

Alcohol consumption patterns, diet and body weight in 10 European countries

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Background/objectives: Europe has the highest level of alcohol consumption in the world. As drinking patterns are important determinants of the beneficial and harmful effects of alcohol consumption, we investigated alcohol consumption in relation to nutrient intake, place of consumption, education and body weight in a sample of adults from 10 European countries.

Methods: A 24-h dietary recall interview was conducted on 13 025 men and 23 009 women, aged 35–74 years, from 27 centres participating in the European Prospective Investigation into Cancer and Nutrition (EPIC) study. Means and standard errors of alcohol consumption, adjusted for age, were calculated, stratified by gender and centre.

Results: In many centres, higher level drinkers (males consuming >24 g of ethanol/day, equivalent to >2 standard drinks and females consuming >12 g of ethanol/day equivalent to >1 standard drink) obtained more energy from fat and protein and less

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from sugar than did abstainers. The proportion of energy from starch tended to be higher for male and lower for female higher level drinkers than for abstainers. Female higher level drinkers had a lower body mass index than did abstainers, whereas male higher level drinkers generally weighed more. Male higher level drinkers were less educated than abstainers in Mediterranean countries, but were more educated elsewhere. Female higher level drinkers were usually more educated than were abstainers. Outside the home, consumption (both genders) tended to be at friends' homes, particularly among men in Northern and Central Europe, and in bars in Spain.

Conclusions: This study reveals clear geographical differences in drinking habits across Europe, and shows that the characteristics of different alcohol consumption categories also vary.

Introduction

Europe has the highest level of alcohol consumption in the world (Rehm *et al.*, 2003a). Studies on drinking patterns across Europe, in terms of place of consumption, types of beverage consumed, and time and context of drinking are important, as there is evidence that drinking patterns, in addition to the quantity and type of alcoholic beverage consumed, influence the beneficial and harmful effects of alcohol consumption. Alcohol consumption can be studied from various viewpoints. From a public health perspective, alcohol consumption can increase the risk of health problems (traffic and other accidents, chronic illnesses, etc.) as well as social problems. Against this burden, there is substantial evidence that light-to-moderate alcohol consumption reduces the risk of total mortality by protecting against cardiovascular disease (Corrao *et al.*, 2000; Rehm *et al.*, 2003b). The lower risk of heart disease in moderate drinkers compared with abstainers and heavy drinkers could be through a direct protective effect or because of confounding cultural factors and associated traits, such as more physical activity, healthier diet, better cognitive function and higher socioeconomic status (Gronbaek, 2007).

Epidemiological studies have paid particular attention to differences in diet in relation to drinking patterns. Several studies have reported that drinkers consumed more meat and fewer dairy products, fruits, cereals and sucrose than did non-drinkers (Hebert and Kabat, 1991; Colditz *et al.*, 1991; La Vecchia *et al.*, 1992). A Dutch study on people aged between 22 and 44 years (Veenstra *et al.*, 1993) found a strong positive relationship between alcohol consumption and energy intake, but differences in intakes of selected nutrients between abstainers, moderate drinkers and heavy drinkers were limited to slightly higher nutrient intakes in drinkers. The MONICA study found a direct association between alcohol and polyunsaturated fat (PUFA) consumption (Nuttens *et al.*, 1992). A report on control subjects in a hospital-based case-control study conducted in Northern Italy found that alcohol consumption, education and smoking were important correlates of dietary patterns (D'Avanzo *et al.*, 1997). The associations revealed by these studies were generally less clear in women than in men,

possibly because women tend not to indulge in extreme alcohol consumption.

Alcohol is an energy-dense macronutrient, regular consumption of which may increase body mass index (BMI). Several studies have, however, shown an inverse association between alcohol intake and BMI in women (Gruchow *et al.*, 1985; Colditz *et al.*, 1991; Slattery *et al.*, 1992), whereas a similar relation is observed less consistently in men (Jones *et al.*, 1982; Slattery *et al.*, 1992).

The relation between alcohol consumption and education level has been investigated in several studies, which reported that people (both genders) with fewer qualifications are more prone to heavy drinking (Knibbe *et al.*, 1985; Droomers *et al.*, 1999; van Oers *et al.*, 1999).

In a previous analysis on a selected sample of adults from the European Prospective Investigation into Cancer and Nutrition (EPIC) study, we described differences in alcohol consumption across EPIC centres in terms of ethanol intake, types of beverage (wine, beer and spirits), context of consumption (mealtimes versus outside mealtimes) and distribution of consumption during the week (Sieri *et al.*, 2002). In this study, we investigated the relation of alcohol consumption to nutrient intake and place of consumption, using the same detailed and standardized data obtained through a single computerized 24-hour dietary recall (24-HDR) interview administered to a large EPIC subsample.

Materials and methods

Setting and subjects

EPIC is a prospective study conducted on half a million adult volunteers enrolled between 1992 and 2000 in 23 centres in 10 Western European countries: Denmark (Copenhagen, Aarhus), France (south coast, south, north-west, north-east), Germany (Heidelberg, Potsdam), Greece, Italy (Varese, Turin, Florence, Naples, Ragusa), the Netherlands (Bilthoven, Utrecht), Norway (south and east, north and west), Spain (Granada, Murcia, Navarra, San Sebastian, Asturias), Sweden (Malmö, Umeå) and the United Kingdom. The initial 23 EPIC centres were redefined into 27 centres relevant to analyses of dietary consumption and patterns (Slimani *et al.*,

2002). In the United Kingdom, a 'health-conscious' group involving mainly lacto-ovo vegetarians and vegans, essentially from Oxford, was considered separately from a 'general population' group recruited by general practitioners in Cambridge and Oxford.

The design and methodology of EPIC are described in detail elsewhere (Riboli and Kaaks, 1997; Riboli *et al.*, 2002). Briefly, the study recruited volunteers who signed an informed consent form. Most centres recruited both genders, except Norway, France, Utrecht and Naples, which had all-women cohorts. Participants completed dietary and lifestyle questionnaires, and their anthropometric measurements were recorded by trained health professionals (self-reported in France, Norway and Oxford). The source populations varied: the general population of a town or province, cancer-screening programmes or blood donor associations.

For calibration purposes, a standardized 24-HDR interview was administered to a random sample (36 994 persons) of the entire EPIC cohort, stratified by age, gender and centre, and weighted for expected cancer cases in each stratum. The dietary interview was undertaken between 1995 and 2000 to improve comparability of dietary data across centres and to partially correct for dietary measurement error arising from centre-specific bias, and random and systematic within-person errors in diet-disease associations (Ferrari *et al.*, 2004). Invitations to attend the interview were organized so as to ensure, as far as possible, a uniform distribution of interviews by day of the week and season of the year. Persons under 35 and over 74 years were excluded from the sample, leaving a total of 36 034 persons for analysis in this study.

Ascertainment of diet and other lifestyle factors

The 24-HDR was administered in a face-to-face interview, except in Norway where it was conducted by telephone (Brustad *et al.*, 2003). Interviewers elicited 24-h dietary recall by conducting interviews in a uniform manner under the real-time guidance of the EPIC-SOFT software, which was developed for the purpose by the International Agency for Research on Cancer in collaboration with all EPIC centres (Slimani *et al.*, 2000). The interview obtained, among other data, detailed information on the distribution of alcohol consumption following the chronological order of the day, structured according to 11 common food consumption occasions (FCOs) described below. Place of consumption was also elicited. Alcoholic beverages were quantified during the interview using household measures of fixed size (glasses) or standard units (bottles of wine, cans of beer, etc). All quantities were automatically transformed by the programme into grams of beverage consumed. The EPIC Nutrient Database (Slimani *et al.*, 2007) was used to convert quantities of beverages into alcohol (ethanol). The alcohol consumption of individuals on recall day was calculated as the sum of the alcohol content of all beverages consumed.

In the EPIC study, country-specific (or in some cases centre-specific) dietary questionnaires designed to capture

local long-term individual dietary habits were used, in contrast to standardized single 24-HDR interviews obtained from an EPIC subsample and used to estimate population means for calibration purposes. The EPIC dietary questionnaires are described in detail elsewhere (Riboli *et al.*, 2002). Briefly, eight countries used self-administered dietary questionnaires, whereas in Greece, Spain and Southern Italy (Naples and Ragusa), the questionnaires were administered by interviewers. In most countries, the questionnaires were extensive quantitative instruments (with up to 260 food items). In Denmark, Norway, Umeå and Naples, semi-quantitative food frequency questionnaires were used (Riboli *et al.*, 2002).

Data on other lifestyle factors, including education, total physical activity and smoking history, considered in this analysis were collected at baseline through standardized questionnaires and clinical examinations, and have been described for the calibration sample elsewhere (Riboli *et al.*, 2002; Haftenberger *et al.*, 2002a, b; Slimani *et al.*, 2002). Data on age, as well as body weight and height were self-reported by participants during the 24-HDR interview. The mean time interval between these baseline questionnaire measures and the 24-HDR interview varied by country, from 1 day to 3 years later (Slimani *et al.*, 2002).

Classification of alcohol consumption

The classification of the EPIC-SOFT food subgroups used in the 24-HDR is described in detail elsewhere (Slimani *et al.*, 2002). Alcoholic beverages were classified into eight groups: wines, fortified wines, beer (including cider), spirits, aniseed drinks, liqueurs, cocktails/punches and all other alcoholic beverages. In this study, we present results for wine, beer/cider, spirits and total alcohol intake only, as other alcohol sources were negligible except in one or two centres.

Alcohol consumption was collected in a standardized way according to the following common 11 FCOs included in the EPIC-SOFT programme: before breakfast, breakfast, in the morning, before lunch, lunch, after lunch, in the afternoon, before dinner, dinner, after dinner, in the evening/at night. In this study, we present results for the main FCOs, namely, breakfast, lunch and dinner, and merge all the other FCOs into the 'other' category.

Places where alcohol was potentially consumed were home, work, fast-food restaurant, bar, cafeteria, restaurant, friends' home, school, street, car/boat/plane and other. We decided to fuse the categories in the following manner: work, school and cafeteria into 'work'; and other, street, car/boat/plane into 'other'. For analysis of beverage type according to place of consumption, we fused fast-food restaurant with restaurant and excluded the category 'other', therefore, the categories considered in this analysis are bar, work, restaurant, friends' home and home.

Gender-specific categories of alcohol consumption were created using information from the dietary questionnaire, as it is impossible to distinguish habitual drinkers from

non-drinkers using a single 24-HDR. Abstainers were defined as those who reported no alcohol consumption in the questionnaire. For men, we derived four categories of drinkers: (1) 'non-drinkers/abstainers'; (2) '1–12 g/day of alcohol corresponding to ≤ 1 drink'; (3) '12.1–24 g/day corresponding to 1 to 2 drinks'; and (4) '>24 g/day corresponding to more than 2 drinks'. In women, three categories were considered: (1) 'non-drinkers/abstainers'; (2) '1–12 g/day or ≤ 1 drink'; and (3) '>12 g/day or >1 drink'. In both genders, the highest gender-specific categories were referred to as the 'higher level drinkers' category.

Statistical methods

We calculated minimally adjusted means of total alcohol consumption by centre using generalized linear models in which covariance analysis took account of a possible confounding effect of age, and a weighting procedure took account of the uneven distribution between centres of interviews by day of the week (weekday versus weekend) and season (Table 1). For the latter, we used weightings calculated as the ratio of the expected to the observed numbers interviewed in each season and a part of the week for each centre and gender. We also calculated fully adjusted means in a further model including energy intake, height and weight available in the Appendix (Table A1).

To assess any gender-specific effect on alcohol consumption, a model that included men and women was used to test for interaction between centre and gender. Stratified analyses were carried out for FCOs and for places of consumption. Age was included as a continuous variable in the covariance analysis.

Analyses were performed using STATA statistical package (Stata version 7.0; Stata Corp, College Station, TX, USA).

Results

Table 1 shows minimally adjusted means of alcohol consumption by study centre, stratified by age classes and gender, and weighted for season and day of the week of interview. Alcohol intake varied greatly between centres, and between men and women. In men, alcohol consumption was highest in Copenhagen (Denmark) and lowest in Umeå (Sweden). In Varese and Turin (Italy), and in Asturias and San Sebastian (Spain), alcohol consumption was higher in older age groups, whereas elsewhere it peaked at an earlier age. Among women, the Danish centres (Copenhagen and Aarhus) had the highest alcohol intake, and the Mediterranean centres of Granada, Navarra, Greece and Ragusa had the lowest. Among women, alcohol consumption generally decreased with age, irrespective of centre.

After further energy, and height and weight adjustments, the estimated mean alcohol intake was still highest in Copenhagen and was lowest in Umeå among men. Although these adjustments had little effect for most centres, it

considerably increased the estimated mean alcohol intake in Greece and in the UK health-conscious group, and considerably decreased intake in San Sebastian and Varese (Table A1). Among women, the only systematic effects of energy adjustment were that the estimated mean alcohol intake increased in Greece and Granada, and decreased in Aarhus and in the north-east and south coast of France (Table A1).

Tables 2a and b show minimally adjusted means of non-alcohol energy and mean percentages of energy obtained from protein, starch and sugar by alcohol consumption categories for men and women, respectively. Energy intake, excluding calories from alcohol, was lower in male higher level drinkers than in abstainers in all Northern and Central European centres. Among women, higher level drinkers consumed more non-alcohol energy than did abstainers in all Mediterranean centres, except Ragusa, but less non-alcohol energy in the Netherlands, the United Kingdom and Denmark.

Male higher level drinkers obtained slightly more energy from protein than did abstainers in most centres (except Granada and Ragusa) and less from sugar than did abstainers in most centres (except Granada). The proportion of energy from starch was higher in higher level drinkers than in abstainers in Granada, Navarra, Murcia, Ragusa, the United Kingdom, Umeå and Aarhus.

Female higher level drinkers obtained more energy from protein than did abstainers in most centres (except Granada, Naples and North-West France). They also obtained less energy from sugar than did abstainers (except in Granada and the UK general population). The proportion of energy obtained from starch was higher in female higher level drinkers than in abstainers in most Mediterranean centres (except in France, Naples, Navarra and Asturias), but was lower in other centres.

Tables 2c and d show minimally adjusted means of non-alcohol energy obtained from total fat and fat subtypes by alcohol consumption category in men and women, respectively. Male higher level drinkers obtained more energy from total fat than did abstainers in most centres (except in Potsdam, in the UK health-conscious group, Aarhus and Umeå). Male higher level drinkers in Potsdam, Aarhus and Umeå obtained slightly less energy from saturated fat than did abstainers, those in Aarhus also obtained less energy from monounsaturated fat (MUFA) and those in Umeå obtained less energy from PUFA. In Greece, Granada, Bilthoven, the UK general population and Copenhagen, total fat consumption increased as alcohol intake increased. Among women, higher level drinkers obtained more energy from total fat than did abstainers in most centres, except the southern centres of Greece, Granada and Ragusa, as well as Aarhus. In Greece, female higher level drinkers consumed the same amount of saturated fat but less MUFA and more PUFA than did abstainers, whereas in Granada, they obtained less energy from saturated fat, MUFA and PUFA than did abstainers. In Ragusa, female higher level drinkers obtained less energy from all kinds of fat than did abstainers.

Table 1 Minimally adjusted^a mean daily alcohol intake (g/day) by centre ordered from South to North, gender and age group

Country and centre	Men										Women											
	All		35–44 years		45–54 years		55–64 years		65–74 years		N		All		35–44 years		45–54 years		55–64 years		65–74 years	
	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.
Greece	1311	20.5	0.9	30.7	2.6	21.7	1.8	18.4	1.6	16.8	1.4	1373	3.7	0.5	5.8	1.2	3.9	0.8	3.1554	0.8	2.4404	0.9
<i>Spain</i>																						
Granada	214	22.4	2.1	—	—	24.4	4.5	21.0	2.9	22.1	4.9	300	2.9	1.0	3.2	2.5	4.0	1.7	2.1	1.5	3.9	3.2
Murcia	243	26.2	2.0	26.5	6.3	27.9	3.6	27.4	2.8	16.7	7.0	304	7.2	1.0	12.1	2.0	7.6	1.6	4.5	1.6	—	—
Navarra	444	33.2	1.5	38.1	6.5	38.5	2.5	30.7	2.1	26.1	4.6	271	3.8	1.0	5.0	2.7	5.2	1.7	2.7	1.6	—	—
San Sebastian	490	33.7	1.4	33.3	3.4	36.0	2.0	33.5	2.7	43.6	7.2	244	6.7	1.1	8.8	2.3	9.1	1.8	4.6	1.8	—	—
Asturias	386	29.8	1.6	29.8	6.0	30.2	2.7	28.8	2.4	33.6	4.3	324	5.5	0.9	8.2	2.3	6.5	1.5	4.5	1.5	3.1	3.5
<i>Italy</i>																						
Ragusa	168	15.1	2.4	—	—	15.9	3.6	14.0	3.8	—	—	138	3.9	1.4	5.0	2.4	5.2	2.7	3.9	2.6	—	—
Naples	—	—	—	—	—	—	—	—	—	—	—	403	8.0	0.8	15.7	2.8	9.1	1.3	6.5	1.3	3.0	2.8
Florence	271	22.0	1.9	23.6	6.0	21.0	3.3	23.0	2.7	—	—	784	7.9	0.6	9.2	2.0	7.5	1.1	7.5	0.8	10.9	2.4
Turin	676	31.2	1.2	26.1	3.9	29.4	2.0	35.0	1.7	27.9	4.6	392	11.4	0.9	10.4	2.7	11.8	1.4	11.9	1.2	—	—
Varese	327	34.0	1.7	—	—	27.9	3.9	35.5	2.1	36.5	5.9	794	7.4	0.6	7.6	1.9	7.5	1.0	6.5	0.9	10.6	1.8
<i>France</i>																						
South coast	—	—	—	—	—	—	—	—	—	—	—	1087	13.4	0.5	14.0	0.9	15.3	0.9	13.3	0.9	—	—
South	—	—	—	—	—	—	—	—	—	—	—	1425	11.0	0.5	—	—	11.2	0.7	11.1	0.7	9.5	1.0
North-East	—	—	—	—	—	—	—	—	—	—	—	2059	12.6	0.4	—	—	12.2	0.6	12.8	0.6	12.0	0.9
North-West	—	—	—	—	—	—	—	—	—	—	—	631	12.9	0.7	—	—	13.4	1.1	11.6	1.0	13.5	1.6
<i>Germany</i>																						
Heidelberg	1034	30.1	1.0	29.9	2.6	33.3	1.6	29.6	1.4	—	—	1087	13.4	0.5	14.0	0.9	15.3	0.9	13.3	0.9	—	—
Potsdam	1233	23.7	0.9	32.7	2.6	25.5	1.8	21.4	1.2	25.4	3.5	1061	8.4	0.5	8.8	1.0	11.0	1.0	7.6	0.8	7.0	3.3
<i>The Netherlands</i>																						
Bilthoven	1024	24.4	1.0	25.9	1.9	27.9	1.5	24.8	1.7	—	—	1086	10.5	0.5	11.1	0.9	13.4	0.8	8.4	1.0	—	—
Utrecht	—	—	—	—	—	—	—	—	—	—	—	1870	12.0	0.4	—	—	13.6	0.7	11.2	0.6	9.6	0.8
<i>United Kingdom</i>																						
Gen. population	402	20.9	1.6	32.8	5.2	20.5	2.8	20.2	2.9	17.4	2.8	570	12.9	0.7	19.6	2.1	16.0	1.2	9.2	1.3	8.9	1.5
Health-conscious	114	15.5	2.9	—	—	10.3	4.8	18.0	4.5	—	—	197	8.8	1.2	10.8	3.8	7.6	2.0	9.7	1.9	8.3	3.3
<i>Denmark</i>																						
Copenhagen	1356	35.2	0.9	—	—	36.6	1.4	34.8	1.1	26.4	4.3	1484	19.9	0.4	—	—	21.8	0.7	18.5	0.6	17.1	2.1
Aarhus	567	33.5	1.3	—	—	34.0	1.9	33.9	1.9	—	—	510	17.7	0.8	—	—	18.9	1.1	16.6	1.1	—	—
<i>Sweden</i>																						
Malmö	1421	15.6	0.9	—	—	16.0	2.5	15.1	1.3	12.1	1.2	1711	8.2	0.4	—	—	10.4	0.8	8.2	0.7	5.1	0.6
Umeå	1344	9.9	0.9	10.6	2.9	12.4	1.6	8.8	1.2	6.0	2.6	1574	5.3	0.4	5.5	1.0	6.7	0.8	4.5	0.7	3.8	1.4
<i>Norway</i>																						
South & East	—	—	—	—	—	—	—	—	—	—	—	1004	7.7	0.5	9.0	1.3	8.7	0.7	7.1	1.3	—	—
North & West	—	—	—	—	—	—	—	—	—	—	—	793	6.4	0.6	7.1	1.4	7.8	0.7	4.2	1.6	—	—

Abbreviations: M, mean; s.e., standard error; '—', if a group comprised fewer than 20 persons, mean intake is not presented.

^aAdjusted for age (when not stratified for age), and weighted by season and day of recall.

Table 2a Minimally adjusted^a mean daily energy intake (kcal), excluding alcohol, and percentage (%) of non-alcohol energy obtained from selected macronutrients by centre and alcohol consumption category in men

Country and centre	N	Energy excluding alcohol (kcal)						Protein (%)						Starch (%)						Sugar (%)																
		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g												
		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.											
Greece	1311	2022	59	2043	32	2066	49	2054	46	17.7	0.29	17.7	0.29	17.8	0.27	23.3	0.55	22.8	0.30	23.3	0.46	22.6	0.43	16.5	0.59	16.3	0.32	14.8	0.49	14.9	0.46					
Spain																																				
Granada	214	2305	106	2320	103	2422	139	2384	93	20.1	0.62	18.8	0.60	19.9	0.82	18.8	0.54	23.4	1.00	20.7	0.97	22.0	1.31	22.4	0.87	16.9	1.06	20.0	1.03	16.5	1.39	16.9	0.93			
Murcia	243	2221	140	2507	98	2498	116	2453	77	17.5	0.82	16.7	0.57	17.7	0.68	18.6	0.45	22.5	1.32	23.0	0.92	21.6	1.09	23.9	0.72	23.4	1.40	20.4	0.98	19.6	1.16	18.5	0.77			
Navarra	444	2381	105	2498	84	2380	93	2362	51	19.4	0.61	19.8	0.49	20.2	0.54	21.0	0.30	21.6	0.98	22.1	0.79	21.1	0.87	22.2	0.48	18.0	1.04	17.4	0.84	16.2	0.93	15.6	0.51			
San Sebastian	490	2598	112	2590	94	2592	91	2586	46	21.1	0.65	21.8	0.55	21.3	0.53	23.1	0.27	20.2	1.05	17.9	0.88	20.9	0.85	20.3	0.43	19.0	1.11	20.4	0.94	20.2	0.90	16.5	0.45			
Asturias	386	2496	81	2443	103	2546	101	2388	59	22.2	0.47	20.6	0.60	21.4	0.59	22.4	0.35	21.4	0.76	24.3	0.96	21.6	0.95	21.9	0.55	20.2	0.80	20.9	1.02	20.9	1.01	18.6	0.59			
Italy																																				
Ragusa	168	2266	145	2305	98	2750	135	2633	120	18.3	0.85	18.7	0.58	17.6	0.79	18.3	0.70	32.7	1.37	35.3	0.92	37.5	1.27	33.2	1.13	19.1	1.45	17.1	0.98	12.5	1.35	16.8	1.19			
Florence	271	2446	125	2366	111	2748	107	2344	69	17.5	0.73	16.9	0.65	17.3	0.63	18.6	0.40	34.7	1.18	32.4	1.05	33.1	1.01	34.1	0.64	17.0	1.25	18.8	1.11	17.3	1.07	15.8	0.68			
Turin	676	2259	87	2254	72	2308	80	2369	40	17.0	0.51	17.2	0.42	17.9	0.47	17.6	0.23	33.1	0.82	32.5	0.68	31.5	0.75	32.8	0.38	21.4	0.87	19.3	0.72	20.9	0.80	18.2	0.40			
Varese	327	2568	136	2450	95	2565	120	2558	57	16.7	0.80	17.9	0.56	17.4	0.70	17.7	0.34	34.5	1.28	30.1	0.90	32.8	1.13	31.9	0.54	19.9	1.35	19.6	0.95	19.8	1.20	17.0	0.57			
Germany																																				
Heidelberg	1034	2459	82	2304	43	2322	50	2150	40	16.0	0.48	16.0	0.25	16.8	0.30	17.4	0.24	21.6	0.77	23.6	0.41	22.8	0.47	21.2	0.38	22.8	0.81	20.1	0.43	17.8	0.50	16.3	0.40			
Potsdam	1233	2559	95	2430	38	2369	43	2340	38	14.9	0.55	14.9	0.22	15.2	0.25	15.9	0.22	20.8	0.89	20.4	0.36	20.4	0.41	19.9	0.36	20.2	0.94	21.8	0.38	19.7	0.43	17.3	0.38			
The Netherlands																																				
Billthoven	1024	2422	61	2480	42	2573	56	2301	45	16.3	0.36	16.5	0.24	17.5	0.33	18.1	0.26	24.6	0.58	24.0	0.39	23.9	0.53	22.4	0.42	22.9	0.61	22.4	0.42	22.1	0.56	21.2	0.45			
United Kingdom																																				
General population	402	2144	114	2276	56	2307	88	2049	91	15.1	0.67	16.6	0.33	17.2	0.51	18.1	0.54	23.6	1.07	25.5	0.52	24.5	0.82	24.5	0.86	27.9	1.14	22.9	0.56	23.3	0.88	21.7	0.91			
Health-conscious	114	2166	171	2175	105	2879	185	1774	151	12.2	1.00	12.8	0.62	13.0	1.08	16.4	0.89	28.6	1.61	25.5	0.99	29.0	1.74	29.9	1.42	27.5	1.71	25.3	1.05	18.2	1.84	23.9	1.51			
Denmark																																				
Copenhagen	1356	2637	152	2455	42	2497	39	2258	32	13.2	0.89	15.8	0.25	16.4	0.23	16.9	0.19	23.9	1.43	21.9	0.40	22.6	0.37	21.5	0.30	25.6	1.51	20.8	0.42	18.5	0.39	18.8	0.32			
Aarhus	567	2850	152	2532	59	2588	63	2379	53	13.7	0.89	16.1	0.35	15.5	0.37	16.8	0.31	19.2	1.43	23.3	0.56	23.3	0.59	21.7	0.50	21.6	1.51	18.6	0.59	18.9	0.63	17.5	0.53			
Sweden																																				
Malmö	1421	2360	57	2290	33	2269	41	2176	46	16.5	0.34	16.5	0.20	16.7	0.24	17.4	0.27	25.8	0.54	25.9	0.31	25.8	0.39	24.4	0.43	21.6	0.57	18.7	0.33	18.5	0.41	17.0	0.46			
Umeå	1344	2485	46	2465	26	2380	63	2229	169	15.3	0.27	15.9	0.15	15.6	0.37	16.1	0.99	26.8	0.43	27.0	0.25	27.3	0.59	28.5	1.59	19.6	0.46	18.9	0.26	17.8	0.63	17.4	1.68			

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

Table 2b Minimally adjusted^a mean daily energy intake (kcal), excluding alcohol, and percentage (%) of non-alcohol energy obtained from selected macronutrients by centre and alcohol consumption category in women

Country and centre	N	Energy excluding alcohol (kcal)						Protein (%)						Starch (%)						Sugar (%)						
		Abstainers		1-12g		>12g		Abstainers		1-12g		>12g		Abstainers		1-12g		>12g		Abstainers		1-12g		>12g		
		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	
<i>Greece</i>	1373	1470	25	1576	23	1622	60	16.2	0.19	16.5	0.18	17.4	0.47	21.6	0.31	20.3	0.28	22.7	0.74	19.5	0.34	19.4	0.31	17.7	0.81	
<i>Spain</i>																										
Granada	300	1636	41	1728	77	1834	142	18.8	0.32	17.6	0.6	18.4	1.10	20.52	0.5	18.96	0.94	21.98	1.73	22.9	0.55	23.4	1.04	23.9	1.91	
Murcia	304	1779	58	1921	53	1936	76	17.9	0.45	17.5	0.41	18.3	0.59	17.7	0.7	18.7	0.64	22.2	0.93	26.3	0.77	24.1	0.71	19.2	1.03	
Navarra	271	1822	46	1799	78	1857	94	19.5	0.36	19.2	0.6	20.6	0.73	18.5	0.57	18.4	0.95	18.3	1.15	20.3	0.63	22.6	1.04	19.0	1.27	
San Sebastian	244	1827	55	1963	75	1934	81	20.6	0.42	20.4	0.58	20.8	0.63	18.6	0.67	18.6	0.91	20.0	0.99	24.4	0.74	21.5	1.00	20.6	1.09	
Asturias	324	1767	41	1851	84	1867	85	21.4	0.32	19.5	0.65	21.6	0.66	20.2	0.49	21.6	1.02	19.5	1.04	23.5	0.55	24.0	1.13	22.5	1.15	
<i>Italy</i>																										
Ragusa	138	1858	73	1787	84	1802	147	17.2	0.56	16.4	0.65	18.3	1.15	25.8	0.88	29.0	1.03	34.0	1.80	18.2	0.98	20.9	1.13	18.0	1.98	
Naples	403	1681	44	1842	55	1818	63	17.4	0.34	17.0	0.43	16.4	0.49	30.2	0.54	28.6	0.67	30.0	0.77	20.1	0.59	17.9	0.74	17.8	0.85	
Florence	784	1707	32	1759	43	1797	39	17.9	0.25	17.7	0.34	18.0	0.30	29.6	0.39	29.1	0.53	31.0	0.48	19.9	0.44	20.1	0.58	17.1	0.53	
Turin	392	1648	49	1678	60	1818	51	17.6	0.38	17.7	0.47	18.3	0.40	27.4	0.59	26.2	0.74	28.1	0.63	22.0	0.66	24.8	0.81	20.6	0.69	
Varese	794	1767	33	1797	39	1778	41	17.1	0.25	16.3	0.31	17.3	0.32	29.4	0.4	27.8	0.48	29.6	0.50	22.2	0.44	22.2	0.53	19.4	0.55	
<i>France</i>																										
South coast	620	1888	52	1937	36	1930	43	18.4	0.40	17.8	0.28	18.6	0.34	22.0	0.63	19.8	0.43	20.9	0.53	22.2	0.69	20.6	0.48	19.0	0.58	
South	1425	1891	33	1840	23	1952	30	17.6	0.26	18.2	0.18	18.0	0.23	23.3	0.41	22.1	0.28	21.7	0.37	22.5	0.45	21.3	0.31	20.8	0.40	
North-East	2059	1874	29	1983	20	1963	23	17.8	0.23	17.8	0.15	18.2	0.18	22.4	0.36	21.3	0.24	20.4	0.28	22.0	0.39	21.5	0.27	20.0	0.31	
North-West	631	1888	59	1863	35	1946.3	41	18.9	0.46	18.3	0.27	18.6	0.32	22.3	0.72	22.6	0.42	21.2	0.52	22.0	0.79	21.6	0.47	19.3	0.55	
<i>Germany</i>																										
Heidelberg	1087	1749	43	1773	26	1806	33	15.9	0.33	15.3	0.2	16.3	0.26	21.8	0.52	21.8	0.32	21.5	0.40	24.8	0.57	23.2	0.35	20.6	0.44	
Potsdam	1061	1803	48	1752	24	1728	39	13.9	0.37	14.7	0.18	15.2	0.30	21.0	0.59	20.5	0.29	20.9	0.48	27.2	0.65	26.8	0.32	22.9	0.53	
<i>The Netherlands</i>																										
Bilthoven	1086	1808	33	1865	28	1747	37	16.6	0.25	16.8	0.22	17.7	0.28	23.6	0.4	22.8	0.35	23.2	0.45	24.6	0.44	24.5	0.38	22.2	0.49	
Utrecht	1870	1891	25	1885	22	1801	27	17.1	0.19	17.8	0.17	18.4	0.21	23.0	0.3	21.5	0.27	20.3	0.33	25.3	0.33	25.2	0.29	24.6	0.37	
<i>United Kingdom</i>																										
General population	570	1673	54	1672	34	1629	55	17.5	0.42	17.4	0.27	18.3	0.43	24.9	0.66	24.3	0.42	22.8	0.67	24.3	0.73	25.2	0.46	25.1	0.74	
Health-conscious	197	2012	80	1710	56	1717	103	12.4	0.62	14.4	0.44	14.1	0.80	25.1	0.97	25.3	0.69	24.7	1.25	28.7	1.07	26.3	0.76	22.4	1.38	
<i>Denmark</i>																										
Copenhagen	1484	1836	59	1799	22	1754	25	15.3	0.46	16.4	0.17	17.3	0.19	23.6	0.72	23.3	0.27	22.9	0.30	22.6	0.8	20.8	0.29	18.9	0.33	
Aarhus	510	1981	86	2001	37	1931	43	15.8	0.67	15.5	0.29	16.8	0.33	22.5	1.05	23.6	0.46	22.4	0.52	19.4	1.16	21.0	0.50	19.2	0.58	
<i>Sweden</i>																										
Malmö	1711	1714	28	1797	21	1759	30	16.6	0.22	16.3	0.16	16.7	0.23	24.5	0.34	24.4	0.26	24.4	0.37	21.2	0.38	21.1	0.29	20.1	0.40	
Umeå	1574	1784	23	1854	21	1746	146	15.9	0.18	16.4	0.16	18.0	1.13	27.3	0.28	26.6	0.25	26.1	1.78	21.3	0.31	21.1	0.28	17.7	1.96	
<i>Norway</i>																										
South & East	1004	1859	34	1753	24	2034	123	16.7	0.27	17.7	0.18	17.5	0.96	22.7	0.42	22.7	0.29	22.6	1.50	23.4	0.46	21.4	0.32	18.2	1.66	
North & West	793	1764	34	1770	28	1856	161	16.7	0.27	17.8	0.22	19.8	1.25	22.8	0.42	22.8	0.34	21.9	1.96	23.3	0.46	21.6	0.38	19.5	2.17	

Abbreviations: M, mean; s.e., standard error.
^aAdjusted for age, and weighted by season and day of recall.

Table 2c Minimally adjusted^a mean percentage of non-alcohol energy obtained from total fat and fat subtypes, by centre and alcohol consumption category in men

Country and centre	N	Total fat (%)						Saturated fat (%)						Monounsaturated fat (%)						Polyunsaturated fat (%)																
		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g		1-12g		12.1-24g		>24g												
		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.											
<i>Greece</i>	1311	42.3	0.66	43.4	0.36	43.9	0.56	44.3	0.52	12.7	0.34	12.9	0.2	13.1	0.3	12.2	0.26	20.9	0.35	21.7	0.19	21.7	0.3	23.4	0.28	5.6	0.22	5.7	0.12	5.9	0.18	5.7	0.17			
<i>Spain</i>																																				
<i>Cranada</i>	214	39.7	1.19	40.5	1.16	41.6	1.57	42.0	1.04	11.9	0.60	12.2	0.6	13.2	0.8	12.2	0.54	19.4	0.63	19.6	0.61	19.6	0.8	20.6	0.55	5.5	0.39	5.5	0.38	5.5	0.51	6.1	0.34			
<i>Murcia</i>	243	36.6	1.58	39.9	1.10	41.2	1.31	39.0	0.87	9.8	0.80	10.4	0.6	11.8	0.7	10.9	0.44	18.3	0.83	20.1	0.58	20.2	0.7	19.1	0.46	5.5	0.52	6.2	0.36	6.0	0.43	6.0	0.28			
<i>Navarra</i>	444	41.1	1.18	40.7	0.95	42.5	1.05	41.3	0.58	11.0	0.60	10.9	0.5	11.9	0.5	11.1	0.29	20.2	0.62	20.1	0.5	20.4	0.6	20.3	0.31	6.5	0.39	6.5	0.31	6.9	0.34	6.6	0.19			
<i>San Sebastian</i>	490	39.8	1.26	39.9	1.06	37.6	1.02	40.2	0.51	11.3	0.64	11.6	0.5	10.4	0.5	11.4	0.26	19.2	0.66	17.7	0.56	17.4	0.5	18.2	0.27	6.0	0.41	7.5	0.35	6.6	0.33	7.4	0.17			
<i>Asturias</i>	386	36.3	0.91	34.3	1.16	36.1	1.14	37.2	0.66	11.8	0.46	10.8	0.6	11.4	0.6	11.7	0.34	16.0	0.48	15.5	0.61	15.9	0.6	16.9	0.35	5.5	0.3	5.2	0.38	5.7	0.37	5.7	0.22			
<i>Italy</i>																																				
<i>Ragusa</i>	168	30.0	1.64	29.0	1.11	32.4	1.52	31.7	1.35	9.7	0.83	9.3	0.6	10.3	0.8	10.0	0.68	14.7	0.86	14.3	0.58	15.5	0.8	15.3	0.71	4.0	0.54	3.8	0.36	4.8	0.50	4.5	0.44			
<i>Florence</i>	271	30.9	1.41	32.0	1.25	32.4	1.21	31.7	0.77	9.9	0.71	10.4	0.6	10.0	0.6	10.2	0.39	15.0	0.74	15.9	0.66	15.5	0.6	15.5	0.41	4.1	0.46	3.9	0.41	4.9	0.39	4.0	0.25			
<i>Turin</i>	676	28.6	0.98	31.0	0.81	29.7	0.90	31.4	0.45	9.1	0.50	10.3	0.4	9.6	0.5	10.3	0.23	13.2	0.52	14.6	0.43	14.1	0.5	14.8	0.24	4.5	0.32	4.3	0.27	4.2	0.29	4.5	0.15			
<i>Varese</i>	327	29.0	1.53	32.4	1.08	30.1	1.35	33.4	0.65	10.2	0.77	10.4	0.5	10.7	0.7	11.2	0.33	13.4	0.81	15.5	0.57	13.8	0.7	15.8	0.34	3.6	0.5	4.5	0.35	3.7	0.44	4.5	0.21			
<i>Germany</i>																																				
<i>Heidelberg</i>	1034	38.7	0.92	38.4	0.49	39.9	0.57	40.4	0.46	15.5	0.47	15.5	0.3	16.5	0.3	16.7	0.23	13.5	0.49	13.3	0.26	14.1	0.3	14.5	0.24	7.2	0.3	6.9	0.16	6.6	0.19	7.0	0.15			
<i>Potsdam</i>	1233	43.3	1.07	41.3	0.43	41.9	0.49	42.3	0.43	18.4	0.54	16.4	0.2	16.9	0.3	17.2	0.22	14.4	0.56	13.8	0.23	14.1	0.3	14.5	0.23	7.7	0.35	8.3	0.14	8.0	0.16	7.8	0.14			
<i>The Netherlands</i>																																				
<i>Bilthoven</i>	1024	36.2	0.69	37.2	0.47	37.6	0.63	38.5	0.51	13.9	0.35	14.4	0.2	14.7	0.3	15.0	0.26	10.9	0.36	11.3	0.25	11.7	0.3	12.1	0.27	7.6	0.23	7.6	0.15	7.3	0.21	7.5	0.17			
<i>United Kingdom</i>																																				
<i>General population</i>	402	33.2	1.28	34.8	0.63	34.9	0.99	35.6	1.03	13.7	0.65	13.6	0.3	13.6	0.5	14.3	0.52	11.5	0.68	12.2	0.33	12.5	0.5	12.6	0.54	5.2	0.42	6.3	0.21	6.0	0.32	5.8	0.34			
<i>Health-conscious</i>	114	31.6	1.92	36.2	1.18	39.7	2.08	29.5	1.7	8.8	0.98	11.4	0.6	12.3	1.1	9.7	0.86	11.2	1.02	13.9	0.62	16.7	1.1	11.2	0.90	8.9	0.63	8.4	0.39	7.9	0.68	6.1	0.56			
<i>Denmark</i>																																				
<i>Copenhagen</i>	1356	36.0	1.71	39.3	0.47	40.3	0.44	40.5	0.36	15.1	0.87	16.2	0.2	16.4	0.2	16.3	0.18	12.2	0.90	13.6	0.25	14.3	0.2	14.4	0.19	5.4	0.56	5.8	0.16	5.9	0.14	6.0	0.12			
<i>Aarhus</i>	567	42.9	1.71	39.3	0.67	40.0	0.71	41.1	0.6	20.1	0.87	16.7	0.3	16.8	0.4	17.2	0.30	14.1	0.90	13.2	0.35	18.9	0.6	13.7	0.37	4.8	0.56	5.6	0.22	5.7	0.23	5.6	0.20			
<i>Sweden</i>																																				
<i>Malmö</i>	1421	36.1	0.64	38.9	0.38	38.9	0.47	41.2	0.52	15.8	0.33	16.7	0.2	16.7	0.2	17.7	0.26	12.7	0.34	14.0	0.2	14.0	0.3	14.9	0.27	5.0	0.21	5.3	0.12	5.4	0.15	5.5	0.17			
<i>Umeå</i>	1344	38.3	0.51	38.1	0.30	39.3	0.71	37.9	1.9	17.1	0.26	16.8	0.2	17.2	0.4	16.8	0.96	13.4	0.27	13.5	0.16	14.0	0.4	13.6	1.00	5.0	0.21	4.9	0.1	5.2	0.23	4.8	0.62			

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

Table 2d Minimally adjusted^a mean percentage of non-alcohol energy obtained from total fat and fat subtypes, by centre and alcohol consumption category in women

Country and centre	N	Total fat (%)						Saturated fat (%)						Monounsaturated fat (%)						Polyunsaturated fat (%)					
		Abstainer		1–12 g		> 12 g		Abstainer		1–12 g		> 12 g		Abstainer		1–12 g		> 12 g		Abstainer		1–12 g		> 12 g	
		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.
<i>Greece</i>	1373	42.3	0.37	43.5	0.34	41.9	0.89	12.6	0.19	13.2	0.17	12.6	0.46	21.0	0.19	21.5	0.17	20.5	0.45	5.70	0.12	5.82	0.11	5.77	0.29
<i>Spain</i>																									
Granada	300	37.8	0.60	40.0	1.13	35.8	2.08	11.5	0.31	12.1	0.58	10.0	1.07	17.8	0.30	19.2	0.57	17.3	1.05	5.43	0.19	5.47	0.36	5.83	0.67
Murcia	304	37.9	0.84	39.7	0.78	40.3	1.12	10.3	0.43	11.2	0.4	11.3	0.58	18.0	0.43	18.7	0.39	18.4	0.57	6.44	0.27	6.67	0.25	7.64	0.36
Navarra	271	41.9	0.68	39.8	1.14	42.2	1.38	12.4	0.35	11.6	0.58	12.2	0.71	19.9	0.34	19.2	0.57	20.1	0.70	6.24	0.22	5.89	0.37	6.51	0.44
San Sebastian	244	36.4	0.80	39.5	1.09	38.7	1.19	10.5	0.41	11.5	0.56	10.9	0.61	16.1	0.40	18.2	0.55	17.5	0.60	6.88	0.26	6.68	0.35	7.34	0.38
Asturias	324	34.9	0.59	35.0	1.23	36.4	1.25	11.6	0.31	10.7	0.63	12.1	0.64	15.0	0.30	15.3	0.62	15.1	0.63	5.45	0.19	5.88	0.40	6.19	0.40
<i>Italy</i>																									
Ragusa	138	38.9	1.06	33.7	1.23	29.7	2.16	12.6	0.55	10.2	0.63	9.3	1.11	18.8	0.54	16.0	0.62	14.2	1.09	5.42	0.34	5.40	0.40	4.13	0.70
Naples	403	32.3	0.64	36.6	0.80	35.8	0.93	11.3	0.33	12.9	0.41	11.7	0.48	14.7	0.32	16.9	0.41	16.5	0.47	4.17	0.21	4.63	0.26	5.51	0.30
Florence	784	32.7	0.47	33.1	0.63	34.0	0.57	11.2	0.24	11.1	0.33	11.2	0.29	15.3	0.24	15.6	0.32	16.1	0.29	4.17	0.15	4.18	0.20	4.54	0.18
Turin	392	33.1	0.71	31.4	0.89	33.1	0.75	10.9	0.37	10.4	0.45	11.0	0.39	14.9	0.36	14.8	0.45	15.3	0.38	5.05	0.23	4.18	0.28	4.80	0.24
Varese	794	31.4	0.48	33.7	0.58	33.8	0.60	10.9	0.25	11.3	0.3	11.6	0.31	14.2	0.24	15.7	0.29	15.5	0.30	4.20	0.15	4.50	0.19	4.52	0.19
<i>France</i>																									
South coast	620	37.2	0.76	41.4	0.52	41.2	0.64	15.0	0.39	17.1	0.27	16.7	0.33	13.1	0.38	14.3	0.26	14.4	0.32	5.70	0.24	6.25	0.17	6.18	0.20
South	1425	36.3	0.49	38.1	0.34	39.1	0.44	15.2	0.25	16.0	0.17	16.5	0.23	12.1	0.25	12.8	0.17	13.3	0.22	5.67	0.16	5.57	0.11	5.44	0.14
North-East	2059	37.4	0.43	38.9	0.29	40.9	0.33	16.2	0.22	16.5	0.15	17.5	0.17	12.3	0.22	13.0	0.15	13.8	0.17	5.29	0.14	5.57	0.09	5.55	0.11
North-West	631	36.5	0.86	37.0	0.51	40.3	0.60	16.4	0.44	16.1	0.26	17.2	0.31	11.5	0.43	12.1	0.26	13.1	0.30	5.11	0.28	5.11	0.16	5.67	0.19
<i>Germany</i>																									
Heidelberg	1087	36.5	0.63	38.5	0.38	39.8	0.48	14.9	0.32	16.0	0.2	16.3	0.25	12.5	0.32	13.3	0.19	13.9	0.24	6.49	0.2	6.61	0.12	6.79	0.16
Potsdam	1061	36.9	0.71	37.0	0.34	39.0	0.58	15.0	0.36	15.0	0.18	15.9	0.30	12.2	0.36	12.4	0.17	13.2	0.29	7.23	0.23	6.97	0.11	7.18	0.19
<i>The Netherlands</i>																									
Bilthoven	1086	35.1	0.48	35.8	0.42	36.8	0.54	14.1	0.25	14.6	0.21	15.1	0.28	10.3	0.24	10.7	0.21	11.3	0.27	6.76	0.15	6.57	0.13	6.35	0.17
Utrecht	1870	34.4	0.36	35.3	0.32	36.6	0.40	14.4	0.19	14.8	0.17	15.3	0.21	9.9	0.18	10.5	0.16	11.3	0.20	6.31	0.12	6.23	0.10	6.04	0.13
<i>United Kingdom</i>																									
General population	570	33.1	0.79	33.0	0.50	33.7	0.80	13.3	0.41	13.2	0.26	13.2	0.41	11.6	0.40	11.3	0.25	11.7	0.41	5.51	0.25	5.75	0.16	5.89	0.26
Health-conscious	197	33.6	1.17	33.9	0.83	38.6	1.50	10.9	0.60	11.7	0.42	13.4	0.77	12.9	0.59	12.6	0.42	14.3	0.76	7.37	0.38	7.02	0.27	7.96	0.48
<i>Denmark</i>																									
Copenhagen	1484	35.9	0.87	36.3	0.32	37.9	0.36	15.6	0.45	15.3	0.16	15.5	0.19	11.9	0.44	12.2	0.16	13.2	0.18	4.96	0.28	5.25	0.10	5.63	0.12
Aarhus	510	38.9	1.27	36.1	0.55	38.2	0.63	16.7	0.65	15.1	0.28	16.2	0.32	13.4	0.64	12.1	0.28	12.9	0.32	5.08	0.41	5.29	0.18	5.31	0.20
<i>Sweden</i>																									
Malmö	1711	37.6	0.41	38.2	0.31	38.7	0.44	16.4	0.21	16.6	0.16	16.9	0.23	13.4	0.21	13.6	0.16	13.8	0.22	4.97	0.13	5.12	0.10	5.14	0.14
Umeå	1574	35.5	0.33	35.8	0.30	38.1	2.14	15.8	0.17	15.7	0.16	16.1	1.10	12.4	0.17	12.6	0.15	13.7	1.08	4.65	0.11	4.81	0.10	5.39	0.69
<i>Norway</i>																									
South & East	1004	34.8	0.50	35.6	0.35	39.1	1.81	14.7	0.26	14.7	0.18	17.4	0.93	10.7	0.25	11.4	0.17	12.2	0.91	6.13	0.16	6.00	0.11	5.62	0.58
North & West	793	35.1	0.50	35.2	0.41	36.7	2.36	14.7	0.26	14.6	0.21	14.8	1.21	10.6	0.25	11.1	0.21	12.6	1.19	6.45	0.16	6.06	0.13	5.51	0.76

Abbreviations: M, mean; s.e., standard error.
^aAdjusted for age, and weighted by season and day of recall.

In Aarhus, they obtained less energy from saturated fat and MUFA, and more from PUFA, than did abstainers.

For women in most centres (except from Greece, Granada, Navarra, San Sebastian, Ragusa, Naples, Turin, south coast France, the UK general population and Aarhus), the energy obtained from total fat increased as alcohol intake increased. Tables 3a and b show mean percentages of energy obtained from non-alcohol macronutrients (fat, carbohydrate and protein) at selected FCOs (breakfast, lunch, dinner and others) by categories of alcohol consumption, for men and women, respectively. In Mediterranean countries, male higher level drinkers consumed less non-alcohol energy than did non-drinkers at breakfast in most centres (exceptions are Ragusa and Turin) and more non-alcohol energy at lunch and dinner than did non-drinkers. In Spanish centres, male higher level drinkers consumed more non-alcohol energy than did abstainers at other FCOs.

In Central European countries, male higher level drinkers consumed less non-alcohol energy than did non-drinkers at breakfast in some centres (exceptions are Heidelberg and the UK general population), and less non-alcohol energy at lunch and more at dinner than did non-drinkers. Moreover, the proportion of energy obtained from non-alcohol sources was higher in higher level drinkers than in abstainers at other FCOs in all centres except in the UK general population. In Northern European countries, the proportion of energy obtained from non-alcohol sources at breakfast among the male higher level drinkers was lower than that for non-drinkers only in Copenhagen and Malmö. Male higher level drinkers consumed more non-alcohol energy at lunch than did abstainers in most northern centres, except Umeå, and more non-alcohol energy at dinner in all centres. Higher level drinkers consumed less non-alcohol energy at other FCOs in northern countries.

Non-alcohol energy consumption at breakfast was lower for female higher level drinkers than for abstainers in most Mediterranean centres (except Granada, Asturias and Ragusa), whereas the proportion of energy obtained from non-alcohol sources was higher at lunch and dinner compared with that for non-drinkers (Table 3b). In non-Mediterranean countries, female higher level drinkers consumed more non-alcohol energy than did non-drinkers at lunch, whereas there was no clear trend at breakfast and dinner. Female higher level drinkers consumed more non-alcohol energy than did abstainers at other FCOs in Greece, most Spanish centres (except San Sebastian and Asturias), Germany, the Netherlands and the UK general population, but they consumed less non-alcohol energy than did abstainers at other FCOs in Italy, France (except the north-west) and Scandinavia.

Figures 1a and b show the proportions of alcohol consumed at different locations by men and women, respectively. Both men and women consumed most alcohol at home (range 53% (Asturias) to 90.4% (Ragusa) for men, and 72.2% (Copenhagen) to 89.8% (Ragusa) for women). Spanish men drank more than 20% of their alcohol in bars. In Greece, Denmark, Sweden, Heidelberg and Bilthoven,

men consumed a non-negligible proportion of alcohol at friends' homes (range 6.9–11.8%), whereas this proportion was low at all other centres (range 1.9–5.2%).

Among women, the proportion of alcohol consumed at home was similar in all centres (range 72.2–89.8%). More alcohol was consumed at friends' homes in Denmark, Sweden, the Netherlands, Murcia, Naples, South and North-West France (10–19.5%) than in other centres (2.1–9.8%). Spanish and British women consumed more alcohol (5.3–16.5%) in bars than did women in other centres (0–4.2%).

Table 4a shows the proportions of alcohol obtained by men from different types of beverages at each location considered. Among men, the main source of alcohol in the Mediterranean and Danish centres was wine, whereas beer was the main source in Germany, the Netherlands, Sweden and in the UK general population. Spirits were an important source of alcohol in Greece, Spain, The Netherlands, the UK general population, Sweden and Denmark. Among men, wine was mainly consumed at home in most centres (except Sweden, the Netherlands, Germany and the UK health-conscious group). In the latter centres, beer was mainly consumed at home, followed by wine and spirits. In some centres of Spain (Navarra, San Sebastian and Asturias) and Italy (Florence, Turin and Varese), more alcohol consumed at home was obtained from spirits than from beer. At work, restaurants and bars, the main alcohol source was wine in Mediterranean countries, but it was beer in non-Mediterranean countries (only in restaurants in the Netherlands and Denmark). The main source of alcohol at friends' homes was wine everywhere, except in the German and Dutch centres, where it was beer.

Among women (Table 4b), the main source of alcohol was wine in all centres except in Murcia (Spain). The consumption of beer was high in Murcia and Aarhus. Spirits were an important source of alcohol in the Netherlands, the United Kingdom and Scandinavian countries. Among women, wine was mainly consumed at home except in Murcia, but in Germany, the Netherlands, Scandinavia and Greece, beer also figured prominently, as did spirits in the United Kingdom, Netherlands, Denmark and Norway. Wine was the main source of alcohol consumed at work (except in Sweden) and restaurants (except Murcia, Naples and Ragusa). At friends' homes, wine was usually the only alcoholic beverage consumed by women, except in Greece where the main alcohol source was spirits. In Scandinavia, Germany, the UK general population and the Netherlands, a non-negligible proportion of alcohol also came from beer and spirits.

Women's preferred drink in bars was wine in Spanish centres, in Northern Italy (Turin, Varese), the UK general population, Potsdam, Utrecht, Malmö and North-West Norway. Only in the British and Spanish centres did women consume spirits in bars.

Table 5 shows mean BMI by categories of alcohol consumption for men and women. Male higher level drinkers had a higher BMI than did abstainers in many centres (except Murcia, Ragusa, Florence, Germany, the Netherlands, Copenhagen and Umeå). In contrast, there was a clear inverse relation between

Table 3a Minimally adjusted^a mean percentage of energy obtained from non-alcohol sources at different food consumption occasions (FCOs) by centre, and alcohol consumption category in men

Country and centre	N	Breakfast			Lunch			Dinner			Other FCOs ^b																								
		1-12g		>24g	12.1-24g		>24g	1-12g		12.1-24g	>24g	1-12g		12.1-24g	>24g																				
		Abstainers	M	s.e.	M	s.e.	M	s.e.	Abstainers	M	s.e.	M	s.e.	Abstainers	M	s.e.	M	s.e.																	
Greece	1311	10.4	0.76	11.9	0.41	9.3	0.64	9.2	0.59	44.1	1.16	45.4	0.63	48.6	0.91	51.1	0.94	27.8	1.18	30.0	0.6	28.6	0.99	33.5	0.92	18.9	1.25	16.0	0.7	19.0	1.05	17.9	0.98		
<i>Spain</i>																																			
Granada	214	14.9	1.36	15.6	1.32	12.7	1.79	13.9	1.19	40.6	2.08	44.4	2.03	45.2	2.74	44.8	1.82	44.8	1.82	32.5	2.11	24.9	2.1	28.9	2.78	26.2	1.85	13.1	2.24	18.1	2.2	17.2	2.95	22.7	1.96
Murcia	243	13.4	1.80	13.1	1.26	10.6	1.49	12.4	0.99	43.8	2.75	43.3	1.92	45.4	2.29	43.8	1.51	28.9	2.79	28.8	2	30.4	2.32	31.6	1.53	14.4	2.97	16.9	2.1	17.8	2.46	20.4	1.63		
Navarra	444	10.9	1.34	10.9	1.08	9.5	1.19	8.2	0.66	46.1	2.06	43.9	1.65	49.8	1.83	47.4	1.01	28.0	2.09	30.2	1.7	31.0	1.85	32.0	1.02	15.9	2.21	18.1	1.8	14.0	1.97	21.5	1.09		
San Sebastian	490	12.7	1.43	10.9	1.21	11.8	1.17	9.3	0.58	40.8	2.20	47.0	1.85	46.1	1.78	48.8	0.90	31.3	2.23	29.0	1.9	32.3	1.81	32.0	0.91	15.4	2.36	15.2	2	13.8	1.92	17.7	0.96		
Asturias	386	14.5	1.03	12.9	1.32	12.8	1.30	13.8	0.76	43.4	1.59	46.1	2.02	44.8	2.00	45.9	1.16	32.1	1.61	30.4	2.1	31.0	2.02	32.6	1.18	11.5	1.71	12.6	2.2	16.6	2.15	16.5	1.25		
<i>Italy</i>																																			
Ragusa	168	8.3	1.87	11.5	1.26	7.2	1.74	9.5	1.54	45.5	2.86	46.7	1.93	53.9	2.66	49.7	2.35	36.4	2.9	37.2	2	38.1	2.70	37.3	2.39	10.4	3.08	6.0	2.1	3.8	2.86	9.2	2.53		
Florence	271	11.7	1.61	12.4	1.43	11.3	1.37	10.2	0.88	39.2	2.46	37.8	2.19	40.1	2.11	44.2	1.35	40.5	2.49	40.0	2.2	45.5	2.14	44.0	1.37	9.3	2.65	11.2	2.4	5.9	2.27	8.0	1.45		
Turin	676	7.2	1.12	9.2	0.93	9.7	1.03	8.0	0.51	43.0	1.71	41.0	1.42	43.2	1.57	45.4	0.78	39.4	1.74	42.5	1.4	41.8	1.59	44.9	0.80	11.5	1.84	9.4	1.5	10.3	1.69	9.9	0.84		
Varese	327	11.6	1.74	12.2	1.23	12.5	1.54	11.2	0.74	41.3	2.67	40.0	1.88	45.2	2.36	45.4	1.13	36.3	2.71	40.5	1.9	38.0	2.39	43.3	1.15	11.5	2.87	8.8	2	8.3	2.54	8.4	1.22		
<i>Germany</i>																																			
Heidelberg	1034	20.6	1.05	21.5	0.56	21.5	0.65	21.3	0.52	22.0	1.61	26.0	0.85	26.0	0.99	27.0	0.80	28.9	1.63	28.4	0.9	30.2	1.00	31.6	0.81	28.7	1.73	27.0	0.9	27.9	1.07	30.8	0.86		
Potsdam	1233	22.9	1.22	22.5	0.49	23.6	0.56	22.1	0.49	23.2	1.86	23.7	0.75	23.5	0.85	23.5	0.74	29.1	1.89	29.2	0.8	31.0	0.87	29.8	0.76	24.9	2.00	26.4	0.8	25.9	0.92	32.9	0.80		
<i>The Netherlands</i>																																			
Bilthoven	1024	16.6	0.79	16.1	0.54	14.5	0.72	14.4	0.58	23.6	1.21	23.2	0.82	23.5	1.11	22.4	0.89	31.8	1.22	31.6	0.8	33.3	1.12	35.7	0.90	28.0	1.30	31.5	0.9	33.6	1.19	36.8	0.96		
<i>United Kingdom</i>																																			
General population	402	15.7	1.46	16.8	0.71	17.4	1.13	16.3	1.17	30.6	2.24	27.2	1.10	23.6	1.73	27.9	1.80	24.5	2.28	33.8	1.1	33.8	1.75	40.0	1.82	29.4	2.41	24.7	1.2	30.9	1.86	25.9	1.94		
Health-conscious	114	18.2	2.19	18.1	1.35	20.0	2.37	17.8	1.94	29.0	3.36	30.6	2.06	23.2	3.63	23.0	2.97	35.3	3.41	32.0	2.1	43.4	3.69	44.3	3.01	17.7	3.62	20.5	2.2	19.7	3.91	24.0	3.20		
<i>Denmark</i>																																			
Copenhagen	1356	19.2	1.95	19.8	0.54	17.7	0.50	19.1	0.42	20.6	2.98	23.2	0.83	24.2	0.76	24.6	0.64	27.9	3.03	34.2	0.8	37.3	0.77	40.2	0.64	32.4	3.21	25.80	0.9	26.0	0.82	26.3	0.68		
Aarhus	567	16.0	1.95	19.1	0.76	18.0	0.81	17.2	0.69	17.0	2.98	21.0	1.17	23.9	1.24	27.6	1.05	30.6	3.03	33.0	1.2	34.5	1.26	36.7	1.06	36.6	3.21	29.3	1.3	28.4	1.33	28.7	1.13		
<i>Sweden</i>																																			
Malmö	1421	20.3	0.73	20.5	0.43	19.7	0.53	20.2	0.59	22.0	1.13	22.0	0.66	22.7	0.81	24.1	0.90	28.2	1.14	31.7	0.7	35.4	0.83	35.6	0.92	30.2	1.21	27.9	0.7	25.7	0.88	26.0	0.97		
Umeå	1344	16.1	0.59	17.5	0.34	18.1	0.81	18.2	2.17	22.6	0.90	23.3	0.52	21.1	1.23	20.4	3.32	33.0	0.91	35.0	0.5	36.1	1.25	39.2	3.36	28.9	0.97	26.0	0.6	27.9	1.33	27.7	3.57		

Abbreviations: M, mean; s.e., standard error.
^aAdjusted for age, and weighted by season and day of recall.
^bComprises before breakfast, in the morning, before lunch, after lunch, in the afternoon, before dinner, after dinner and in the evening/at night.

Table 3b Minimally adjusted^a mean percentage of energy obtained from non-alcohol sources at different food consumption occasions (FCOs) by centre, and category of alcohol consumption in women

Country and centre	N	Breakfast				Lunch				Dinner				Other FCOs ^b												
		1–12 g		> 12 g		1–12 g		> 12 g		Abstainer		1–12 g		> 12 g		Abstainer		1–12 g		> 12 g						
		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.					
<i>Greece</i>	1373	13.4	0.39	12.6	0.36	11.0	0.94	43.2	0.59	43.4	0.55	42.9	1.39	22.9	0.62	24.5	0.57	27.3	1.49	20.7	0.64	20.7	0.59	22.2	1.55	
<i>Spain</i>																										
Granada	300	17.2	0.63	16.5	1.20	19.0	2.21	40.2	0.96	41.3	1.83	43.8	3.36	25.2	1.01	25.4	1.91	20.3	3.51	17.7	1.04	18.9	1.98	19.4	3.64	
Murcia	304	13.8	0.90	12.4	0.82	11.6	1.19	42.7	1.36	43.4	1.25	44.7	1.81	27.2	1.42	28.4	1.31	29.1	1.89	16.9	1.48	17.4	1.36	18.5	1.96	
Navarra	271	13.6	0.72	13.2	1.21	11.6	1.47	45.1	1.10	42.8	1.83	46.1	2.23	24.8	1.15	25.3	1.92	27.5	2.33	16.9	1.19	19.7	1.99	18.1	2.42	
San Sebastian	244	15.0	0.85	14.4	1.16	13.9	1.26	44.2	1.29	39.9	1.76	46.0	1.92	26.0	1.35	30.0	1.84	32.4	2.00	15.4	1.40	16.9	1.91	11.5	2.08	
Asturias	324	15.3	0.63	17.6	1.31	17.0	1.33	40.6	0.96	40.0	1.99	43.1	2.02	29.9	1.00	28.5	2.08	29.3	2.11	14.7	1.04	15.5	2.15	14.6	2.19	
<i>Italy</i>																										
Ragusa	138	7.6	1.13	10.8	1.31	11.6	2.30	52.5	1.72	43.0	1.99	44.5	3.49	28.6	1.79	35.2	2.08	37.7	3.65	11.4	1.86	12.5	2.16	9.4	3.78	
Naples	403	10.7	0.68	9.6	0.85	9.2	0.98	42.7	1.04	43.5	1.3	44.7	1.49	32.9	1.09	34.3	1.35	37.2	1.56	14.9	1.13	14.3	1.4	12.7	1.62	
Florence	784	11.9	0.50	12.4	0.67	11.4	0.61	38.5	0.76	38.6	1.02	43.2	0.93	37.0	0.80	37.4	1.07	39.8	0.97	13.0	0.83	12.8	1.11	10.0	1.00	
Turin	392	9.9	0.76	11.6	0.94	8.8	0.80	39.2	1.15	38.6	1.43	45.9	1.22	37.8	1.21	38.1	1.49	39.4	1.27	13.8	1.25	13.2	1.55	11.7	1.32	
Varese	794	12.9	0.51	14.6	0.61	12.5	0.64	37.3	0.77	38.6	0.93	41.1	0.97	35.5	0.81	34.5	0.97	38.8	1.02	14.8	0.84	14.2	1.01	11.5	1.06	
<i>France</i>																										
South coast	620	16.6	0.80	17.9	0.55	16.1	0.68	41.3	1.22	40.8	0.84	42.0	1.03	28.6	1.28	31.7	0.88	35.7	1.07	14.0	1.32	11.4	0.91	11.5	1.11	
South	1425	18.4	0.52	18.9	0.36	17.0	0.47	39.2	0.79	39.5	0.54	41.4	0.71	30.2	0.83	31.6	0.57	34.6	0.74	12.7	0.86	11.9	0.59	12.0	0.77	
North-East	2059	19.6	0.46	18.2	0.31	17.8	0.35	36.6	0.69	36.7	0.47	37.4	0.54	30.3	0.73	33.1	0.49	35.9	0.56	14.1	0.75	13.9	0.51	13.8	0.58	
North-West	631	20.5	0.92	20.2	0.54	18.2	0.64	40.1	1.39	38.1	0.82	39.4	0.96	28.6	1.45	31.4	0.86	34.8	1.01	11.6	1.51	12.3	0.89	12.7	1.05	
<i>Germany</i>																										
Heidelberg	1087	19.6	0.67	20.9	0.41	20.7	0.51	27.3	1.01	26.0	0.62	25.9	0.78	24.7	1.05	26.6	0.64	31.1	0.81	28.7	1.09	28.7	0.67	29.3	0.84	
Potsdam	1061	20.5	0.75	19.8	0.37	22.1	0.61	25.7	1.14	25.5	0.56	23.8	0.93	24.3	1.19	25.7	0.58	28.3	0.97	29.9	1.24	30.6	0.6	30.9	1.01	
<i>The Netherlands</i>																										
Bilthoven	1086	15.2	0.51	14.2	0.44	14.3	0.57	22.3	0.77	21.8	0.67	21.4	0.86	32.3	0.80	32.4	0.70	36.9	0.90	30.6	0.84	33.7	0.73	34.6	0.94	
Utrecht	1870	14.1	0.38	13.4	0.34	13.1	0.42	23.3	0.58	22.4	0.52	21.4	0.64	31.9	0.61	32.3	0.54	35.6	0.67	30.9	0.63	34.0	0.56	37.5	0.70	
<i>United Kingdom</i>																										
General population	570	15.6	0.84	16.5	0.53	15.5	0.86	27.1	1.28	27.6	0.81	27.2	1.30	34.3	1.33	34.9	0.85	38.5	1.36	23.1	1.38	23.7	0.88	27.7	1.41	
Health-conscious	197	17.3	1.24	17.7	0.88	17.5	1.60	26.8	1.89	26.8	1.33	30.8	2.43	30.5	1.97	33.9	1.39	32.5	2.54	25.5	2.05	23.7	1.44	25.5	2.63	
<i>Denmark</i>																										
Copenhagen	1484	17.0	0.92	18.0	0.34	18.9	0.38	18.3	1.40	21.1	0.51	23.3	0.58	28.9	1.47	34.6	0.54	40.2	0.61	36.1	1.52	29.1	0.56	25.9	0.63	
Aarhus	510	17.0	1.35	17.0	0.58	16.8	0.67	19.2	2.04	20.8	0.88	24.3	1.01	32.7	2.13	31.0	0.92	35.8	1.06	31.8	2.21	33.2	0.96	30.1	1.10	
<i>Sweden</i>																										
Malmö	1711	17.8	0.44	18.4	0.33	19.2	0.47	22.9	0.67	22.3	0.5	24.3	0.71	29.0	0.70	30.6	0.52	34.2	0.74	30.6	0.72	30.4	0.54	26.4	0.77	
Umeå	1574	17.6	0.35	17.2	0.32	16.5	0.27	21.1	0.54	22.3	0.49	26.8	0.45	30.6	0.56	33.9	0.51	31.2	0.61	31.1	0.58	28.4	0.53	31.3	0.74	
<i>Norway</i>																										
South & East	1004	21.1	0.53	21.1	0.37	21.9	0.44	21.6	2.51	18.0	0.56	16.3	2.92	27.4	0.85	33.0	0.58	35.7	3.05	33.3	0.88	30.5	0.61	30.9	3.16	
North & West	793	19.4	0.54	19.9	0.44	21.6	2.51	15.6	0.81	16.6	0.67	18.0	3.81	29.9	0.85	32.5	0.70	36.6	3.98	35.3	0.88	33.5	0.72	28.1	4.13	

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

^bComprises before breakfast, in the morning, before lunch, after lunch, in the afternoon, before dinner, after dinner and in the evening/at night.

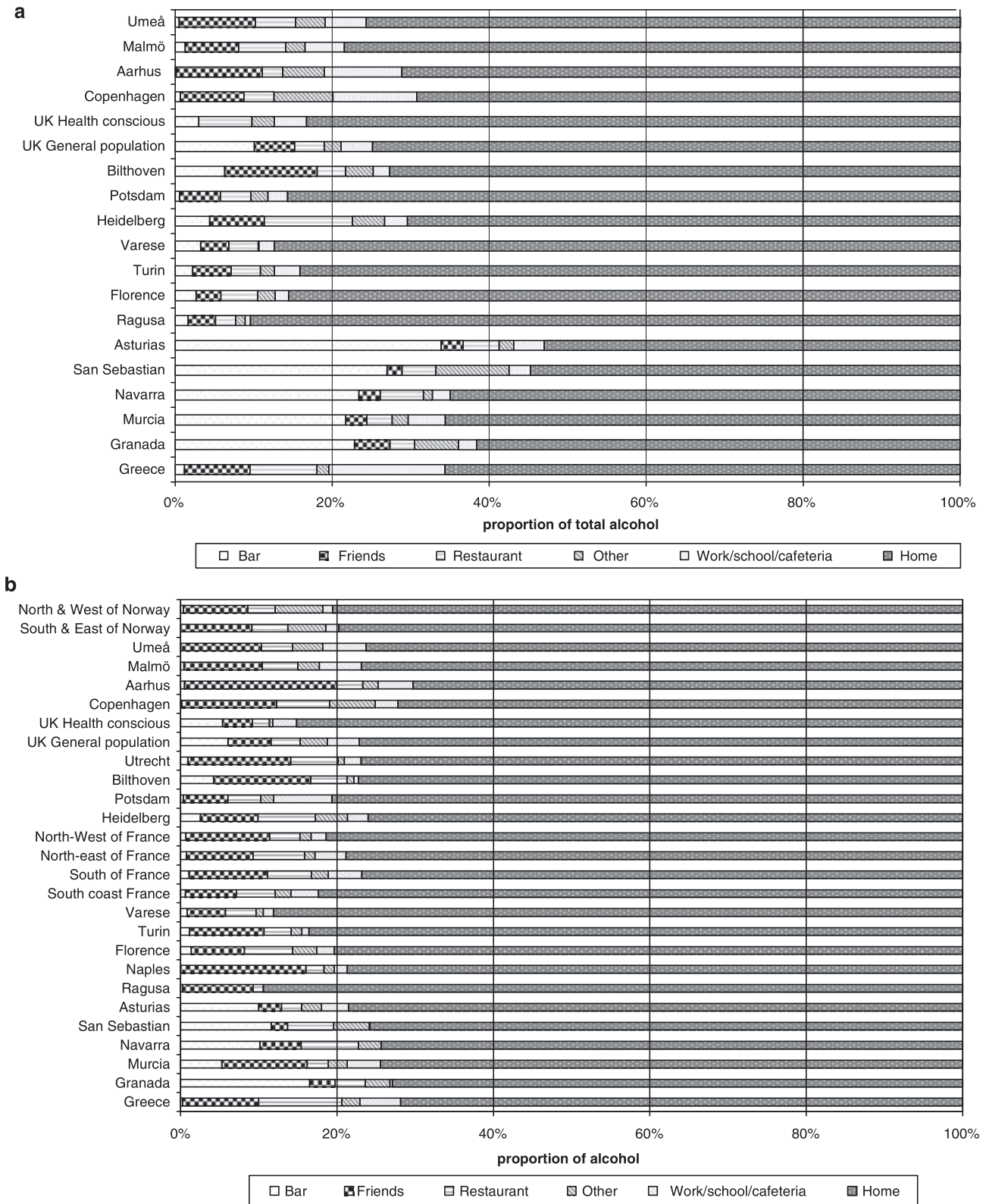


Figure 1 Proportion of alcohol consumption at different places among (a) men and (b) women across EPIC centres.

Table 4a Minimally adjusted^a mean daily intake (g/day) of alcohol from wine, beer and spirits by centre and place of consumption in men

Country and centre	N	Home			Work			Restaurants			Bars			Friends' homes		
		Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits
Greece	1311	12.80	3.97	2.07	1.79	0.68	1.85	2.79	1.03	0.02	0.03	0.50	0.26	1.23	0.70	0.73
<i>Spain</i>																
Granada	214	13.13	2.80	1.07	0.41	0.12	0.48	1.01	0.19	0.01	4.33	2.19	2.24	1.24	0.28	0.29
Murcia	243	13.04	5.76	2.18	0.91	0.37	0.26	0.86	0.16	0.06	3.55	3.23	2.56	0.50	0.34	0.46
Navarra	444	18.54	0.40	3.12	0.84	0.10	0.05	2.27	0.02	1.16	8.25	1.66	3.45	0.83	0.02	0.34
San Sebastian	490	17.12	1.16	2.46	0.87	0.05	0.00	2.17	0.23	0.61	9.70	1.09	1.53	1.14	0.00	0.11
Asturias	386	14.99	1.27	2.35	0.84	0.19	0.52	2.77	0.17	1.27	10.14	2.46	2.51	1.14	0.22	0.18
<i>Italy</i>																
Ragusa	168	21.96	1.36	0.46	0.23	0.00	0.00	0.91	0.00	0.07	0.28	0.00	0.08	0.51	0.06	0.09
Florence	271	23.44	0.78	1.58	0.33	0.00	0.08	1.54	0.00	0.24	0.38	0.00	0.00	0.71	0.03	0.01
Turin	676	30.20	0.84	1.49	0.76	0.14	0.00	1.53	0.10	0.20	0.43	0.09	0.15	2.00	0.00	0.35
Varese	327	30.63	1.25	2.76	0.66	0.12	0.06	1.77	0.11	0.31	1.21	0.11	0.70	1.45	0.10	0.14
<i>Germany</i>																
Heidelberg	1034	12.42	13.28	1.27	0.54	0.83	0.00	2.42	4.13	0.27	0.30	3.08	0.03	1.81	1.84	0.32
Potsdam	1233	6.20	22.26	3.16	0.19	0.36	0.00	0.35	1.61	0.26	0.02	0.15	0.01	0.68	1.81	0.50
<i>The Netherlands</i>																
Bilthoven	1024	7.63	12.57	4.68	0.00	1.32	0.00	1.40	0.84	0.09	0.48	5.37	0.43	1.45	3.93	0.71
<i>United Kingdom</i>																
General population	402	12.94	7.36	7.42	0.25	0.75	0.00	1.26	1.51	0.06	0.14	5.75	0.16	2.25	0.41	0.09
Health-conscious	114	11.21	17.63	2.03	0.00	1.15	0.00	1.03	1.32	0.00	0.46	1.58	0.00	0.00	0.00	0.00
<i>Denmark</i>																
Copenhagen	1356	18.66	9.56	2.75	1.02	3.55	0.27	1.69	0.80	0.22	0.00	0.44	0.06	3.12	1.66	0.44
Aarhus	567	16.75	12.95	4.40	0.83	3.15	0.25	1.27	0.75	0.04	0.01	0.11	0.00	3.39	2.30	1.33
<i>Sweden</i>																
Malmö	1421	5.51	8.02	4.59	0.20	0.66	0.30	0.79	1.11	0.46	0.00	0.67	0.19	0.93	0.84	0.76
Umeå	1344	4.43	8.19	2.57	0.01	0.47	0.01	0.53	0.86	0.13	0.04	0.09	0.01	1.53	1.29	1.99

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

alcohol consumption and BMI in women at all centres except in France and the UK health-conscious group.

Table 6 shows mean years of schooling by categories of alcohol consumption in men and women. Male heavy drinkers were less educated than were abstainers in Mediterranean centres (exceptions are Asturias and Florence), whereas in other centres, they were more educated than were abstainers. In general, female higher level drinkers were more educated than were abstainers in all centres, except in the Mediterranean centres of Greece, Murcia, Ragusa and Varese.

Discussion

In a previous study using the same EPIC datasets as those used in this paper, we analysed patterns of alcohol consumption and found that consumption was highest in the two Danish centres; that men drank more than women; that men's alcohol intake came mostly from wine in Southern Europe and from beer in other countries; and that in most centres, women's main alcohol source was wine (Sieri *et al.*, 2002). Furthermore, increased weekend drinking

was a characteristic of Northern Europe, whereas alcohol consumption is generally restricted to mealtimes in Mediterranean countries (Sieri *et al.*, 2002).

In this study, we found that patterns of alcohol consumption varied markedly across centres, and hence across Europe in terms of total amount consumed, association with nutrient intake, BMI, education level and place of consumption.

Alcohol consumption in men and women decreased with age, although in some Mediterranean centres, it increased in the oldest age category. Mediterranean men and women who were higher level drinkers generally had a higher total energy intake than did abstainers, even when calories from alcohol were excluded. By contrast, in Scandinavian countries (Denmark and Sweden), higher level drinkers had lower total and non-alcohol energy intakes than did abstainers.

Studies that have investigated differences in energy intake according to drinking habits have reported discordant results. Some studies found that total energy intake increased with increasing alcohol consumption (Colditz *et al.*, 1991; Toniolo *et al.*, 1991; Veenstra *et al.*, 1993), although Mannisto *et al.* (1997) reported the opposite. The results diverged even more when energy from alcohol was excluded.

Table 4b Minimally adjusted^a mean daily intake (g/day) of alcohol from wine, beer and spirits by centre and place of consumption in women

Country and centre	N	Home			Work			Restaurants			Bars			Friends' homes		
		Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits	Wine	Beer	Spirits
<i>Greece</i>	1373	5.78	2.06	0.56	0.07	0.08	0.05	1.63	1.39	0.01	0.00	0.02	0.01	0.52	0.39	1.07
<i>Spain</i>																
Granada	300	1.81	1.40	0.10	0.00	0.00	0.13	0.19	0.15	0.00	1.64	1.42	0.11	1.67	0.10	0.00
Murcia	304	3.45	4.63	0.56	0.11	0.14	0.00	0.37	0.58	0.11	0.27	0.54	0.27	0.79	0.71	0.20
Navarra	271	7.73	0.06	0.36	0.00	0.00	0.00	1.27	0.08	0.29	0.58	0.49	0.33	1.40	0.00	0.00
San Sebastian	244	6.86	0.17	0.14	0.01	0.00	0.00	2.74	0.07	0.03	1.53	0.27	0.32	0.06	0.00	0.02
Asturias	324	8.56	0.42	0.44	0.71	0.00	0.00	1.43	0.19	0.00	1.81	1.02	0.14	0.29	0.18	0.03
<i>Italy</i>																
Ragusa	138	9.04	0.71	0.09	0.06	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.00	0.69	0.10	0.00
Naples	403	11.90	0.20	0.76	0.01	0.02	0.00	0.17	0.24	0.05	0.00	0.00	0.00	2.36	0.02	0.28
Florence	784	12.24	0.49	0.37	0.06	0.00	0.00	0.80	0.19	0.13	0.14	0.00	0.00	1.15	0.09	0.23
Turin	392	15.74	0.61	0.88	0.02	0.00	0.00	0.50	0.05	0.08	0.06	0.01	0.01	1.31	0.00	0.16
Varese	794	11.18	0.47	0.68	0.05	0.00	0.00	0.51	0.20	0.10	0.08	0.03	0.00	0.68	0.02	0.12
<i>France</i>																
South coast	620	14.72	0.64	0.48	0.30	0.04	0.00	0.82	0.04	0.04	0.05	0.06	0.00	1.67	0.05	0.32
South	1425	12.62	0.59	1.10	0.29	0.04	0.01	1.43	0.07	0.08	0.09	0.18	0.00	2.62	0.11	0.17
North-East	2059	12.86	1.31	0.90	0.40	0.09	0.01	1.64	0.17	0.10	0.06	0.08	0.00	2.04	0.09	0.21
North-West	631	12.18	0.99	0.86	0.11	0.11	0.02	1.04	0.07	0.01	0.06	0.10	0.00	2.92	0.11	0.29
<i>Germany</i>																
Heidelberg	1087	14.97	3.90	0.55	0.24	0.00	0.04	1.89	0.78	0.14	0.33	0.44	0.08	1.73	0.55	0.18
Potsdam	1061	10.86	4.52	1.37	0.67	0.00	0.02	1.53	0.40	0.08	0.11	0.00	0.00	2.36	0.28	0.20
<i>The Netherlands</i>																
Bilthoven	1086	12.25	3.54	2.66	0.12	0.06	0.00	1.40	0.02	0.09	0.51	1.13	0.10	2.62	0.64	0.21
Utrecht	1870	13.69	1.32	3.47	0.21	0.06	0.11	2.00	0.22	0.18	0.46	0.12	0.03	2.89	0.34	0.84
<i>United Kingdom</i>																
General population	570	16.43	1.04	5.76	0.49	0.00	0.00	1.58	0.17	0.19	1.26	0.84	0.73	2.27	0.00	0.48
Health-conscious	197	12.49	2.03	3.53	0.13	0.00	0.00	0.13	0.05	0.00	0.31	1.46	0.14	0.12	0.16	0.30
<i>Denmark</i>																
Copenhagen	1484	16.95	4.02	2.19	0.39	0.27	0.05	2.20	0.35	0.18	0.02	0.08	0.00	4.58	0.59	0.62
Aarhus	510	13.69	5.22	2.23	0.55	0.19	0.02	1.11	0.18	0.07	0.09	0.10	0.00	7.25	1.15	0.88
<i>Sweden</i>																
Malmö	1711	9.22	3.31	1.18	0.27	0.28	0.04	0.85	0.56	0.10	0.21	0.07	0.01	2.56	0.41	0.54
Umeå	1574	8.17	3.71	0.90	0.03	0.18	0.00	1.08	0.34	0.25	0.00	0.00	0.00	2.60	0.63	0.97
<i>Norway</i>																
South and East	1004	13.31	4.51	2.82	0.60	0.09	0.01	1.33	0.78	0.18	0.00	0.00	0.03	3.29	0.34	0.31
North and West	793	17.88	2.44	2.64	0.06	0.13	0.21	0.97	0.67	0.20	0.73	0.00	0.00	2.42	0.28	0.26

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

Toniolo *et al.* (1991) found, as we did, that in Mediterranean countries, non-alcohol energy intake increased with increasing alcohol consumption; Veenstra *et al.* (1993) found that non-alcohol energy intake did not differ between alcohol consumption groups in the Netherlands; Mannisto *et al.* (1997) found lower non-alcohol energy intake among heavy drinkers than among abstainers in Finland (consistent with our findings in men from Central and Northern Europe).

We also found that in many centres, male and female higher level drinkers obtained more energy from total fat and protein, and less from simple sugars than did people in lower alcohol consumption categories. The proportion of

energy obtained from starch tended to be higher for Mediterranean female higher level drinkers.

These findings are borne out by the results of previous studies even if the use of different cutoff points for levels of drinking should be taken into account. Thus, an Italian study found that female heavy drinkers consumed somewhat more fat and less sugar than did other drinking categories (D'Avanzo *et al.*, 1997), and a population-based study in Hawaii (Le Marchand *et al.*, 1989) found that carbohydrate consumption was higher among abstainers, whereas fat consumption was higher among drinkers; this study also observed that male heavy drinkers consumed more protein. In the Nurses' Health

Table 5 Minimally adjusted^a mean body mass index by centre ordered from south to north, gender and alcohol consumption category

Country and centre	Men										Women					
	N	Abstainers		1–12 g		12.1–24 g		> 24 g		N	Abstainers		1–12 g		12.1–24 g	
		M	s.e.	M	s.e.	M	s.e.	M	s.e.		M	s.e.	M	s.e.		
Greece	1311	27.6	0.26	27.5	0.14	28.1	0.22	28.2	0.20	1373	28.9	0.17	27.8	0.16	27.4	0.41
<i>Spain</i>																
Granada	214	29.4	0.47	28.1	0.45	28.3	0.61	30.5	0.41	300	30.1	0.28	27.9	0.52	26.3	0.96
Murcia	243	28.7	0.62	28.7	0.43	28.7	0.51	28.3	0.34	304	30.1	0.39	29.0	0.36	29.6	0.52
Navarra	444	28.2	0.46	29.1	0.37	28.7	0.41	28.6	0.23	271	28.2	0.31	27.0	0.52	26.9	0.64
San Sebastian	490	27.1	0.49	27.4	0.41	27.7	0.4	28.2	0.20	244	28.4	0.37	26.4	0.50	25.9	0.55
Asturias	386	28.6	0.36	29.2	0.45	28.7	0.45	29.1	0.26	324	28.6	0.27	27.6	0.57	27.8	0.58
<i>Italy</i>																
Ragusa	168	28.3	0.64	27.3	0.43	27.1	0.6	26.6	0.53	138	26.9	0.49	26.1	0.57	26.9	1.00
Naples										403	27.7	0.30	27.7	0.37	26.8	0.43
Florence	271	27.4	0.55	26.4	0.49	25.7	0.47	26.8	0.30	784	25.7	0.22	25.9	0.29	25.4	0.26
Turin	676	26.0	0.38	26.4	0.32	26.0	0.35	26.1	0.18	392	25.8	0.33	25.3	0.41	24.3	0.35
Varese	327	25.9	0.6	26.3	0.42	26.0	0.53	26.0	0.25	794	26.4	0.22	25.4	0.27	25.5	0.28
<i>France</i>																
South coast										620	22.4	0.35	23.4	0.24	23.0	0.29
South										1425	22.3	0.23	23.0	0.16	22.8	0.20
North-East										2059	23.3	0.20	23.4	0.13	23.4	0.15
North-West										631	22.3	0.40	22.8	0.23	23.1	0.28
<i>Germany</i>																
Heidelberg	1034	27.9	0.36	27.3	0.19	26.8	0.22	27.6	0.18	1087	26.8	0.29	25.9	0.18	25.1	0.22
Potsdam	1233	27.5	0.42	27.2	0.17	27.1	0.19	27.4	0.17	1061	26.9	0.33	26.9	0.16	25.7	0.27
<i>The Netherlands</i>																
Bilthoven	1024	26.8	0.27	26.4	0.18	26.5	0.25	26.6	0.20	1086	26.9	0.22	25.8	0.19	25.4	0.25
Utrecht										1870	25.6	0.17	25.3	0.15	24.4	0.18
<i>United Kingdom</i>																
General population	402	25.8	0.5	26.0	0.25	25.7	0.39	26.1	0.40	570	26.1	0.37	25.1	0.23	24.8	0.37
Health-conscious	114	22.7	0.75	24.2	0.46	23.7	0.82	24.7	0.67	197	22.9	0.54	23.8	0.38	25.1	0.69
<i>Denmark</i>																
Copenhagen	1356	28.1	0.67	26.7	0.19	26.4	0.17	26.4	0.14	1484	26.7	0.40	25.7	0.15	25.0	0.17
Aarhus	567	25.6	0.67	26.7	0.26	25.9	0.28	27.0	0.24	510	26.5	0.58	25.6	0.25	24.4	0.29
<i>Sweden</i>																
Malmö	1421	25.1	0.25	25.6	0.15	25.6	0.18	26.1	0.20	1711	25.6	0.19	24.5	0.14	24.1	0.20
Umeå	1344	25.7	0.2	25.6	0.12	25.3	0.28	25.6	0.74	1574	25.3	0.15	24.4	0.14	22.8	0.99
<i>Norway</i>																
South and East										1004	25.1	0.23	24.2	0.16	23.0	0.83
North and West										793	25.5	0.23	24.6	0.19	24.2	1.09

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

Study (Colditz *et al.*, 1991), women drinking a lot of alcohol (25–49 g/day) had low carbohydrate—mainly low sugar—consumption, hence energy from alcohol substituted energy from sugar, whereas among men enrolled in the Health Professionals Study, calories from alcohol were added to energy intake from other sources (Colditz *et al.*, 1991). A cross-sectional survey carried out by three French MONICA centres also showed that carbohydrate intake decreased, and protein and fat increased in men as alcohol intake increased (Ruidavets *et al.*, 2004). Finally, a study on Scottish men showed that alcohol consumption was associated with

lowered carbohydrate intake, as well as with lower total fat, saturated fat and MUFA (Thomson *et al.*, 1988).

Although beer and wine contain moderate amounts of carbohydrate, the reasons for the persistently lower carbohydrate intake among drinkers are unknown. Results on the relation of fat and protein intake to alcohol intake are much less consistent, possibly because of differences in the methods of assessing and categorizing alcohol intake in the various studies. We used three alcohol consumption categories for women (abstainer, 1–12 g/day and >12 g/day) and four for men (abstainer, 1–12 g/day, 12.1–24 g/day and >24 g/day).

Table 6 Minimally adjusted^a mean years of schooling by centre ordered from south to north, gender and alcohol consumption categories

Country and centre	Men										Women					
	N	Abstainers		1–12 g		12.1–24 g		> 24 g		N	Abstainers		1–12 g		12.1–24 g	
		M	s.e.	M	s.e.	M	s.e.	M	s.e.		M	s.e.	M	s.e.	M	s.e.
Greece	1311	9.6	0.36	10.6	0.19	8.9	0.3	8.4	0.28	1373	7.6	0.17	9.7	0.16	7.5	0.41
<i>Spain</i>																
Granada	214	8.9	0.65	9.5	0.64	8.7	0.87	6.3	0.58	300	2.5	0.30	4.6	0.54	6.4	0.97
Murcia	243	7.3	0.90	5.7	0.61	5.6	0.73	5.4	0.49	304	4.5	0.41	5.7	0.37	3.6	0.56
Navarra	444	6.6	0.63	5.6	0.51	5.4	0.57	6.1	0.31	271	4.5	0.32	5.6	0.52	6.9	0.65
San Sebastian	490	6.4	0.67	6.7	0.57	5.9	0.55	6.1	0.28	244	5.0	0.37	5.6	0.51	6.1	0.55
Asturias	386	4.6	0.50	6.7	0.62	8.1	0.62	7.3	0.36	324	4.4	0.28	5.8	0.57	5.1	0.59
<i>Italy</i>																
Ragusa	168	10.8	0.88	11.5	0.6	9.3	0.82	9.9	0.72	138	10.2	0.49	10.1	0.57	8.8	1.00
Naples	403	10.9	0.30	11.0	0.37	11.8	0.43			403	10.9	0.30	11.0	0.37	11.8	0.43
Florence	271	10.6	0.76	12.0	0.67	11.5	0.65	11.7	0.42	784	11.0	0.22	11.3	0.29	11.7	0.27
Turin	676	11.3	0.53	11.6	0.44	10.6	0.48	11.0	0.24	392	10.3	0.33	11.5	0.41	10.9	0.35
Varese	327	11.5	0.82	11.4	0.58	10.2	0.73	10.1	0.35	794	9.9	0.22	9.6	0.27	9.7	0.28
<i>France</i>																
South coast										620	13.6	0.36	13.6	0.24	13.8	0.30
South										1425	13.5	0.23	13.7	0.16	14.3	0.21
North-East										2059	13.3	0.20	13.9	0.14	14.0	0.16
North-West										631	13.6	0.40	12.8	0.24	14.0	0.28
<i>Germany</i>																
Heidelberg	1034	9.2	0.49	9.9	0.26	10.2	0.31	10.4	0.24	1087	9.0	0.29	9.4	0.18	10.9	0.22
Potsdam	1233	11.3	0.57	12.1	0.23	12.6	0.26	12.3	0.23	1061	8.7	0.33	10.2	0.16	10.9	0.26
<i>The Netherlands</i>																
Bilthoven	1024	9.4	0.37	10.7	0.25	11.3	0.34	11.4	0.27	1086	9.5	0.22	11.0	0.19	12.1	0.25
Utrecht										1870	10.1	0.17	11.2	0.15	12.6	0.18
<i>United Kingdom</i>																
General population	402	10.6	0.80	11.6	0.37	12.3	0.55	11.8	0.61	570	9.9	0.40	10.9	0.26	11.4	0.40
Health-conscious	114	13.8	1.13	14.9	0.73	12.2	1.33	15.6	1.12	197	15.0	0.62	14.4	0.42	14.4	0.69
<i>Denmark</i>																
Copenhagen	1356	10.0	0.92	10.9	0.25	11.0	0.23	11.2	0.2	1484	8.9	0.40	9.9	0.15	10.7	0.17
Aarhus	567	8.5	0.92	9.8	0.36	10.9	0.38	10.4	0.32	510	7.9	0.58	9.3	0.25	10.4	0.29
<i>Sweden</i>																
Malmö	1421	10.6	0.35	10.3	0.2	11.0	0.25	11.3	0.28	1711	8.9	0.19	10.8	0.14	11.7	0.20
Umeå	1344	9.9	0.28	10.2	0.16	11.4	0.38	12.4	1.02	1574	10.2	0.15	11.7	0.14	13.9	0.99
<i>Norway</i>																
South and East										1004	9.8	0.23	10.7	0.16	11.0	0.83
North and West										793	8.9	0.23	10.4	0.19	11.3	1.09

Abbreviations: M, mean; s.e., standard error.

^aAdjusted for age, and weighted by season and day of recall.

The Nurses' Health and Health Professionals studies used six categories of alcohol consumption (Colditz *et al.*, 1991). Other studies defined moderate and heavy drinkers in different ways (Thomson *et al.*, 1988; Veenstra *et al.*, 1993).

With regard to the dietary instrument, we used a 24-HDR interview, whereas other studies used 7-day weighted records (Thomson *et al.*, 1988), 2-day records (Veenstra *et al.*, 1993), food frequency questionnaires (Colditz *et al.*, 1991; D'Avanzo *et al.*, 1997) or diet history (Thomson *et al.*, 1988; Le Marchand *et al.*, 1989). The principal limitation of our 24-HDR is that it could not capture day-to-day variations in diet, as only a single

measurement was obtained from the study subjects for calibration purposes. This would be problematic if we were trying to assess habitual alcohol intake in individuals. We were, however, interested only in variations in the mean drinking patterns across centres and countries, and this instrument is particularly suited to assess group means. A strength of the 24-HDR, and hence of our study, is that it is a highly standardized, detailed method of collecting data on alcohol consumption and converting it into ethanol, using an *ad hoc* harmonized nutrient database across countries (Slimani *et al.*, 2007).

Our study is important for its analysis of places of alcohol consumption and types of beverage consumed in different places. We found that outside the home, men in Northern and Central European centres tended to consume alcohol more at friends' homes than at other places, whereas in Spain, bars were the preferred places of consumption. Among women, alcohol outside the home was generally consumed at friends' homes in all centres, although in Spain and the United Kingdom, consumption in bars was also prominent. As expected, Mediterraneans preferred wine and Northern Europeans preferred beer, regardless of where the drinks were consumed.

The GENACIS results on drinking in 'bars, pubs and discos' showed, as we did, that the greatest frequency occurs in Spain and the United Kingdom (Ahlström *et al.*, 2005). Similarly, the ECAS (The European Cancer Anaemia) survey showed that drinking in restaurants and bars was most frequent in the United Kingdom (and to a lesser extent in France and Italy), with the lowest frequency occurring in Sweden (Leifman, 2008).

With regard to alcohol consumption and BMI, we found that these variables inversely associated in women, in accordance with several other studies (Jones *et al.*, 1982; Gruchow *et al.*, 1985; Williamson *et al.*, 1987; Kaye *et al.*, 1990; Colditz *et al.*, 1991; Liu *et al.*, 1994; Mannisto *et al.*, 1997). In men, some studies have found no relationship between alcohol and BMI (Colditz *et al.*, 1991; Dallongeville *et al.*, 1998), but others have found either a direct association (Fisher and Gordon, 1985)—as we did for many centres—or an inverse one (Mannisto *et al.*, 1997; Wilsgaard *et al.*, 2005).

Our study also reveals that the educational level of male higher level drinkers was lower than that of abstainers in most Mediterranean centres, but higher in other countries. Among women, this association was less consistent. Regarding the association between high alcohol consumption and education level, studies have shown inconsistent results. Some studies reported education to be negatively associated with heavy alcohol consumption in both genders (Cummins *et al.*, 1981; Knupfer, 1989; Hulshof *et al.*, 1991; Tejera *et al.*, 1991), whereas in other studies, the finding was less consistent for women than for men (Droomers *et al.*, 1999; van Oers *et al.*, 1999). As our study revealed the existence of differing geographical patterns, this could be a possible explanation for the inconsistencies found in the literature.

It is not possible to extrapolate our findings to other populations as the EPIC cohorts are not representative samples of the populations from which they were drawn; nevertheless, it is interesting that our study revealed clear geographical differences in drinking habits across Europe and shed light on the varying characteristics of different categories of European drinkers.

Conflict of interest

P Wallström received lecture fees from Prenet AB. CL Parr has received grant support from the Norwegian Foundation for Health and Rehabilitation. M Jenab has received grant

support from the World Cancer Research Fund. S Bingham has received grant support from MRC Centre. The remaining authors have declared no financial interests.

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Appendix

Table A1 Fully adjusted^a mean alcohol intake by centre ordered from south to north, gender and age group

Country and centre	Men										Women												
	All		35–44 years		45–54 years		55–64 years		65–74 years		N	All		35–44 years		45–54 years		55–64 years		65–74 years			
	M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.		M	s.e.	M	s.e.	M	s.e.	M	s.e.	M	s.e.		
Greece	1311	23.8	0.8	31.5	2.5	23.2	1.7	22.7	1.5	22.1	1.3	1373	6.8	0.5	8.2	1.2	6.0	0.8	6.8	0.8	6.8	0.9	
Spain																							
Granada	214	21.2	2.0	—	—	22.6	4.2	19.7	2.7	22.6	4.5	300	4.9	0.9	4.7	2.4	4.4	1.6	5.1	1.5	6.5	3.0	
Murcia	243	23.8	1.9	21.3	5.9	24.1	3.4	25.7	2.6	15.5	6.6	304	7.1	0.9	11.0	1.9	7.1	1.6	4.5	1.5	—	—	
Navarra	444	30.8	1.4	29.6	6.1	32.8	2.3	29.8	2.0	29.4	4.3	271	4.2	1.0	4.6	2.6	5.4	1.6	3.4	1.5	—	—	
San Sebastian	490	29.0	1.4	27.4	3.2	29.5	1.9	29.2	2.5	41.5	6.7	244	6.2	1.0	6.7	2.2	7.2	1.7	5.9	1.7	—	—	
Asturias	386	27.0	1.5	25.8	5.6	26.7	2.5	26.5	2.2	30.3	4.1	324	6.0	0.9	7.7	2.2	6.8	1.5	5.2	1.4	4.2	3.3	
Italy																							
Ragusa	168	13.6	2.3	—	—	13.5	3.4	13.2	3.5	—	—	138	4.4	1.4	3.1	2.3	7.7	2.6	3.3	2.4	—	—	
Naples	271	20.8	1.8	17.6	5.6	20.1	3.1	20.6	2.5	—	—	403	8.8	0.8	14.0	2.6	9.9	1.3	8.0	1.2	3.0	2.6	
Florence	676	30.5	1.1	24.2	3.7	27.8	1.9	34.4	1.6	28.1	4.3	392	12.0	0.8	10.3	2.6	12.2	1.4	12.8	1.1	11.8	2.3	
Varese	327	30.6	1.6	—	—	25.4	3.6	32.1	2.0	31.6	5.5	794	7.8	0.6	6.9	1.8	7.7	1.0	7.1	0.9	12.1	1.7	
France																							
South coast																							
South																							
North-East																							
North-West																							
Germany																							
Heidelberg	1034	30.4	0.9	28.7	2.4	32.6	1.5	30.1	1.3	—	—	1087	13.2	0.5	12.4	0.8	14.5	0.9	13.7	0.8	—	—	
Potsdam	1233	22.8	0.8	28.3	2.4	24.6	1.7	20.8	1.1	25.2	3.3	1061	8.9	0.5	8.6	1.0	10.9	1.0	8.3	0.7	7.8	3.1	
The Netherlands																							
Bilthoven	1024	23.1	1.0	22.2	1.8	25.3	1.4	23.5	1.6	—	—	1086	10.2	0.5	9.1	0.9	12.7	0.8	8.9	0.9	—	—	
Utrecht																							
United Kingdom																							
General population	402	22.9	1.5	31.4	4.8	21.4	2.6	23.2	2.7	21.3	2.7	570	13.9	0.7	19.6	2.0	16.1	1.1	10.7	1.2	11.4	1.4	
Health-conscious	114	20.4	2.8	—	—	17.4	4.5	22.5	4.3	—	—	197	8.1	1.1	10.6	3.6	7.3	1.9	8.3	1.8	7.7	3.2	
Denmark																							
Copenhagen	1356	33.7	0.8	—	—	35.7	1.3	32.9	1.0	26.3	4.0	1484	19.2	0.4	—	—	21.0	0.7	18.0	0.5	17.8	2.0	
Aarhus	567	30.6	1.2	—	—	30.8	1.8	30.8	1.8	—	—	510	15.6	0.7	—	—	16.2	1.0	15.0	1.0	—	—	
Sweden																							
Malmö	1421	17.6	0.8	—	—	16.7	2.3	18.1	1.2	16.0	1.1	1711	8.4	0.4	—	—	10.2	0.8	8.9	0.6	6.2	0.6	
Umeå	1344	10.0	0.8	6.2	2.7	12.3	1.5	9.8	1.1	7.4	2.4	1574	5.2	0.4	4.8	1.0	6.2	0.7	4.9	0.6	4.2	1.3	
Norway																							
South and East																							
North and West																							