknowledgements — The study was supported by grants from the Swedish Medical Research Council (27X-4578), the Swedish Council for Planning and Coordination of Research, the Swedish Council for Social Research, the Foundation of King Gustaf V and Queen Victoria, the Faculty of Medicine of Göteborg University, and the City of Gothenburg.

REFERENCES

- Arvidsson Lenner, R., Bengtsson, C., Carlgren, G., Isaksson, B., Lundgren, B. K., Petersson, I. and Tibblin, E. (1977) The study of women in Gothenburg 1968–69. Intake of energy and nutrients in five age groups. *Acta Medica Scandinavica* **202**, 183–188.
- Bengtsson, C., Blohmé, G., Hallberg, L., Hällström, T., Isaksson, B., Korsan-Bengtson, K., Rybo, G., Tibblin, E., Tibblin, G. and Westerberg, H. (1973a) The study of women in Gothenburg 1968–69 — a population study. General design, purpose and sampling results. *Acta Medica Scandinavica* **193**, 311–318.
- Bengtsson, C., Hällström, T. and Tibblin, G. (1973b) Social factors, stress experience, and personality traits in women with ischaemic heart disease, compared to a population sample of women. *Acta Medica Scandinavica* (Suppl. 549), 82–92.
- Bengtsson, C., Hallberg, L., Hällström, T., Hultborn, A., Isaksson, B., Lennartsson, J., Lindquist, O., Lindstedt, S., Noppa, H., Redvall, L. and Samuelsson, S. (1978) The population study of women in Göteborg 1974–75 — the second phase of a longitudinal study. General design, purpose and sampling results. *Scandinavian Journal of Social Medicine* **6**, 49–54.
- Bengtsson, C., Gredmark, T., Hallberg, L., Hällström, T., Isaksson, B., Lapidus, L., Lindquist, O., Lindstedt, S., Lurie, M., Nyström, E., Rybo, G., Samuelsson, S., Rafnsson, V. and Sigurdsson, J. A.

- (1989) The population study of women in Gothenburg 1980–81 — the third phase of a longitudinal study. Comparison between participants and non-participants. *Scandinavian Journal of Social Medicine* **17**, 141–145.
- Bengtsson, C., Ahlqwist, M., Andersson, K., Björkelund, C., Lissner, L. and Söderström, M. (1997) The prospective population study of women in Gothenburg, Sweden, 1968–69 to 1992–93. A 24-year follow-up with special reference to participation, representativeness, and mortality. *Scandinavian Journal of Primary Health Care* **15**, 214–219.
- Carlsson, G. (1956) *Socialgruppering*. Mimeograph, Lund University.
- Dahlgren, L. and Myrhed, M. (1977) Female alcoholics. I. Ways of admission of the alcoholic patient. A study with special reference to the alcoholic female. *Acta Psychiatrica Scandinavica* **56**, 39–49.
- Dahlgren, L. and Willander, A. (1989) Are special treatment facilities for female alcoholics needed? A controlled 2-year follow-up study from a specialized female unit (EWA) versus a mixed male/female treatment facility. *Alcoholism: Clinical and Experimental Research* **13**, 499–504.
- Duncan, B. B., Chambless, L. E., Schmidt, M. I., Folsom, A. R., Szklo, M., Crouse III, J. R. and Carpenter, M. A. (1995) Association of the waist-to-hip ratio is different with wine than with beer or hard liquor consumption. *American Journal of Epidemiology* **142**, 1034–1308.
- Fuchs, C. S., Stampfer, M. J., Colditz, G. A., Giovannucci, E. L., Manson, J. E., Kawachi, I., Hunter, D. J., Hankinson, S. E., Hennekens, C. H., Rosner, B., Speizer, F. E. and Willet, W. C. (1995) Alcohol consumption and mortality among women. *New England Journal of Medicine* **332**, 1245–1250.
- Goddard, E. (1994) Drinking and health — an official survey of new information from British households. *Journal of Epidemiology and Community Health* **48**, 106.
- Grønbaek, M. and Heitmann, B. L. (1996) Validity of self-reported intakes of wine, beer and spirits in population studies. *European Journal of Clinical Nutrition* **50**, 487–490.
- Hupkens, C. L. H., Knob, R. A. and Drop, M. J. (1993) Alcohol consumption in the European community: uniformity and diversity in drinking patterns. *Addiction* **88**, 1391–1404.
- Järvinen, M. and Olafsdottir, H. (1989) Drinking patterns among women in the Nordic countries. In *Women, Alcohol and Drugs in the Nordic Countries*, Haavio-Mannila, E. ed., pp. 47–75. NAD, Helsinki.
- Klatsky, A. L. (1994) Epidemiology of coronary heart disease — influence of alcohol. *Alcoholism: Clinical and Experimental Research* **18**, 88–96.
- Mantel, N. (1963) Chi-square tests with one degree of freedom; extensions of the Mantel–Haenszel procedure. *American Statistical Association Journal* **58**, 690–700.
- Neve, R. J. M., Drop, M. J., Lemmens, P. H. and Swinkels, H. (1996) Gender differences in drinking behaviour in the Netherlands: convergence or stability? *Addiction* **91**, 357–373.
- Nyberg, K. and Allebeck, P. (1995) Alcohol in Swedish history. In *International Handbook on Alcohol and Culture*, Heath, D. ed., pp. 280–288. Greenwood Press, Westport, CT.
- Rimm, E. B., Klatsky, A., Grobbee, D. and Stampfer, M. J. (1996) Review of moderate alcohol consumption and reduced risk of coronary heart disease: is the effect due to beer, wine, or spirits? *British Medical Journal* **312**, 731–736.
- Sælan, H., Møller, L. and Køster, A. (1992) Alcohol consumption in a Danish cohort during 11 years. *Scandinavian Journal of Social Medicine* **22**, 87–93.
- Wilsnack, S. and Wilsnack, R. W. (1995) Drinking and problem drinking in US women. Patterns and recent trends. In *Recent Developments in Alcoholism*, Vol. 12, *Women and Alcoholism*, Galanter, M. ed, pp. 29–60. Plenum Press, New York.